SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			1,3-DIMETHYLBENZENE/M-XYLENE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.23	<LM23	0.23	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	21-SA-06	08/15/1991	21SA0602NR	1.500	1.0	*LM23	1.0	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	21-SA-06	08/15/1991	21SA0602Y	1.500	3.3	<LM23	3.3	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	21-SA-06	08/15/1991	21SA0602Y	1.500	2.0	<LM23	2.0	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.1	<LM23	0.1	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.2	<LM23	0.2	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	21-SA-06	08/15/1991	21SA0602Y	1.500	0.2	<LM23	0.2	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.26	<LM23	0.26	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	21-SA-06	08/15/1991	21SA0602NR	1.500	0.6	*LM23	0.6	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.31	<LM23	0.31	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	21-SA-06	08/15/1991	21SA0602Y	1.500	0.24	<LM23	0.24	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.1	<LM23	0.1	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.64	<LM23	0.64	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	21-SA-06	08/15/1991	21SA0602Y	1.500	1.8	<LM23	1.8	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.96	<LM23	0.96	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	21-SA-06	08/15/1991	21SA0602NR	1.500	0.6	*LM23	0.6	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.25	<LM23	0.25	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	21-SA-06	08/15/1991	21SA0602Y	1.500	0.2	<LM23	0.2	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.19	<LM23	0.19	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	21-SA-06	08/15/1991	21SA0602NR	1.500	1.0	*LM23	1.0	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	21-SA-06	08/15/1991	21SA0602Y	1.500	4.4	<LM23	4.4	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	21-SA-06	08/15/1991	21SA0602Y	1.500	4.3	<LM23	4.3	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.63	<LM23	0.63	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	21-SA-06	08/15/1991	21SA0602NR	1.500	0.6	*LM23	0.6	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	21-SA-06	08/15/1991	21SA0602Y	1.500	0.16	<LM23	0.16	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.1	<LM23	0.1	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	21-SA-06	08/15/1991	21SA0602NR	1.500	0.6	*LM23	0.6	UGG
				21-SS-07	08/15/1991	21SS0701NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	21-SA-06	08/15/1991	21SA0602Y	1.500	0.23	<LM23	0.23	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	21-SA-06	08/15/1991	21SA0602Y	1.500	0.23	<LM23	0.23	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	21-SA-06	08/15/1991	21SA0602Y	1.500	0.78	<LM23	0.78	UGG
				21-SS-07	08/15/1991	21SS0701Y	0.500	0.78	<LM23	0.78	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP22	SD	EXPLOSIVES	2,4-DINITROTOLUENE	22-SD-01	08/09/1991	22SD0101N	0.500	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	22-SD-01	08/09/1991	22SD0101N	0.500	0.32	<LM25	0.32	UGG
			NITROBENZENE	22-SD-01	08/09/1991	22SD0101N	0.500	1.8	<LM25	1.8	UGG
		METALS	ANTIMONY	22-SD-01	08/09/1991	22SD0101N	0.500	19.6	<99	19.6	UGG
			ARSENIC	22-SD-01	08/09/1991	22SD0101Y	0.500	18.4	=B9	2.5	UGG
			BARIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	233.0	=JS12	3.29	UGG
			BERYLLIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	0.971	=JS12	0.427	UGG
			CADMIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	27.5	=JS12	1.04	UGG
			COPPER	22-SD-01	08/09/1991	22SD0101Y	0.500	17.4	=JS12	2.84	UGG
			LEAD	22-SD-01	08/09/1991	22SD0101Y	0.500	36.0	=JD21	0.467	UGG
			MERCURY	22-SD-01	08/09/1991	22SD0101Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	22-SD-01	08/09/1991	22SD0101Y	0.500	26.1	=JS12	2.74	UGG
			SELENIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	22-SD-01	08/09/1991	22SD0101Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	22-SD-01	08/09/1991	22SD0101Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	22-SD-01	08/09/1991	22SD0101Y	0.500	220.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	22-SD-01	08/09/1991	22SD0101N	0.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	22-SD-01	08/09/1991	22SD0101N	0.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	22-SD-01	08/09/1991	22SD0101N	0.500	0.064	<LM25	0.064	UGG
			ALDRIN	22-SD-01	08/09/1991	22SD0101N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	22-SD-01	08/09/1991	22SD0101N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	22-SD-01	08/09/1991	22SD0101N	0.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	22-SD-01	08/09/1991	22SD0101N	0.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	22-SD-01	08/09/1991	22SD0101N	0.500	2.4	<LM25	2.4	UGG
			CHLORDANE	22-SD-01	08/09/1991	22SD0101N	0.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	22-SD-01	08/09/1991	22SD0101N	0.500	0.21	<LM25	0.21	UGG
			DIELDRIN	22-SD-01	08/09/1991	22SD0101N	0.500	0.079	<LM25	0.079	UGG
			ENDRIN	22-SD-01	08/09/1991	22SD0101N	0.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	22-SD-01	08/09/1991	22SD0101N	0.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	22-SD-01	08/09/1991	22SD0101N	0.500	0.48	<LM25	0.48	UGG
			ISODRIN	22-SD-01	08/09/1991	22SD0101N	0.500	0.48	<LM25	0.48	UGG
			LINDANE	22-SD-01	08/09/1991	22SD0101N	0.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	22-SD-01	08/09/1991	22SD0101N	0.500	0.26	<LM25	0.26	UGG
			PCB 1016	22-SD-01	08/09/1991	22SD0101N	0.500	0.32	<LM25	0.32	UGG
			PCB 1221	22-SD-01	08/09/1991	22SD0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1232	22-SD-01	08/09/1991	22SD0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1242	22-SD-01	08/09/1991	22SD0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1248	22-SD-01	08/09/1991	22SD0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1254	22-SD-01	08/09/1991	22SD0101NR	0.500	3.8	*LM25	3.8	UGG
			PCB 1260	22-SD-01	08/09/1991	22SD0101N	0.500	0.79	<LM25	0.79	UGG
			PCB 1262	22-SD-01	08/09/1991	22SD0101Y	0.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	22-SD-01	08/09/1991	22SD0101NR	0.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.075	<LM25	0.075	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			2,3,6-TCP	22-SD-01	08/09/1991	22SD0101Y	0.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	22-SD-01	08/09/1991	22SD0101Y	0.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	22-SD-01	08/09/1991	22SD0101NR	0.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	22-SD-01	08/09/1991	22SD0101Y	0.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	22-SD-01	08/09/1991	22SD0101Y	0.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	22-SD-01	08/09/1991	22SD0101Y	0.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	22-SD-01	08/09/1991	22SD0101NR	0.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	22-SD-01	08/09/1991	22SD0101Y	0.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	22-SD-01	08/09/1991	22SD0101NR	0.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.71	<LM25	0.71	UGG
			ATRAZINE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	22-SD-01	08/09/1991	22SD0101NR	0.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	22-SD-01	08/09/1991	22SD0101Y	0.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	22-SD-01	08/09/1991	22SD0101Y	0.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	4.43	=LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.8	<LM25	1.8	UGG
			CHRYSENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	22-SD-01	08/09/1991	22SD0101Y	0.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.24	<LM25	0.24	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			DIMETHYL PHTHALATE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.063	<LM25	0.063	UGG
			DITHIANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	22-SD-01	08/09/1991	22SD0101NR	0.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.032	<LM25	0.032	UGG
			FLUORENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	22-SD-01	08/09/1991	22SD0101Y	0.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.39	<LM25	0.39	UGG
			MALATHION	22-SD-01	08/09/1991	22SD0101Y	0.500	0.18	<LM25	0.18	UGG
			MIREX	22-SD-01	08/09/1991	22SD0101Y	0.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.32	<LM25	0.32	UGG
			PARATHION	22-SD-01	08/09/1991	22SD0101Y	0.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.238	=LM25	0.032	UGG
			PHENOL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.052	<LM25	0.052	UGG
			PYRENE	22-SD-01	08/09/1991	22SD0101Y	0.500	11.1	=LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	22-SD-01	08/09/1991	22SD0101Y	0.500	0.92	<LM25	0.92	UGG
			VAPONA	22-SD-01	08/09/1991	22SD0101Y	0.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	22-SD-01	08/09/1991	22SD0101Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	22-SD-01	08/09/1991	22SD0101Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	22-SD-01	08/09/1991	22SD0101Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	22-SD-01	08/09/1991	22SD0101N	0.500	0.042	<LM25	0.042	UGG
						22SD0101Y	0.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	22-SD-01	08/09/1991	22SD0101NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	22-SD-01	08/09/1991	22SD0101Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	22-SD-01	08/09/1991	22SD0101Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.26	<LM23	0.26	UGG

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			CARBON DISULFIDE	22-SD-01	08/09/1991	22SD0101NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	22-SD-01	08/09/1991	22SD0101Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	22-SD-01	08/09/1991	22SD0101Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	22-SD-01	08/09/1991	22SD0101NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	22-SD-01	08/09/1991	22SD0101Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	22-SD-01	08/09/1991	22SD0101NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	22-SD-01	08/09/1991	22SD0101Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	22-SD-01	08/09/1991	22SD0101Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	22-SD-01	08/09/1991	22SD0101NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	22-SD-01	08/09/1991	22SD0101Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.444	=LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	22-SD-01	08/09/1991	22SD0101NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	22-SD-01	08/09/1991	22SD0101Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	22-SD-01	08/09/1991	22SD0101Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	22-SD-01	08/09/1991	22SD0101Y	0.500	0.78	<LM23	0.78	UGG
	SO	EXPLOSIVES	2,4-DINITROTOLUENE	22-SA-02	08/09/1991	22SA0201N	0.500	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	22-SA-02	08/09/1991	22SA0201N	0.500	0.32	<LM25	0.32	UGG
			NITROBENZENE	22-SA-02	08/09/1991	22SA0201N	0.500	1.8	<LM25	1.8	UGG
		METALS	ANTIMONY	22-SA-02	08/09/1991	22SA0201N	0.500	19.6	<99	19.6	UGG
			ARSENIC	22-SA-02	08/09/1991	22SA0201Y	0.500	8.46	=B9	2.5	UGG
			BARIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	230.0	=JS12	3.29	UGG
			BERYLLIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	1.02	=JS12	0.427	UGG
			CADMIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	31.2	=JS12	1.04	UGG
			COPPER	22-SA-02	08/09/1991	22SA0201Y	0.500	25.1	=JS12	2.84	UGG
			LEAD	22-SA-02	08/09/1991	22SA0201Y	0.500	40.0	=JD21	0.467	UGG
			MERCURY	22-SA-02	08/09/1991	22SA0201Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	22-SA-02	08/09/1991	22SA0201Y	0.500	21.6	=JS12	2.74	UGG
			SELENIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	22-SA-02	08/09/1991	22SA0201Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	22-SA-02	08/09/1991	22SA0201Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	22-SA-02	08/09/1991	22SA0201Y	0.500	113.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	22-SA-02	08/09/1991	22SA0201N	0.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	22-SA-02	08/09/1991	22SA0201N	0.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	22-SA-02	08/09/1991	22SA0201N	0.500	0.064	<LM25	0.064	UGG
			ALDRIN	22-SA-02	08/09/1991	22SA0201N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	22-SA-02	08/09/1991	22SA0201N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	22-SA-02	08/09/1991	22SA0201N	0.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	22-SA-02	08/09/1991	22SA0201N	0.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	22-SA-02	08/09/1991	22SA0201N	0.500	2.4	<LM25	2.4	UGG
			CHLORDANE	22-SA-02	08/09/1991	22SA0201N	0.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	22-SA-02	08/09/1991	22SA0201N	0.500	0.21	<LM25	0.21	UGG

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			DIELDRIN	22-SA-02	08/09/1991	22SA0201N	0.500	0.079	<LM25	0.079	UGG
			ENDRIN	22-SA-02	08/09/1991	22SA0201N	0.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	22-SA-02	08/09/1991	22SA0201N	0.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	22-SA-02	08/09/1991	22SA0201N	0.500	0.48	<LM25	0.48	UGG
			ISODRIN	22-SA-02	08/09/1991	22SA0201N	0.500	0.48	<LM25	0.48	UGG
			LINDANE	22-SA-02	08/09/1991	22SA0201N	0.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	22-SA-02	08/09/1991	22SA0201N	0.500	0.26	<LM25	0.26	UGG
			PCB 1016	22-SA-02	08/09/1991	22SA0201N	0.500	0.32	<LM25	0.32	UGG
			PCB 1221	22-SA-02	08/09/1991	22SA0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1232	22-SA-02	08/09/1991	22SA0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1242	22-SA-02	08/09/1991	22SA0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1248	22-SA-02	08/09/1991	22SA0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1254	22-SA-02	08/09/1991	22SA0201NR	0.500	3.8	*LM25	3.8	UGG
			PCB 1260	22-SA-02	08/09/1991	22SA0201N	0.500	0.79	<LM25	0.79	UGG
			PCB 1262	22-SA-02	08/09/1991	22SA0201Y	0.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	22-SA-02	08/09/1991	22SA0201NR	0.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.075	<LM25	0.075	UGG
			2,3,6-TCP	22-SA-02	08/09/1991	22SA0201Y	0.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	22-SA-02	08/09/1991	22SA0201Y	0.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	22-SA-02	08/09/1991	22SA0201NR	0.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	22-SA-02	08/09/1991	22SA0201Y	0.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	22-SA-02	08/09/1991	22SA0201Y	0.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	22-SA-02	08/09/1991	22SA0201Y	0.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	22-SA-02	08/09/1991	22SA0201NR	0.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	22-SA-02	08/09/1991	22SA0201Y	0.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	22-SA-02	08/09/1991	22SA0201NR	0.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.033	<LM25	0.033	UGG

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			ANTHRACENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.71	<LM25	0.71	UGG
			ATRAZINE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	22-SA-02	08/09/1991	22SA0201NR	0.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	22-SA-02	08/09/1991	22SA0201Y	0.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	22-SA-02	08/09/1991	22SA0201Y	0.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.8	<LM25	1.8	UGG
			CHRYSENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	22-SA-02	08/09/1991	22SA0201Y	0.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.063	<LM25	0.063	UGG
			DITHIANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	22-SA-02	08/09/1991	22SA0201NR	0.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.119	=LM25	0.032	UGG
			FLUORENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	22-SA-02	08/09/1991	22SA0201Y	0.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.39	<LM25	0.39	UGG
			MALATHION	22-SA-02	08/09/1991	22SA0201Y	0.500	0.18	<LM25	0.18	UGG
			MIREX	22-SA-02	08/09/1991	22SA0201Y	0.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.32	<LM25	0.32	UGG
			PARATHION	22-SA-02	08/09/1991	22SA0201Y	0.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.032	<LM25	0.032	UGG
			PHENOL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.052	<LM25	0.052	UGG
			PYRENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.242	=LM25	0.083	UGG

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			SUPONA/2-CHLORO-1-(2,4-DICHLOR	22-SA-02	08/09/1991	22SA0201Y	0.500	0.92	<LM25	0.92	UGG
			VAPONA	22-SA-02	08/09/1991	22SA0201Y	0.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	22-SA-02	08/09/1991	22SA0201Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	22-SA-02	08/09/1991	22SA0201Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	22-SA-02	08/09/1991	22SA0201Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	22-SA-02	08/09/1991	22SA0201N	0.500	0.042	<LM25	0.042	UGG
						22SA0201Y	0.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	22-SA-02	08/09/1991	22SA0201NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	22-SA-02	08/09/1991	22SA0201Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	22-SA-02	08/09/1991	22SA0201Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	22-SA-02	08/09/1991	22SA0201NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	22-SA-02	08/09/1991	22SA0201Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	22-SA-02	08/09/1991	22SA0201Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	22-SA-02	08/09/1991	22SA0201NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	22-SA-02	08/09/1991	22SA0201Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	22-SA-02	08/09/1991	22SA0201NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	22-SA-02	08/09/1991	22SA0201Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	22-SA-02	08/09/1991	22SA0201Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	22-SA-02	08/09/1991	22SA0201NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	22-SA-02	08/09/1991	22SA0201Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	22-SA-02	08/09/1991	22SA0201NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	22-SA-02	08/09/1991	22SA0201Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	22-SA-02	08/09/1991	22SA0201Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	22-SA-02	08/09/1991	22SA0201Y	0.500	0.78	<LM23	0.78	UGG

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IAAP23	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	23-SA-01	08/15/1991	23SA0101Y	0.500	2.1	<LW02	2.09	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	23-SA-01	08/15/1991	23SA0101Y	0.500	0.59	<LW02	0.59	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.59	<LW02	0.59	UGG
			2,4,6-TNT	23-SA-01	08/15/1991	23SA0101Y	0.500	1.9	<LW02	1.92	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	23-SA-01	08/15/1991	23SA0101Y	0.500	0.42	<LW02	0.42	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.42	<LW02	0.42	UGG
				23-SA-03	08/15/1991	23SA0301N	3.000	1.4	<LM25	1.4	UGG
						23SA0302N	3.000	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	23-SA-01	08/15/1991	23SA0101Y	0.500	0.4	<LW02	0.4	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.4	<LW02	0.4	UGG
				23-SA-03	08/15/1991	23SA0301N	3.000	0.32	<LM25	0.32	UGG
						23SA0302N	3.000	0.32	<LM25	0.32	UGG
			HMX	23-SA-01	08/15/1991	23SA0101Y	0.500	1.3	<LW02	1.27	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	1.3	<LW02	1.27	UGG
			NITROBENZENE	23-SA-01	08/15/1991	23SA0101Y	0.500	0.42	<LW02	0.42	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.42	<LW02	0.42	UGG
				23-SA-03	08/15/1991	23SA0301N	3.000	1.8	<LM25	1.8	UGG
						23SA0302N	3.000	1.8	<LM25	1.8	UGG
			RDX	23-SA-01	08/15/1991	23SA0101Y	0.500	0.98	<LW02	0.98	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.98	<LW02	0.98	UGG
			TETRYL	23-SA-01	08/15/1991	23SA0101Y	0.500	0.25	<LW02	0.25	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	23-SA-01	08/15/1991	23SA0101Y	0.500	19.6	<JS12	19.6	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	19.6	<JS12	19.6	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	19.6	<JS12	19.6	UGG
						23SA0302Y	3.000	19.6	<JS12	19.6	UGG
			ARSENIC	23-SA-01	08/15/1991	23SA0101Y	0.500	5.42	=B9	2.5	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	6.15	=B9	2.5	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	8.63	=B9	2.5	UGG
						23SA0302Y	3.000	7.94	=B9	2.5	UGG
			BARIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	108.0	=JS12	3.29	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	5,100.0	=JS12	3.29	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	186.0	=JS12	3.29	UGG
						23SA0302Y	3.000	178.0	=JS12	3.29	UGG
			BERYLLIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	0.873	=JS12	0.427	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	2.15	=JS12	0.427	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	0.758	=JS12	0.427	UGG
						23SA0302Y	3.000	0.67	=JS12	0.427	UGG
			CADMIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	1.2	<JS12	1.2	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	180.0	=JS12	1.2	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	1.2	<JS12	1.2	UGG
						23SA0302Y	3.000	1.2	<JS12	1.2	UGG
			CHROMIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	19.9	=JS12	1.04	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	613.0	=JS12	1.04	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	20.9	=JS12	1.04	UGG
						23SA0302Y	3.000	24.4	=JS12	1.04	UGG
			COPPER	23-SA-01	08/15/1991	23SA0101Y	0.500	9.71	=JS12	2.84	UGG

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				23-SA-02	08/15/1991	23SA0201Y	0.800	5,100.0	=JS12	2.84	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	25.5	=JS12	2.84	UGG
						23SA0302Y	3.000	22.5	=JS12	2.84	UGG
			LEAD	23-SA-01	08/15/1991	23SA0101Y	0.500	10.0	=JD21	0.467	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	6,400.0	=JD21	0.467	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	42.0	=JD21	0.467	UGG
						23SA0302Y	3.000	11.0	=JD21	0.467	UGG
			MERCURY	23-SA-01	08/15/1991	23SA0101Y	0.500	0.05	<Y9	0.05	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.271	=Y9	0.05	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	0.05	<Y9	0.05	UGG
						23SA0302Y	3.000	0.05	<Y9	0.05	UGG
			NICKEL	23-SA-01	08/15/1991	23SA0101Y	0.500	12.9	=JS12	2.74	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	147.0	=JS12	2.74	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	19.8	=JS12	2.74	UGG
						23SA0302Y	3.000	20.1	=JS12	2.74	UGG
			SELENIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	0.449	<JD20	0.449	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	0.449	<JD20	0.449	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	0.449	<JD20	0.449	UGG
						23SA0302Y	3.000	0.449	<JD20	0.449	UGG
			SILVER	23-SA-01	08/15/1991	23SA0101Y	0.500	0.803	<JS12	0.803	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	20.0	=JS12	0.803	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	0.803	<JS12	0.803	UGG
						23SA0302Y	3.000	0.803	<JS12	0.803	UGG
			THALLIUM	23-SA-01	08/15/1991	23SA0101Y	0.500	34.3	<JS12	34.3	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	34.3	<JS12	34.3	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	34.3	<JS12	34.3	UGG
						23SA0302Y	3.000	34.3	<JS12	34.3	UGG
			ZINC	23-SA-01	08/15/1991	23SA0101Y	0.500	30.9	=JS12	2.34	UGG
				23-SA-02	08/15/1991	23SA0201Y	0.800	14,000.0	=JS12	2.34	UGG
				23-SA-03	08/15/1991	23SA0301Y	3.000	63.2	=JS12	2.34	UGG
						23SA0302Y	3.000	61.3	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	23-SA-03	08/15/1991	23SA0301N	3.000	0.068	<LM25	0.068	UGG
						23SA0302N	3.000	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	23-SA-03	08/15/1991	23SA0301N	3.000	0.1	<LM25	0.1	UGG
						23SA0302N	3.000	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	23-SA-03	08/15/1991	23SA0301N	3.000	0.064	<LM25	0.064	UGG
						23SA0302N	3.000	0.064	<LM25	0.064	UGG
			ALDRIN	23-SA-03	08/15/1991	23SA0301N	3.000	1.3	<LM25	1.3	UGG
						23SA0302N	3.000	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	23-SA-03	08/15/1991	23SA0301N	3.000	1.3	<LM25	1.3	UGG
						23SA0302N	3.000	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	23-SA-03	08/15/1991	23SA0301N	3.000	0.4	<LM25	0.4	UGG
						23SA0302N	3.000	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	23-SA-03	08/15/1991	23SA0301N	3.000	1.3	<LM25	1.3	UGG
						23SA0302N	3.000	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	23-SA-03	08/15/1991	23SA0301N	3.000	2.4	<LM25	2.4	UGG
						23SA0302N	3.000	2.4	<LM25	2.4	UGG
			CHLORDANE	23-SA-03	08/15/1991	23SA0301N	3.000	0.68	<LM25	0.68	UGG
						23SA0302N	3.000	0.68	<LM25	0.68	UGG

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			DELTA-BENZENEHEXACHLORIDE	23-SA-03	08/15/1991	23SA0301N	3.000	0.21	<LM25	0.21	UGG
						23SA0302N	3.000	0.21	<LM25	0.21	UGG
			DIELDRIN	23-SA-03	08/15/1991	23SA0301N	3.000	0.079	<LM25	0.079	UGG
						23SA0302N	3.000	0.079	<LM25	0.079	UGG
			ENDRIN	23-SA-03	08/15/1991	23SA0301N	3.000	1.3	<LM25	1.3	UGG
						23SA0302N	3.000	1.3	<LM25	1.3	UGG
			HEPTACHLOR	23-SA-03	08/15/1991	23SA0301N	3.000	0.24	<LM25	0.24	UGG
						23SA0302N	3.000	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	23-SA-03	08/15/1991	23SA0301N	3.000	0.48	<LM25	0.48	UGG
						23SA0302N	3.000	0.48	<LM25	0.48	UGG
			ISODRIN	23-SA-03	08/15/1991	23SA0301N	3.000	0.48	<LM25	0.48	UGG
						23SA0302N	3.000	0.48	<LM25	0.48	UGG
			LINDANE	23-SA-03	08/15/1991	23SA0301N	3.000	0.1	<LM25	0.1	UGG
						23SA0302N	3.000	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	23-SA-03	08/15/1991	23SA0301N	3.000	0.26	<LM25	0.26	UGG
						23SA0302N	3.000	0.26	<LM25	0.26	UGG
			PCB 1016	23-SA-03	08/15/1991	23SA0301N	3.000	0.32	<LM25	0.32	UGG
						23SA0302N	3.000	0.32	<LM25	0.32	UGG
			PCB 1221	23-SA-03	08/15/1991	23SA0301NR	3.000	1.9	*LM25	1.9	UGG
						23SA0302NR	3.000	1.9	*LM25	1.9	UGG
			PCB 1232	23-SA-03	08/15/1991	23SA0301NR	3.000	1.9	*LM25	1.9	UGG
						23SA0302NR	3.000	1.9	*LM25	1.9	UGG
			PCB 1242	23-SA-03	08/15/1991	23SA0301NR	3.000	1.9	*LM25	1.9	UGG
						23SA0302NR	3.000	1.9	*LM25	1.9	UGG
			PCB 1248	23-SA-03	08/15/1991	23SA0301NR	3.000	1.9	*LM25	1.9	UGG
						23SA0302NR	3.000	1.9	*LM25	1.9	UGG
			PCB 1254	23-SA-03	08/15/1991	23SA0301NR	3.000	3.8	*LM25	3.8	UGG
						23SA0302NR	3.000	3.8	*LM25	3.8	UGG
			PCB 1260	23-SA-03	08/15/1991	23SA0301N	3.000	0.79	<LM25	0.79	UGG
						23SA0302N	3.000	0.79	<LM25	0.79	UGG
			PCB 1262	23-SA-03	08/15/1991	23SA0301Y	3.000	6.3	<LM25	0.3	UGG
						23SA0302Y	3.000	6.3	<LM25	0.3	UGG
			TOXAPHENE	23-SA-03	08/15/1991	23SA0301NR	3.000	12.0	*LM25	12.0	UGG
						23SA0302NR	3.000	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.032	<LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.22	<LM25	0.22	UGG
						23SA0302Y	3.000	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.042	<LM25	0.042	UGG
						23SA0302Y	3.000	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.52	<LM25	0.52	UGG
						23SA0302Y	3.000	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.034	<LM25	0.034	UGG
						23SA0302Y	3.000	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.075	<LM25	0.075	UGG
						23SA0302Y	3.000	0.075	<LM25	0.075	UGG
			2,3,6-TCP	23-SA-03	08/15/1991	23SA0301Y	3.000	0.62	<LM25	0.62	UGG
						23SA0302Y	3.000	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.49	<LM25	0.49	UGG

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						23SA0302Y	3.000	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.061	<LM25	0.061	UGG
						23SA0302Y	3.000	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.065	<LM25	0.065	UGG
						23SA0302Y	3.000	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	3.0	<LM25	3.0	UGG
						23SA0302Y	3.000	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	4.7	<LM25	4.7	UGG
						23SA0302Y	3.000	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.57	<LM25	0.57	UGG
						23SA0302Y	3.000	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.24	<LM25	0.24	UGG
						23SA0302Y	3.000	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.055	<LM25	0.055	UGG
						23SA0302Y	3.000	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	23-SA-03	08/15/1991	23SA0301Y	3.000	0.8	<LM25	0.8	UGG
						23SA0302Y	3.000	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	23-SA-03	08/15/1991	23SA0301Y	3.000	12.0	>LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.098	<LM25	0.098	UGG
						23SA0302Y	3.000	0.098	<LM25	0.098	UGG
			2-NITROANILINE	23-SA-03	08/15/1991	23SA0301NR	3.000	3.1	*LM25	3.1	UGG
						23SA0302NR	3.000	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	1.1	<LM25	1.1	UGG
						23SA0302Y	3.000	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.6	<LM25	1.6	UGG
						23SA0302Y	3.000	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.6	<LM25	1.6	UGG
						23SA0302Y	3.000	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	23-SA-03	08/15/1991	23SA0301Y	3.000	0.93	<LM25	0.93	UGG
						23SA0302Y	3.000	0.93	<LM25	0.93	UGG
			3-NITROANILINE	23-SA-03	08/15/1991	23SA0301Y	3.000	3.0	<LM25	3.0	UGG
						23SA0302Y	3.000	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.34	<LM25	0.34	UGG
						23SA0302Y	3.000	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	23-SA-03	08/15/1991	23SA0301Y	3.000	0.041	<LM25	0.041	UGG
						23SA0302Y	3.000	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	23-SA-03	08/15/1991	23SA0301NR	3.000	0.63	*LM25	0.63	UGG
						23SA0302NR	3.000	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	23-SA-03	08/15/1991	23SA0301Y	3.000	0.17	<LM25	0.17	UGG
						23SA0302Y	3.000	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.24	<LM25	0.24	UGG
						23SA0302Y	3.000	0.24	<LM25	0.24	UGG
			4-NITROANILINE	23-SA-03	08/15/1991	23SA0301NR	3.000	3.1	*LM25	3.1	UGG
						23SA0302NR	3.000	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	3.3	<LM25	3.3	UGG
						23SA0302Y	3.000	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.041	<LM25	0.041	UGG
						23SA0302Y	3.000	0.041	<LM25	0.041	UGG

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			ACENAPHTHYLENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.033	<LM25	0.033	UGG
						23SA0302Y	3.000	0.033	<LM25	0.033	UGG
			ANTHRACENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.71	<LM25	0.71	UGG
						23SA0302Y	3.000	0.71	<LM25	0.71	UGG
			ATRAZINE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.065	<LM25	0.065	UGG
						23SA0302Y	3.000	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.041	<LM25	0.48	UGG
						23SA0302Y	3.000	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.2	<LM25	1.2	UGG
						23SA0302Y	3.000	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.31	<LM25	0.31	UGG
						23SA0302Y	3.000	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.18	<LM25	0.18	UGG
						23SA0302Y	3.000	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.13	<LM25	0.13	UGG
						23SA0302Y	3.000	0.13	<LM25	0.13	UGG
			BENZOIC ACID	23-SA-03	08/15/1991	23SA0301NR	3.000	3.1	*LM25	3.1	UGG
						23SA0302NR	3.000	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.032	<LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.19	<LM25	0.19	UGG
						23SA0302Y	3.000	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	23-SA-03	08/15/1991	23SA0301Y	3.000	0.36	<LM25	0.36	UGG
						23SA0302Y	3.000	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	23-SA-03	08/15/1991	23SA0301Y	3.000	0.44	<LM25	0.44	UGG
						23SA0302Y	3.000	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.48	<LM25	0.48	UGG
						23SA0302Y	3.000	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.8	<LM25	1.8	UGG
						23SA0302Y	3.000	1.8	<LM25	1.8	UGG
			CHRYSENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.032	<LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.3	<LM25	1.3	UGG
						23SA0302Y	3.000	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.23	<LM25	0.23	UGG
						23SA0302Y	3.000	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.31	<LM25	0.31	UGG
						23SA0302Y	3.000	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	23-SA-03	08/15/1991	23SA0301Y	3.000	0.038	<LM25	0.038	UGG
						23SA0302Y	3.000	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.071	<LM25	0.071	UGG
						23SA0302Y	3.000	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.57	<LM25	0.57	UGG
						23SA0302Y	3.000	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.24	<LM25	0.24	UGG
						23SA0302Y	3.000	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.063	<LM25	0.063	UGG
						23SA0302Y	3.000	0.063	<LM25	0.063	UGG
			DITHIANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.065	<LM25	0.065	UGG

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						23SA0302Y	3.000	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.2	<LM25	1.2	UGG
						23SA0302Y	3.000	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.8	<LM25	1.8	UGG
						23SA0302Y	3.000	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	23-SA-03	08/15/1991	23SA0301NR	3.000	0.28	*LM25	0.28	UGG
						23SA0302NR	3.000	0.28	*LM25	0.28	UGG
			FLUORANTHENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.032	<LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			FLUORENE	23-SA-03	08/15/1991	23SA0301Y	3.000	3.77	=LM25	0.065	UGG
						23SA0302Y	3.000	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.08	<LM25	0.08	UGG
						23SA0302Y	3.000	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.97	<LM25	0.97	UGG
						23SA0302Y	3.000	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.52	<LM25	0.52	UGG
						23SA0302Y	3.000	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.8	<LM25	1.8	UGG
						23SA0302Y	3.000	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	23-SA-03	08/15/1991	23SA0301Y	3.000	2.4	<LM25	2.4	UGG
						23SA0302Y	3.000	2.4	<LM25	2.4	UGG
			ISOPHORONE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.39	<LM25	0.39	UGG
						23SA0302Y	3.000	0.39	<LM25	0.39	UGG
			MALATHION	23-SA-03	08/15/1991	23SA0301Y	3.000	0.18	<LM25	0.18	UGG
						23SA0302Y	3.000	0.18	<LM25	0.18	UGG
			MIREX	23-SA-03	08/15/1991	23SA0301Y	3.000	0.14	<LM25	0.14	UGG
						23SA0302Y	3.000	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.1	<LM25	1.1	UGG
						23SA0302Y	3.000	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.46	<LM25	0.46	UGG
						23SA0302Y	3.000	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.29	<LM25	0.29	UGG
						23SA0302Y	3.000	0.29	<LM25	0.29	UGG
			NAPHTHALENE	23-SA-03	08/15/1991	23SA0301Y	3.000	6.2	>LM25	0.74	UGG
						23SA0302Y	3.000	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.097	<LM25	0.097	UGG
						23SA0302Y	3.000	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.066	<LM25	0.066	UGG
						23SA0302Y	3.000	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.32	<LM25	0.32	UGG
						23SA0302Y	3.000	0.32	<LM25	0.32	UGG
			PARATHION	23-SA-03	08/15/1991	23SA0301Y	3.000	1.7	<LM25	1.7	UGG
						23SA0302Y	3.000	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.76	<LM25	0.76	UGG
						23SA0302Y	3.000	0.76	<LM25	0.76	UGG
			PHENANTHRENE	23-SA-03	08/15/1991	23SA0301Y	3.000	5.71	=LM25	0.032	UGG
						23SA0302Y	3.000	0.032	<LM25	0.032	UGG
			PHENOL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.052	<LM25	0.052	UGG
						23SA0302Y	3.000	0.052	<LM25	0.052	UGG

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			PYRENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.702	=LM25	0.083	UGG
						23SA0302Y	3.000	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	23-SA-03	08/15/1991	23SA0301Y	3.000	0.92	<LM25	0.92	UGG
						23SA0302Y	3.000	0.92	<LM25	0.92	UGG
			VAPONA	23-SA-03	08/15/1991	23SA0301Y	3.000	0.068	<LM25	0.068	UGG
						23SA0302Y	3.000	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	23-SA-03	08/15/1991	23SA0301Y	3.000	0.5	<LM23	0.5	UGG
						23SA0302Y	3.000	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.33	<LM23	0.33	UGG
						23SA0302Y	3.000	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.49	<LM23	0.49	UGG
						23SA0302Y	3.000	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	23-SA-03	08/15/1991	23SA0301Y	3.000	0.27	<LM23	0.27	UGG
						23SA0302Y	3.000	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.32	<LM23	0.32	UGG
						23SA0302Y	3.000	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	23-SA-03	08/15/1991	23SA0301Y	3.000	0.32	<LM23	0.32	UGG
						23SA0302Y	3.000	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.53	<LM23	0.53	UGG
						23SA0302Y	3.000	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	23-SA-03	08/15/1991	23SA0301N	3.000	0.042	<LM25	0.042	UGG
						23SA0301Y	3.000	0.14	<LM23	0.14	UGG
						23SA0302N	3.000	0.042	<LM25	0.042	UGG
						23SA0302Y	3.000	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	23-SA-03	08/15/1991	23SA0301Y	3.000	7.0	=LM23	0.23	UGG
						23SA0302Y	3.000	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	23-SA-03	08/15/1991	23SA0301NR	3.000	1.0	*LM23	1.0	UGG
						23SA0302NR	3.000	1.0	*LM23	1.0	UGG
			ACETONE	23-SA-03	08/15/1991	23SA0301Y	3.000	3.3	<LM23	3.3	UGG
						23SA0302Y	3.000	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	23-SA-03	08/15/1991	23SA0301Y	3.000	2.0	<LM23	2.0	UGG
						23SA0302Y	3.000	2.0	<LM23	2.0	UGG
			BENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.1	<LM23	0.1	UGG
						23SA0302Y	3.000	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			BROMOFORM	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			BROMOMETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.26	<LM23	0.26	UGG
						23SA0302Y	3.000	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	23-SA-03	08/15/1991	23SA0301NR	3.000	0.6	*LM23	0.6	UGG
						23SA0302NR	3.000	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.31	<LM23	0.31	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						23SA0302Y	3.000	0.31	<LM23	0.31	UGG
			CHLORFORM	23-SA-03	08/15/1991	23SA0301Y	3.000	0.24	<LM23	0.24	UGG
						23SA0302Y	3.000	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.1	<LM23	0.1	UGG
						23SA0302Y	3.000	0.1	<LM23	0.1	UGG
			CHLOROETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.64	<LM23	0.64	UGG
						23SA0302Y	3.000	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.8	<LM23	1.8	UGG
						23SA0302Y	3.000	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.96	<LM23	0.96	UGG
						23SA0302Y	3.000	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	23-SA-03	08/15/1991	23SA0301NR	3.000	0.6	*LM23	0.6	UGG
						23SA0302NR	3.000	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.25	<LM23	0.25	UGG
						23SA0302Y	3.000	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	23-SA-03	08/15/1991	23SA0301Y	3.000	0.2	<LM23	0.2	UGG
						23SA0302Y	3.000	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	23-SA-03	08/15/1991	23SA0301Y	3.000	3.66	=LM23	0.19	UGG
						23SA0302Y	3.000	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	23-SA-03	08/15/1991	23SA0301NR	3.000	1.0	*LM23	1.0	UGG
						23SA0302NR	3.000	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	23-SA-03	08/15/1991	23SA0301Y	3.000	4.4	<LM23	4.4	UGG
						23SA0302Y	3.000	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	23-SA-03	08/15/1991	23SA0301Y	3.000	4.3	<LM23	4.3	UGG
						23SA0302Y	3.000	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.63	<LM23	0.63	UGG
						23SA0302Y	3.000	0.63	<LM23	0.63	UGG
			STYRENE	23-SA-03	08/15/1991	23SA0301NR	3.000	0.6	*LM23	0.6	UGG
						23SA0302NR	3.000	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	23-SA-03	08/15/1991	23SA0301Y	3.000	0.16	<LM23	0.16	UGG
						23SA0302Y	3.000	0.16	<LM23	0.16	UGG
			TOLUENE	23-SA-03	08/15/1991	23SA0301Y	3.000	1.27	=LM23	0.1	UGG
						23SA0302Y	3.000	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	23-SA-03	08/15/1991	23SA0301NR	3.000	0.6	*LM23	0.6	UGG
						23SA0302NR	3.000	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	23-SA-03	08/15/1991	23SA0301Y	3.000	0.23	<LM23	0.23	UGG
						23SA0302Y	3.000	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	23-SA-03	08/15/1991	23SA0301Y	3.000	0.23	<LM23	0.23	UGG
						23SA0302Y	3.000	0.23	<LM23	0.23	UGG
			XYLENES	23-SA-03	08/15/1991	23SA0301Y	3.000	6.96	=LM23	0.78	UGG
						23SA0302Y	3.000	0.78	<LM23	0.78	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP24	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	24-SA-02	08/10/1991	24SA0201Y	1.500	2.1	<LW02	2.09	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	24-SA-02	08/10/1991	24SA0201Y	1.500	0.59	<LW02	0.59	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	24-SA-02	08/10/1991	24SA0201Y	1.500	1.9	<LW02	1.92	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	24-SA-02	08/10/1991	24SA0201Y	1.500	0.42	<LW02	0.42	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	24-SA-02	08/10/1991	24SA0201Y	1.500	0.4	<LW02	0.4	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.4	<LW02	0.4	UGG
			HMX	24-SA-02	08/10/1991	24SA0201Y	1.500	1.3	<LW02	1.27	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	24-SA-02	08/10/1991	24SA0201Y	1.500	0.42	<LW02	0.42	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.42	<LW02	0.42	UGG
			RDX	24-SA-02	08/10/1991	24SA0201Y	1.500	0.98	<LW02	0.98	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	24-SA-02	08/10/1991	24SA0201Y	1.500	0.25	<LW02	0.25	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	24-SA-02	08/10/1991	24SA0201Y	1.500	19.6	<JS12	19.6	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	24-SA-02	08/10/1991	24SA0201Y	1.500	6.05	=B9	2.5	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	6.9	=B9	2.5	UGG
			BARIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	371.0	=JS12	3.29	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	167.0	=JS12	3.29	UGG
			BERYLLIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	0.659	=JS12	0.427	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.735	=JS12	0.427	UGG
			CADMIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	1.2	<JS12	1.2	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	22.3	=JS12	1.04	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	24.6	=JS12	1.04	UGG
			COPPER	24-SA-02	08/10/1991	24SA0201Y	1.500	93.5	=JS12	2.84	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	44.7	=JS12	2.84	UGG
			LEAD	24-SA-02	08/10/1991	24SA0201Y	1.500	160.0	=JD21	0.467	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	35.0	=JD21	0.467	UGG
			MERCURY	24-SA-02	08/10/1991	24SA0201Y	1.500	0.063	=Y9	0.05	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.061	=Y9	0.05	UGG
			NICKEL	24-SA-02	08/10/1991	24SA0201Y	1.500	15.4	=JS12	2.74	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	25.0	=JS12	2.74	UGG
			SELENIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	0.449	<JD20	0.449	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	24-SA-02	08/10/1991	24SA0201Y	1.500	0.803	<JS12	0.803	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	24-SA-02	08/10/1991	24SA0201Y	1.500	34.3	<JS12	34.3	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	24-SA-02	08/10/1991	24SA0201Y	1.500	105.0	=JS12	2.34	UGG
				24-SS-01	08/10/1991	24SS0101Y	0.500	99.3	=JS12	2.34	UGG
	SW	EXPLOSIVES	1,3,5-TRINITROBENZENE	24-SW-01	08/10/1991	24SW0101Y	0.500	0.56	<UW01	0.56	UGL
			1,3-DINITROBENZENE	24-SW-01	08/10/1991	24SW0101Y	0.500	0.61	<UW01	0.61	UGL
			2,4,6-TNT	24-SW-01	08/10/1991	24SW0101Y	0.500	16.0	=UW01	0.78	UGL

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			2,4-DINITROTOLUENE	24-SW-01	08/10/1991	24SW0101Y	0.500	0.6	<UW01	0.6	UGL
			2,6-DINITROTOLUENE	24-SW-01	08/10/1991	24SW0101Y	0.500	0.55	<UW01	0.55	UGL
			HMX	24-SW-01	08/10/1991	24SW0101Y	0.500	12.0	=UW01	1.3	UGL
			NITROBENZENE	24-SW-01	08/10/1991	24SW0101Y	0.500	1.1	<UW01	1.13	UGL
			RDX	24-SW-01	08/10/1991	24SW0101Y	0.500	34.0	=UW01	0.63	UGL
			TETRYL	24-SW-01	08/10/1991	24SW0101Y	0.500	0.66	<UW01	0.66	UGL
		METALS	ANTIMONY	24-SW-01	08/10/1991	24SW0101N	0.500	60.0	<99	60.0	UGL
			ARSENIC	24-SW-01	08/10/1991	24SW0101YG	0.500	12.0	<AX8	2.35	UGL
			BARIUM	24-SW-01	08/10/1991	24SW0101N	0.500	296.0	=99	0.0	UGL
			BERYLLIUM	24-SW-01	08/10/1991	24SW0101N	0.500	1.12	<99	1.12	UGL
			CADMIUM	24-SW-01	08/10/1991	24SW0101N	0.500	10.9	=99	0.0	UGL
			CHROMIUM	24-SW-01	08/10/1991	24SW0101N	0.500	31.3	=99	0.0	UGL
			COPPER	24-SW-01	08/10/1991	24SW0101N	0.500	20.1	=99	0.0	UGL
			LEAD	24-SW-01	08/10/1991	24SW0101Y	0.500	20.7	=SD18	4.47	UGL
			MERCURY	24-SW-01	08/10/1991	24SW0101Y	0.500	0.1	<CC8	0.1	UGL
			NICKEL	24-SW-01	08/10/1991	24SW0101N	0.500	70.7	=99	0.0	UGL
			SELENIUM	24-SW-01	08/10/1991	24SW0101Y	0.500	2.53	<SD25	2.53	UGL
			SILVER	24-SW-01	08/10/1991	24SW0101N	0.500	10.0	<99	10.0	UGL
			THALLIUM	24-SW-01	08/10/1991	24SW0101N	0.500	125.0	<99	125.0	UGL
			ZINC	24-SW-01	08/10/1991	24SW0101N	0.500	243.0	=99	0.0	UGL

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP25	SD	EXPLOSIVES	1,3,5-TRINITROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.59	<LW02	0.59	UGG
			2,4,6-TNT	25-SD-03	08/14/1991	25SD0301Y	0.300	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	25-SD-03	08/14/1991	25SD0301N	0.300	1.4	<LM25	1.4	UGG
						25SD0301Y	0.300	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	25-SD-03	08/14/1991	25SD0301N	0.300	0.32	<LM25	0.32	UGG
						25SD0301Y	0.300	0.4	<LW02	0.4	UGG
			HMX	25-SD-03	08/14/1991	25SD0301Y	0.300	1.3	<LW02	1.27	UGG
			NITROBENZENE	25-SD-03	08/14/1991	25SD0301N	0.300	1.8	<LM25	1.8	UGG
						25SD0301Y	0.300	0.42	<LW02	0.42	UGG
			RDX	25-SD-03	08/14/1991	25SD0301Y	0.300	0.98	<LW02	0.98	UGG
			TETRYL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	25-SD-03	08/14/1991	25SD0301Y	0.300	19.6	<JS12	19.6	UGG
			ARSENIC	25-SD-03	08/14/1991	25SD0301Y	0.300	3.31	=B9	2.5	UGG
			BARIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	149.0	=JS12	3.29	UGG
			BERYLLIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	0.997	=JS12	0.427	UGG
			CADMIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	1.2	<JS12	1.2	UGG
			CHROMIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	31.3	=JS12	1.04	UGG
			COPPER	25-SD-03	08/14/1991	25SD0301Y	0.300	11.7	=JS12	2.84	UGG
			LEAD	25-SD-03	08/14/1991	25SD0301Y	0.300	19.0	=JD21	0.467	UGG
			MERCURY	25-SD-03	08/14/1991	25SD0301Y	0.300	0.05	<Y9	0.05	UGG
			NICKEL	25-SD-03	08/14/1991	25SD0301Y	0.300	24.2	=JS12	2.74	UGG
			SELENIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	0.449	<JD20	0.449	UGG
			SILVER	25-SD-03	08/14/1991	25SD0301Y	0.300	0.803	<JS12	0.803	UGG
			THALLIUM	25-SD-03	08/14/1991	25SD0301Y	0.300	34.3	<JS12	34.3	UGG
			ZINC	25-SD-03	08/14/1991	25SD0301Y	0.300	49.3	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	25-SD-03	08/14/1991	25SD0301N	0.300	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	25-SD-03	08/14/1991	25SD0301N	0.300	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	25-SD-03	08/14/1991	25SD0301N	0.300	0.064	<LM25	0.064	UGG
			ALDRIN	25-SD-03	08/14/1991	25SD0301N	0.300	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	25-SD-03	08/14/1991	25SD0301N	0.300	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	25-SD-03	08/14/1991	25SD0301N	0.300	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	25-SD-03	08/14/1991	25SD0301N	0.300	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	25-SD-03	08/14/1991	25SD0301N	0.300	2.4	<LM25	2.4	UGG
			CHLORDANE	25-SD-03	08/14/1991	25SD0301N	0.300	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	25-SD-03	08/14/1991	25SD0301N	0.300	0.21	<LM25	0.21	UGG
			DIELDRIN	25-SD-03	08/14/1991	25SD0301N	0.300	0.079	<LM25	0.079	UGG
			ENDRIN	25-SD-03	08/14/1991	25SD0301N	0.300	1.3	<LM25	1.3	UGG
			HEPTACHLOR	25-SD-03	08/14/1991	25SD0301N	0.300	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	25-SD-03	08/14/1991	25SD0301N	0.300	0.48	<LM25	0.48	UGG
			ISODRIN	25-SD-03	08/14/1991	25SD0301N	0.300	0.48	<LM25	0.48	UGG
			LINDANE	25-SD-03	08/14/1991	25SD0301N	0.300	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	25-SD-03	08/14/1991	25SD0301N	0.300	0.26	<LM25	0.26	UGG
			PCB 1016	25-SD-03	08/14/1991	25SD0301N	0.300	0.32	<LM25	0.32	UGG
			PCB 1221	25-SD-03	08/14/1991	25SD0301NR	0.300	1.9	*LM25	1.9	UGG
			PCB 1232	25-SD-03	08/14/1991	25SD0301NR	0.300	1.9	*LM25	1.9	UGG
			PCB 1242	25-SD-03	08/14/1991	25SD0301NR	0.300	1.9	*LM25	1.9	UGG
			PCB 1248	25-SD-03	08/14/1991	25SD0301NR	0.300	1.9	*LM25	1.9	UGG
			PCB 1254	25-SD-03	08/14/1991	25SD0301NR	0.300	3.8	*LM25	3.8	UGG

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			PCB 1260	25-SD-03	08/14/1991	25SD0301N	0.300	0.79	<LM25	0.79	UGG
			PCB 1262	25-SD-03	08/14/1991	25SD0301Y	0.300	6.3	<LM25	0.3	UGG
			TOXAPHENE	25-SD-03	08/14/1991	25SD0301NR	0.300	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.075	<LM25	0.075	UGG
			2,3,6-TCP	25-SD-03	08/14/1991	25SD0301Y	0.300	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	25-SD-03	08/14/1991	25SD0301Y	0.300	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.098	<LM25	0.098	UGG
			2-NITROANILINE	25-SD-03	08/14/1991	25SD0301NR	0.300	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	25-SD-03	08/14/1991	25SD0301Y	0.300	0.93	<LM25	0.93	UGG
			3-NITROANILINE	25-SD-03	08/14/1991	25SD0301Y	0.300	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	25-SD-03	08/14/1991	25SD0301Y	0.300	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	25-SD-03	08/14/1991	25SD0301NR	0.300	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	25-SD-03	08/14/1991	25SD0301Y	0.300	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.24	<LM25	0.24	UGG
			4-NITROANILINE	25-SD-03	08/14/1991	25SD0301NR	0.300	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.033	<LM25	0.033	UGG
			ANTHRACENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.71	<LM25	0.71	UGG
			ATRAZINE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.13	<LM25	0.13	UGG
			BENZOIC ACID	25-SD-03	08/14/1991	25SD0301NR	0.300	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	25-SD-03	08/14/1991	25SD0301Y	0.300	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	25-SD-03	08/14/1991	25SD0301Y	0.300	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.48	<LM25	0.48	UGG

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			BUTYLBENZYL PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.8	<LM25	1.8	UGG
			CHRYSENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	25-SD-03	08/14/1991	25SD0301Y	0.300	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.063	<LM25	0.063	UGG
			DITHIANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	25-SD-03	08/14/1991	25SD0301NR	0.300	0.28	*LM25	0.28	UGG
			FLUORANTHENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			FLUORENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	25-SD-03	08/14/1991	25SD0301Y	0.300	2.4	<LM25	2.4	UGG
			ISOPHORONE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.39	<LM25	0.39	UGG
			MALATHION	25-SD-03	08/14/1991	25SD0301Y	0.300	0.18	<LM25	0.18	UGG
			MIREX	25-SD-03	08/14/1991	25SD0301Y	0.300	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.29	<LM25	0.29	UGG
			NAPHTHALENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.32	<LM25	0.32	UGG
			PARATHION	25-SD-03	08/14/1991	25SD0301Y	0.300	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.76	<LM25	0.76	UGG
			PHENANTHRENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.032	<LM25	0.032	UGG
			PHENOL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.052	<LM25	0.052	UGG
			PYRENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	25-SD-03	08/14/1991	25SD0301Y	0.300	0.92	<LM25	0.92	UGG
			VAPONA	25-SD-03	08/14/1991	25SD0301Y	0.300	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	25-SD-03	08/14/1991	25SD0301Y	0.300	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	25-SD-03	08/14/1991	25SD0301Y	0.300	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	25-SD-03	08/14/1991	25SD0301Y	0.300	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	25-SD-03	08/14/1991	25SD0301N	0.300	0.042	<LM25	0.042	UGG
						25SD0301Y	0.300	0.14	<LM23	0.14	UGG

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			1,3-DICLOROPROPANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	25-SD-03	08/14/1991	25SD0301NR	0.300	1.0	*LM23	1.0	UGG
			ACETONE	25-SD-03	08/14/1991	25SD0301Y	0.300	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	25-SD-03	08/14/1991	25SD0301Y	0.300	2.0	<LM23	2.0	UGG
			BENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			BROMOFORM	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			BROMOMETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	25-SD-03	08/14/1991	25SD0301NR	0.300	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.31	<LM23	0.31	UGG
			CHLORFORM	25-SD-03	08/14/1991	25SD0301Y	0.300	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.1	<LM23	0.1	UGG
			CHLOROETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	25-SD-03	08/14/1991	25SD0301Y	0.300	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	25-SD-03	08/14/1991	25SD0301NR	0.300	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	25-SD-03	08/14/1991	25SD0301Y	0.300	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	25-SD-03	08/14/1991	25SD0301NR	0.300	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	25-SD-03	08/14/1991	25SD0301Y	0.300	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	25-SD-03	08/14/1991	25SD0301Y	0.300	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.63	<LM23	0.63	UGG
			STYRENE	25-SD-03	08/14/1991	25SD0301NR	0.300	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	25-SD-03	08/14/1991	25SD0301Y	0.300	0.16	<LM23	0.16	UGG
			TOLUENE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	25-SD-03	08/14/1991	25SD0301NR	0.300	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	25-SD-03	08/14/1991	25SD0301Y	0.300	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	25-SD-03	08/14/1991	25SD0301Y	0.300	0.23	<LM23	0.23	UGG
			XYLENES	25-SD-03	08/14/1991	25SD0301Y	0.300	0.78	<LM23	0.78	UGG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	2.1	<LW02	2.09	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.59	<LW02	0.59	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	25-SS-01	08/14/1991	25SS0101Y	0.500	1.9	<LW02	1.92	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	25-SS-01	08/14/1991	25SS0101N	0.500	1.4	<LM25	1.4	UGG
						25SS0101Y	0.500	0.42	<LW02	0.42	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	1.4	<LM25	1.4	UGG
						25SS0201Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	25-SS-01	08/14/1991	25SS0101N	0.500	0.32	<LM25	0.32	UGG
						25SS0101Y	0.500	0.4	<LW02	0.4	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.32	<LM25	0.32	UGG
						25SS0201Y	0.500	0.4	<LW02	0.4	UGG
			HMX	25-SS-01	08/14/1991	25SS0101Y	0.500	1.3	<LW02	1.27	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	25-SS-01	08/14/1991	25SS0101N	0.500	1.8	<LM25	1.8	UGG
						25SS0101Y	0.500	0.42	<LW02	0.42	UGG

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				25-SS-02	08/14/1991	25SS0201N	0.500	1.8	<LM25	1.8	UGG
						25SS0201Y	0.500	0.42	<LW02	0.42	UGG
			RDX	25-SS-01	08/14/1991	25SS0101Y	0.500	0.98	<LW02	0.98	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.25	<LW02	0.25	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	25-SS-01	08/14/1991	25SS0101Y	0.500	19.6	<JS12	19.6	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	25-SS-01	08/14/1991	25SS0101Y	0.500	6.06	=B9	2.5	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	4.98	=B9	2.5	UGG
			BARIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	161.0	=JS12	3.29	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	161.0	=JS12	3.29	UGG
			BERYLLIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	0.69	=JS12	0.427	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.994	=JS12	0.427	UGG
			CADMIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	1.2	<JS12	1.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	29.4	=JS12	1.04	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	21.3	=JS12	1.04	UGG
			COPPER	25-SS-01	08/14/1991	25SS0101Y	0.500	18.6	=JS12	2.84	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	27.2	=JS12	2.84	UGG
			LEAD	25-SS-01	08/14/1991	25SS0101Y	0.500	21.0	=JD21	0.467	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	24.0	=JD21	0.467	UGG
			MERCURY	25-SS-01	08/14/1991	25SS0101Y	0.500	0.05	<Y9	0.05	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.239	=Y9	0.05	UGG
			NICKEL	25-SS-01	08/14/1991	25SS0101Y	0.500	18.3	=JS12	2.74	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	16.7	=JS12	2.74	UGG
			SELENIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	0.449	<JD20	0.449	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	25-SS-01	08/14/1991	25SS0101Y	0.500	0.803	<JS12	0.803	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	25-SS-01	08/14/1991	25SS0101Y	0.500	34.3	<JS12	34.3	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	25-SS-01	08/14/1991	25SS0101Y	0.500	98.0	=JS12	2.34	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	89.1	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	25-SS-01	08/14/1991	25SS0101N	0.500	0.068	<LM25	0.068	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	25-SS-01	08/14/1991	25SS0101N	0.500	0.1	<LM25	0.1	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	25-SS-01	08/14/1991	25SS0101N	0.500	0.064	<LM25	0.064	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.064	<LM25	0.064	UGG
			ALDRIN	25-SS-01	08/14/1991	25SS0101N	0.500	1.3	<LM25	1.3	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	25-SS-01	08/14/1991	25SS0101N	0.500	1.3	<LM25	1.3	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	25-SS-01	08/14/1991	25SS0101N	0.500	0.4	<LM25	0.4	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	25-SS-01	08/14/1991	25SS0101N	0.500	1.3	<LM25	1.3	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	25-SS-01	08/14/1991	25SS0101N	0.500	2.4	<LM25	2.4	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				25-SS-02	08/14/1991	25SS0201N	0.500	2.4	<LM25	2.4	UGG
			CHLORDANE	25-SS-01	08/14/1991	25SS0101N	0.500	0.68	<LM25	0.68	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	25-SS-01	08/14/1991	25SS0101N	0.500	0.21	<LM25	0.21	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.21	<LM25	0.21	UGG
			DIELDRIN	25-SS-01	08/14/1991	25SS0101N	0.500	0.079	<LM25	0.079	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.079	<LM25	0.079	UGG
			ENDRIN	25-SS-01	08/14/1991	25SS0101N	0.500	1.3	<LM25	1.3	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	25-SS-01	08/14/1991	25SS0101N	0.500	0.24	<LM25	0.24	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	25-SS-01	08/14/1991	25SS0101N	0.500	0.48	<LM25	0.48	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.48	<LM25	0.48	UGG
			ISODRIN	25-SS-01	08/14/1991	25SS0101N	0.500	0.48	<LM25	0.48	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.48	<LM25	0.48	UGG
			LINDANE	25-SS-01	08/14/1991	25SS0101N	0.500	0.1	<LM25	0.1	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	25-SS-01	08/14/1991	25SS0101N	0.500	0.26	<LM25	0.26	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.26	<LM25	0.26	UGG
			PCB 1016	25-SS-01	08/14/1991	25SS0101N	0.500	0.32	<LM25	0.32	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.32	<LM25	0.32	UGG
			PCB 1221	25-SS-01	08/14/1991	25SS0101NR	0.500	1.9	*LM25	1.9	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1232	25-SS-01	08/14/1991	25SS0101NR	0.500	1.9	*LM25	1.9	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1242	25-SS-01	08/14/1991	25SS0101NR	0.500	1.9	*LM25	1.9	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1248	25-SS-01	08/14/1991	25SS0101NR	0.500	1.9	*LM25	1.9	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1254	25-SS-01	08/14/1991	25SS0101NR	0.500	3.8	*LM25	3.8	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	3.8	*LM25	3.8	UGG
			PCB 1260	25-SS-01	08/14/1991	25SS0101N	0.500	0.79	<LM25	0.79	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.79	<LM25	0.79	UGG
			PCB 1262	25-SS-01	08/14/1991	25SS0101Y	0.500	6.3	<LM25	0.3	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	25-SS-01	08/14/1991	25SS0101NR	0.500	12.0	*LM25	12.0	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.22	<LM25	0.22	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.042	<LM25	0.042	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.52	<LM25	0.52	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.034	<LM25	0.034	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.075	<LM25	0.075	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.075	<LM25	0.075	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			2,3,6-TCP	25-SS-01	08/14/1991	25SS0101Y	0.500	0.62	<LM25	0.62	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.49	<LM25	0.49	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.061	<LM25	0.061	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.065	<LM25	0.065	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	3.0	<LM25	3.0	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	4.7	<LM25	4.7	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.57	<LM25	0.57	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.24	<LM25	0.24	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.055	<LM25	0.055	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	25-SS-01	08/14/1991	25SS0101Y	0.500	0.8	<LM25	0.8	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.098	<LM25	0.098	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	25-SS-01	08/14/1991	25SS0101NR	0.500	3.1	*LM25	3.1	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	1.1	<LM25	1.1	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.6	<LM25	1.6	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.6	<LM25	1.6	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	25-SS-01	08/14/1991	25SS0101Y	0.500	0.93	<LM25	0.93	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	25-SS-01	08/14/1991	25SS0101Y	0.500	3.0	<LM25	3.0	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.34	<LM25	0.34	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	25-SS-01	08/14/1991	25SS0101Y	0.500	0.041	<LM25	0.041	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	25-SS-01	08/14/1991	25SS0101NR	0.500	0.63	*LM25	0.63	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	25-SS-01	08/14/1991	25SS0101Y	0.500	0.17	<LM25	0.17	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.24	<LM25	0.24	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	25-SS-01	08/14/1991	25SS0101NR	0.500	3.1	*LM25	3.1	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	3.3	<LM25	3.3	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				25-SS-02	08/14/1991	25SS0201Y	0.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.041	<LM25	0.041	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.033	<LM25	0.033	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.71	<LM25	0.71	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.71	<LM25	0.71	UGG
			ATRAZINE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.065	<LM25	0.065	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.041	<LM25	0.48	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.2	<LM25	1.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.31	<LM25	0.31	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.18	<LM25	0.18	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.13	<LM25	0.13	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	25-SS-01	08/14/1991	25SS0101NR	0.500	3.1	*LM25	3.1	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.19	<LM25	0.19	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	25-SS-01	08/14/1991	25SS0101Y	0.500	0.36	<LM25	0.36	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	25-SS-01	08/14/1991	25SS0101Y	0.500	0.44	<LM25	0.44	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.48	<LM25	0.48	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.8	<LM25	1.8	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.8	<LM25	1.8	UGG
			CHRYSENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.3	<LM25	1.3	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.23	<LM25	0.23	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.31	<LM25	0.31	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	25-SS-01	08/14/1991	25SS0101Y	0.500	0.038	<LM25	0.038	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.071	<LM25	0.071	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.57	<LM25	0.57	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.24	<LM25	0.24	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.24	<LM25	0.24	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			DIMETHYL PHTHALATE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.063	<LM25	0.063	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.063	<LM25	0.063	UGG
			DITHIANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.065	<LM25	0.065	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.2	<LM25	1.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.8	<LM25	1.8	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	25-SS-01	08/14/1991	25SS0101NR	0.500	0.28	*LM25	0.28	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			FLUORENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.065	<LM25	0.065	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.08	<LM25	0.08	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.97	<LM25	0.97	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.52	<LM25	0.52	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.8	<LM25	1.8	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	25-SS-01	08/14/1991	25SS0101Y	0.500	2.4	<LM25	2.4	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.39	<LM25	0.39	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.39	<LM25	0.39	UGG
			MALATHION	25-SS-01	08/14/1991	25SS0101Y	0.500	0.18	<LM25	0.18	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.18	<LM25	0.18	UGG
			MIREX	25-SS-01	08/14/1991	25SS0101Y	0.500	0.14	<LM25	0.14	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.1	<LM25	1.1	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.46	<LM25	0.46	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.29	<LM25	0.29	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.74	<LM25	0.74	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.097	<LM25	0.097	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.066	<LM25	0.066	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.32	<LM25	0.32	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.32	<LM25	0.32	UGG
			PARATHION	25-SS-01	08/14/1991	25SS0101Y	0.500	1.7	<LM25	1.7	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.76	<LM25	0.76	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.032	<LM25	0.032	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.032	<LM25	0.032	UGG
			PHENOL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.052	<LM25	0.052	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.052	<LM25	0.052	UGG
			PYRENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.083	<LM25	0.083	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	25-SS-01	08/14/1991	25SS0101Y	0.500	0.92	<LM25	0.92	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.92	<LM25	0.92	UGG
			VAPONA	25-SS-01	08/14/1991	25SS0101Y	0.500	0.068	<LM25	0.068	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	25-SS-01	08/14/1991	25SS0101Y	0.500	0.5	<LM23	0.5	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.264	=LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.33	<LM23	0.33	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.49	<LM23	0.49	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	25-SS-01	08/14/1991	25SS0101Y	0.500	0.27	<LM23	0.27	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.32	<LM23	0.32	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	25-SS-01	08/14/1991	25SS0101Y	0.500	0.32	<LM23	0.32	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.53	<LM23	0.53	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	25-SS-01	08/14/1991	25SS0101N	0.500	0.042	<LM25	0.042	UGG
						25SS0101Y	0.500	0.14	<LM23	0.14	UGG
				25-SS-02	08/14/1991	25SS0201N	0.500	0.042	<LM25	0.042	UGG
						25SS0201Y	0.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.23	<LM23	0.23	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	25-SS-01	08/14/1991	25SS0101NR	0.500	1.0	*LM23	1.0	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	25-SS-01	08/14/1991	25SS0101Y	0.500	3.3	<LM23	3.3	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	25-SS-01	08/14/1991	25SS0101Y	0.500	2.0	<LM23	2.0	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.1	<LM23	0.1	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.26	<LM23	0.26	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.26	<LM23	0.26	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			CARBON DISULFIDE	25-SS-01	08/14/1991	25SS0101NR	0.500	0.6	*LM23	0.6	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.31	<LM23	0.31	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	25-SS-01	08/14/1991	25SS0101Y	0.500	0.24	<LM23	0.24	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.1	<LM23	0.1	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.64	<LM23	0.64	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	25-SS-01	08/14/1991	25SS0101Y	0.500	1.8	<LM23	1.8	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.96	<LM23	0.96	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	25-SS-01	08/14/1991	25SS0101NR	0.500	0.6	*LM23	0.6	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.25	<LM23	0.25	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	25-SS-01	08/14/1991	25SS0101Y	0.500	0.2	<LM23	0.2	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.19	<LM23	0.19	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	25-SS-01	08/14/1991	25SS0101NR	0.500	1.0	*LM23	1.0	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	25-SS-01	08/14/1991	25SS0101Y	0.500	4.4	<LM23	4.4	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	25-SS-01	08/14/1991	25SS0101Y	0.500	4.3	<LM23	4.3	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.63	<LM23	0.63	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	25-SS-01	08/14/1991	25SS0101NR	0.500	0.6	*LM23	0.6	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	25-SS-01	08/14/1991	25SS0101Y	0.500	0.16	<LM23	0.16	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.1	<LM23	0.1	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	25-SS-01	08/14/1991	25SS0101NR	0.500	0.6	*LM23	0.6	UGG
				25-SS-02	08/14/1991	25SS0201NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	25-SS-01	08/14/1991	25SS0101Y	0.500	0.23	<LM23	0.23	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	25-SS-01	08/14/1991	25SS0101Y	0.500	0.23	<LM23	0.23	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	25-SS-01	08/14/1991	25SS0101Y	0.500	0.78	<LM23	0.78	UGG
				25-SS-02	08/14/1991	25SS0201Y	0.500	0.78	<LM23	0.78	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP26	SD	ANIONS	NITRITE, NITRATE - NONSPECIFIC	26-SD-04	08/16/1991	26SD0401Y	0.500	1.0	<KF17	1.0	UGG
			SULFATE	26-SD-04	08/16/1991	26SD0401Y	0.500	80.4	=KT07	5.0	UGG
		METALS	ANTIMONY	26-SD-04	08/16/1991	26SD0401Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	26-SD-04	08/16/1991	26SD0401Y	0.500	2.5	<B9	2.5	UGG
			BARIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	358.0	=JS12	3.29	UGG
			BERYLLIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	20.6	=JS12	1.04	UGG
			COPPER	26-SD-04	08/16/1991	26SD0401Y	0.500	9.65	=JS12	2.84	UGG
			LEAD	26-SD-04	08/16/1991	26SD0401Y	0.500	11.0	=JD21	0.467	UGG
			MERCURY	26-SD-04	08/16/1991	26SD0401Y	0.500	0.072	=Y9	0.05	UGG
			NICKEL	26-SD-04	08/16/1991	26SD0401Y	0.500	11.1	=JS12	2.74	UGG
			SELENIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	26-SD-04	08/16/1991	26SD0401Y	0.500	1.22	=JS12	0.803	UGG
			THALLIUM	26-SD-04	08/16/1991	26SD0401Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	26-SD-04	08/16/1991	26SD0401Y	0.500	46.0	=JS12	2.34	UGG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	26-SS-01	08/16/1991	26SS0101Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	26-SS-01	08/16/1991	26SS0101Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	26-SS-01	08/16/1991	26SS0101Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	26-SS-01	08/16/1991	26SS0101Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	26-SS-01	08/16/1991	26SS0101Y	0.500	0.4	<LW02	0.4	UGG
			HMX	26-SS-01	08/16/1991	26SS0101Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	26-SS-01	08/16/1991	26SS0101Y	0.500	0.42	<LW02	0.42	UGG
			RDX	26-SS-01	08/16/1991	26SS0101Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	26-SS-01	08/16/1991	26SS0101Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	26-SS-01	08/16/1991	26SS0101Y	0.500	19.6	<JS12	19.6	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	26-SS-01	08/16/1991	26SS0101Y	0.500	2.5	<B9	2.5	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	6.34	=B9	2.5	UGG
			BARIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	38.0	=JS12	3.29	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	202.0	=JS12	3.29	UGG
			BERYLLIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	0.427	<JS12	0.427	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	0.7	=JS12	0.427	UGG
			CADMIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	1.2	<JS12	1.2	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	33.9	=JS12	1.04	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	23.3	=JS12	1.04	UGG
			COPPER	26-SS-01	08/16/1991	26SS0101Y	0.500	16.4	=JS12	2.84	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	27.6	=JS12	2.84	UGG
			LEAD	26-SS-01	08/16/1991	26SS0101Y	0.500	7.46	=JD21	0.467	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	28.0	=JD21	0.467	UGG
			MERCURY	26-SS-01	08/16/1991	26SS0101Y	0.500	5.6	=Y9	0.05	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	0.086	=Y9	0.05	UGG
			NICKEL	26-SS-01	08/16/1991	26SS0101Y	0.500	11.0	=JS12	2.74	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	16.8	=JS12	2.74	UGG
			SELENIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	0.449	<JD20	0.449	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	26-SS-01	08/16/1991	26SS0101Y	0.500	139.0	=JS12	0.803	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	0.803	<JS12	0.803	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			THALLIUM	26-SS-01	08/16/1991	26SS0101Y	0.500	34.3	<JS12	34.3	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	26-SS-01	08/16/1991	26SS0101Y	0.500	44.5	=JS12	2.34	UGG
				26-SS-02	08/16/1991	26SS0201Y	0.500	275.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-TR	26-SS-02	08/16/1991	26SS0201YU	0.500	0.084	=LH17	0.0034	UGG
			ALDRIN	26-SS-02	08/16/1991	26SS0201YU	0.500	0.003	=LH17	0.0014	UGG
			ALPHA-BENZENEHEXACHLORIDE	26-SS-02	08/16/1991	26SS0201Y	0.500	0.003	<LH17	0.0028	UGG
			CHLORDANE	26-SS-02	08/16/1991	26SS0201Y	0.500	0.068	<LH17	0.0684	UGG
			DELTA-BENZENEHEXACHLORIDE	26-SS-02	08/16/1991	26SS0201Y	0.500	0.008	<LH17	0.0085	UGG
			DIELDRIN	26-SS-02	08/16/1991	26SS0201YU	0.500	0.006	=LH17	0.0016	UGG
			ENDRIN	26-SS-02	08/16/1991	26SS0201YU	0.500	0.011	=LH17	0.0065	UGG
			HEPTACHLOR	26-SS-02	08/16/1991	26SS0201Y	0.500	0.002	<LH17	0.0022	UGG
			ISODRIN	26-SS-02	08/16/1991	26SS0201Y	0.500	0.003	<LH17	0.003	UGG
			LINDANE	26-SS-02	08/16/1991	26SS0201Y	0.500	0.001	<LH17	0.001	UGG
			PCB 1016	26-SS-02	08/16/1991	26SS0201Y	0.500	0.1	<LH17	0.1	UGG
			PCB 1260	26-SS-02	08/16/1991	26SS0201YC	0.500	0.288	=LH17	0.0479	UGG
	SW	ANIONS	NITRITE, NITRATE - NONSPECIFIC	26-SW-04	08/16/1991	26SW0401Y	0.500	4,500.0	=LL8	10.0	UGL
			SULFATE	26-SW-04	08/16/1991	26SW0401Y	0.500	63,000.0	=TT09	175.0	UGL
		EXPLOSIVES	1,3,5-TRINITROBENZENE	26-SW-03	08/16/1991	26SW0301Y	0.500	0.56	<UW01	0.56	UGL
			1,3-DINITROBENZENE	26-SW-03	08/16/1991	26SW0301Y	0.500	0.61	<UW01	0.61	UGL
			2,4,6-TNT	26-SW-03	08/16/1991	26SW0301Y	0.500	12.0	=UW01	0.78	UGL
			2,4-DINITROTOLUENE	26-SW-03	08/16/1991	26SW0301Y	0.500	0.6	<UW01	0.6	UGL
			2,6-DINITROTOLUENE	26-SW-03	08/16/1991	26SW0301Y	0.500	0.55	<UW01	0.55	UGL
			HMX	26-SW-03	08/16/1991	26SW0301Y	0.500	4.2	=UW01	1.3	UGL
			NITROBENZENE	26-SW-03	08/16/1991	26SW0301Y	0.500	1.1	<UW01	1.13	UGL
			RDX	26-SW-03	08/16/1991	26SW0301Y	0.500	6.7	=UW01	0.63	UGL
			TETRYL	26-SW-03	08/16/1991	26SW0301Y	0.500	0.66	<UW01	0.66	UGL
		METALS	ANTIMONY	26-SW-03	08/16/1991	26SW0301Y	0.500	60.0	<SS12	60.0	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	60.0	<SS12	60.0	UGL
			ARSENIC	26-SW-03	08/16/1991	26SW0301Y	0.500	2.35	<AX8	2.35	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	2.35	<AX8	2.35	UGL
			BARIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	91.0	=SS12	2.82	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	92.6	=SS12	2.82	UGL
			BERYLLIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	1.12	<SS12	1.12	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	1.12	<SS12	1.12	UGL
			CADMIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	6.78	<SS12	6.78	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	6.78	<SS12	6.78	UGL
			CHROMIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	16.8	<SS12	16.8	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	16.8	<SS12	16.8	UGL
			COPPER	26-SW-03	08/16/1991	26SW0301Y	0.500	18.8	<SS12	18.8	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	18.8	<SS12	18.8	UGL
			LEAD	26-SW-03	08/16/1991	26SW0301Y	0.500	4.47	<SD18	4.47	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	4.47	<SD18	4.47	UGL
			MERCURY	26-SW-03	08/16/1991	26SW0301Y	0.500	0.142	=CC8	0.1	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	0.115	=CC8	0.1	UGL
			NICKEL	26-SW-03	08/16/1991	26SW0301Y	0.500	32.1	<SS12	32.1	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	32.1	<SS12	32.1	UGL
			SELENIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	2.53	<SD25	2.53	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	2.53	<SD25	2.53	UGL

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			SILVER	26-SW-03	08/16/1991	26SW0301Y	0.500	25.1	=SS12	10.0	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	10.0	<SS12	10.0	UGL
			THALLIUM	26-SW-03	08/16/1991	26SW0301Y	0.500	125.0	<SS12	125.0	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	125.0	<SS12	125.0	UGL
			ZINC	26-SW-03	08/16/1991	26SW0301Y	0.500	88.4	=SS12	18.0	UGL
				26-SW-04	08/16/1991	26SW0401Y	0.500	486.0	=SS12	18.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP27	SO	ANIONS	NITRITE, NITRATE - NONSPECIFIC	27-SA-01	08/13/1991	27SA0101Y	0.500	2.49	=KF17	1.0	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	1.0	<KF17	1.0	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	2.18	=KF17	1.0	UGG
			SULFATE	27-SA-01	08/13/1991	27SA0101Y	0.500	115.0	=KT07	5.0	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	30.6	=KT07	5.0	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	420.0	=KT07	5.0	UGG
		EXPLOSIVES	1,3,5-TRINITROBENZENE	27-SA-01	08/13/1991	27SA0101Y	0.500	2.1	<LW02	2.09	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	2.1	<LW02	2.09	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	27-SA-01	08/13/1991	27SA0101Y	0.500	0.59	<LW02	0.59	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.59	<LW02	0.59	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.59	<LW02	0.59	UGG
			2,4,6-TNT	27-SA-01	08/13/1991	27SA0101Y	0.500	1.9	<LW02	1.92	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	1.9	<LW02	1.92	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	27-SA-01	08/13/1991	27SA0101Y	0.500	0.42	<LW02	0.42	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.42	<LW02	0.42	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	27-SA-01	08/13/1991	27SA0101Y	0.500	0.4	<LW02	0.4	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.4	<LW02	0.4	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.4	<LW02	0.4	UGG
			HMX	27-SA-01	08/13/1991	27SA0101Y	0.500	1.3	<LW02	1.27	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	1.3	<LW02	1.27	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	1.3	<LW02	1.27	UGG
			NITROBENZENE	27-SA-01	08/13/1991	27SA0101Y	0.500	0.42	<LW02	0.42	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.42	<LW02	0.42	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.42	<LW02	0.42	UGG
			RDX	27-SA-01	08/13/1991	27SA0101Y	0.500	0.98	<LW02	0.98	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.98	<LW02	0.98	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.98	<LW02	0.98	UGG
			TETRYL	27-SA-01	08/13/1991	27SA0101Y	0.500	0.25	<LW02	0.25	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.25	<LW02	0.25	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	27-SA-01	08/13/1991	27SA0101Y	0.500	19.6	<JS12	19.6	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	19.6	<JS12	19.6	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	19.6	<JS12	19.6	UGG
			ARSENIC	27-SA-01	08/13/1991	27SA0101Y	0.500	6.43	=B9	2.5	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	10.8	=B9	2.5	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	99.0	=B9	2.5	UGG
			BARIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	227.0	=JS12	3.29	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	250.0	=JS12	3.29	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	224.0	=JS12	3.29	UGG
			BERYLLIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	1.06	=JS12	0.427	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	1.18	=JS12	0.427	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	5.6	=JS12	0.427	UGG
			CADMIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	1.2	<JS12	1.2	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	1.2	<JS12	1.2	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	1.2	<JS12	1.2	UGG
			CHROMIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	27.4	=JS12	1.04	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				27-SA-02	08/13/1991	27SA0201Y	0.500	33.3	=JS12	1.04	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	32.2	=JS12	1.04	UGG
			COPPER	27-SA-01	08/13/1991	27SA0101Y	0.500	16.1	=JS12	2.84	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	21.2	=JS12	2.84	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	137.0	=JS12	2.84	UGG
			LEAD	27-SA-01	08/13/1991	27SA0101Y	0.500	18.8	=JD21	0.467	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	27.0	=JD21	0.467	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	97.0	=JD21	0.467	UGG
			MERCURY	27-SA-01	08/13/1991	27SA0101Y	0.500	0.05	<Y9	0.05	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.05	<Y9	0.05	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.131	=Y9	0.05	UGG
			NICKEL	27-SA-01	08/13/1991	27SA0101Y	0.500	17.2	=JS12	2.74	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	24.5	=JS12	2.74	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	51.2	=JS12	2.74	UGG
			SELENIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	0.449	<JD20	0.449	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.449	<JD20	0.449	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	13.5	=JD20	0.449	UGG
			SILVER	27-SA-01	08/13/1991	27SA0101Y	0.500	0.803	<JS12	0.803	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	0.803	<JS12	0.803	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	0.803	<JS12	0.803	UGG
			THALLIUM	27-SA-01	08/13/1991	27SA0101Y	0.500	34.3	<JS12	34.3	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	34.3	<JS12	34.3	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	34.3	<JS12	34.3	UGG
			ZINC	27-SA-01	08/13/1991	27SA0101Y	0.500	68.1	=JS12	2.34	UGG
				27-SA-02	08/13/1991	27SA0201Y	0.500	74.2	=JS12	2.34	UGG
				27-SA-03	08/13/1991	27SA0301Y	1.000	63.1	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP28	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	2.1	<LW02	2.09	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	2.1	<LW02	2.09	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.59	<LW02	0.59	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.97	=LW02	0.59	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	28-SS-01	08/09/1991	28SS0101Y	0.500	1.9	<LW02	1.92	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	1.9	<LW02	1.92	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.42	<LW02	0.42	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.42	<LW02	0.42	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.4	<LW02	0.4	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.4	<LW02	0.4	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.4	<LW02	0.4	UGG
			HMX	28-SS-01	08/09/1991	28SS0101YP	0.500	0.75	=LW02	1.27	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	1.3	<LW02	1.27	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.42	<LW02	0.42	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.42	<LW02	0.42	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.42	<LW02	0.42	UGG
			RDX	28-SS-01	08/09/1991	28SS0101Y	0.500	0.98	<LW02	0.98	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.98	<LW02	0.98	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	28-SS-01	08/09/1991	28SS0101Y	0.500	0.25	<LW02	0.25	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.25	<LW02	0.25	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	28-SS-01	08/09/1991	28SS0101Y	0.500	19.6	<JS12	19.6	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	19.6	<JS12	19.6	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	28-SS-01	08/09/1991	28SS0101Y	0.500	5.59	=B9	2.5	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	5.97	=B9	2.5	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	7.12	=B9	2.5	UGG
			BARIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	211.0	=JS12	3.29	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	187.0	=JS12	3.29	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	323.0	=JS12	3.29	UGG
			BERYLLIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	0.637	=JS12	0.427	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.664	=JS12	0.427	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.717	=JS12	0.427	UGG
			CADMIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	1.2	<JS12	1.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	1.2	<JS12	1.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	24.5	=JS12	1.04	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	18.8	=JS12	1.04	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	17.7	=JS12	1.04	UGG
			COPPER	28-SS-01	08/09/1991	28SS0101Y	0.500	17.4	=JS12	2.84	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	15.9	=JS12	2.84	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	17.4	=JS12	2.84	UGG
			LEAD	28-SS-01	08/09/1991	28SS0101Y	0.500	19.0	=JD21	0.467	UGG

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				28-SS-02	08/09/1991	28SS0201Y	0.500	23.0	=JD21	0.467	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	18.0	=JD21	0.467	UGG
			MERCURY	28-SS-01	08/09/1991	28SS0101Y	0.500	0.05	<Y9	0.05	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.05	<Y9	0.05	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	28-SS-01	08/09/1991	28SS0101Y	0.500	19.4	=JS12	2.74	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	20.4	=JS12	2.74	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	24.1	=JS12	2.74	UGG
			SELENIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	0.449	<JD20	0.449	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.449	<JD20	0.449	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	28-SS-01	08/09/1991	28SS0101Y	0.500	0.803	<JS12	0.803	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.803	<JS12	0.803	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	28-SS-01	08/09/1991	28SS0101Y	0.500	34.3	<JS12	34.3	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	34.3	<JS12	34.3	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	28-SS-01	08/09/1991	28SS0101Y	0.500	64.0	=JS12	2.34	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	55.9	=JS12	2.34	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	49.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	28-SS-01	08/09/1991	28SS0101YC	0.500	0.008	=LH17	0.0027	UGG
				28-SS-02	08/09/1991	28SS0201YC	0.500	0.006	=LH17	0.0027	UGG
				28-SS-03	08/09/1991	28SS0301YC	0.500	0.032	=LH17	0.0027	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	28-SS-01	08/09/1991	28SS0101YC	0.500	0.03	=LH17	0.0034	UGG
				28-SS-02	08/09/1991	28SS0201YC	0.500	0.03	=LH17	0.0034	UGG
				28-SS-03	08/09/1991	28SS0301YC	0.500	0.063	=LH17	0.0034	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	28-SS-01	08/09/1991	28SS0101YC	0.500	0.057	=LH17	0.0027	UGG
				28-SS-02	08/09/1991	28SS0201YC	0.500	0.011	=LH17	0.0027	UGG
				28-SS-03	08/09/1991	28SS0301YC	0.500	0.018	=LH17	0.0027	UGG
			ALDRIN	28-SS-01	08/09/1991	28SS0101Y	0.500	0.001	<LH17	0.0014	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.001	<LH17	0.0014	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.001	<LH17	0.0014	UGG
			ALPHA-BENZENEHEXACHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.003	<LH17	0.0028	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.003	<LH17	0.0028	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.003	<LH17	0.0028	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	28-SS-01	08/09/1991	28SS0101Y	0.500	0.001	<LH17	0.001	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.001	<LH17	0.001	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.001	<LH17	0.001	UGG
			BETA-BENZENEHEXACHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.008	<LH17	0.0077	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.008	<LH17	0.0077	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.008	<LH17	0.0077	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	28-SS-01	08/09/1991	28SS0101Y	0.500	0.001	<LH17	0.0007	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.001	<LH17	0.0007	UGG
				28-SS-03	08/09/1991	28SS0301YU	0.500	0.018	=LH17	0.0007	UGG
			CHLORDANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.068	<LH17	0.0684	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.068	<LH17	0.0684	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.068	<LH17	0.0684	UGG
			DELTA-BENZENEHEXACHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.008	<LH17	0.0085	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.008	<LH17	0.0085	UGG

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				28-SS-03	08/09/1991	28SS0301Y	0.500	0.008	<LH17	0.0085	UGG
			DIELDRIN	28-SS-01	08/09/1991	28SS0101YC	0.500	0.013	=LH17	0.0016	UGG
				28-SS-02	08/09/1991	28SS0201YC	0.500	0.009	=LH17	0.0016	UGG
				28-SS-03	08/09/1991	28SS0301YC	0.500	0.061	=LH17	0.0016	UGG
			ENDRIN	28-SS-01	08/09/1991	28SS0101YU	0.500	0.016	=LH17	0.0065	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.007	<LH17	0.0065	UGG
				28-SS-03	08/09/1991	28SS0301YU	0.500	0.019	=LH17	0.0065	UGG
			HEPTACHLOR	28-SS-01	08/09/1991	28SS0101Y	0.500	0.002	<LH17	0.0022	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.002	<LH17	0.0022	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.002	<LH17	0.0022	UGG
			HEPTACHLOR EPOXIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.001	<LH17	0.0013	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.001	<LH17	0.0013	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.001	<LH17	0.0013	UGG
			ISODRIN	28-SS-01	08/09/1991	28SS0101Y	0.500	0.003	<LH17	0.003	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.003	<LH17	0.003	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.003	<LH17	0.003	UGG
			LINDANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.001	<LH17	0.001	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.001	<LH17	0.001	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.001	<LH17	0.001	UGG
			METHOXYCHLOR	28-SS-01	08/09/1991	28SS0101Y	0.500	0.036	<LH17	0.0359	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.036	<LH17	0.0359	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.036	<LH17	0.0359	UGG
			PCB 1016	28-SS-01	08/09/1991	28SS0101Y	0.500	0.1	<LH17	0.1	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.1	<LH17	0.1	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.1	<LH17	0.1	UGG
			PCB 1221	28-SS-01	08/09/1991	28SS0101NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.1	*LH17	0.1	UGG
			PCB 1232	28-SS-01	08/09/1991	28SS0101NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.1	*LH17	0.1	UGG
			PCB 1242	28-SS-01	08/09/1991	28SS0101NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.1	*LH17	0.1	UGG
			PCB 1248	28-SS-01	08/09/1991	28SS0101NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.1	*LH17	0.1	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.1	*LH17	0.1	UGG
			PCB 1254	28-SS-01	08/09/1991	28SS0101NR	0.500	0.048	*LH17	0.048	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.048	*LH17	0.048	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.048	*LH17	0.048	UGG
			PCB 1260	28-SS-01	08/09/1991	28SS0101YC	0.500	0.072	=LH17	0.0479	UGG
				28-SS-02	08/09/1991	28SS0201YC	0.500	0.075	=LH17	0.0479	UGG
				28-SS-03	08/09/1991	28SS0301YC	0.500	0.13	=LH17	0.0479	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	28-SS-01	08/09/1991	28SS0101Y	0.500	0.5	<LM23	0.5	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.5	<LM23	0.5	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG

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			1,1,2,2-TETRACHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.33	<LM23	0.33	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.33	<LM23	0.33	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.49	<LM23	0.49	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.49	<LM23	0.49	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	28-SS-01	08/09/1991	28SS0101Y	0.500	0.27	<LM23	0.27	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.27	<LM23	0.27	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.32	<LM23	0.32	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.32	<LM23	0.32	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	28-SS-01	08/09/1991	28SS0101Y	0.500	0.32	<LM23	0.32	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.32	<LM23	0.32	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.53	<LM23	0.53	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.53	<LM23	0.53	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.14	<LM23	0.14	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.14	<LM23	0.14	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	28-SS-01	08/09/1991	28SS0101NR	0.500	1.0	*LM23	1.0	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	1.0	*LM23	1.0	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	28-SS-01	08/09/1991	28SS0101Y	0.500	3.3	<LM23	3.3	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	3.3	<LM23	3.3	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	28-SS-01	08/09/1991	28SS0101Y	0.500	2.0	<LM23	2.0	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	2.0	<LM23	2.0	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.26	<LM23	0.26	UGG

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				28-SS-02	08/09/1991	28SS0201Y	0.500	0.26	<LM23	0.26	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	28-SS-01	08/09/1991	28SS0101NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.31	<LM23	0.31	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.31	<LM23	0.31	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	28-SS-01	08/09/1991	28SS0101Y	0.500	0.24	<LM23	0.24	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.24	<LM23	0.24	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.64	<LM23	0.64	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.64	<LM23	0.64	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	1.8	<LM23	1.8	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	1.8	<LM23	1.8	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.96	<LM23	0.96	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.96	<LM23	0.96	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	28-SS-01	08/09/1991	28SS0101NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.25	<LM23	0.25	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.25	<LM23	0.25	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	28-SS-01	08/09/1991	28SS0101Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.2	<LM23	0.2	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.19	<LM23	0.19	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.19	<LM23	0.19	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	28-SS-01	08/09/1991	28SS0101NR	0.500	1.0	*LM23	1.0	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	1.0	*LM23	1.0	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	28-SS-01	08/09/1991	28SS0101Y	0.500	4.4	<LM23	4.4	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	4.4	<LM23	4.4	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	28-SS-01	08/09/1991	28SS0101Y	0.500	4.3	<LM23	4.3	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	4.3	<LM23	4.3	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.63	<LM23	0.63	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.63	<LM23	0.63	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	28-SS-01	08/09/1991	28SS0101NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.6	*LM23	0.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	28-SS-01	08/09/1991	28SS0101Y	0.500	0.16	<LM23	0.16	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.16	<LM23	0.16	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.1	<LM23	0.1	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	28-SS-01	08/09/1991	28SS0101NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-02	08/09/1991	28SS0201NR	0.500	0.6	*LM23	0.6	UGG
				28-SS-03	08/09/1991	28SS0301NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	28-SS-01	08/09/1991	28SS0101Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	28-SS-01	08/09/1991	28SS0101Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.23	<LM23	0.23	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	28-SS-01	08/09/1991	28SS0101Y	0.500	0.78	<LM23	0.78	UGG
				28-SS-02	08/09/1991	28SS0201Y	0.500	0.78	<LM23	0.78	UGG
				28-SS-03	08/09/1991	28SS0301Y	0.500	0.78	<LM23	0.78	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP29	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	29-SS-01	08/16/1991	29SS0101Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	29-SS-01	08/16/1991	29SS0101Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	29-SS-01	08/16/1991	29SS0101Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	29-SS-01	08/16/1991	29SS0101Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	29-SS-01	08/16/1991	29SS0101Y	0.500	0.4	<LW02	0.4	UGG
			HMX	29-SS-01	08/16/1991	29SS0101Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	29-SS-01	08/16/1991	29SS0101Y	0.500	0.42	<LW02	0.42	UGG
			RDX	29-SS-01	08/16/1991	29SS0101Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	29-SS-01	08/16/1991	29SS0101Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	29-SS-01	08/16/1991	29SS0101Y	0.500	19.6	<JS12	19.6	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	29-SS-01	08/16/1991	29SS0101Y	0.500	2.5	<B9	2.5	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	8.47	=B9	2.5	UGG
			BARIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	19.4	=JS12	3.29	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	206.0	=JS12	3.29	UGG
			BERYLLIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	0.427	<JS12	0.427	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	1.2	<JS12	1.2	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	8.05	=JS12	1.04	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	20.2	=JS12	1.04	UGG
			COPPER	29-SS-01	08/16/1991	29SS0101Y	0.500	10.6	=JS12	2.84	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	14.1	=JS12	2.84	UGG
			LEAD	29-SS-01	08/16/1991	29SS0101Y	0.500	5.4	=JD21	0.467	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	36.0	=JD21	0.467	UGG
			MERCURY	29-SS-01	08/16/1991	29SS0101Y	0.500	0.109	=Y9	0.05	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	29-SS-01	08/16/1991	29SS0101Y	0.500	6.84	=JS12	2.74	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	17.9	=JS12	2.74	UGG
			SELENIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	0.449	<JD20	0.449	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	29-SS-01	08/16/1991	29SS0101Y	0.500	15.5	=JS12	0.803	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	29-SS-01	08/16/1991	29SS0101Y	0.500	34.3	<JS12	34.3	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	29-SS-01	08/16/1991	29SS0101Y	0.500	25.0	=JS12	2.34	UGG
				29-SS-02	08/21/1991	29SS0201Y	0.500	270.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-TR	29-SS-02	08/21/1991	29SS0201YC	0.500	0.047	=LH17	0.0034	UGG
			ALDRIN	29-SS-02	08/21/1991	29SS0201Y	0.500	0.001	<LH17	0.0014	UGG
			ALPHA-BENZENEHEXACHLORIDE	29-SS-02	08/21/1991	29SS0201Y	0.500	0.003	<LH17	0.0028	UGG
			CHLORDANE	29-SS-02	08/21/1991	29SS0201Y	0.500	0.068	<LH17	0.0684	UGG
			DELTA-BENZENEHEXACHLORIDE	29-SS-02	08/21/1991	29SS0201YC	0.500	0.035	=LH17	0.0085	UGG
			DIELDRIN	29-SS-02	08/21/1991	29SS0201Y	0.500	0.002	<LH17	0.0016	UGG
			ENDRIN	29-SS-02	08/21/1991	29SS0201YU	0.500	0.011	=LH17	0.0065	UGG
			HEPTACHLOR	29-SS-02	08/21/1991	29SS0201Y	0.500	0.002	<LH17	0.0022	UGG
			ISODRIN	29-SS-02	08/21/1991	29SS0201Y	0.500	0.003	<LH17	0.003	UGG
			LINDANE	29-SS-02	08/21/1991	29SS0201Y	0.500	0.001	<LH17	0.001	UGG
			PCB 1016	29-SS-02	08/21/1991	29SS0201Y	0.500	0.1	<LH17	0.1	UGG
			PCB 1260	29-SS-02	08/21/1991	29SS0201Y	0.500	0.048	<LH17	0.0479	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
	SW	EXPLOSIVES	1,3,5-TRINITROBENZENE	29-SW-03	08/16/1991	29SW0301Y	0.500	0.56	<UW01	0.56	UGL
			1,3-DINITROBENZENE	29-SW-03	08/16/1991	29SW0301Y	0.500	0.61	<UW01	0.61	UGL
			2,4,6-TNT	29-SW-03	08/16/1991	29SW0301Y	0.500	0.78	<UW01	0.78	UGL
			2,4-DINITROTOLUENE	29-SW-03	08/16/1991	29SW0301Y	0.500	0.6	<UW01	0.6	UGL
			2,6-DINITROTOLUENE	29-SW-03	08/16/1991	29SW0301Y	0.500	0.55	<UW01	0.55	UGL
			HMX	29-SW-03	08/16/1991	29SW0301Y	0.500	23.0	=UW01	1.3	UGL
			NITROBENZENE	29-SW-03	08/16/1991	29SW0301Y	0.500	1.1	<UW01	1.13	UGL
			RDX	29-SW-03	08/16/1991	29SW0301Y	0.500	200.0	=UW01	0.63	UGL
			TETRYL	29-SW-03	08/16/1991	29SW0301Y	0.500	0.66	<UW01	0.66	UGL
		METALS	ANTIMONY	29-SW-03	08/16/1991	29SW0301Y	0.500	60.0	<SS12	60.0	UGL
			ARSENIC	29-SW-03	08/16/1991	29SW0301Y	0.500	2.35	<AX8	2.35	UGL
			BARIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	97.4	=SS12	2.82	UGL
			BERYLLIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	1.12	<SS12	1.12	UGL
			CADMIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	6.78	<SS12	6.78	UGL
			CHROMIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	16.8	<SS12	16.8	UGL
			COPPER	29-SW-03	08/16/1991	29SW0301Y	0.500	18.8	<SS12	18.8	UGL
			LEAD	29-SW-03	08/16/1991	29SW0301Y	0.500	4.47	<SD18	4.47	UGL
			MERCURY	29-SW-03	08/16/1991	29SW0301Y	0.500	0.1	<CC8	0.1	UGL
			NICKEL	29-SW-03	08/16/1991	29SW0301Y	0.500	32.1	<SS12	32.1	UGL
			SELENIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	2.53	<SD25	2.53	UGL
			SILVER	29-SW-03	08/16/1991	29SW0301Y	0.500	10.0	<SS12	10.0	UGL
			THALLIUM	29-SW-03	08/16/1991	29SW0301Y	0.500	125.0	<SS12	125.0	UGL
			ZINC	29-SW-03	08/16/1991	29SW0301Y	0.500	119.0	=SS12	18.0	UGL

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP30	SD	EXPLOSIVES	1,3,5-TRINITROBENZENE	30-SD-06	08/15/1991	30SD0601Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	30-SD-06	08/15/1991	30SD0601Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	30-SD-06	08/15/1991	30SD0601Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	30-SD-06	08/15/1991	30SD0601Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	30-SD-06	08/15/1991	30SD0601Y	0.500	0.4	<LW02	0.4	UGG
			HMX	30-SD-06	08/15/1991	30SD0601Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	30-SD-06	08/15/1991	30SD0601Y	0.500	0.42	<LW02	0.42	UGG
			RDX	30-SD-06	08/15/1991	30SD0601Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	30-SD-06	08/15/1991	30SD0601Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	30-SD-05	08/15/1991	30SD0501Y	0.500	19.6	<JS12	19.6	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	30-SD-05	08/15/1991	30SD0501Y	0.500	3.44	=B9	2.5	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	10.4	=B9	2.5	UGG
			BARIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	236.0	=JS12	3.29	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	63.8	=JS12	3.29	UGG
			BERYLLIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	0.427	<JS12	0.427	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	1.2	<JS12	1.2	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	3.95	=JS12	1.04	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	5.69	=JS12	1.04	UGG
			COPPER	30-SD-05	08/15/1991	30SD0501Y	0.500	2.84	<JS12	2.84	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	2.84	<JS12	2.84	UGG
			LEAD	30-SD-05	08/15/1991	30SD0501Y	0.500	4.8	=JD21	0.467	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	15.0	=JD21	0.467	UGG
			MERCURY	30-SD-05	08/15/1991	30SD0501Y	0.500	0.05	<Y9	0.05	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	30-SD-05	08/15/1991	30SD0501Y	0.500	8.53	=JS12	2.74	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	6.68	=JS12	2.74	UGG
			SELENIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	0.449	<JD20	0.449	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	30-SD-05	08/15/1991	30SD0501Y	0.500	0.803	<JS12	0.803	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	30-SD-05	08/15/1991	30SD0501Y	0.500	34.3	<JS12	34.3	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	30-SD-05	08/15/1991	30SD0501Y	0.500	13.1	=JS12	2.34	UGG
				30-SD-06	08/15/1991	30SD0601Y	0.500	12.7	=JS12	2.34	UGG
		RADIONUCLIDES	ALPHA GROSS	30-SD-05	08/15/1991	30SD0501Y	0.500	2.9	=00	0.0	PCG
				30-SD-06	08/15/1991	30SD0601Y	0.500	3.9	=00	0.0	PCG
			BISMUTH 214	30-SD-05	08/15/1991	30SD0501Y	0.500	0.75	=99	0.0	PCG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.35	=99	0.0	PCG
			GROSS BETA	30-SD-05	08/15/1991	30SD0501Y	0.500	5.9	=00	0.0	PCG
				30-SD-06	08/15/1991	30SD0601Y	0.500	10.7	=00	0.0	PCG
			LEAD 212	30-SD-06	08/15/1991	30SD0601Y	0.500	0.15	=99	0.0	PCG
			LEAD 214	30-SD-05	08/15/1991	30SD0501Y	0.500	0.78	=99	0.0	PCG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.28	=99	0.0	PCG
			RADIUM 226	30-SD-05	08/15/1991	30SD0501Y	0.500	0.53	=99	0.0	PCG
				30-SD-06	08/15/1991	30SD0601Y	0.500	0.38	=99	0.0	PCG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	30-SA-01	08/14/1991	30SA0101Y	0.500	2.1	<LW02	2.09	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-02	08/14/1991	30SA0201Y	0.500	2.1	<LW02	2.09	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	2.1	<LW02	2.09	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	2.1	<LW02	2.09	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	2.1	<LW02	2.09	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	2.1	<LW02	2.09	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	2.1	<LW02	2.09	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	2.1	<LW02	2.09	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	2.1	<LW02	2.09	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	2.1	<LW02	2.09	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	30-SA-01	08/14/1991	30SA0101Y	0.500	0.59	<LW02	0.59	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.59	<LW02	0.59	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.59	<LW02	0.59	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.59	<LW02	0.59	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.59	<LW02	0.59	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.59	<LW02	0.59	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.59	<LW02	0.59	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.59	<LW02	0.59	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.59	<LW02	0.59	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.59	<LW02	0.59	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.59	<LW02	0.59	UGG
			2,4,6-TNT	30-SA-01	08/14/1991	30SA0101Y	0.500	1.9	<LW02	1.92	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	1.9	<LW02	1.92	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	1.9	<LW02	1.92	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	1.9	<LW02	1.92	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	1.9	<LW02	1.92	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	1.9	<LW02	1.92	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	1.9	<LW02	1.92	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	1.9	<LW02	1.92	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	1.9	<LW02	1.92	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	1.9	<LW02	1.92	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	30-SA-01	08/14/1991	30SA0101Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	30-SA-01	08/14/1991	30SA0101Y	0.500	0.4	<LW02	0.4	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.4	<LW02	0.4	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.4	<LW02	0.4	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.4	<LW02	0.4	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.4	<LW02	0.4	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.4	<LW02	0.4	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.4	<LW02	0.4	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.4	<LW02	0.4	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.4	<LW02	0.4	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.4	<LW02	0.4	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.4	<LW02	0.4	UGG
			HMX	30-SA-01	08/14/1991	30SA0101Y	0.500	1.3	<LW02	1.27	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	1.3	<LW02	1.27	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	1.3	<LW02	1.27	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	1.3	<LW02	1.27	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	1.3	<LW02	1.27	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	1.3	<LW02	1.27	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	1.3	<LW02	1.27	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	1.3	<LW02	1.27	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	1.3	<LW02	1.27	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	2.2	=LW02	1.27	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	1.3	<LW02	1.27	UGG
			NITROBENZENE	30-SA-01	08/14/1991	30SA0101Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.42	<LW02	0.42	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.42	<LW02	0.42	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.42	<LW02	0.42	UGG
			RDX	30-SA-01	08/14/1991	30SA0101Y	0.500	0.98	<LW02	0.98	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.98	<LW02	0.98	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.98	<LW02	0.98	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.98	<LW02	0.98	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.98	<LW02	0.98	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.98	<LW02	0.98	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.98	<LW02	0.98	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.98	<LW02	0.98	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.98	<LW02	0.98	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	16.0	=LW02	0.98	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.98	<LW02	0.98	UGG
			TETRYL	30-SA-01	08/14/1991	30SA0101Y	0.500	0.25	<LW02	0.25	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.25	<LW02	0.25	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.25	<LW02	0.25	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.25	<LW02	0.25	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.25	<LW02	0.25	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.25	<LW02	0.25	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.25	<LW02	0.25	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.25	<LW02	0.25	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.25	<LW02	0.25	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.25	<LW02	0.25	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.25	<LW02	0.25	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
		METALS	ANTIMONY	30-SA-01	08/14/1991	30SA0101Y	0.500	19.6	<JS12	19.6	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	19.6	<JS12	19.6	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	19.6	<JS12	19.6	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	19.6	<JS12	19.6	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	19.6	<JS12	19.6	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	19.6	<JS12	19.6	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	19.6	<JS12	19.6	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	19.6	<JS12	19.6	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	19.6	<JS12	19.6	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	19.6	<JS12	19.6	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	19.6	<JS12	19.6	UGG
			ARSENIC	30-SA-01	08/14/1991	30SA0101Y	0.500	5.23	=B9	2.5	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	8.07	=B9	2.5	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	6.34	=B9	2.5	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	5.8	=B9	2.5	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	8.7	=B9	2.5	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	6.78	=B9	2.5	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	3.88	=B9	2.5	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	4.4	=B9	2.5	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	5.61	=B9	2.5	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	18.1	=B9	2.5	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	21.3	=B9	2.5	UGG
			BARIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	217.0	=JS12	3.29	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	618.0	=JS12	3.29	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	722.0	=JS12	3.29	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	563.0	=JS12	3.29	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	63.9	=JS12	3.29	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	78.2	=JS12	3.29	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	14.0	=JS12	3.29	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	682.0	=JS12	3.29	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	234.0	=JS12	3.29	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	17.7	=JS12	3.29	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	258.0	=JS12	3.29	UGG
			BERYLLIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	0.724	=JS12	0.427	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	2.36	=JS12	0.427	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.862	=JS12	0.427	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.875	=JS12	0.427	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	1.09	=JS12	0.427	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.697	=JS12	0.427	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	1.9	=JS12	0.427	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.851	=JS12	0.427	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.916	=JS12	0.427	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	1.66	=JS12	0.427	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.857	=JS12	0.427	UGG
			CADMIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	1.2	<JS12	1.2	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	1.2	<JS12	1.2	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	1.2	<JS12	1.2	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	1.2	<JS12	1.2	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	1.2	<JS12	1.2	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-08	08/14/1991	30SA0801Y	1.000	1.2	<JS12	1.2	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	2.53	=JS12	1.2	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	3.32	=JS12	1.2	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	1.2	<JS12	1.2	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	2.5	=JS12	1.2	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	1.2	<JS12	1.2	UGG
			CHROMIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	219.0	=JS12	1.04	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	31.0	=JS12	1.04	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	33.4	=JS12	1.04	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	32.6	=JS12	1.04	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	24.1	=JS12	1.04	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	24.0	=JS12	1.04	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	416.0	=JS12	1.04	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	25.5	=JS12	1.04	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	31.2	=JS12	1.04	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	2,800.0	=JS12	1.04	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	20.1	=JS12	1.04	UGG
			COPPER	30-SA-01	08/14/1991	30SA0101Y	0.500	8,100.0	=JS12	2.84	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	2,100.0	=JS12	2.84	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	965.0	=JS12	2.84	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	101.0	=JS12	2.84	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	66.6	=JS12	2.84	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	15.4	=JS12	2.84	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	1,800.0	=JS12	2.84	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	462.0	=JS12	2.84	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	41.9	=JS12	2.84	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	8,200.0	=JS12	2.84	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	29.1	=JS12	2.84	UGG
			LEAD	30-SA-01	08/14/1991	30SA0101Y	0.500	21.0	=JD21	0.467	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	36.0	=JD21	0.467	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	26.0	=JD21	0.467	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	17.0	=JD21	0.467	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	15.0	=JD21	0.467	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	13.0	=JD21	0.467	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	30.0	=JD21	0.467	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	75.0	=JD21	0.467	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	14.0	=JD21	0.467	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	260.0	=JD21	0.467	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	45.0	=JD21	0.467	UGG
			MERCURY	30-SA-01	08/14/1991	30SA0101Y	0.500	0.063	=Y9	0.05	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.05	<Y9	0.05	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.05	<Y9	0.05	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.05	<Y9	0.05	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.05	<Y9	0.05	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.05	<Y9	0.05	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.253	=Y9	0.05	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.075	=Y9	0.05	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.05	<Y9	0.05	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.05	<Y9	0.05	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.05	<Y9	0.05	UGG
			NICKEL	30-SA-01	08/14/1991	30SA0101Y	0.500	472.0	=JS12	2.74	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	27.2	=JS12	2.74	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	23.2	=JS12	2.74	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	20.9	=JS12	2.74	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	24.7	=JS12	2.74	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	19.9	=JS12	2.74	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	504.0	=JS12	2.74	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	26.3	=JS12	2.74	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	24.5	=JS12	2.74	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	1,900.0	=JS12	2.74	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	43.7	=JS12	2.74	UGG
			SELENIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	0.449	<JD20	0.449	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.449	<JD20	0.449	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.449	<JD20	0.449	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.449	<JD20	0.449	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.449	<JD20	0.449	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.449	<JD20	0.449	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.449	<JD20	0.449	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.449	<JD20	0.449	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.449	<JD20	0.449	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.449	<JD20	0.449	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.681	=JD20	0.449	UGG
			SILVER	30-SA-01	08/14/1991	30SA0101Y	0.500	4.72	=JS12	0.803	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	0.803	<JS12	0.803	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	0.803	<JS12	0.803	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	0.803	<JS12	0.803	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	0.803	<JS12	0.803	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.803	<JS12	0.803	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.803	<JS12	0.803	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	0.803	<JS12	0.803	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.803	<JS12	0.803	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.803	<JS12	0.803	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.803	<JS12	0.803	UGG
			THALLIUM	30-SA-01	08/14/1991	30SA0101Y	0.500	34.3	<JS12	34.3	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	34.3	<JS12	34.3	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	34.3	<JS12	34.3	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	34.3	<JS12	34.3	UGG
				30-SA-07	08/14/1991	30SA0701Y	0.500	34.3	<JS12	34.3	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	34.3	<JS12	34.3	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	34.3	<JS12	34.3	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	34.3	<JS12	34.3	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	34.3	<JS12	34.3	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	34.3	<JS12	34.3	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	34.3	<JS12	34.3	UGG
			ZINC	30-SA-01	08/14/1991	30SA0101Y	0.500	66.8	=JS12	2.34	UGG
				30-SA-02	08/14/1991	30SA0201Y	0.500	452.0	=JS12	2.34	UGG
				30-SA-03	08/14/1991	30SA0301Y	0.500	211.0	=JS12	2.34	UGG
				30-SA-04	08/14/1991	30SA0401Y	1.000	67.6	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-07	08/14/1991	30SA0701Y	0.500	44.1	=JS12	2.34	UGG
				30-SA-08	08/14/1991	30SA0801Y	1.000	42.3	=JS12	2.34	UGG
				30-SA-09	08/14/1991	30SA0901Y	1.000	156.0	=JS12	2.34	UGG
				30-SA-10	08/14/1991	30SA1001Y	0.500	143.0	=JS12	2.34	UGG
				30-SA-11	08/14/1991	30SA1101Y	1.000	58.6	=JS12	2.34	UGG
				30-SA-12	08/15/1991	30SA1201Y	1.000	3,900.0	=JS12	2.34	UGG
				30-SA-13	08/15/1991	30SA1301Y	0.700	67.0	=JS12	2.34	UGG
		RADIONUCLIDES	ACTINIUM 228	30-SA-12	08/15/1991	30SA1201Y	1.000	0.0	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	1.1	=99	0.0	PCG
			ALPHA GROSS	30-SA-01	08/14/1991	30SA0101N	0.500	4.8	=00	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	2.7	=00	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	3.6	=00	0.0	PCG
				30-SA-04	08/14/1991	30SA0401Y	1.000	2.6	=00	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	3.0	=00	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	1.6	=00	0.0	PCG
				30-SA-09	08/14/1991	30SA0901Y	1.000	1.7	=00	0.0	PCG
				30-SA-10	08/14/1991	30SA1001N	0.500	1.9	=00	0.0	PCG
				30-SA-11	08/14/1991	30SA1101Y	1.000	1.8	=00	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	1.7	=00	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	3.0	=99	0.0	PCG
			BISMUTH 214	30-SA-01	08/14/1991	30SA0101N	0.500	1.52	=99	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	0.67	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.9	=99	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	0.72	=99	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.67	=99	0.0	PCG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.65	=99	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.4	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	1.34	=99	0.0	PCG
			CESIUM 137	30-SA-02	08/14/1991	30SA0201N	0.500	0.17	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.27	=99	0.0	PCG
				30-SA-11	08/14/1991	30SA1101Y	1.000	0.16	=99	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.0	=99	0.0	PCG
			GAMMA SCAN / GAMMA SCREEN	30-SA-04	08/14/1991	30SA0401Y	1.000	0.25	=99	0.0	PCG
				30-SA-10	08/14/1991	30SA1001N	0.500	0.25	<99	0.25	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.0	=99	0.0	PCG
			GROSS BETA	30-SA-01	08/14/1991	30SA0101N	0.500	29.3	=00	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	17.7	=00	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	21.0	=00	0.0	PCG
				30-SA-04	08/14/1991	30SA0401Y	1.000	10.8	=00	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	11.0	=00	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	7.2	=00	0.0	PCG
				30-SA-09	08/14/1991	30SA0901Y	1.000	3.4	=00	0.0	PCG
				30-SA-10	08/14/1991	30SA1001N	0.500	7.5	=00	0.0	PCG
				30-SA-11	08/14/1991	30SA1101Y	1.000	10.8	=00	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	2.1	=00	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	12.6	=00	0.0	PCG
			LEAD 212	30-SA-02	08/14/1991	30SA0201N	0.500	0.85	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.93	=99	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	0.54	=99	0.0	PCG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.73	=99	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.0	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.78	=99	0.0	PCG
			LEAD 214	30-SA-01	08/14/1991	30SA0101N	0.500	0.41	=99	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	0.84	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.64	=99	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	0.39	=99	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.74	=99	0.0	PCG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.52	=99	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.23	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.51	=99	0.0	PCG
			RADIUM 226	30-SA-01	08/14/1991	30SA0101N	0.500	0.95	=99	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	0.59	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.57	=99	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	0.47	=99	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.48	=99	0.0	PCG
				30-SA-09	08/14/1991	30SA0901Y	1.000	0.32	=99	0.0	PCG
				30-SA-12	08/15/1991	30SA1201Y	1.000	0.27	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.68	=99	0.0	PCG
			THALLIUM 208	30-SA-01	08/14/1991	30SA0101N	0.500	0.56	=99	0.0	PCG
				30-SA-02	08/14/1991	30SA0201N	0.500	0.72	=99	0.0	PCG
				30-SA-03	08/14/1991	30SA0301N	0.500	0.64	=99	0.0	PCG
				30-SA-07	08/14/1991	30SA0701N	0.500	0.36	=99	0.0	PCG
				30-SA-08	08/14/1991	30SA0801Y	1.000	0.51	=99	0.0	PCG
				30-SA-13	08/15/1991	30SA1301Y	0.700	0.76	=99	0.0	PCG
	SW	EXPLOSIVES	1,3,5-TRINITROBENZENE	30-SW-05	08/15/1991	30SW0501Y	0.300	0.56	<UW01	0.56	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.56	<UW01	0.56	UGL
			1,3-DINITROBENZENE	30-SW-05	08/15/1991	30SW0501Y	0.300	0.61	<UW01	0.61	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.61	<UW01	0.61	UGL
			2,4,6-TNT	30-SW-05	08/15/1991	30SW0501Y	0.300	0.78	<UW01	0.78	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.78	<UW01	0.78	UGL
			2,4-DINITROTOLUENE	30-SW-05	08/15/1991	30SW0501Y	0.300	0.6	<UW01	0.6	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.6	<UW01	0.6	UGL
			2,6-DINITROTOLUENE	30-SW-05	08/15/1991	30SW0501Y	0.300	0.55	<UW01	0.55	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.55	<UW01	0.55	UGL
			HMX	30-SW-05	08/15/1991	30SW0501Y	0.300	1.3	<UW01	1.3	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	1.3	<UW01	1.3	UGL
			NITROBENZENE	30-SW-05	08/15/1991	30SW0501Y	0.300	1.1	<UW01	1.13	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	2.3	=UW01	1.13	UGL
			RDX	30-SW-05	08/15/1991	30SW0501Y	0.300	0.63	<UW01	0.63	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.63	<UW01	0.63	UGL
			TETRYL	30-SW-05	08/15/1991	30SW0501Y	0.300	0.66	<UW01	0.66	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.66	<UW01	0.66	UGL
		METALS	ANTIMONY	30-SW-05	08/15/1991	30SW0501Y	0.300	60.0	<SS12	60.0	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	60.0	<SS12	60.0	UGL
						30SW0602YD	0.300	60.0	<SS12	60.0	UGL
			ARSENIC	30-SW-05	08/15/1991	30SW0501Y	0.300	5.39	=AX8	2.35	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	5.39	=AX8	2.35	UGL
						30SW0602YD	0.300	4.19	=AX8	2.35	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			BARIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	75.8	=SS12	2.82	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	76.7	=SS12	2.82	UGL
						30SW0602YD	0.300	77.8	=SS12	2.82	UGL
			BERYLLIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	1.12	<SS12	1.12	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	1.12	<SS12	1.12	UGL
						30SW0602YD	0.300	1.12	<SS12	1.12	UGL
			CADMIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	6.78	<SS12	6.78	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	6.78	<SS12	6.78	UGL
						30SW0602YD	0.300	6.78	<SS12	6.78	UGL
			CHROMIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	16.8	<SS12	16.8	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	16.8	<SS12	16.8	UGL
						30SW0602YD	0.300	16.8	<SS12	16.8	UGL
			COPPER	30-SW-05	08/15/1991	30SW0501Y	0.300	18.8	<SS12	18.8	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	18.8	<SS12	18.8	UGL
						30SW0602YD	0.300	18.8	<SS12	18.8	UGL
			LEAD	30-SW-05	08/15/1991	30SW0501Y	0.300	4.47	<SD18	4.47	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	7.76	=SD18	4.47	UGL
						30SW0602YD	0.300	4.47	<SD18	4.47	UGL
			MERCURY	30-SW-05	08/15/1991	30SW0501Y	0.300	0.1	<CC8	0.1	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	0.1	<CC8	0.1	UGL
						30SW0602YD	0.300	0.1	<CC8	0.1	UGL
			NICKEL	30-SW-05	08/15/1991	30SW0501Y	0.300	32.1	<SS12	32.1	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	32.1	<SS12	32.1	UGL
						30SW0602YD	0.300	32.1	<SS12	32.1	UGL
			SELENIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	2.53	<SD25	2.53	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	2.53	<SD25	2.53	UGL
						30SW0602YD	0.300	2.53	<SD25	2.53	UGL
			SILVER	30-SW-05	08/15/1991	30SW0501Y	0.300	10.0	<SS12	10.0	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	10.0	<SS12	10.0	UGL
						30SW0602YD	0.300	10.0	<SS12	10.0	UGL
			THALLIUM	30-SW-05	08/15/1991	30SW0501Y	0.300	125.0	<SS12	125.0	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	125.0	<SS12	125.0	UGL
						30SW0602YD	0.300	125.0	<SS12	125.0	UGL
			ZINC	30-SW-05	08/15/1991	30SW0501Y	0.300	18.0	<SS12	18.0	UGL
				30-SW-06	08/15/1991	30SW0601Y	0.300	18.0	<SS12	18.0	UGL
						30SW0602YD	0.300	18.0	<SS12	18.0	UGL
		RADIONUCLIDES	ALPHA GROSS	30-SW-05	08/15/1991	30SW0501Y	0.300	2.0	=00	0.0	PCL
				30-SW-06	08/15/1991	30SW0601Y	0.300	2.0	=00	0.0	PCL
						30SW0602YD	0.300	2.0	=00	0.0	PCL
			GAMMA SCAN / GAMMA SCREEN	30-SW-05	08/15/1991	30SW0501Y	0.300	2.0	=99	0.0	PCL
				30-SW-06	08/15/1991	30SW0601Y	0.300	2.0	=99	0.0	PCL
						30SW0602YD	0.300	2.0	=99	0.0	PCL
			GROSS BETA	30-SW-05	08/15/1991	30SW0501Y	0.300	6.0	=00	0.0	PCL
				30-SW-06	08/15/1991	30SW0601Y	0.300	4.0	=00	0.0	PCL
						30SW0602YD	0.300	4.0	=00	0.0	PCL

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP31	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	2.1	<LW02	2.09	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.59	<LW02	0.59	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	31-SA-01	08/15/1991	31SA0102Y	3.000	1.9	<LW02	1.92	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	31-SA-01	08/15/1991	31SA0102N	3.000	1.4	<LM25	1.4	UGG
						31SA0102Y	3.000	0.42	<LW02	0.42	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.4	<LM25	1.4	UGG
						31SS0101Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	31-SA-01	08/15/1991	31SA0102N	3.000	0.32	<LM25	0.32	UGG
						31SA0102Y	3.000	0.4	<LW02	0.4	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.32	<LM25	0.32	UGG
						31SS0101Y	0.500	0.4	<LW02	0.4	UGG
			HMX	31-SA-01	08/15/1991	31SA0102Y	3.000	1.3	<LW02	1.27	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	31-SA-01	08/15/1991	31SA0102N	3.000	1.8	<LM25	1.8	UGG
						31SA0102Y	3.000	0.42	<LW02	0.42	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.8	<LM25	1.8	UGG
						31SS0101Y	0.500	0.42	<LW02	0.42	UGG
			RDX	31-SA-01	08/15/1991	31SA0102Y	3.000	0.98	<LW02	0.98	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.25	<LW02	0.25	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	31-SA-01	08/15/1991	31SA0102Y	3.000	19.6	<JS12	19.6	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	31-SA-01	08/15/1991	31SA0102Y	3.000	10.9	=B9	2.5	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	5.97	=B9	2.5	UGG
			BARIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	235.0	=JS12	3.29	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	194.0	=JS12	3.29	UGG
			BERYLLIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	1.04	=JS12	0.427	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.802	=JS12	0.427	UGG
			CADMIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	1.2	<JS12	1.2	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	28.4	=JS12	1.04	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	16.3	=JS12	1.04	UGG
			COPPER	31-SA-01	08/15/1991	31SA0102Y	3.000	25.5	=JS12	2.84	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	15.8	=JS12	2.84	UGG
			LEAD	31-SA-01	08/15/1991	31SA0102Y	3.000	14.0	=JD21	0.467	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	23.0	=JD21	0.467	UGG
			MERCURY	31-SA-01	08/15/1991	31SA0102Y	3.000	0.05	<Y9	0.05	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	31-SA-01	08/15/1991	31SA0102Y	3.000	25.8	=JS12	2.74	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	13.3	=JS12	2.74	UGG
			SELENIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	0.656	=JD20	0.449	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	31-SA-01	08/15/1991	31SA0102Y	3.000	0.803	<JS12	0.803	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	31-SA-01	08/15/1991	31SA0102Y	3.000	34.3	<JS12	34.3	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				31-SS-01	08/15/1991	31SS0101Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	31-SA-01	08/15/1991	31SA0102Y	3.000	72.6	=JS12	2.34	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	69.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	31-SA-01	08/15/1991	31SA0102N	3.000	0.068	<LM25	0.068	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	31-SA-01	08/15/1991	31SA0102N	3.000	0.1	<LM25	0.1	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	31-SA-01	08/15/1991	31SA0102N	3.000	0.064	<LM25	0.064	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.064	<LM25	0.064	UGG
			ALDRIN	31-SA-01	08/15/1991	31SA0102N	3.000	1.3	<LM25	1.3	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	31-SA-01	08/15/1991	31SA0102N	3.000	1.3	<LM25	1.3	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	31-SA-01	08/15/1991	31SA0102N	3.000	0.4	<LM25	0.4	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	31-SA-01	08/15/1991	31SA0102N	3.000	1.3	<LM25	1.3	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	31-SA-01	08/15/1991	31SA0102N	3.000	2.4	<LM25	2.4	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	2.4	<LM25	2.4	UGG
			CHLORDANE	31-SA-01	08/15/1991	31SA0102N	3.000	0.68	<LM25	0.68	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	31-SA-01	08/15/1991	31SA0102N	3.000	0.21	<LM25	0.21	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.21	<LM25	0.21	UGG
			DIELDRIN	31-SA-01	08/15/1991	31SA0102N	3.000	0.079	<LM25	0.079	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.079	<LM25	0.079	UGG
			ENDRIN	31-SA-01	08/15/1991	31SA0102N	3.000	1.3	<LM25	1.3	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	31-SA-01	08/15/1991	31SA0102N	3.000	0.24	<LM25	0.24	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	31-SA-01	08/15/1991	31SA0102N	3.000	0.48	<LM25	0.48	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.48	<LM25	0.48	UGG
			ISODRIN	31-SA-01	08/15/1991	31SA0102N	3.000	0.48	<LM25	0.48	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.48	<LM25	0.48	UGG
			LINDANE	31-SA-01	08/15/1991	31SA0102N	3.000	0.1	<LM25	0.1	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	31-SA-01	08/15/1991	31SA0102N	3.000	0.26	<LM25	0.26	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.26	<LM25	0.26	UGG
			PCB 1016	31-SA-01	08/15/1991	31SA0102N	3.000	0.32	<LM25	0.32	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.32	<LM25	0.32	UGG
			PCB 1221	31-SA-01	08/15/1991	31SA0102NR	3.000	1.9	*LM25	1.9	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1232	31-SA-01	08/15/1991	31SA0102NR	3.000	1.9	*LM25	1.9	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1242	31-SA-01	08/15/1991	31SA0102NR	3.000	1.9	*LM25	1.9	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1248	31-SA-01	08/15/1991	31SA0102NR	3.000	1.9	*LM25	1.9	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1254	31-SA-01	08/15/1991	31SA0102NR	3.000	3.8	*LM25	3.8	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	3.8	*LM25	3.8	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			PCB 1260	31-SA-01	08/15/1991	31SA0102N	3.000	0.79	<LM25	0.79	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.79	<LM25	0.79	UGG
			PCB 1262	31-SA-01	08/15/1991	31SA0102Y	3.000	6.3	<LM25	0.3	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	31-SA-01	08/15/1991	31SA0102NR	3.000	12.0	*LM25	12.0	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.22	<LM25	0.22	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.042	<LM25	0.042	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.52	<LM25	0.52	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.034	<LM25	0.034	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.075	<LM25	0.075	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.075	<LM25	0.075	UGG
			2,3,6-TCP	31-SA-01	08/15/1991	31SA0102Y	3.000	0.62	<LM25	0.62	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.49	<LM25	0.49	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.061	<LM25	0.061	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.065	<LM25	0.065	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	3.0	<LM25	3.0	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	4.7	<LM25	4.7	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.57	<LM25	0.57	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.24	<LM25	0.24	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.055	<LM25	0.055	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	31-SA-01	08/15/1991	31SA0102Y	3.000	0.8	<LM25	0.8	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.098	<LM25	0.098	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	31-SA-01	08/15/1991	31SA0102NR	3.000	3.1	*LM25	3.1	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	1.1	<LM25	1.1	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.6	<LM25	1.6	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.6	<LM25	1.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	31-SA-01	08/15/1991	31SA0102Y	3.000	0.93	<LM25	0.93	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	31-SA-01	08/15/1991	31SA0102Y	3.000	3.0	<LM25	3.0	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.34	<LM25	0.34	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	31-SA-01	08/15/1991	31SA0102Y	3.000	0.041	<LM25	0.041	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	31-SA-01	08/15/1991	31SA0102NR	3.000	0.63	*LM25	0.63	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	31-SA-01	08/15/1991	31SA0102Y	3.000	0.17	<LM25	0.17	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.24	<LM25	0.24	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	31-SA-01	08/15/1991	31SA0102NR	3.000	3.1	*LM25	3.1	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	3.3	<LM25	3.3	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.041	<LM25	0.041	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.033	<LM25	0.033	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.71	<LM25	0.71	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.71	<LM25	0.71	UGG
			ATRAZINE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.065	<LM25	0.065	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.041	<LM25	0.48	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.2	<LM25	1.2	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.31	<LM25	0.31	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.18	<LM25	0.18	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.13	<LM25	0.13	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	31-SA-01	08/15/1991	31SA0102NR	3.000	3.1	*LM25	3.1	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.19	<LM25	0.19	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	31-SA-01	08/15/1991	31SA0102Y	3.000	0.36	<LM25	0.36	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	31-SA-01	08/15/1991	31SA0102Y	3.000	0.44	<LM25	0.44	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.48	<LM25	0.48	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.48	<LM25	0.48	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			BUTYLBENZYL PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.8	<LM25	1.8	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.8	<LM25	1.8	UGG
			CHRYSENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.3	<LM25	1.3	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.23	<LM25	0.23	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.31	<LM25	0.31	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	31-SA-01	08/15/1991	31SA0102Y	3.000	0.038	<LM25	0.038	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.071	<LM25	0.071	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.57	<LM25	0.57	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.24	<LM25	0.24	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.063	<LM25	0.063	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.063	<LM25	0.063	UGG
			DITHIANE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.065	<LM25	0.065	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.2	<LM25	1.2	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.8	<LM25	1.8	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	31-SA-01	08/15/1991	31SA0102NR	3.000	0.28	*LM25	0.28	UGG
				31-SS-01	08/15/1991	31SS0101NR	0.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.063	=LM25	0.032	UGG
			FLUORENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.065	<LM25	0.065	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.08	<LM25	0.08	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.97	<LM25	0.97	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.52	<LM25	0.52	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.8	<LM25	1.8	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	31-SA-01	08/15/1991	31SA0102Y	3.000	2.4	<LM25	2.4	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.39	<LM25	0.39	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.39	<LM25	0.39	UGG
			MALATHION	31-SA-01	08/15/1991	31SA0102Y	3.000	0.18	<LM25	0.18	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.18	<LM25	0.18	UGG
			MIREX	31-SA-01	08/15/1991	31SA0102Y	3.000	0.14	<LM25	0.14	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	31-SA-01	08/15/1991	31SA0102Y	3.000	1.1	<LM25	1.1	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.46	<LM25	0.46	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.29	<LM25	0.29	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.74	<LM25	0.74	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.097	<LM25	0.097	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.066	<LM25	0.066	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.32	<LM25	0.32	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.32	<LM25	0.32	UGG
			PARATHION	31-SA-01	08/15/1991	31SA0102Y	3.000	1.7	<LM25	1.7	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.76	<LM25	0.76	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.032	<LM25	0.032	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.032	<LM25	0.032	UGG
			PHENOL	31-SA-01	08/15/1991	31SA0102Y	3.000	0.052	<LM25	0.052	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.052	<LM25	0.052	UGG
			PYRENE	31-SA-01	08/15/1991	31SA0102Y	3.000	0.083	<LM25	0.083	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	31-SA-01	08/15/1991	31SA0102Y	3.000	0.92	<LM25	0.92	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.92	<LM25	0.92	UGG
			VAPONA	31-SA-01	08/15/1991	31SA0102Y	3.000	0.068	<LM25	0.068	UGG
				31-SS-01	08/15/1991	31SS0101Y	0.500	0.068	<LM25	0.068	UGG
		VOLATILES	1,3-DICHLOROBENZENE	31-SA-01	08/15/1991	31SA0102N	3.000	0.042	<LM25	0.042	UGG
				31-SS-01	08/15/1991	31SS0101N	0.500	0.042	<LM25	0.042	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP32	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	2.1	<LW02	2.09	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.59	<LW02	0.59	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	32-SA-01	08/13/1991	32SA0101Y	1.500	1.9	<LW02	1.92	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	32-SA-01	08/13/1991	32SA0101N	1.500	1.4	<LM25	1.4	UGG
						32SA0101Y	1.500	0.42	<LW02	0.42	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	32-SA-01	08/13/1991	32SA0101N	1.500	0.32	<LM25	0.32	UGG
						32SA0101Y	1.500	0.4	<LW02	0.4	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.4	<LW02	0.4	UGG
			HMX	32-SA-01	08/13/1991	32SA0101Y	1.500	1.3	<LW02	1.27	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	32-SA-01	08/13/1991	32SA0101N	1.500	1.8	<LM25	1.8	UGG
						32SA0101Y	1.500	0.42	<LW02	0.42	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.42	<LW02	0.42	UGG
			RDX	32-SA-01	08/13/1991	32SA0101Y	1.500	0.98	<LW02	0.98	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.98	<LW02	0.98	UGG
			TETRYL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.25	<LW02	0.25	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	32-SA-01	08/13/1991	32SA0101Y	1.500	19.6	<JS12	19.6	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	19.6	<JS12	19.6	UGG
			ARSENIC	32-SA-01	08/13/1991	32SA0101Y	1.500	6.96	=B9	2.5	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	5.78	=B9	2.5	UGG
			BARIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	202.0	=JS12	3.29	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	174.0	=JS12	3.29	UGG
			BERYLLIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	0.831	=JS12	0.427	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.921	=JS12	0.427	UGG
			CADMIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	1.2	<JS12	1.2	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	1.2	<JS12	1.2	UGG
			CHROMIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	22.7	=JS12	1.04	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	23.8	=JS12	1.04	UGG
			COPPER	32-SA-01	08/13/1991	32SA0101Y	1.500	19.3	=JS12	2.84	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	25.6	=JS12	2.84	UGG
			LEAD	32-SA-01	08/13/1991	32SA0101Y	1.500	20.0	=JD21	0.467	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	15.0	=JD21	0.467	UGG
			MERCURY	32-SA-01	08/13/1991	32SA0101Y	1.500	0.057	=Y9	0.05	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.07	=Y9	0.05	UGG
			NICKEL	32-SA-01	08/13/1991	32SA0101Y	1.500	18.7	=JS12	2.74	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	17.9	=JS12	2.74	UGG
			SELENIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	0.449	<JD20	0.449	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.449	<JD20	0.449	UGG
			SILVER	32-SA-01	08/13/1991	32SA0101Y	1.500	0.803	<JS12	0.803	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	0.803	<JS12	0.803	UGG
			THALLIUM	32-SA-01	08/13/1991	32SA0101Y	1.500	34.3	<JS12	34.3	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	34.3	<JS12	34.3	UGG
			ZINC	32-SA-01	08/13/1991	32SA0101Y	1.500	66.1	=JS12	2.34	UGG
				32-SA-02	08/13/1991	32SA0201Y	1.500	60.5	=JS12	2.34	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	32-SA-01	08/13/1991	32SA0101N	1.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	32-SA-01	08/13/1991	32SA0101N	1.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	32-SA-01	08/13/1991	32SA0101N	1.500	0.064	<LM25	0.064	UGG
			ALDRIN	32-SA-01	08/13/1991	32SA0101N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	32-SA-01	08/13/1991	32SA0101N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	32-SA-01	08/13/1991	32SA0101N	1.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	32-SA-01	08/13/1991	32SA0101N	1.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	32-SA-01	08/13/1991	32SA0101N	1.500	2.4	<LM25	2.4	UGG
			CHLORDANE	32-SA-01	08/13/1991	32SA0101N	1.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	32-SA-01	08/13/1991	32SA0101N	1.500	0.21	<LM25	0.21	UGG
			DIELDRIN	32-SA-01	08/13/1991	32SA0101N	1.500	0.079	<LM25	0.079	UGG
			ENDRIN	32-SA-01	08/13/1991	32SA0101N	1.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	32-SA-01	08/13/1991	32SA0101N	1.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	32-SA-01	08/13/1991	32SA0101N	1.500	0.48	<LM25	0.48	UGG
			ISODRIN	32-SA-01	08/13/1991	32SA0101N	1.500	0.48	<LM25	0.48	UGG
			LINDANE	32-SA-01	08/13/1991	32SA0101N	1.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	32-SA-01	08/13/1991	32SA0101N	1.500	0.26	<LM25	0.26	UGG
			PCB 1016	32-SA-01	08/13/1991	32SA0101N	1.500	0.32	<LM25	0.32	UGG
			PCB 1221	32-SA-01	08/13/1991	32SA0101NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1232	32-SA-01	08/13/1991	32SA0101NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1242	32-SA-01	08/13/1991	32SA0101NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1248	32-SA-01	08/13/1991	32SA0101NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1254	32-SA-01	08/13/1991	32SA0101NR	1.500	3.8	*LM25	3.8	UGG
			PCB 1260	32-SA-01	08/13/1991	32SA0101N	1.500	0.79	<LM25	0.79	UGG
			PCB 1262	32-SA-01	08/13/1991	32SA0101Y	1.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	32-SA-01	08/13/1991	32SA0101NR	1.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.075	<LM25	0.075	UGG
			2,3,6-TCP	32-SA-01	08/13/1991	32SA0101Y	1.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	32-SA-01	08/13/1991	32SA0101Y	1.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	32-SA-01	08/13/1991	32SA0101NR	1.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	32-SA-01	08/13/1991	32SA0101Y	1.500	0.93	<LM25	0.93	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			3-NITROANILINE	32-SA-01	08/13/1991	32SA0101Y	1.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	32-SA-01	08/13/1991	32SA0101Y	1.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	32-SA-01	08/13/1991	32SA0101NR	1.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	32-SA-01	08/13/1991	32SA0101Y	1.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	32-SA-01	08/13/1991	32SA0101NR	1.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.71	<LM25	0.71	UGG
			ATRAZINE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	32-SA-01	08/13/1991	32SA0101NR	1.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	32-SA-01	08/13/1991	32SA0101Y	1.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	32-SA-01	08/13/1991	32SA0101Y	1.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.8	<LM25	1.8	UGG
			CHRYSENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	3.2	=LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	32-SA-01	08/13/1991	32SA0101Y	1.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.063	<LM25	0.063	UGG
			DITHIANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	32-SA-01	08/13/1991	32SA0101NR	1.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			FLUORENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	32-SA-01	08/13/1991	32SA0101Y	1.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.39	<LM25	0.39	UGG
			MALATHION	32-SA-01	08/13/1991	32SA0101Y	1.500	0.18	<LM25	0.18	UGG
			MIREX	32-SA-01	08/13/1991	32SA0101Y	1.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.46	<LM25	0.46	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			N-NITROSODIPHENYLAMINE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.32	<LM25	0.32	UGG
			PARATHION	32-SA-01	08/13/1991	32SA0101Y	1.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.032	<LM25	0.032	UGG
			PHENOL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.052	<LM25	0.052	UGG
			PYRENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	32-SA-01	08/13/1991	32SA0101Y	1.500	0.92	<LM25	0.92	UGG
			VAPONA	32-SA-01	08/13/1991	32SA0101Y	1.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	32-SA-01	08/13/1991	32SA0101Y	1.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	32-SA-01	08/13/1991	32SA0101Y	1.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	32-SA-01	08/13/1991	32SA0101Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	32-SA-01	08/13/1991	32SA0101N	1.500	0.042	<LM25	0.042	UGG
						32SA0101Y	1.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	32-SA-01	08/13/1991	32SA0101NR	1.500	1.0	*LM23	1.0	UGG
			ACETONE	32-SA-01	08/13/1991	32SA0101Y	1.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	32-SA-01	08/13/1991	32SA0101Y	1.500	2.0	<LM23	2.0	UGG
			BENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			BROMOFORM	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	32-SA-01	08/13/1991	32SA0101NR	1.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.31	<LM23	0.31	UGG
			CHLORFORM	32-SA-01	08/13/1991	32SA0101Y	1.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	32-SA-01	08/13/1991	32SA0101Y	1.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	32-SA-01	08/13/1991	32SA0101NR	1.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	32-SA-01	08/13/1991	32SA0101Y	1.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	32-SA-01	08/13/1991	32SA0101NR	1.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	32-SA-01	08/13/1991	32SA0101Y	1.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	32-SA-01	08/13/1991	32SA0101Y	1.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.63	<LM23	0.63	UGG
			STYRENE	32-SA-01	08/13/1991	32SA0101NR	1.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	32-SA-01	08/13/1991	32SA0101Y	1.500	0.16	<LM23	0.16	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			TOLUENE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	32-SA-01	08/13/1991	32SA0101NR	1.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	32-SA-01	08/13/1991	32SA0101Y	1.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	32-SA-01	08/13/1991	32SA0101Y	1.500	0.23	<LM23	0.23	UGG
			XYLENES	32-SA-01	08/13/1991	32SA0101Y	1.500	0.78	<LM23	0.78	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP33	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	33-SA-01	08/10/1991	33SA0101Y	0.500	2.1	<LW02	2.09	UGG
						33SA0102Y	1.000	30.0	=LW02	2.09	UGG
			1,3-DINITROBENZENE	33-SA-01	08/10/1991	33SA0101Y	0.500	0.59	<LW02	0.59	UGG
						33SA0102Y	1.000	0.59	<LW02	0.59	UGG
			2,4,6-TNT	33-SA-01	08/10/1991	33SA0101Y	0.500	1.9	<LW02	1.92	UGG
						33SA0102Y	1.000	49.0	=LW02	1.92	UGG
			2,4-DINITROTOLUENE	33-SA-01	08/10/1991	33SA0101Y	0.500	0.42	<LW02	0.42	UGG
						33SA0102Y	1.000	2.4	=LW02	0.42	UGG
			2,6-DINITROTOLUENE	33-SA-01	08/10/1991	33SA0101Y	0.500	0.4	<LW02	0.4	UGG
						33SA0102Y	1.000	0.47	=LW02	0.4	UGG
			HMX	33-SA-01	08/10/1991	33SA0101YP	0.500	0.68	=LW02	1.27	UGG
						33SA0102Y	1.000	87.0	=LW02	1.27	UGG
			NITROBENZENE	33-SA-01	08/10/1991	33SA0101Y	0.500	0.42	<LW02	0.42	UGG
						33SA0102Y	1.000	0.42	<LW02	0.42	UGG
			RDX	33-SA-01	08/10/1991	33SA0101Y	0.500	0.98	<LW02	0.98	UGG
						33SA0102Y	1.000	140.0	=LW02	0.98	UGG
			TETRYL	33-SA-01	08/10/1991	33SA0101Y	0.500	0.25	<LW02	0.25	UGG
						33SA0102Y	1.000	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	33-SA-01	08/10/1991	33SA0101Y	0.500	19.6	<JS12	19.6	UGG
						33SA0102Y	1.000	19.6	<JS12	19.6	UGG
			ARSENIC	33-SA-01	08/10/1991	33SA0101Y	0.500	4.72	=B9	2.5	UGG
						33SA0102Y	1.000	5.44	=B9	2.5	UGG
			BARIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	288.0	=JS12	3.29	UGG
						33SA0102Y	1.000	3,400.0	=JS12	3.29	UGG
			BERYLLIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	0.729	=JS12	0.427	UGG
						33SA0102Y	1.000	1.27	=JS12	0.427	UGG
			CADMIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	1.2	<JS12	1.2	UGG
						33SA0102Y	1.000	12.5	=JS12	1.2	UGG
			CHROMIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	24.3	=JS12	1.04	UGG
						33SA0102Y	1.000	106.0	=JS12	1.04	UGG
			COPPER	33-SA-01	08/10/1991	33SA0101Y	0.500	40.7	=JS12	2.84	UGG
						33SA0102Y	1.000	1,150.0	=JS12	2.84	UGG
			LEAD	33-SA-01	08/10/1991	33SA0101Y	0.500	40.0	=JD21	0.467	UGG
						33SA0102Y	1.000	170.0	=JD21	0.467	UGG
			MERCURY	33-SA-01	08/10/1991	33SA0101Y	0.500	0.307	=Y9	0.05	UGG
						33SA0102Y	1.000	0.436	=Y9	0.05	UGG
			NICKEL	33-SA-01	08/10/1991	33SA0101Y	0.500	23.1	=JS12	2.74	UGG
						33SA0102Y	1.000	81.5	=JS12	2.74	UGG
			SELENIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	0.449	<JD20	0.449	UGG
						33SA0102Y	1.000	0.449	<JD20	0.449	UGG
			SILVER	33-SA-01	08/10/1991	33SA0101Y	0.500	0.803	<JS12	0.803	UGG
						33SA0102Y	1.000	11.7	=JS12	0.803	UGG
			THALLIUM	33-SA-01	08/10/1991	33SA0101Y	0.500	34.3	<JS12	34.3	UGG
						33SA0102Y	1.000	34.3	<JS12	34.3	UGG
			ZINC	33-SA-01	08/10/1991	33SA0101Y	0.500	92.1	=JS12	2.34	UGG
						33SA0102Y	1.000	3,300.0	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP34	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	2.1	<LW02	2.09	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	2.1	<LW02	2.09	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	2.1	<LW02	2.09	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.59	<LW02	0.59	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.59	<LW02	0.59	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.59	<LW02	0.59	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	34-SA-02	08/13/1991	34SA0201Y	1.500	1.9	<LW02	1.92	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.9	<LW02	1.92	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.9	<LW02	1.92	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	34-SA-02	08/13/1991	34SA0201N	1.500	1.4	<LM25	1.4	UGG
						34SA0201Y	1.500	0.42	<LW02	0.42	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.4	<LM25	1.4	UGG
						34SA0301Y	1.500	0.42	<LW02	0.42	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.4	<LM25	1.4	UGG
						34SS0101Y	0.500	0.42	<LW02	0.42	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.4	<LM25	1.4	UGG
						34SS0401Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	34-SA-02	08/13/1991	34SA0201N	1.500	0.32	<LM25	0.32	UGG
						34SA0201Y	1.500	0.4	<LW02	0.4	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.32	<LM25	0.32	UGG
						34SA0301Y	1.500	0.4	<LW02	0.4	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.32	<LM25	0.32	UGG
						34SS0101Y	0.500	0.4	<LW02	0.4	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.32	<LM25	0.32	UGG
						34SS0401Y	0.500	0.4	<LW02	0.4	UGG
			HMX	34-SA-02	08/13/1991	34SA0201Y	1.500	1.3	<LW02	1.27	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.3	<LW02	1.27	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	3.1	=LW02	1.27	UGG
				34-SS-04	08/13/1991	34SS0401YP	0.500	0.78	=LW02	1.27	UGG
			NITROBENZENE	34-SA-02	08/13/1991	34SA0201N	1.500	1.8	<LM25	1.8	UGG
						34SA0201Y	1.500	0.42	<LW02	0.42	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.8	<LM25	1.8	UGG
						34SA0301Y	1.500	0.42	<LW02	0.42	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.8	<LM25	1.8	UGG
						34SS0101Y	0.500	0.42	<LW02	0.42	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.8	<LM25	1.8	UGG
						34SS0401Y	0.500	0.42	<LW02	0.42	UGG
			RDX	34-SA-02	08/13/1991	34SA0201Y	1.500	0.98	<LW02	0.98	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.98	<LW02	0.98	UGG
				34-SS-01	08/13/1991	34SS0101YP	0.500	0.4	=LW02	0.98	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.25	<LW02	0.25	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.25	<LW02	0.25	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.25	<LW02	0.25	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	34-SA-02	08/13/1991	34SA0201Y	1.500	19.6	<JS12	19.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SA-03	08/13/1991	34SA0301Y	1.500	19.6	<JS12	19.6	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	19.6	<JS12	19.6	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	34-SA-02	08/13/1991	34SA0201Y	1.500	5.81	=B9	2.5	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	5.27	=B9	2.5	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	5.62	=B9	2.5	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	6.63	=B9	2.5	UGG
			BARIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	268.0	=JS12	3.29	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	474.0	=JS12	3.29	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	9.49	=JS12	3.29	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1,210.0	=JS12	3.29	UGG
			BERYLLIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	1.15	=JS12	0.427	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.629	=JS12	0.427	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.812	=JS12	0.427	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.25	=JS12	0.427	UGG
			CADMIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	1.2	<JS12	1.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.88	=JS12	1.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.83	=JS12	1.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	21.3	=JS12	1.2	UGG
			CHROMIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	156.0	=JS12	1.04	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	27.0	=JS12	1.04	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	54.2	=JS12	1.04	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	148.0	=JS12	1.04	UGG
			COPPER	34-SA-02	08/13/1991	34SA0201Y	1.500	138.0	=JS12	2.84	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	74.8	=JS12	2.84	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	341.0	=JS12	2.84	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	2,900.0	=JS12	2.84	UGG
			LEAD	34-SA-02	08/13/1991	34SA0201Y	1.500	24.0	=JD21	0.467	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	760.0	=JD21	0.467	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	57.0	=JD21	0.467	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1,000.0	=JD21	0.467	UGG
			MERCURY	34-SA-02	08/13/1991	34SA0201Y	1.500	0.056	=Y9	0.05	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.086	=Y9	0.05	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.05	<Y9	0.05	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.157	=Y9	0.05	UGG
			NICKEL	34-SA-02	08/13/1991	34SA0201Y	1.500	23.8	=JS12	2.74	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	19.3	=JS12	2.74	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	38.6	=JS12	2.74	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	60.4	=JS12	2.74	UGG
			SELENIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	0.449	<JD20	0.449	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.449	<JD20	0.449	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.449	<JD20	0.449	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	34-SA-02	08/13/1991	34SA0201Y	1.500	0.803	<JS12	0.803	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.803	<JS12	0.803	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.803	<JS12	0.803	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.73	=JS12	0.803	UGG
			THALLIUM	34-SA-02	08/13/1991	34SA0201Y	1.500	34.3	<JS12	34.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	34.3	<JS12	34.3	UGG

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				34-SS-01	08/13/1991	34SS0101Y	0.500	34.3	<JS12	34.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	34-SA-02	08/13/1991	34SA0201Y	1.500	106.0	=JS12	2.34	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	309.0	=JS12	2.34	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	501.0	=JS12	2.34	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	4,600.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	34-SA-02	08/13/1991	34SA0201N	1.500	0.068	<LM25	0.068	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.068	<LM25	0.068	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.068	<LM25	0.068	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	34-SA-02	08/13/1991	34SA0201N	1.500	0.1	<LM25	0.1	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.1	<LM25	0.1	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.1	<LM25	0.1	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	34-SA-02	08/13/1991	34SA0201N	1.500	0.064	<LM25	0.064	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.064	<LM25	0.064	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.064	<LM25	0.064	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.064	<LM25	0.064	UGG
			ALDRIN	34-SA-02	08/13/1991	34SA0201N	1.500	1.3	<LM25	1.3	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.3	<LM25	1.3	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.3	<LM25	1.3	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	34-SA-02	08/13/1991	34SA0201N	1.500	1.3	<LM25	1.3	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.3	<LM25	1.3	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.3	<LM25	1.3	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	34-SA-02	08/13/1991	34SA0201N	1.500	0.4	<LM25	0.4	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.4	<LM25	0.4	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.4	<LM25	0.4	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	34-SA-02	08/13/1991	34SA0201N	1.500	1.3	<LM25	1.3	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.3	<LM25	1.3	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.3	<LM25	1.3	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	34-SA-02	08/13/1991	34SA0201N	1.500	2.4	<LM25	2.4	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	2.4	<LM25	2.4	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	2.4	<LM25	2.4	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	2.4	<LM25	2.4	UGG
			CHLORDANE	34-SA-02	08/13/1991	34SA0201N	1.500	0.68	<LM25	0.68	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.68	<LM25	0.68	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.68	<LM25	0.68	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	34-SA-02	08/13/1991	34SA0201N	1.500	0.21	<LM25	0.21	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.21	<LM25	0.21	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.21	<LM25	0.21	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.21	<LM25	0.21	UGG
			DIELDRIN	34-SA-02	08/13/1991	34SA0201N	1.500	0.079	<LM25	0.079	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.079	<LM25	0.079	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.079	<LM25	0.079	UGG

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				34-SS-04	08/13/1991	34SS0401N	0.500	0.079	<LM25	0.079	UGG
			ENDRIN	34-SA-02	08/13/1991	34SA0201N	1.500	1.3	<LM25	1.3	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	1.3	<LM25	1.3	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	1.3	<LM25	1.3	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	34-SA-02	08/13/1991	34SA0201N	1.500	0.24	<LM25	0.24	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.24	<LM25	0.24	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.24	<LM25	0.24	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	34-SA-02	08/13/1991	34SA0201N	1.500	0.48	<LM25	0.48	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.48	<LM25	0.48	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.48	<LM25	0.48	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.48	<LM25	0.48	UGG
			ISODRIN	34-SA-02	08/13/1991	34SA0201N	1.500	0.48	<LM25	0.48	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.48	<LM25	0.48	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.48	<LM25	0.48	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.48	<LM25	0.48	UGG
			LINDANE	34-SA-02	08/13/1991	34SA0201N	1.500	0.1	<LM25	0.1	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.1	<LM25	0.1	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.1	<LM25	0.1	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	34-SA-02	08/13/1991	34SA0201N	1.500	0.26	<LM25	0.26	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.26	<LM25	0.26	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.26	<LM25	0.26	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.26	<LM25	0.26	UGG
			PCB 1016	34-SA-02	08/13/1991	34SA0201N	1.500	0.32	<LM25	0.32	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.32	<LM25	0.32	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.32	<LM25	0.32	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.32	<LM25	0.32	UGG
			PCB 1221	34-SA-02	08/13/1991	34SA0201NR	1.500	1.9	*LM25	1.9	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.9	*LM25	1.9	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.9	*LM25	1.9	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1232	34-SA-02	08/13/1991	34SA0201NR	1.500	1.9	*LM25	1.9	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.9	*LM25	1.9	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.9	*LM25	1.9	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1242	34-SA-02	08/13/1991	34SA0201NR	1.500	1.9	*LM25	1.9	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.9	*LM25	1.9	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.9	*LM25	1.9	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1248	34-SA-02	08/13/1991	34SA0201NR	1.500	1.9	*LM25	1.9	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.9	*LM25	1.9	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.9	*LM25	1.9	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.9	*LM25	1.9	UGG
			PCB 1254	34-SA-02	08/13/1991	34SA0201NR	1.500	3.8	*LM25	3.8	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	3.8	*LM25	3.8	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	3.8	*LM25	3.8	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	3.8	*LM25	3.8	UGG

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			PCB 1260	34-SA-02	08/13/1991	34SA0201N	1.500	0.79	<LM25	0.79	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.79	<LM25	0.79	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.79	<LM25	0.79	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.79	<LM25	0.79	UGG
			PCB 1262	34-SA-02	08/13/1991	34SA0201Y	1.500	6.3	<LM25	0.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	6.3	<LM25	0.3	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	6.3	<LM25	0.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	34-SA-02	08/13/1991	34SA0201NR	1.500	12.0	*LM25	12.0	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	12.0	*LM25	12.0	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	12.0	*LM25	12.0	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.22	<LM25	0.22	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.22	<LM25	0.22	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.22	<LM25	0.22	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.042	<LM25	0.042	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.042	<LM25	0.042	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.042	<LM25	0.042	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.52	<LM25	0.52	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.52	<LM25	0.52	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.52	<LM25	0.52	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.034	<LM25	0.034	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.034	<LM25	0.034	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.034	<LM25	0.034	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.075	<LM25	0.075	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.075	<LM25	0.075	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.075	<LM25	0.075	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.075	<LM25	0.075	UGG
			2,3,6-TCP	34-SA-02	08/13/1991	34SA0201Y	1.500	0.62	<LM25	0.62	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.62	<LM25	0.62	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.62	<LM25	0.62	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.49	<LM25	0.49	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.49	<LM25	0.49	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.49	<LM25	0.49	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.061	<LM25	0.061	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.061	<LM25	0.061	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.061	<LM25	0.061	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.065	<LM25	0.065	UGG

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				34-SA-03	08/13/1991	34SA0301Y	1.500	0.065	<LM25	0.065	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.065	<LM25	0.065	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	3.0	<LM25	3.0	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	3.0	<LM25	3.0	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	3.0	<LM25	3.0	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	4.7	<LM25	4.7	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	4.7	<LM25	4.7	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	4.7	<LM25	4.7	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.57	<LM25	0.57	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.57	<LM25	0.57	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.57	<LM25	0.57	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.24	<LM25	0.24	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.24	<LM25	0.24	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.24	<LM25	0.24	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.055	<LM25	0.055	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.055	<LM25	0.055	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.055	<LM25	0.055	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	34-SA-02	08/13/1991	34SA0201Y	1.500	0.8	<LM25	0.8	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.8	<LM25	0.8	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.8	<LM25	0.8	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.284	=LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.098	<LM25	0.098	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.098	<LM25	0.098	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.098	<LM25	0.098	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	34-SA-02	08/13/1991	34SA0201NR	1.500	3.1	*LM25	3.1	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	3.1	*LM25	3.1	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	3.1	*LM25	3.1	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	1.1	<LM25	1.1	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.1	<LM25	1.1	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.1	<LM25	1.1	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.6	<LM25	1.6	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.6	<LM25	1.6	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.6	<LM25	1.6	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.6	<LM25	1.6	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.6	<LM25	1.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.6	<LM25	1.6	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	34-SA-02	08/13/1991	34SA0201Y	1.500	0.93	<LM25	0.93	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.93	<LM25	0.93	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.93	<LM25	0.93	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	34-SA-02	08/13/1991	34SA0201Y	1.500	3.0	<LM25	3.0	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	3.0	<LM25	3.0	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	3.0	<LM25	3.0	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.34	<LM25	0.34	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.34	<LM25	0.34	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.34	<LM25	0.34	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	34-SA-02	08/13/1991	34SA0201Y	1.500	0.041	<LM25	0.041	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.041	<LM25	0.041	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.041	<LM25	0.041	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	34-SA-02	08/13/1991	34SA0201NR	1.500	0.63	*LM25	0.63	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.63	*LM25	0.63	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.63	*LM25	0.63	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	34-SA-02	08/13/1991	34SA0201Y	1.500	0.17	<LM25	0.17	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.17	<LM25	0.17	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.17	<LM25	0.17	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.24	<LM25	0.24	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.24	<LM25	0.24	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.24	<LM25	0.24	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	34-SA-02	08/13/1991	34SA0201NR	1.500	3.1	*LM25	3.1	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	3.1	*LM25	3.1	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	3.1	*LM25	3.1	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	3.3	<LM25	3.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	3.3	<LM25	3.3	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	3.3	<LM25	3.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.041	<LM25	0.041	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.041	<LM25	0.041	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.041	<LM25	0.041	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.033	<LM25	0.033	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.033	<LM25	0.033	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.033	<LM25	0.033	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.71	<LM25	0.71	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.71	<LM25	0.71	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.71	<LM25	0.71	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.71	<LM25	0.71	UGG
			ATRAZINE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.065	<LM25	0.065	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.065	<LM25	0.065	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.065	<LM25	0.065	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.041	<LM25	0.48	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.041	<LM25	0.48	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.041	<LM25	0.48	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.112	=LM25	0.48	UGG
			BENZO(A)PYRENE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.2	<LM25	1.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.2	<LM25	1.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.2	<LM25	1.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.31	<LM25	0.31	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.31	<LM25	0.31	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.31	<LM25	0.31	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.18	<LM25	0.18	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.18	<LM25	0.18	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.18	<LM25	0.18	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.13	<LM25	0.13	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.13	<LM25	0.13	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.13	<LM25	0.13	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	34-SA-02	08/13/1991	34SA0201NR	1.500	3.1	*LM25	3.1	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	3.1	*LM25	3.1	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	3.1	*LM25	3.1	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.19	<LM25	0.19	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.19	<LM25	0.19	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.19	<LM25	0.19	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	34-SA-02	08/13/1991	34SA0201Y	1.500	0.36	<LM25	0.36	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.36	<LM25	0.36	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.36	<LM25	0.36	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	34-SA-02	08/13/1991	34SA0201Y	1.500	0.44	<LM25	0.44	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.44	<LM25	0.44	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.44	<LM25	0.44	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.48	<LM25	0.48	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.48	<LM25	0.48	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.48	<LM25	0.48	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.22	=LM25	0.48	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			BUTYLBENZYL PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.8	<LM25	1.8	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.8	<LM25	1.8	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.8	<LM25	1.8	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.8	<LM25	1.8	UGG
			CHRYSENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.553	=LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	3.48	=LM25	1.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	3.01	=LM25	1.3	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	2.27	=LM25	1.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	2.16	=LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.23	<LM25	0.23	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.23	<LM25	0.23	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.23	<LM25	0.23	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.31	<LM25	0.31	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.31	<LM25	0.31	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.31	<LM25	0.31	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	34-SA-02	08/13/1991	34SA0201Y	1.500	0.038	<LM25	0.038	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.038	<LM25	0.038	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.038	<LM25	0.038	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.071	<LM25	0.071	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.071	<LM25	0.071	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.071	<LM25	0.071	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.57	<LM25	0.57	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.57	<LM25	0.57	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.57	<LM25	0.57	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.24	<LM25	0.24	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.24	<LM25	0.24	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.24	<LM25	0.24	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.063	<LM25	0.063	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.063	<LM25	0.063	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.063	<LM25	0.063	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.063	<LM25	0.063	UGG
			DITHIANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.065	<LM25	0.065	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.065	<LM25	0.065	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.065	<LM25	0.065	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.2	<LM25	1.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.2	<LM25	1.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.2	<LM25	1.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.8	<LM25	1.8	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.8	<LM25	1.8	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.8	<LM25	1.8	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	34-SA-02	08/13/1991	34SA0201NR	1.500	0.28	*LM25	0.28	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.28	*LM25	0.28	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.28	*LM25	0.28	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.032	<LM25	0.032	UGG
			FLUORENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.065	<LM25	0.065	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.065	<LM25	0.065	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.065	<LM25	0.065	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.08	<LM25	0.08	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.08	<LM25	0.08	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.08	<LM25	0.08	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.97	<LM25	0.97	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.97	<LM25	0.97	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.97	<LM25	0.97	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.52	<LM25	0.52	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.52	<LM25	0.52	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.52	<LM25	0.52	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.8	<LM25	1.8	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.8	<LM25	1.8	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.8	<LM25	1.8	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	34-SA-02	08/13/1991	34SA0201Y	1.500	2.4	<LM25	2.4	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	2.4	<LM25	2.4	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	2.4	<LM25	2.4	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.39	<LM25	0.39	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.39	<LM25	0.39	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.39	<LM25	0.39	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.39	<LM25	0.39	UGG
			MALATHION	34-SA-02	08/13/1991	34SA0201Y	1.500	0.18	<LM25	0.18	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.18	<LM25	0.18	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.18	<LM25	0.18	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.18	<LM25	0.18	UGG
			MIREX	34-SA-02	08/13/1991	34SA0201Y	1.500	0.14	<LM25	0.14	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.14	<LM25	0.14	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.14	<LM25	0.14	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.1	<LM25	1.1	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.1	<LM25	1.1	UGG

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				34-SS-01	08/13/1991	34SS0101Y	0.500	1.1	<LM25	1.1	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.46	<LM25	0.46	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.46	<LM25	0.46	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.46	<LM25	0.46	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.29	<LM25	0.29	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.29	<LM25	0.29	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.29	<LM25	0.29	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.74	<LM25	0.74	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.74	<LM25	0.74	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.74	<LM25	0.74	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.097	<LM25	0.097	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.097	<LM25	0.097	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.097	<LM25	0.097	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.066	<LM25	0.066	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.066	<LM25	0.066	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.066	<LM25	0.066	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.32	<LM25	0.32	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.32	<LM25	0.32	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.32	<LM25	0.32	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.32	<LM25	0.32	UGG
			PARATHION	34-SA-02	08/13/1991	34SA0201Y	1.500	1.7	<LM25	1.7	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.7	<LM25	1.7	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.7	<LM25	1.7	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.76	<LM25	0.76	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.76	<LM25	0.76	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.76	<LM25	0.76	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.032	<LM25	0.032	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.032	<LM25	0.032	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.032	<LM25	0.032	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.265	=LM25	0.032	UGG
			PHENOL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.052	<LM25	0.052	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.052	<LM25	0.052	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.052	<LM25	0.052	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.052	<LM25	0.052	UGG
			PYRENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.083	<LM25	0.083	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.083	<LM25	0.083	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.083	<LM25	0.083	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.304	=LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	34-SA-02	08/13/1991	34SA0201Y	1.500	0.92	<LM25	0.92	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.92	<LM25	0.92	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.92	<LM25	0.92	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.92	<LM25	0.92	UGG
			VAPONA	34-SA-02	08/13/1991	34SA0201Y	1.500	0.068	<LM25	0.068	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.068	<LM25	0.068	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.068	<LM25	0.068	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	34-SA-02	08/13/1991	34SA0201Y	1.500	0.5	<LM23	0.5	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.5	<LM23	0.5	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.5	<LM23	0.5	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.33	<LM23	0.33	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.33	<LM23	0.33	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.33	<LM23	0.33	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.49	<LM23	0.49	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.49	<LM23	0.49	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.49	<LM23	0.49	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	34-SA-02	08/13/1991	34SA0201Y	1.500	0.27	<LM23	0.27	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.27	<LM23	0.27	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.27	<LM23	0.27	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.32	<LM23	0.32	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.32	<LM23	0.32	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.32	<LM23	0.32	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	34-SA-02	08/13/1991	34SA0201Y	1.500	0.32	<LM23	0.32	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.32	<LM23	0.32	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.32	<LM23	0.32	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.53	<LM23	0.53	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.53	<LM23	0.53	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.53	<LM23	0.53	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	34-SA-02	08/13/1991	34SA0201N	1.500	0.042	<LM25	0.042	UGG
						34SA0201Y	1.500	0.14	<LM23	0.14	UGG
				34-SA-03	08/13/1991	34SA0301N	1.500	0.042	<LM25	0.042	UGG
						34SA0301Y	1.500	0.14	<LM23	0.14	UGG
				34-SS-01	08/13/1991	34SS0101N	0.500	0.042	<LM25	0.042	UGG
						34SS0101Y	0.500	0.14	<LM23	0.14	UGG
				34-SS-04	08/13/1991	34SS0401N	0.500	0.042	<LM25	0.042	UGG
						34SS0401Y	0.500	0.14	<LM23	0.14	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			1,3-DICLOROPROPANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.23	<LM23	0.23	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.23	<LM23	0.23	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.23	<LM23	0.23	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	34-SA-02	08/13/1991	34SA0201NR	1.500	1.0	*LM23	1.0	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.0	*LM23	1.0	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.0	*LM23	1.0	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	34-SA-02	08/13/1991	34SA0201Y	1.500	3.3	<LM23	3.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	3.3	<LM23	3.3	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	3.3	<LM23	3.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	34-SA-02	08/13/1991	34SA0201Y	1.500	2.0	<LM23	2.0	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	2.0	<LM23	2.0	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	2.0	<LM23	2.0	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.1	<LM23	0.1	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.1	<LM23	0.1	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.1	<LM23	0.1	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.26	<LM23	0.26	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.26	<LM23	0.26	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.26	<LM23	0.26	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	34-SA-02	08/13/1991	34SA0201NR	1.500	0.6	*LM23	0.6	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.6	*LM23	0.6	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.6	*LM23	0.6	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.31	<LM23	0.31	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.31	<LM23	0.31	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.31	<LM23	0.31	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	34-SA-02	08/13/1991	34SA0201Y	1.500	0.24	<LM23	0.24	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.24	<LM23	0.24	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.24	<LM23	0.24	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.1	<LM23	0.1	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.1	<LM23	0.1	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.1	<LM23	0.1	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.64	<LM23	0.64	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.64	<LM23	0.64	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.64	<LM23	0.64	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	34-SA-02	08/13/1991	34SA0201Y	1.500	1.8	<LM23	1.8	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	1.8	<LM23	1.8	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	1.8	<LM23	1.8	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.96	<LM23	0.96	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.96	<LM23	0.96	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.96	<LM23	0.96	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	34-SA-02	08/13/1991	34SA0201NR	1.500	0.6	*LM23	0.6	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.6	*LM23	0.6	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.6	*LM23	0.6	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.25	<LM23	0.25	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.25	<LM23	0.25	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.25	<LM23	0.25	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	34-SA-02	08/13/1991	34SA0201Y	1.500	0.2	<LM23	0.2	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.2	<LM23	0.2	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.2	<LM23	0.2	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.19	<LM23	0.19	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.19	<LM23	0.19	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.19	<LM23	0.19	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	34-SA-02	08/13/1991	34SA0201NR	1.500	1.0	*LM23	1.0	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	1.0	*LM23	1.0	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	1.0	*LM23	1.0	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	34-SA-02	08/13/1991	34SA0201Y	1.500	4.4	<LM23	4.4	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	4.4	<LM23	4.4	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	4.4	<LM23	4.4	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	34-SA-02	08/13/1991	34SA0201Y	1.500	4.3	<LM23	4.3	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	4.3	<LM23	4.3	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	4.3	<LM23	4.3	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.63	<LM23	0.63	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.63	<LM23	0.63	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.63	<LM23	0.63	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	34-SA-02	08/13/1991	34SA0201NR	1.500	0.6	*LM23	0.6	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.6	*LM23	0.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.6	*LM23	0.6	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	34-SA-02	08/13/1991	34SA0201Y	1.500	0.16	<LM23	0.16	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.16	<LM23	0.16	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.16	<LM23	0.16	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.1	<LM23	0.1	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.1	<LM23	0.1	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.1	<LM23	0.1	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	34-SA-02	08/13/1991	34SA0201NR	1.500	0.6	*LM23	0.6	UGG
				34-SA-03	08/13/1991	34SA0301NR	1.500	0.6	*LM23	0.6	UGG
				34-SS-01	08/13/1991	34SS0101NR	0.500	0.6	*LM23	0.6	UGG
				34-SS-04	08/13/1991	34SS0401NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	34-SA-02	08/13/1991	34SA0201Y	1.500	0.23	<LM23	0.23	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.23	<LM23	0.23	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.23	<LM23	0.23	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	34-SA-02	08/13/1991	34SA0201Y	1.500	0.23	<LM23	0.23	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.23	<LM23	0.23	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.23	<LM23	0.23	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	34-SA-02	08/13/1991	34SA0201Y	1.500	0.78	<LM23	0.78	UGG
				34-SA-03	08/13/1991	34SA0301Y	1.500	0.78	<LM23	0.78	UGG
				34-SS-01	08/13/1991	34SS0101Y	0.500	0.78	<LM23	0.78	UGG
				34-SS-04	08/13/1991	34SS0401Y	0.500	0.78	<LM23	0.78	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP35	SD	EXPLOSIVES	1,3,5-TRINITROBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	2.1	<LW02	2.09	UGG
						35SD0402YD	0.300	2.1	<LW02	2.09	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	2.1	<LW02	2.09	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.59	<LW02	0.59	UGG
						35SD0402YD	0.300	4.3	=LW02	0.59	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.59	<LW02	0.59	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.59	<LW02	0.59	UGG
			2,4,6-TNT	35-SD-04	08/12/1991	35SD0401Y	0.300	1.9	<LW02	1.92	UGG
						35SD0402YD	0.300	1.9	<LW02	1.92	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	1.9	<LW02	1.92	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.42	<LW02	0.42	UGG
						35SD0402YD	0.300	0.42	<LW02	0.42	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.42	<LW02	0.42	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.4	<LW02	0.4	UGG
						35SD0402YD	0.300	0.4	<LW02	0.4	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.4	<LW02	0.4	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.4	<LW02	0.4	UGG
			HMX	35-SD-04	08/12/1991	35SD0401Y	0.300	1.3	<LW02	1.27	UGG
						35SD0402YD	0.300	1.3	<LW02	1.27	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	1.3	<LW02	1.27	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	1.3	<LW02	1.27	UGG
			NITROBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.42	<LW02	0.42	UGG
						35SD0402YD	0.300	0.42	<LW02	0.42	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.42	<LW02	0.42	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.42	<LW02	0.42	UGG
			RDX	35-SD-04	08/12/1991	35SD0401Y	0.300	0.98	<LW02	0.98	UGG
						35SD0402YD	0.300	0.98	<LW02	0.98	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.98	<LW02	0.98	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.98	<LW02	0.98	UGG
			TETRYL	35-SD-04	08/12/1991	35SD0401Y	0.300	0.25	<LW02	0.25	UGG
						35SD0402YD	0.300	0.25	<LW02	0.25	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.25	<LW02	0.25	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	35-SD-04	08/12/1991	35SD0401Y	0.300	19.6	<JS12	19.6	UGG
						35SD0402YD	0.300	19.6	<JS12	19.6	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	19.6	<JS12	19.6	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	19.6	<JS12	19.6	UGG
			ARSENIC	35-SD-04	08/12/1991	35SD0401Y	0.300	4.0	=B9	2.5	UGG
						35SD0402YD	0.300	5.73	=B9	2.5	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	5.23	=B9	2.5	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	4.13	=B9	2.5	UGG
			BARIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	534.0	=JS12	3.29	UGG
						35SD0402YD	0.300	549.0	=JS12	3.29	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	176.0	=JS12	3.29	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	171.0	=JS12	3.29	UGG
			BERYLLIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	0.902	=JS12	0.427	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						35SD0402YD	0.300	2.94	=JS12	0.427	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.799	=JS12	0.427	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.774	=JS12	0.427	UGG
			CADMIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	1.2	<JS12	1.2	UGG
						35SD0402YD	0.300	1.2	<JS12	1.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	1.2	<JS12	1.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	1.2	<JS12	1.2	UGG
			CHROMIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	27.2	=JS12	1.04	UGG
						35SD0402YD	0.300	31.0	=JS12	1.04	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	23.1	=JS12	1.04	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	22.0	=JS12	1.04	UGG
			COPPER	35-SD-04	08/12/1991	35SD0401Y	0.300	197.0	=JS12	2.84	UGG
						35SD0402YD	0.300	344.0	=JS12	2.84	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	14.1	=JS12	2.84	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	17.3	=JS12	2.84	UGG
			LEAD	35-SD-04	08/12/1991	35SD0401Y	0.300	55.0	=JD21	0.467	UGG
						35SD0402YD	0.300	54.0	=JD21	0.467	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	28.0	=JD21	0.467	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	20.0	=JD21	0.467	UGG
			MERCURY	35-SD-04	08/12/1991	35SD0401Y	0.300	0.073	=Y9	0.05	UGG
						35SD0402YD	0.300	0.05	<Y9	0.05	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.05	<Y9	0.05	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.05	<Y9	0.05	UGG
			NICKEL	35-SD-04	08/12/1991	35SD0401Y	0.300	32.6	=JS12	2.74	UGG
						35SD0402YD	0.300	15.3	=JS12	2.74	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	14.5	=JS12	2.74	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	15.5	=JS12	2.74	UGG
			SELENIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	0.449	<JD20	0.449	UGG
						35SD0402YD	0.300	0.449	<JD20	0.449	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.449	<JD20	0.449	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.449	<JD20	0.449	UGG
			SILVER	35-SD-04	08/12/1991	35SD0401Y	0.300	0.803	<JS12	0.803	UGG
						35SD0402YD	0.300	0.803	<JS12	0.803	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.803	<JS12	0.803	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.803	<JS12	0.803	UGG
			THALLIUM	35-SD-04	08/12/1991	35SD0401Y	0.300	34.3	<JS12	34.3	UGG
						35SD0402YD	0.300	34.3	<JS12	34.3	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	34.3	<JS12	34.3	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	34.3	<JS12	34.3	UGG
			ZINC	35-SD-04	08/12/1991	35SD0401Y	0.300	141.0	=JS12	2.34	UGG
						35SD0402YD	0.300	104.0	=JS12	2.34	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	55.6	=JS12	2.34	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	63.6	=JS12	2.34	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	35-SD-04	08/12/1991	35SD0401Y	0.300	0.5	<LM23	0.5	UGG
						35SD0402YD	0.300	0.5	<LM23	0.5	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.5	<LM23	0.5	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG

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				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.33	<LM23	0.33	UGG
						35SD0402YD	0.300	0.33	<LM23	0.33	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.33	<LM23	0.33	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.49	<LM23	0.49	UGG
						35SD0402YD	0.300	0.49	<LM23	0.49	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.49	<LM23	0.49	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	35-SD-04	08/12/1991	35SD0401Y	0.300	0.27	<LM23	0.27	UGG
						35SD0402YD	0.300	0.27	<LM23	0.27	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.27	<LM23	0.27	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.32	<LM23	0.32	UGG
						35SD0402YD	0.300	0.32	<LM23	0.32	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.32	<LM23	0.32	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	35-SD-04	08/12/1991	35SD0401Y	0.300	0.32	<LM23	0.32	UGG
						35SD0402YD	0.300	0.32	<LM23	0.32	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.32	<LM23	0.32	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.53	<LM23	0.53	UGG
						35SD0402YD	0.300	0.53	<LM23	0.53	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.53	<LM23	0.53	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.14	<LM23	0.14	UGG
						35SD0402YD	0.300	0.14	<LM23	0.14	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.14	<LM23	0.14	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.23	<LM23	0.23	UGG
						35SD0402YD	0.300	0.23	<LM23	0.23	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.23	<LM23	0.23	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	35-SD-04	08/12/1991	35SD0401NR	0.300	1.0	*LM23	1.0	UGG
						35SD0402NR	0.300	1.0	*LM23	1.0	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	1.0	*LM23	1.0	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	1.0	*LM23	1.0	UGG
			ACETONE	35-SD-04	08/12/1991	35SD0401Y	0.300	3.3	<LM23	3.3	UGG
						35SD0402YD	0.300	3.3	<LM23	3.3	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	3.3	<LM23	3.3	UGG

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				35-SD-06	08/12/1991	35SD0601Y	0.300	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	35-SD-04	08/12/1991	35SD0401Y	0.300	2.0	<LM23	2.0	UGG
						35SD0402YD	0.300	2.0	<LM23	2.0	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	2.0	<LM23	2.0	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	2.0	<LM23	2.0	UGG
			BENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.1	<LM23	0.1	UGG
						35SD0402YD	0.300	0.1	<LM23	0.1	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.1	<LM23	0.1	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			BROMOFORM	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			BROMOMETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.26	<LM23	0.26	UGG
						35SD0402YD	0.300	0.26	<LM23	0.26	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.26	<LM23	0.26	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	35-SD-04	08/12/1991	35SD0401NR	0.300	0.6	*LM23	0.6	UGG
						35SD0402NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.31	<LM23	0.31	UGG
						35SD0402YD	0.300	0.31	<LM23	0.31	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.31	<LM23	0.31	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.31	<LM23	0.31	UGG
			CHLORFORM	35-SD-04	08/12/1991	35SD0401Y	0.300	0.24	<LM23	0.24	UGG
						35SD0402YD	0.300	0.24	<LM23	0.24	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.24	<LM23	0.24	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.1	<LM23	0.1	UGG
						35SD0402YD	0.300	0.1	<LM23	0.1	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.1	<LM23	0.1	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.1	<LM23	0.1	UGG
			CHLOROETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.64	<LM23	0.64	UGG
						35SD0402YD	0.300	0.64	<LM23	0.64	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.64	<LM23	0.64	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	35-SD-04	08/12/1991	35SD0401Y	0.300	1.8	<LM23	1.8	UGG
						35SD0402YD	0.300	1.8	<LM23	1.8	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	1.8	<LM23	1.8	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.96	<LM23	0.96	UGG
						35SD0402YD	0.300	0.96	<LM23	0.96	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.96	<LM23	0.96	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.96	<LM23	0.96	UGG

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			CIS-1,3-DICHLOROPROPYLENE/CIS-	35-SD-04	08/12/1991	35SD0401NR	0.300	0.6	*LM23	0.6	UGG
						35SD0402NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.25	<LM23	0.25	UGG
						35SD0402YD	0.300	0.25	<LM23	0.25	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.25	<LM23	0.25	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	35-SD-04	08/12/1991	35SD0401Y	0.300	0.2	<LM23	0.2	UGG
						35SD0402YD	0.300	0.2	<LM23	0.2	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.2	<LM23	0.2	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.19	<LM23	0.19	UGG
						35SD0402YD	0.300	0.19	<LM23	0.19	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.19	<LM23	0.19	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	35-SD-04	08/12/1991	35SD0401NR	0.300	1.0	*LM23	1.0	UGG
						35SD0402NR	0.300	1.0	*LM23	1.0	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	1.0	*LM23	1.0	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	35-SD-04	08/12/1991	35SD0401Y	0.300	4.4	<LM23	4.4	UGG
						35SD0402YD	0.300	4.4	<LM23	4.4	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	4.4	<LM23	4.4	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	35-SD-04	08/12/1991	35SD0401Y	0.300	4.3	<LM23	4.3	UGG
						35SD0402YD	0.300	4.3	<LM23	4.3	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	4.3	<LM23	4.3	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.63	<LM23	0.63	UGG
						35SD0402YD	0.300	0.63	<LM23	0.63	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.63	<LM23	0.63	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.63	<LM23	0.63	UGG
			STYRENE	35-SD-04	08/12/1991	35SD0401NR	0.300	0.6	*LM23	0.6	UGG
						35SD0402NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	35-SD-04	08/12/1991	35SD0401Y	0.300	0.16	<LM23	0.16	UGG
						35SD0402YD	0.300	0.16	<LM23	0.16	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.16	<LM23	0.16	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.16	<LM23	0.16	UGG
			TOLUENE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.1	<LM23	0.1	UGG
						35SD0402YD	0.300	0.1	<LM23	0.1	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.1	<LM23	0.1	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	35-SD-04	08/12/1991	35SD0401NR	0.300	0.6	*LM23	0.6	UGG
						35SD0402NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-05	08/12/1991	35SD0501NR	0.300	0.6	*LM23	0.6	UGG
				35-SD-06	08/12/1991	35SD0601NR	0.300	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	35-SD-04	08/12/1991	35SD0401Y	0.300	0.23	<LM23	0.23	UGG

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						35SD0402YD	0.300	0.23	<LM23	0.23	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.23	<LM23	0.23	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	35-SD-04	08/12/1991	35SD0401Y	0.300	0.23	<LM23	0.23	UGG
						35SD0402YD	0.300	0.23	<LM23	0.23	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.23	<LM23	0.23	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.23	<LM23	0.23	UGG
			XYLENES	35-SD-04	08/12/1991	35SD0401Y	0.300	0.78	<LM23	0.78	UGG
						35SD0402YD	0.300	0.78	<LM23	0.78	UGG
				35-SD-05	08/12/1991	35SD0501Y	0.300	0.78	<LM23	0.78	UGG
				35-SD-06	08/12/1991	35SD0601Y	0.300	0.78	<LM23	0.78	UGG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	2.1	<LW02	2.09	UGG
						35SA0102Y	1.200	38.0	=LW02	2.09	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	2.1	<LW02	2.09	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.59	<LW02	0.59	UGG
						35SA0102YP	1.200	0.46	=LW02	0.59	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.59	<LW02	0.59	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	35-SA-01	08/12/1991	35SA0101Y	0.500	1.9	<LW02	1.92	UGG
						35SA0102YP	1.200	0.85	=LW02	1.92	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	1.9	<LW02	1.92	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.42	<LW02	0.42	UGG
						35SA0102Y	1.200	0.42	<LW02	0.42	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.42	<LW02	0.42	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.4	<LW02	0.4	UGG
						35SA0102Y	1.200	0.4	<LW02	0.4	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.4	<LW02	0.4	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.4	<LW02	0.4	UGG
			HMX	35-SA-01	08/12/1991	35SA0101Y	0.500	1.3	<LW02	1.27	UGG
						35SA0102Y	1.200	230.0	=LW02	1.27	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	5.6	=LW02	1.27	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	3.6	=LW02	1.27	UGG
			NITROBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.42	<LW02	0.42	UGG
						35SA0102Y	1.200	0.42	<LW02	0.42	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.42	<LW02	0.42	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.42	<LW02	0.42	UGG
			RDX	35-SA-01	08/12/1991	35SA0101Y	0.500	0.98	<LW02	0.98	UGG
						35SA0102Y	1.200	460.0	=LW02	0.98	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	1.9	=LW02	0.98	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	35-SA-01	08/12/1991	35SA0101Y	0.500	0.25	<LW02	0.25	UGG
						35SA0102Y	1.200	0.25	<LW02	0.25	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.25	<LW02	0.25	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	35-SA-01	08/12/1991	35SA0101Y	0.500	19.6	<JS12	19.6	UGG
						35SA0102Y	1.200	19.6	<JS12	19.6	UGG

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				35-SA-02	08/13/1991	35SA0201Y	1.500	19.6	<JS12	19.6	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	35-SA-01	08/12/1991	35SA0101Y	0.500	6.37	=B9	2.5	UGG
						35SA0102Y	1.200	12.8	=B9	2.5	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	3.46	=B9	2.5	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	6.98	=B9	2.5	UGG
			BARIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	248.0	=JS12	3.29	UGG
						35SA0102Y	1.200	32,000.0	=JS12	3.29	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	368.0	=JS12	3.29	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	608.0	=JS12	3.29	UGG
			BERYLLIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	0.839	=JS12	0.427	UGG
						35SA0102Y	1.200	0.626	=JS12	0.427	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.682	=JS12	0.427	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.766	=JS12	0.427	UGG
			CADMIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	1.2	<JS12	1.2	UGG
						35SA0102Y	1.200	13.9	=JS12	1.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	1.2	<JS12	1.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	28.1	=JS12	1.04	UGG
						35SA0102Y	1.200	213.0	=JS12	1.04	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	18.2	=JS12	1.04	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	29.4	=JS12	1.04	UGG
			COPPER	35-SA-01	08/12/1991	35SA0101Y	0.500	32.7	=JS12	2.84	UGG
						35SA0102Y	1.200	27,000.0	=JS12	2.84	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	35.9	=JS12	2.84	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	187.0	=JS12	2.84	UGG
			LEAD	35-SA-01	08/12/1991	35SA0101Y	0.500	16.0	=JD21	0.467	UGG
						35SA0102Y	1.200	1,800.0	=JD21	0.467	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	63.0	=JD21	0.467	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	48.0	=JD21	0.467	UGG
			MERCURY	35-SA-01	08/12/1991	35SA0101Y	0.500	0.062	=Y9	0.05	UGG
						35SA0102Y	1.200	1.04	=Y9	0.05	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.071	=Y9	0.05	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.078	=Y9	0.05	UGG
			NICKEL	35-SA-01	08/12/1991	35SA0101Y	0.500	18.9	=JS12	2.74	UGG
						35SA0102Y	1.200	511.0	=JS12	2.74	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	10.6	=JS12	2.74	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	21.8	=JS12	2.74	UGG
			SELENIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	0.449	<JD20	0.449	UGG
						35SA0102Y	1.200	0.449	<JD20	0.449	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.449	<JD20	0.449	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	35-SA-01	08/12/1991	35SA0101Y	0.500	0.803	<JS12	0.803	UGG
						35SA0102Y	1.200	11.3	=JS12	0.803	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.803	<JS12	0.803	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	1.1	=JS12	0.803	UGG
			THALLIUM	35-SA-01	08/12/1991	35SA0101Y	0.500	34.3	<JS12	34.3	UGG
						35SA0102Y	1.200	34.3	<JS12	34.3	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	34.3	<JS12	34.3	UGG

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				35-SS-03	08/12/1991	35SS0301Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	35-SA-01	08/12/1991	35SA0101Y	0.500	64.2	=JS12	2.34	UGG
						35SA0102Y	1.200	18,000.0	=JS12	2.34	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	58.9	=JS12	2.34	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	241.0	=JS12	2.34	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	35-SA-01	08/12/1991	35SA0101Y	0.500	0.5	<LM23	0.5	UGG
						35SA0102Y	1.200	0.5	<LM23	0.5	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.5	<LM23	0.5	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.33	<LM23	0.33	UGG
						35SA0102Y	1.200	0.33	<LM23	0.33	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.33	<LM23	0.33	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.49	<LM23	0.49	UGG
						35SA0102Y	1.200	0.49	<LM23	0.49	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.49	<LM23	0.49	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	35-SA-01	08/12/1991	35SA0101Y	0.500	0.27	<LM23	0.27	UGG
						35SA0102Y	1.200	0.27	<LM23	0.27	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.27	<LM23	0.27	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.32	<LM23	0.32	UGG
						35SA0102Y	1.200	0.32	<LM23	0.32	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.32	<LM23	0.32	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	35-SA-01	08/12/1991	35SA0101Y	0.500	0.32	<LM23	0.32	UGG
						35SA0102Y	1.200	0.32	<LM23	0.32	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.32	<LM23	0.32	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.53	<LM23	0.53	UGG
						35SA0102Y	1.200	0.53	<LM23	0.53	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.53	<LM23	0.53	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.14	<LM23	0.14	UGG
						35SA0102Y	1.200	0.14	<LM23	0.14	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.14	<LM23	0.14	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG

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			1,3-DIMETHYLBENZENE/M-XYLENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.23	<LM23	0.23	UGG
						35SA0102Y	1.200	0.23	<LM23	0.23	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.23	<LM23	0.23	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	35-SA-01	08/12/1991	35SA0101NR	0.500	1.0	*LM23	1.0	UGG
						35SA0102NR	1.200	1.0	*LM23	1.0	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	1.0	*LM23	1.0	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	1.0	*LM23	1.0	UGG
			ACETONE	35-SA-01	08/12/1991	35SA0101Y	0.500	3.3	<LM23	3.3	UGG
						35SA0102Y	1.200	3.3	<LM23	3.3	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	3.3	<LM23	3.3	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	35-SA-01	08/12/1991	35SA0101Y	0.500	2.0	<LM23	2.0	UGG
						35SA0102Y	1.200	2.0	<LM23	2.0	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	2.0	<LM23	2.0	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	2.0	<LM23	2.0	UGG
			BENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.1	<LM23	0.1	UGG
						35SA0102Y	1.200	0.1	<LM23	0.1	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.1	<LM23	0.1	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG
			BROMOFORM	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.26	<LM23	0.26	UGG
						35SA0102Y	1.200	0.26	<LM23	0.26	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.26	<LM23	0.26	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	35-SA-01	08/12/1991	35SA0101NR	0.500	0.6	*LM23	0.6	UGG
						35SA0102NR	1.200	0.6	*LM23	0.6	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	0.6	*LM23	0.6	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.31	<LM23	0.31	UGG
						35SA0102Y	1.200	0.31	<LM23	0.31	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.31	<LM23	0.31	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.31	<LM23	0.31	UGG
			CHLORFORM	35-SA-01	08/12/1991	35SA0101Y	0.500	0.24	<LM23	0.24	UGG
						35SA0102Y	1.200	0.24	<LM23	0.24	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.24	<LM23	0.24	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.1	<LM23	0.1	UGG
						35SA0102Y	1.200	0.1	<LM23	0.1	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.1	<LM23	0.1	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.64	<LM23	0.64	UGG

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						35SA0102Y	1.200	0.64	<LM23	0.64	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.64	<LM23	0.64	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	35-SA-01	08/12/1991	35SA0101Y	0.500	1.8	<LM23	1.8	UGG
						35SA0102Y	1.200	1.8	<LM23	1.8	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	1.8	<LM23	1.8	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.96	<LM23	0.96	UGG
						35SA0102Y	1.200	0.96	<LM23	0.96	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.96	<LM23	0.96	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	35-SA-01	08/12/1991	35SA0101NR	0.500	0.6	*LM23	0.6	UGG
						35SA0102NR	1.200	0.6	*LM23	0.6	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	0.6	*LM23	0.6	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.25	<LM23	0.25	UGG
						35SA0102Y	1.200	0.25	<LM23	0.25	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.25	<LM23	0.25	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	35-SA-01	08/12/1991	35SA0101Y	0.500	0.2	<LM23	0.2	UGG
						35SA0102Y	1.200	0.2	<LM23	0.2	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.2	<LM23	0.2	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.19	<LM23	0.19	UGG
						35SA0102Y	1.200	0.19	<LM23	0.19	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.19	<LM23	0.19	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	35-SA-01	08/12/1991	35SA0101NR	0.500	1.0	*LM23	1.0	UGG
						35SA0102NR	1.200	1.0	*LM23	1.0	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	1.0	*LM23	1.0	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	35-SA-01	08/12/1991	35SA0101Y	0.500	4.4	<LM23	4.4	UGG
						35SA0102Y	1.200	4.4	<LM23	4.4	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	4.4	<LM23	4.4	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	35-SA-01	08/12/1991	35SA0101Y	0.500	4.3	<LM23	4.3	UGG
						35SA0102Y	1.200	4.3	<LM23	4.3	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	4.3	<LM23	4.3	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.63	<LM23	0.63	UGG
						35SA0102Y	1.200	0.63	<LM23	0.63	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.63	<LM23	0.63	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.63	<LM23	0.63	UGG
			STYRENE	35-SA-01	08/12/1991	35SA0101NR	0.500	0.6	*LM23	0.6	UGG
						35SA0102NR	1.200	0.6	*LM23	0.6	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	0.6	*LM23	0.6	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	35-SA-01	08/12/1991	35SA0101Y	0.500	0.16	<LM23	0.16	UGG
						35SA0102Y	1.200	0.16	<LM23	0.16	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.16	<LM23	0.16	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.16	<LM23	0.16	UGG
			TOLUENE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.1	<LM23	0.1	UGG
						35SA0102Y	1.200	0.127	=LM23	0.1	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.1	<LM23	0.1	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	35-SA-01	08/12/1991	35SA0101NR	0.500	0.6	*LM23	0.6	UGG
						35SA0102NR	1.200	0.6	*LM23	0.6	UGG
				35-SA-02	08/13/1991	35SA0201NR	1.500	0.6	*LM23	0.6	UGG
				35-SS-03	08/12/1991	35SS0301NR	0.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	35-SA-01	08/12/1991	35SA0101Y	0.500	0.23	<LM23	0.23	UGG
						35SA0102Y	1.200	0.23	<LM23	0.23	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.23	<LM23	0.23	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	35-SA-01	08/12/1991	35SA0101Y	0.500	0.23	<LM23	0.23	UGG
						35SA0102Y	1.200	0.23	<LM23	0.23	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.23	<LM23	0.23	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.23	<LM23	0.23	UGG
			XYLENES	35-SA-01	08/12/1991	35SA0101Y	0.500	0.78	<LM23	0.78	UGG
						35SA0102Y	1.200	0.78	<LM23	0.78	UGG
				35-SA-02	08/13/1991	35SA0201Y	1.500	0.78	<LM23	0.78	UGG
				35-SS-03	08/12/1991	35SS0301Y	0.500	0.78	<LM23	0.78	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP36	SD	EXPLOSIVES	1,3,5-TRINITROBENZENE	36-SD-03	08/09/1991	36SD0301Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	36-SD-03	08/09/1991	36SD0301Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	36-SD-03	08/09/1991	36SD0301Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	36-SD-03	08/09/1991	36SD0301Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	36-SD-03	08/09/1991	36SD0301Y	0.500	0.4	<LW02	0.4	UGG
			HMX	36-SD-03	08/09/1991	36SD0301Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	36-SD-03	08/09/1991	36SD0301Y	0.500	0.42	<LW02	0.42	UGG
			RDX	36-SD-03	08/09/1991	36SD0301Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	36-SD-03	08/09/1991	36SD0301Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	36-SD-03	08/09/1991	36SD0301Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	36-SD-03	08/09/1991	36SD0301Y	0.500	5.2	=B9	2.5	UGG
			BARIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	164.0	=JS12	3.29	UGG
			BERYLLIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	43.8	=JS12	1.04	UGG
			COPPER	36-SD-03	08/09/1991	36SD0301Y	0.500	1,600.0	=JS12	2.84	UGG
			LEAD	36-SD-03	08/09/1991	36SD0301Y	0.500	50.0	=JD21	0.467	UGG
			MERCURY	36-SD-03	08/09/1991	36SD0301Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	36-SD-03	08/09/1991	36SD0301Y	0.500	25.3	=JS12	2.74	UGG
			SELENIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	36-SD-03	08/09/1991	36SD0301Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	36-SD-03	08/09/1991	36SD0301Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	36-SD-03	08/09/1991	36SD0301Y	0.500	582.0	=JS12	2.34	UGG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	36-SA-01	08/09/1991	36SA0101Y	0.500	2.1	<LW02	2.09	UGG
						36SA0102Y	1.500	2.1	<LW02	2.09	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	2.1	<LW02	2.09	UGG
						36SA0202Y	1.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	36-SA-01	08/09/1991	36SA0101Y	0.500	0.59	<LW02	0.59	UGG
						36SA0102Y	1.500	0.59	<LW02	0.59	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.59	<LW02	0.59	UGG
						36SA0202Y	1.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	36-SA-01	08/09/1991	36SA0101Y	0.500	1.9	<LW02	1.92	UGG
						36SA0102Y	1.500	1.9	<LW02	1.92	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	1.9	<LW02	1.92	UGG
						36SA0202Y	1.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	36-SA-01	08/09/1991	36SA0101Y	0.500	0.42	<LW02	0.42	UGG
						36SA0102N	1.500	1.4	<LM25	1.4	UGG
						36SA0102Y	1.500	0.42	<LW02	0.42	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.42	<LW02	0.42	UGG
						36SA0202N	1.500	1.4	<LM25	1.4	UGG
						36SA0202Y	1.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	36-SA-01	08/09/1991	36SA0101Y	0.500	0.4	<LW02	0.4	UGG
						36SA0102N	1.500	0.32	<LM25	0.32	UGG
						36SA0102Y	1.500	0.4	<LW02	0.4	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.4	<LW02	0.4	UGG
						36SA0202N	1.500	0.32	<LM25	0.32	UGG
						36SA0202Y	1.500	0.4	<LW02	0.4	UGG
			HMX	36-SA-01	08/09/1991	36SA0101Y	0.500	1.3	<LW02	1.27	UGG
						36SA0102Y	1.500	1.3	<LW02	1.27	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				36-SA-02	08/09/1991	36SA0201Y	0.500	1.3	<LW02	1.27	UGG
						36SA0202Y	1.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	36-SA-01	08/09/1991	36SA0101Y	0.500	0.42	<LW02	0.42	UGG
						36SA0102N	1.500	1.8	<LM25	1.8	UGG
						36SA0102Y	1.500	0.42	<LW02	0.42	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.42	<LW02	0.42	UGG
						36SA0202N	1.500	1.8	<LM25	1.8	UGG
						36SA0202Y	1.500	0.42	<LW02	0.42	UGG
			RDX	36-SA-01	08/09/1991	36SA0101Y	0.500	0.98	<LW02	0.98	UGG
						36SA0102Y	1.500	0.98	<LW02	0.98	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.98	<LW02	0.98	UGG
						36SA0202Y	1.500	0.98	<LW02	0.98	UGG
			TETRYL	36-SA-01	08/09/1991	36SA0101Y	0.500	0.25	<LW02	0.25	UGG
						36SA0102Y	1.500	0.25	<LW02	0.25	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.25	<LW02	0.25	UGG
						36SA0202Y	1.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	36-SA-01	08/09/1991	36SA0101Y	0.500	19.6	<JS12	19.6	UGG
						36SA0102Y	1.500	19.6	<JS12	19.6	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	19.6	<JS12	19.6	UGG
						36SA0202Y	1.500	19.6	<JS12	19.6	UGG
			ARSENIC	36-SA-01	08/09/1991	36SA0101Y	0.500	5.86	=B9	2.5	UGG
						36SA0102Y	1.500	6.7	=B9	2.5	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	6.22	=B9	2.5	UGG
						36SA0202Y	1.500	7.29	=B9	2.5	UGG
			BARIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	199.0	=JS12	3.29	UGG
						36SA0102Y	1.500	216.0	=JS12	3.29	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	183.0	=JS12	3.29	UGG
						36SA0202Y	1.500	982.0	=JS12	3.29	UGG
			BERYLLIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	0.637	=JS12	0.427	UGG
						36SA0102Y	1.500	0.667	=JS12	0.427	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.747	=JS12	0.427	UGG
						36SA0202Y	1.500	0.705	=JS12	0.427	UGG
			CADMIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	1.2	<JS12	1.2	UGG
						36SA0102Y	1.500	1.2	<JS12	1.2	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	1.2	<JS12	1.2	UGG
						36SA0202Y	1.500	2.88	=JS12	1.2	UGG
			CHROMIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	23.4	=JS12	1.04	UGG
						36SA0102Y	1.500	25.9	=JS12	1.04	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	25.3	=JS12	1.04	UGG
						36SA0202Y	1.500	304.0	=JS12	1.04	UGG
			COPPER	36-SA-01	08/09/1991	36SA0101Y	0.500	45.5	=JS12	2.84	UGG
						36SA0102Y	1.500	64.3	=JS12	2.84	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	58.5	=JS12	2.84	UGG
						36SA0202Y	1.500	17,000.0	=JS12	2.84	UGG
			LEAD	36-SA-01	08/09/1991	36SA0101Y	0.500	27.0	=JD21	0.467	UGG
						36SA0102Y	1.500	26.0	=JD21	0.467	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	17.0	=JD21	0.467	UGG
						36SA0202Y	1.500	760.0	=JD21	0.467	UGG
			MERCURY	36-SA-01	08/09/1991	36SA0101Y	0.500	0.05	<Y9	0.05	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						36SA0102Y	1.500	0.057	=Y9	0.05	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.05	<Y9	0.05	UGG
						36SA0202Y	1.500	0.05	<Y9	0.05	UGG
			NICKEL	36-SA-01	08/09/1991	36SA0101Y	0.500	18.4	=JS12	2.74	UGG
						36SA0102Y	1.500	19.8	=JS12	2.74	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	19.4	=JS12	2.74	UGG
						36SA0202Y	1.500	87.4	=JS12	2.74	UGG
			SELENIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	0.449	<JD20	0.449	UGG
						36SA0102Y	1.500	0.449	<JD20	0.449	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.449	<JD20	0.449	UGG
						36SA0202Y	1.500	0.449	<JD20	0.449	UGG
			SILVER	36-SA-01	08/09/1991	36SA0101Y	0.500	0.803	<JS12	0.803	UGG
						36SA0102Y	1.500	0.803	<JS12	0.803	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	0.803	<JS12	0.803	UGG
						36SA0202Y	1.500	0.803	<JS12	0.803	UGG
			THALLIUM	36-SA-01	08/09/1991	36SA0101Y	0.500	34.3	<JS12	34.3	UGG
						36SA0102Y	1.500	34.3	<JS12	34.3	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	34.3	<JS12	34.3	UGG
						36SA0202Y	1.500	34.3	<JS12	34.3	UGG
			ZINC	36-SA-01	08/09/1991	36SA0101Y	0.500	73.3	=JS12	2.34	UGG
						36SA0102Y	1.500	136.0	=JS12	2.34	UGG
				36-SA-02	08/09/1991	36SA0201Y	0.500	73.0	=JS12	2.34	UGG
						36SA0202Y	1.500	10,000.0	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	36-SA-01	08/09/1991	36SA0102N	1.500	0.068	<LM25	0.068	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	36-SA-01	08/09/1991	36SA0102N	1.500	0.1	<LM25	0.1	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	36-SA-01	08/09/1991	36SA0102N	1.500	0.064	<LM25	0.064	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.064	<LM25	0.064	UGG
			ALDRIN	36-SA-01	08/09/1991	36SA0102N	1.500	1.3	<LM25	1.3	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	36-SA-01	08/09/1991	36SA0102N	1.500	1.3	<LM25	1.3	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	36-SA-01	08/09/1991	36SA0102N	1.500	0.4	<LM25	0.4	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	36-SA-01	08/09/1991	36SA0102N	1.500	1.3	<LM25	1.3	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	36-SA-01	08/09/1991	36SA0102N	1.500	2.4	<LM25	2.4	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	2.4	<LM25	2.4	UGG
			CHLORDANE	36-SA-01	08/09/1991	36SA0102N	1.500	0.68	<LM25	0.68	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	36-SA-01	08/09/1991	36SA0102N	1.500	0.21	<LM25	0.21	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.21	<LM25	0.21	UGG
			DIELDRIN	36-SA-01	08/09/1991	36SA0102N	1.500	0.079	<LM25	0.079	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.079	<LM25	0.079	UGG
			ENDRIN	36-SA-01	08/09/1991	36SA0102N	1.500	1.3	<LM25	1.3	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	36-SA-01	08/09/1991	36SA0102N	1.500	0.24	<LM25	0.24	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.24	<LM25	0.24	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			HEPTACHLOR EPOXIDE	36-SA-01	08/09/1991	36SA0102N	1.500	0.48	<LM25	0.48	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.48	<LM25	0.48	UGG
			ISODRIN	36-SA-01	08/09/1991	36SA0102N	1.500	0.48	<LM25	0.48	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.48	<LM25	0.48	UGG
			LINDANE	36-SA-01	08/09/1991	36SA0102N	1.500	0.1	<LM25	0.1	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	36-SA-01	08/09/1991	36SA0102N	1.500	0.26	<LM25	0.26	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.26	<LM25	0.26	UGG
			PCB 1016	36-SA-01	08/09/1991	36SA0102N	1.500	0.32	<LM25	0.32	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.32	<LM25	0.32	UGG
			PCB 1221	36-SA-01	08/09/1991	36SA0102NR	1.500	1.9	*LM25	1.9	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1232	36-SA-01	08/09/1991	36SA0102NR	1.500	1.9	*LM25	1.9	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1242	36-SA-01	08/09/1991	36SA0102NR	1.500	1.9	*LM25	1.9	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1248	36-SA-01	08/09/1991	36SA0102NR	1.500	1.9	*LM25	1.9	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1254	36-SA-01	08/09/1991	36SA0102NR	1.500	3.8	*LM25	3.8	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	3.8	*LM25	3.8	UGG
			PCB 1260	36-SA-01	08/09/1991	36SA0102N	1.500	0.79	<LM25	0.79	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.79	<LM25	0.79	UGG
			PCB 1262	36-SA-01	08/09/1991	36SA0102Y	1.500	6.3	<LM25	0.3	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	36-SA-01	08/09/1991	36SA0102NR	1.500	12.0	*LM25	12.0	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.22	<LM25	0.22	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.042	<LM25	0.042	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.52	<LM25	0.52	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.034	<LM25	0.034	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.075	<LM25	0.075	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.075	<LM25	0.075	UGG
			2,3,6-TCP	36-SA-01	08/09/1991	36SA0102Y	1.500	0.62	<LM25	0.62	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.49	<LM25	0.49	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.061	<LM25	0.061	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.065	<LM25	0.065	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	3.0	<LM25	3.0	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	4.7	<LM25	4.7	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				36-SA-02	08/09/1991	36SA0202Y	1.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.57	<LM25	0.57	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.24	<LM25	0.24	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.055	<LM25	0.055	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	36-SA-01	08/09/1991	36SA0102Y	1.500	0.8	<LM25	0.8	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.098	<LM25	0.098	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	36-SA-01	08/09/1991	36SA0102NR	1.500	3.1	*LM25	3.1	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	1.1	<LM25	1.1	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.6	<LM25	1.6	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.6	<LM25	1.6	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	36-SA-01	08/09/1991	36SA0102Y	1.500	0.93	<LM25	0.93	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	36-SA-01	08/09/1991	36SA0102Y	1.500	3.0	<LM25	3.0	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.34	<LM25	0.34	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	36-SA-01	08/09/1991	36SA0102Y	1.500	0.041	<LM25	0.041	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	36-SA-01	08/09/1991	36SA0102NR	1.500	0.63	*LM25	0.63	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	36-SA-01	08/09/1991	36SA0102Y	1.500	0.17	<LM25	0.17	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.24	<LM25	0.24	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	36-SA-01	08/09/1991	36SA0102NR	1.500	3.1	*LM25	3.1	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	3.3	<LM25	3.3	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.041	<LM25	0.041	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.033	<LM25	0.033	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.71	<LM25	0.71	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.71	<LM25	0.71	UGG
			ATRAZINE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.065	<LM25	0.065	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.041	<LM25	0.48	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.041	<LM25	0.48	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			BENZO(A)PYRENE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.2	<LM25	1.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.31	<LM25	0.31	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.18	<LM25	0.18	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.13	<LM25	0.13	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	36-SA-01	08/09/1991	36SA0102NR	1.500	3.1	*LM25	3.1	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.19	<LM25	0.19	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	36-SA-01	08/09/1991	36SA0102Y	1.500	0.36	<LM25	0.36	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	36-SA-01	08/09/1991	36SA0102Y	1.500	0.44	<LM25	0.44	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	2.49	=LM25	0.48	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.8	<LM25	1.8	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.8	<LM25	1.8	UGG
			CHRYSENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.3	<LM25	1.3	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.23	<LM25	0.23	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.31	<LM25	0.31	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	36-SA-01	08/09/1991	36SA0102Y	1.500	0.038	<LM25	0.038	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.071	<LM25	0.071	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.57	<LM25	0.57	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.24	<LM25	0.24	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.063	<LM25	0.063	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.063	<LM25	0.063	UGG
			DITHIANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.065	<LM25	0.065	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.2	<LM25	1.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.8	<LM25	1.8	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	36-SA-01	08/09/1991	36SA0102NR	1.500	0.28	*LM25	0.28	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG

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				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			FLUORENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.065	<LM25	0.065	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.08	<LM25	0.08	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.97	<LM25	0.97	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.52	<LM25	0.52	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.8	<LM25	1.8	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	36-SA-01	08/09/1991	36SA0102Y	1.500	2.4	<LM25	2.4	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.39	<LM25	0.39	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.39	<LM25	0.39	UGG
			MALATHION	36-SA-01	08/09/1991	36SA0102Y	1.500	0.18	<LM25	0.18	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.18	<LM25	0.18	UGG
			MIREX	36-SA-01	08/09/1991	36SA0102Y	1.500	0.14	<LM25	0.14	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.1	<LM25	1.1	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.46	<LM25	0.46	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.29	<LM25	0.29	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.74	<LM25	0.74	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.097	<LM25	0.097	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.066	<LM25	0.066	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.32	<LM25	0.32	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.32	<LM25	0.32	UGG
			PARATHION	36-SA-01	08/09/1991	36SA0102Y	1.500	1.7	<LM25	1.7	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.76	<LM25	0.76	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.032	<LM25	0.032	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.032	<LM25	0.032	UGG
			PHENOL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.052	<LM25	0.052	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.052	<LM25	0.052	UGG
			PYRENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.083	<LM25	0.083	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	36-SA-01	08/09/1991	36SA0102Y	1.500	0.92	<LM25	0.92	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.92	<LM25	0.92	UGG
			VAPONA	36-SA-01	08/09/1991	36SA0102Y	1.500	0.068	<LM25	0.068	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	36-SA-01	08/09/1991	36SA0102Y	1.500	0.5	<LM23	0.5	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.5	<LM23	0.5	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			1,1,1-TRICHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.33	<LM23	0.33	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.49	<LM23	0.49	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	36-SA-01	08/09/1991	36SA0102Y	1.500	0.27	<LM23	0.27	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.32	<LM23	0.32	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	36-SA-01	08/09/1991	36SA0102Y	1.500	0.32	<LM23	0.32	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.53	<LM23	0.53	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	36-SA-01	08/09/1991	36SA0102N	1.500	0.042	<LM25	0.042	UGG
						36SA0102Y	1.500	0.14	<LM23	0.14	UGG
				36-SA-02	08/09/1991	36SA0202N	1.500	0.042	<LM25	0.042	UGG
						36SA0202Y	1.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.23	<LM23	0.23	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	36-SA-01	08/09/1991	36SA0102NR	1.500	1.0	*LM23	1.0	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.0	*LM23	1.0	UGG
			ACETONE	36-SA-01	08/09/1991	36SA0102Y	1.500	3.3	<LM23	3.3	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	36-SA-01	08/09/1991	36SA0102Y	1.500	2.0	<LM23	2.0	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	2.0	<LM23	2.0	UGG
			BENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.1	<LM23	0.1	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			BROMOFORM	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.26	<LM23	0.26	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	36-SA-01	08/09/1991	36SA0102NR	1.500	0.6	*LM23	0.6	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.31	<LM23	0.31	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.31	<LM23	0.31	UGG
			CHLORFORM	36-SA-01	08/09/1991	36SA0102Y	1.500	0.24	<LM23	0.24	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.1	<LM23	0.1	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.64	<LM23	0.64	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	36-SA-01	08/09/1991	36SA0102Y	1.500	1.8	<LM23	1.8	UGG

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				36-SA-02	08/09/1991	36SA0202Y	1.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.96	<LM23	0.96	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	36-SA-01	08/09/1991	36SA0102NR	1.500	0.6	*LM23	0.6	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.25	<LM23	0.25	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	36-SA-01	08/09/1991	36SA0102Y	1.500	0.2	<LM23	0.2	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.19	<LM23	0.19	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	36-SA-01	08/09/1991	36SA0102NR	1.500	1.0	*LM23	1.0	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	36-SA-01	08/09/1991	36SA0102Y	1.500	4.4	<LM23	4.4	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	36-SA-01	08/09/1991	36SA0102Y	1.500	4.3	<LM23	4.3	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.63	<LM23	0.63	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.63	<LM23	0.63	UGG
			STYRENE	36-SA-01	08/09/1991	36SA0102NR	1.500	0.6	*LM23	0.6	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	36-SA-01	08/09/1991	36SA0102Y	1.500	0.16	<LM23	0.16	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.16	<LM23	0.16	UGG
			TOLUENE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.1	<LM23	0.1	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	36-SA-01	08/09/1991	36SA0102NR	1.500	0.6	*LM23	0.6	UGG
				36-SA-02	08/09/1991	36SA0202NR	1.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	36-SA-01	08/09/1991	36SA0102Y	1.500	0.23	<LM23	0.23	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	36-SA-01	08/09/1991	36SA0102Y	1.500	0.23	<LM23	0.23	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.23	<LM23	0.23	UGG
			XYLENES	36-SA-01	08/09/1991	36SA0102Y	1.500	0.78	<LM23	0.78	UGG
				36-SA-02	08/09/1991	36SA0202Y	1.500	0.78	<LM23	0.78	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP37	SD	EXPLOSIVES	1,3,5-TRINITROBENZENE	37-SD-01	08/10/1991	37SD0101Y	0.500	2.1	<LW02	2.09	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	2.1	<LW02	2.09	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	37-SD-01	08/10/1991	37SD0101Y	0.500	0.59	<LW02	0.59	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.59	<LW02	0.59	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	37-SD-01	08/10/1991	37SD0101Y	0.500	1.9	<LW02	1.92	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	1.9	<LW02	1.92	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	37-SD-01	08/10/1991	37SD0101Y	0.500	0.42	<LW02	0.42	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.42	<LW02	0.42	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	37-SD-01	08/10/1991	37SD0101Y	0.500	0.4	<LW02	0.4	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.4	<LW02	0.4	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.4	<LW02	0.4	UGG
			HMX	37-SD-01	08/10/1991	37SD0101Y	0.500	1.3	<LW02	1.27	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	1.3	<LW02	1.27	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	37-SD-01	08/10/1991	37SD0101Y	0.500	0.42	<LW02	0.42	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.42	<LW02	0.42	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.42	<LW02	0.42	UGG
			RDX	37-SD-01	08/10/1991	37SD0101Y	0.500	0.98	<LW02	0.98	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.98	<LW02	0.98	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	37-SD-01	08/10/1991	37SD0101Y	0.500	0.25	<LW02	0.25	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.25	<LW02	0.25	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	37-SD-01	08/10/1991	37SD0101Y	0.500	19.6	<JS12	19.6	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	19.6	<JS12	19.6	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	37-SD-01	08/10/1991	37SD0101Y	0.500	2.5	<B9	2.5	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	2.5	<B9	2.5	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	5.24	=B9	2.5	UGG
			BARIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	224.0	=JS12	3.29	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	127.0	=JS12	3.29	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	60.1	=JS12	3.29	UGG
			BERYLLIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	0.709	=JS12	0.427	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.968	=JS12	0.427	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	1.2	<JS12	1.2	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	1.2	<JS12	1.2	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	21.1	=JS12	1.04	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	29.9	=JS12	1.04	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	9.55	=JS12	1.04	UGG
			COPPER	37-SD-01	08/10/1991	37SD0101Y	0.500	10.9	=JS12	2.84	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	13.6	=JS12	2.84	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	2.84	<JS12	2.84	UGG
			LEAD	37-SD-01	08/10/1991	37SD0101Y	0.500	21.0	=JD21	0.467	UGG

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				37-SD-02	08/10/1991	37SD0201Y	0.500	10.0	=JD21	0.467	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	11.0	=JD21	0.467	UGG
			MERCURY	37-SD-01	08/10/1991	37SD0101Y	0.500	0.094	=Y9	0.05	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.05	<Y9	0.05	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	37-SD-01	08/10/1991	37SD0101Y	0.500	16.0	=JS12	2.74	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	19.3	=JS12	2.74	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	4.71	=JS12	2.74	UGG
			SELENIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	0.449	<JD20	0.449	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.449	<JD20	0.449	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.449	<JD20	0.449	UGG
			SILVER	37-SD-01	08/10/1991	37SD0101Y	0.500	0.803	<JS12	0.803	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	0.803	<JS12	0.803	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	37-SD-01	08/10/1991	37SD0101Y	0.500	34.3	<JS12	34.3	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	34.3	<JS12	34.3	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	37-SD-01	08/10/1991	37SD0101Y	0.500	58.0	=JS12	2.34	UGG
				37-SD-02	08/10/1991	37SD0201Y	0.500	38.7	=JS12	2.34	UGG
				37-SD-03	08/10/1991	37SD0301Y	0.500	21.7	=JS12	2.34	UGG
	SO	EXPLOSIVES	1,3,5-TRINITROBENZENE	37-SA-04	08/09/1991	37SA0401Y	0.500	2.1	<LW02	2.09	UGG
						37SA0402Y	5.000	2.1	<LW02	2.09	UGG
						37SA0403YD	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	37-SA-04	08/09/1991	37SA0401Y	0.500	0.59	<LW02	0.59	UGG
						37SA0402Y	5.000	0.59	<LW02	0.59	UGG
						37SA0403YD	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	37-SA-04	08/09/1991	37SA0401Y	0.500	1.9	<LW02	1.92	UGG
						37SA0402Y	5.000	1.9	<LW02	1.92	UGG
						37SA0403YD	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	37-SA-04	08/09/1991	37SA0401Y	0.500	0.42	<LW02	0.42	UGG
						37SA0402Y	5.000	0.42	<LW02	0.42	UGG
						37SA0403YD	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	37-SA-04	08/09/1991	37SA0401Y	0.500	0.4	<LW02	0.4	UGG
						37SA0402Y	5.000	0.4	<LW02	0.4	UGG
						37SA0403YD	0.500	0.4	<LW02	0.4	UGG
			HMX	37-SA-04	08/09/1991	37SA0401Y	0.500	1.3	<LW02	1.27	UGG
						37SA0402Y	5.000	1.3	<LW02	1.27	UGG
						37SA0403YD	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	37-SA-04	08/09/1991	37SA0401Y	0.500	0.42	<LW02	0.42	UGG
						37SA0402Y	5.000	0.42	<LW02	0.42	UGG
						37SA0403YD	0.500	0.42	<LW02	0.42	UGG
			RDX	37-SA-04	08/09/1991	37SA0401Y	0.500	0.98	<LW02	0.98	UGG
						37SA0402Y	5.000	0.98	<LW02	0.98	UGG
						37SA0403YD	0.500	0.98	<LW02	0.98	UGG
			TETRYL	37-SA-04	08/09/1991	37SA0401Y	0.500	0.25	<LW02	0.25	UGG
						37SA0402Y	5.000	0.25	<LW02	0.25	UGG
						37SA0403YD	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	37-SA-04	08/09/1991	37SA0401N	0.500	19.6	<99	19.6	UGG
						37SA0402N	5.000	19.6	<99	19.6	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						37SA0403N	0.500	19.6	<99	19.6	UGG
			ARSENIC	37-SA-04	08/09/1991	37SA0401Y	0.500	7.5	=B9	2.5	UGG
						37SA0402Y	5.000	4.16	=B9	2.5	UGG
						37SA0403YD	0.500	7.4	=B9	2.5	UGG
			BARIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	195.0	=JS12	3.29	UGG
						37SA0402Y	5.000	123.0	=JS12	3.29	UGG
						37SA0403Y	0.500	200.0	=JS12	3.29	UGG
			BERYLLIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	0.969	=JS12	0.427	UGG
						37SA0402Y	5.000	0.576	=JS12	0.427	UGG
						37SA0403Y	0.500	0.989	=JS12	0.427	UGG
			CADMIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	1.2	<JS12	1.2	UGG
						37SA0402Y	5.000	1.2	<JS12	1.2	UGG
						37SA0403Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	39.9	=JS12	1.04	UGG
						37SA0402Y	5.000	24.0	=JS12	1.04	UGG
						37SA0403Y	0.500	40.1	=JS12	1.04	UGG
			COPPER	37-SA-04	08/09/1991	37SA0401Y	0.500	22.4	=JS12	2.84	UGG
						37SA0402Y	5.000	8.54	=JS12	2.84	UGG
						37SA0403Y	0.500	22.2	=JS12	2.84	UGG
			LEAD	37-SA-04	08/09/1991	37SA0401Y	0.500	13.0	=JD21	0.467	UGG
						37SA0402Y	5.000	7.8	=JD21	0.467	UGG
						37SA0403YD	0.500	15.0	=JD21	0.467	UGG
			MERCURY	37-SA-04	08/09/1991	37SA0401Y	0.500	0.05	<Y9	0.05	UGG
						37SA0402Y	5.000	0.05	<Y9	0.05	UGG
						37SA0403YD	0.500	0.148	=Y9	0.05	UGG
			NICKEL	37-SA-04	08/09/1991	37SA0401Y	0.500	24.0	=JS12	2.74	UGG
						37SA0402Y	5.000	11.7	=JS12	2.74	UGG
						37SA0403Y	0.500	23.5	=JS12	2.74	UGG
			SELENIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	0.449	<JD20	0.449	UGG
						37SA0402Y	5.000	0.449	<JD20	0.449	UGG
						37SA0402YD	5.000	0.735	=JD20	0.449	UGG
						37SA0403YD	0.500	0.449	<JD20	0.449	UGG
			SILVER	37-SA-04	08/09/1991	37SA0401Y	0.500	0.803	<JS12	0.803	UGG
						37SA0402Y	5.000	0.803	<JS12	0.803	UGG
						37SA0403Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	37-SA-04	08/09/1991	37SA0401Y	0.500	34.3	<JS12	34.3	UGG
						37SA0402Y	5.000	34.3	<JS12	34.3	UGG
						37SA0403Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	37-SA-04	08/09/1991	37SA0401Y	0.500	62.9	=JS12	2.34	UGG
						37SA0402Y	5.000	29.7	=JS12	2.34	UGG
						37SA0403Y	0.500	63.2	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP38	SO	ANIONS	NITRITE, NITRATE - NONSPECIFIC	38-SA-01	08/09/1991	38SA0101Y	0.800	8.82	=KF17	1.0	UGG
			SULFATE	38-SA-01	08/09/1991	38SA0101Y	0.800	50.4	=KT07	5.0	UGG
		EXPLOSIVES	2,4-DINITROTOLUENE	38-SA-01	08/09/1991	38SA0101N	0.800	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	38-SA-01	08/09/1991	38SA0101N	0.800	0.32	<LM25	0.32	UGG
			NITROBENZENE	38-SA-01	08/09/1991	38SA0101N	0.800	1.8	<LM25	1.8	UGG
		METALS	ANTIMONY	38-SA-01	08/09/1991	38SA0101N	0.800	19.6	<99	19.6	UGG
			ARSENIC	38-SA-01	08/09/1991	38SA0101Y	0.800	3.95	=B9	2.5	UGG
			BARIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	163.0	=JS12	3.29	UGG
			BERYLLIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	0.427	<JS12	0.427	UGG
			CADMIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	6.46	=JS12	1.2	UGG
			CHROMIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	88.4	=JS12	1.04	UGG
			COPPER	38-SA-01	08/09/1991	38SA0101Y	0.800	31.5	=JS12	2.84	UGG
			LEAD	38-SA-01	08/09/1991	38SA0101Y	0.800	22.0	=JD21	0.467	UGG
			MERCURY	38-SA-01	08/09/1991	38SA0101Y	0.800	4.8	=Y9	0.05	UGG
			NICKEL	38-SA-01	08/09/1991	38SA0101Y	0.800	26.0	=JS12	2.74	UGG
			SELENIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	0.731	=JD20	0.449	UGG
			SILVER	38-SA-01	08/09/1991	38SA0101Y	0.800	0.803	<JS12	0.803	UGG
			THALLIUM	38-SA-01	08/09/1991	38SA0101Y	0.800	34.3	<JS12	34.3	UGG
			ZINC	38-SA-01	08/09/1991	38SA0101Y	0.800	87.1	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	38-SA-01	08/09/1991	38SA0101N	0.800	0.068	<LM25	0.068	UGG
						38SA0101Y	0.800	0.003	<LH17	0.0027	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	38-SA-01	08/09/1991	38SA0101N	0.800	0.1	<LM25	0.1	UGG
						38SA0101YC	0.800	0.011	=LH17	0.0034	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	38-SA-01	08/09/1991	38SA0101N	0.800	0.064	<LM25	0.064	UGG
						38SA0101Y	0.800	0.003	<LH17	0.0027	UGG
			ALDRIN	38-SA-01	08/09/1991	38SA0101N	0.800	1.3	<LM25	1.3	UGG
						38SA0101Y	0.800	0.001	<LH17	0.0014	UGG
			ALPHA-BENZENEHEXACHLORIDE	38-SA-01	08/09/1991	38SA0101N	0.800	1.3	<LM25	1.3	UGG
						38SA0101Y	0.800	0.003	<LH17	0.0028	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	38-SA-01	08/09/1991	38SA0101N	0.800	0.4	<LM25	0.4	UGG
						38SA0101Y	0.800	0.001	<LH17	0.001	UGG
			BETA-BENZENEHEXACHLORIDE	38-SA-01	08/09/1991	38SA0101N	0.800	1.3	<LM25	1.3	UGG
						38SA0101Y	0.800	0.008	<LH17	0.0077	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	38-SA-01	08/09/1991	38SA0101N	0.800	2.4	<LM25	2.4	UGG
						38SA0101Y	0.800	0.001	<LH17	0.0007	UGG
			CHLORDANE	38-SA-01	08/09/1991	38SA0101N	0.800	0.68	<LM25	0.68	UGG
						38SA0101Y	0.800	0.068	<LH17	0.0684	UGG
			DELTA-BENZENEHEXACHLORIDE	38-SA-01	08/09/1991	38SA0101N	0.800	0.21	<LM25	0.21	UGG
						38SA0101Y	0.800	0.008	<LH17	0.0085	UGG
			DIELDRIN	38-SA-01	08/09/1991	38SA0101N	0.800	0.079	<LM25	0.079	UGG
						38SA0101Y	0.800	0.002	<LH17	0.0016	UGG
			ENDRIN	38-SA-01	08/09/1991	38SA0101N	0.800	1.3	<LM25	1.3	UGG
						38SA0101Y	0.800	0.007	<LH17	0.0065	UGG
			HEPTACHLOR	38-SA-01	08/09/1991	38SA0101N	0.800	0.24	<LM25	0.24	UGG
						38SA0101Y	0.800	0.002	<LH17	0.0022	UGG
			HEPTACHLOR EPOXIDE	38-SA-01	08/09/1991	38SA0101N	0.800	0.48	<LM25	0.48	UGG
						38SA0101Y	0.800	0.001	<LH17	0.0013	UGG
			ISODRIN	38-SA-01	08/09/1991	38SA0101N	0.800	0.48	<LM25	0.48	UGG
						38SA0101Y	0.800	0.003	<LH17	0.003	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			LINDANE	38-SA-01	08/09/1991	38SA0101N	0.800	0.1	<LM25	0.1	UGG
						38SA0101Y	0.800	0.001	<LH17	0.001	UGG
			METHOXYCHLOR	38-SA-01	08/09/1991	38SA0101N	0.800	0.26	<LM25	0.26	UGG
						38SA0101Y	0.800	0.036	<LH17	0.0359	UGG
			PCB 1016	38-SA-01	08/09/1991	38SA0101N	0.800	0.32	<LM25	0.32	UGG
						38SA0101Y	0.800	0.1	<LH17	0.1	UGG
			PCB 1221	38-SA-01	08/09/1991	38SA0101NR	0.800	0.1	*LH17	0.1	UGG
			PCB 1232	38-SA-01	08/09/1991	38SA0101NR	0.800	0.1	*LH17	0.1	UGG
			PCB 1242	38-SA-01	08/09/1991	38SA0101NR	0.800	0.1	*LH17	0.1	UGG
			PCB 1248	38-SA-01	08/09/1991	38SA0101NR	0.800	0.1	*LH17	0.1	UGG
			PCB 1254	38-SA-01	08/09/1991	38SA0101NR	0.800	0.048	*LH17	0.048	UGG
			PCB 1260	38-SA-01	08/09/1991	38SA0101N	0.800	0.79	<LM25	0.79	UGG
						38SA0101Y	0.800	0.048	<LH17	0.0479	UGG
			PCB 1262	38-SA-01	08/09/1991	38SA0101Y	0.800	6.3	<LM25	0.3	UGG
			TOXAPHENE	38-SA-01	08/09/1991	38SA0101NR	0.800	12.0	*LM25	12.0	UGG
		RADIONUCLIDES	ALPHA GROSS	38-SA-01	08/09/1991	38SA0101Y	0.800	3.0	=00	0.0	PCG
			BISMUTH 214	38-SA-01	08/09/1991	38SA0101Y	0.800	0.37	=99	0.0	PCG
			CESIUM 137	38-SA-01	08/09/1991	38SA0101Y	0.800	0.06	=99	0.0	PCG
			GAMMA SCAN / GAMMA SCREEN	38-SA-01	08/09/1991	38SA0101Y	0.800	0.0	=99	0.0	PCG
			GROSS BETA	38-SA-01	08/09/1991	38SA0101Y	0.800	12.6	=00	0.0	PCG
			LEAD 212	38-SA-01	08/09/1991	38SA0101Y	0.800	0.57	=99	0.0	PCG
			LEAD 214	38-SA-01	08/09/1991	38SA0101Y	0.800	0.36	=99	0.0	PCG
			RADIUM 226	38-SA-01	08/09/1991	38SA0101Y	0.800	0.25	=99	0.0	PCG
			THALLIUM 208	38-SA-01	08/09/1991	38SA0101Y	0.800	0.38	=99	0.0	PCG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.075	<LM25	0.075	UGG
			2,3,6-TCP	38-SA-01	08/09/1991	38SA0101Y	0.800	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	38-SA-01	08/09/1991	38SA0101Y	0.800	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.098	<LM25	0.098	UGG
			2-NITROANILINE	38-SA-01	08/09/1991	38SA0101NR	0.800	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	38-SA-01	08/09/1991	38SA0101Y	0.800	0.93	<LM25	0.93	UGG
			3-NITROANILINE	38-SA-01	08/09/1991	38SA0101Y	0.800	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.34	<LM25	0.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			4-BROMOPHENYLPHENYL ETHER	38-SA-01	08/09/1991	38SA0101Y	0.800	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	38-SA-01	08/09/1991	38SA0101NR	0.800	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	38-SA-01	08/09/1991	38SA0101Y	0.800	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.24	<LM25	0.24	UGG
			4-NITROANILINE	38-SA-01	08/09/1991	38SA0101NR	0.800	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.033	<LM25	0.033	UGG
			ANTHRACENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.71	<LM25	0.71	UGG
			ATRAZINE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.107	=LM25	0.48	UGG
			BENZO(A)PYRENE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.13	<LM25	0.13	UGG
			BENZOIC ACID	38-SA-01	08/09/1991	38SA0101NR	0.800	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	38-SA-01	08/09/1991	38SA0101Y	0.800	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	38-SA-01	08/09/1991	38SA0101Y	0.800	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.8	<LM25	1.8	UGG
			CHRYSENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.104	=LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	38-SA-01	08/09/1991	38SA0101Y	0.800	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.063	<LM25	0.063	UGG
			DITHIANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	38-SA-01	08/09/1991	38SA0101NR	0.800	0.28	*LM25	0.28	UGG
			FLUORANTHENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.152	=LM25	0.032	UGG
			FLUORENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	38-SA-01	08/09/1991	38SA0101Y	0.800	2.4	<LM25	2.4	UGG
			ISOPHORONE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.39	<LM25	0.39	UGG
			MALATHION	38-SA-01	08/09/1991	38SA0101Y	0.800	0.18	<LM25	0.18	UGG
			MIREX	38-SA-01	08/09/1991	38SA0101Y	0.800	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.29	<LM25	0.29	UGG
			NAPHTHALENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.74	<LM25	0.74	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			P-CHLOROPHENYLMETHYL SULFIDE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.32	<LM25	0.32	UGG
			PARATHION	38-SA-01	08/09/1991	38SA0101Y	0.800	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.76	<LM25	0.76	UGG
			PHENANTHRENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.137	=LM25	0.032	UGG
			PHENOL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.052	<LM25	0.052	UGG
			PYRENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	38-SA-01	08/09/1991	38SA0101Y	0.800	0.92	<LM25	0.92	UGG
			VAPONA	38-SA-01	08/09/1991	38SA0101Y	0.800	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	38-SA-01	08/09/1991	38SA0101Y	0.800	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	38-SA-01	08/09/1991	38SA0101Y	0.800	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	38-SA-01	08/09/1991	38SA0101Y	0.800	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	38-SA-01	08/09/1991	38SA0101N	0.800	0.042	<LM25	0.042	UGG
						38SA0101Y	0.800	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	38-SA-01	08/09/1991	38SA0101NR	0.800	1.0	*LM23	1.0	UGG
			ACETONE	38-SA-01	08/09/1991	38SA0101Y	0.800	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	38-SA-01	08/09/1991	38SA0101Y	0.800	2.0	<LM23	2.0	UGG
			BENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			BROMOFORM	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			BROMOMETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.26	<LM23	0.26	UGG
			CARBON DISULFIDE	38-SA-01	08/09/1991	38SA0101NR	0.800	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.31	<LM23	0.31	UGG
			CHLORFORM	38-SA-01	08/09/1991	38SA0101Y	0.800	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.1	<LM23	0.1	UGG
			CHLOROETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	38-SA-01	08/09/1991	38SA0101Y	0.800	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	38-SA-01	08/09/1991	38SA0101NR	0.800	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	38-SA-01	08/09/1991	38SA0101Y	0.800	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	38-SA-01	08/09/1991	38SA0101NR	0.800	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	38-SA-01	08/09/1991	38SA0101Y	0.800	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	38-SA-01	08/09/1991	38SA0101Y	0.800	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.63	<LM23	0.63	UGG
			STYRENE	38-SA-01	08/09/1991	38SA0101NR	0.800	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	38-SA-01	08/09/1991	38SA0101Y	0.800	0.16	<LM23	0.16	UGG
			TOLUENE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	38-SA-01	08/09/1991	38SA0101NR	0.800	0.6	*LM23	0.6	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			TRICHLOROETHYLENE/TRICHLOROETH	38-SA-01	08/09/1991	38SA0101Y	0.800	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	38-SA-01	08/09/1991	38SA0101Y	0.800	0.23	<LM23	0.23	UGG
			XYLENES	38-SA-01	08/09/1991	38SA0101Y	0.800	0.78	<LM23	0.78	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP39	SO	EXPLOSIVES	2,4-DINITROTOLUENE	39-SA-01	08/14/1991	39SA0101N	0.500	14.0	<LM25	1.4	UGG
						39SA0103ND	0.500	14.0	<LM25	1.4	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.4	<LM25	1.4	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.4	<LM25	1.4	UGG
						39SA0302N	1.500	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	39-SA-01	08/14/1991	39SA0101N	0.500	3.2	<LM25	0.32	UGG
						39SA0103ND	0.500	3.2	<LM25	0.32	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.32	<LM25	0.32	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.32	<LM25	0.32	UGG
						39SA0302N	1.500	0.32	<LM25	0.32	UGG
			NITROBENZENE	39-SA-01	08/14/1991	39SA0101N	0.500	18.0	<LM25	1.8	UGG
						39SA0103ND	0.500	18.0	<LM25	1.8	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.8	<LM25	1.8	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.8	<LM25	1.8	UGG
						39SA0302N	1.500	1.8	<LM25	1.8	UGG
		METALS	ANTIMONY	39-SA-01	08/14/1991	39SA0101Y	0.500	19.6	<JS12	19.6	UGG
						39SA0103YD	0.500	19.6	<JS12	19.6	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	19.6	<JS12	19.6	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	19.6	<JS12	19.6	UGG
						39SA0302Y	1.500	19.6	<JS12	19.6	UGG
			ARSENIC	39-SA-01	08/14/1991	39SA0101Y	0.500	3.52	=B9	2.5	UGG
						39SA0103YD	0.500	4.03	=B9	2.5	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	7.41	=B9	2.5	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	8.48	=B9	2.5	UGG
						39SA0302Y	1.500	3.22	=B9	2.5	UGG
			BARIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	1,400.0	=JS12	3.29	UGG
						39SA0103YD	0.500	1,180.0	=JS12	3.29	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	209.0	=JS12	3.29	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	236.0	=JS12	3.29	UGG
						39SA0302Y	1.500	251.0	=JS12	3.29	UGG
			BERYLLIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	3.4	=JS12	0.427	UGG
						39SA0103YD	0.500	0.732	=JS12	0.427	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.63	=JS12	0.427	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.82	=JS12	0.427	UGG
						39SA0302Y	1.500	0.85	=JS12	0.427	UGG
			CADMIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	62.0	=JS12	1.2	UGG
						39SA0103YD	0.500	7.19	=JS12	1.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.2	<JS12	1.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.2	<JS12	1.2	UGG
						39SA0302Y	1.500	1.2	<JS12	1.2	UGG
			CHROMIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	259.0	=JS12	1.04	UGG
						39SA0103YD	0.500	358.0	=JS12	1.04	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	19.7	=JS12	1.04	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	22.5	=JS12	1.04	UGG
						39SA0302Y	1.500	25.5	=JS12	1.04	UGG
			COPPER	39-SA-01	08/14/1991	39SA0101Y	0.500	285.0	=JS12	2.84	UGG
						39SA0103YD	0.500	1,150.0	=JS12	2.84	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	61.5	=JS12	2.84	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	16.7	=JS12	2.84	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						39SA0302Y	1.500	15.0	=JS12	2.84	UGG
			LEAD	39-SA-01	08/14/1991	39SA0101Y	0.500	2,600.0	=JD21	0.467	UGG
						39SA0103YD	0.500	3,000.0	=JD21	0.467	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	49.0	=JD21	0.467	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	31.0	=JD21	0.467	UGG
						39SA0302Y	1.500	10.0	=JD21	0.467	UGG
			MERCURY	39-SA-01	08/14/1991	39SA0101Y	0.500	0.265	=Y9	0.05	UGG
						39SA0103YD	0.500	0.197	=Y9	0.05	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.072	=Y9	0.05	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.05	<Y9	0.05	UGG
						39SA0302Y	1.500	0.05	<Y9	0.05	UGG
			NICKEL	39-SA-01	08/14/1991	39SA0101Y	0.500	22.3	=JS12	2.74	UGG
						39SA0103YD	0.500	23.7	=JS12	2.74	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	15.6	=JS12	2.74	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	14.6	=JS12	2.74	UGG
						39SA0302Y	1.500	19.6	=JS12	2.74	UGG
			SELENIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	0.449	<JD20	0.449	UGG
						39SA0103YD	0.500	0.449	<JD20	0.449	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.449	<JD20	0.449	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.449	<JD20	0.449	UGG
						39SA0302Y	1.500	0.449	<JD20	0.449	UGG
			SILVER	39-SA-01	08/14/1991	39SA0101Y	0.500	1.65	=JS12	0.803	UGG
						39SA0103YD	0.500	3.78	=JS12	0.803	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	2.21	=JS12	0.803	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.19	=JS12	0.803	UGG
						39SA0302Y	1.500	0.803	<JS12	0.803	UGG
			THALLIUM	39-SA-01	08/14/1991	39SA0101Y	0.500	34.3	<JS12	34.3	UGG
						39SA0103YD	0.500	34.3	<JS12	34.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	34.3	<JS12	34.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	34.3	<JS12	34.3	UGG
						39SA0302Y	1.500	34.3	<JS12	34.3	UGG
			ZINC	39-SA-01	08/14/1991	39SA0101Y	0.500	305.0	=JS12	2.34	UGG
						39SA0103YD	0.500	1,400.0	=JS12	2.34	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	81.2	=JS12	2.34	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	75.3	=JS12	2.34	UGG
						39SA0302Y	1.500	57.8	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	39-SA-01	08/14/1991	39SA0101N	0.500	0.68	<LM25	0.068	UGG
						39SA0103ND	0.500	0.68	<LM25	0.068	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.068	<LM25	0.068	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.068	<LM25	0.068	UGG
						39SA0302N	1.500	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	39-SA-01	08/14/1991	39SA0101N	0.500	1.0	<LM25	0.1	UGG
						39SA0103ND	0.500	1.0	<LM25	0.1	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.1	<LM25	0.1	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.1	<LM25	0.1	UGG
						39SA0302N	1.500	0.1	<LM25	0.1	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	39-SA-01	08/14/1991	39SA0101N	0.500	0.64	<LM25	0.064	UGG
						39SA0103ND	0.500	0.64	<LM25	0.064	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.064	<LM25	0.064	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-03	08/14/1991	39SA0301N	0.500	0.064	<LM25	0.064	UGG
						39SA0302N	1.500	0.064	<LM25	0.064	UGG
			ALDRIN	39-SA-01	08/14/1991	39SA0101N	0.500	13.0	<LM25	1.3	UGG
						39SA0103ND	0.500	13.0	<LM25	1.3	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.3	<LM25	1.3	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.3	<LM25	1.3	UGG
						39SA0302N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-BENZENEHEXACHLORIDE	39-SA-01	08/14/1991	39SA0101N	0.500	13.0	<LM25	1.3	UGG
						39SA0103ND	0.500	13.0	<LM25	1.3	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.3	<LM25	1.3	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.3	<LM25	1.3	UGG
						39SA0302N	1.500	1.3	<LM25	1.3	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	39-SA-01	08/14/1991	39SA0101N	0.500	4.0	<LM25	0.4	UGG
						39SA0103ND	0.500	4.0	<LM25	0.4	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.4	<LM25	0.4	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.4	<LM25	0.4	UGG
						39SA0302N	1.500	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	39-SA-01	08/14/1991	39SA0101N	0.500	13.0	<LM25	1.3	UGG
						39SA0103ND	0.500	13.0	<LM25	1.3	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.3	<LM25	1.3	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.3	<LM25	1.3	UGG
						39SA0302N	1.500	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	39-SA-01	08/14/1991	39SA0101N	0.500	24.0	<LM25	2.4	UGG
						39SA0103ND	0.500	24.0	<LM25	2.4	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	2.4	<LM25	2.4	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	2.4	<LM25	2.4	UGG
						39SA0302N	1.500	2.4	<LM25	2.4	UGG
			CHLORDANE	39-SA-01	08/14/1991	39SA0101N	0.500	6.8	<LM25	0.68	UGG
						39SA0103ND	0.500	6.8	<LM25	0.68	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.68	<LM25	0.68	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.68	<LM25	0.68	UGG
						39SA0302N	1.500	0.68	<LM25	0.68	UGG
			DELTA-BENZENEHEXACHLORIDE	39-SA-01	08/14/1991	39SA0101N	0.500	2.1	<LM25	0.21	UGG
						39SA0103ND	0.500	2.1	<LM25	0.21	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.21	<LM25	0.21	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.21	<LM25	0.21	UGG
						39SA0302N	1.500	0.21	<LM25	0.21	UGG
			DIELDRIN	39-SA-01	08/14/1991	39SA0101N	0.500	0.79	<LM25	0.079	UGG
						39SA0103ND	0.500	0.79	<LM25	0.079	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.079	<LM25	0.079	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.079	<LM25	0.079	UGG
						39SA0302N	1.500	0.079	<LM25	0.079	UGG
			ENDRIN	39-SA-01	08/14/1991	39SA0101N	0.500	13.0	<LM25	1.3	UGG
						39SA0103ND	0.500	13.0	<LM25	1.3	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	1.3	<LM25	1.3	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	1.3	<LM25	1.3	UGG
						39SA0302N	1.500	1.3	<LM25	1.3	UGG
			HEPTACHLOR	39-SA-01	08/14/1991	39SA0101N	0.500	2.4	<LM25	0.24	UGG
						39SA0103ND	0.500	2.4	<LM25	0.24	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-02	08/14/1991	39SA0201N	1.500	0.24	<LM25	0.24	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.24	<LM25	0.24	UGG
						39SA0302N	1.500	0.24	<LM25	0.24	UGG
			HEPTACHLOR EPOXIDE	39-SA-01	08/14/1991	39SA0101N	0.500	4.8	<LM25	0.48	UGG
						39SA0103ND	0.500	4.8	<LM25	0.48	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.48	<LM25	0.48	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.48	<LM25	0.48	UGG
						39SA0302N	1.500	0.48	<LM25	0.48	UGG
			ISODRIN	39-SA-01	08/14/1991	39SA0101N	0.500	4.8	<LM25	0.48	UGG
						39SA0103ND	0.500	4.8	<LM25	0.48	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.48	<LM25	0.48	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.48	<LM25	0.48	UGG
						39SA0302N	1.500	0.48	<LM25	0.48	UGG
			LINDANE	39-SA-01	08/14/1991	39SA0101N	0.500	1.0	<LM25	0.1	UGG
						39SA0103ND	0.500	1.0	<LM25	0.1	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.1	<LM25	0.1	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.1	<LM25	0.1	UGG
						39SA0302N	1.500	0.1	<LM25	0.1	UGG
			METHOXYCHLOR	39-SA-01	08/14/1991	39SA0101N	0.500	2.6	<LM25	0.26	UGG
						39SA0103ND	0.500	2.6	<LM25	0.26	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.26	<LM25	0.26	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.26	<LM25	0.26	UGG
						39SA0302N	1.500	0.26	<LM25	0.26	UGG
			PCB 1016	39-SA-01	08/14/1991	39SA0101N	0.500	3.2	<LM25	0,32	UGG
						39SA0103ND	0.500	3.2	<LM25	0.32	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.32	<LM25	0.32	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.32	<LM25	0.32	UGG
						39SA0302N	1.500	0.32	<LM25	0.32	UGG
			PCB 1221	39-SA-01	08/14/1991	39SA0101NR	0.500	19.0	*LM25	19.0	UGG
						39SA0103NR	0.500	19.0	*LM25	19.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.9	*LM25	1.9	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.9	*LM25	1.9	UGG
						39SA0302NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1232	39-SA-01	08/14/1991	39SA0101NR	0.500	19.0	*LM25	19.0	UGG
						39SA0103NR	0.500	19.0	*LM25	19.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.9	*LM25	1.9	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.9	*LM25	1.9	UGG
						39SA0302NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1242	39-SA-01	08/14/1991	39SA0101NR	0.500	19.0	*LM25	19.0	UGG
						39SA0103NR	0.500	19.0	*LM25	19.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.9	*LM25	1.9	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.9	*LM25	1.9	UGG
						39SA0302NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1248	39-SA-01	08/14/1991	39SA0101NR	0.500	19.0	*LM25	19.0	UGG
						39SA0103NR	0.500	19.0	*LM25	19.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.9	*LM25	1.9	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.9	*LM25	1.9	UGG
						39SA0302NR	1.500	1.9	*LM25	1.9	UGG
			PCB 1254	39-SA-01	08/14/1991	39SA0101NR	0.500	38.0	*LM25	38.0	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						39SA0103NR	0.500	38.0	*LM25	38.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	3.8	*LM25	3.8	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	3.8	*LM25	3.8	UGG
						39SA0302NR	1.500	3.8	*LM25	3.8	UGG
			PCB 1260	39-SA-01	08/14/1991	39SA0101N	0.500	7.9	<LM25	0.79	UGG
						39SA0103ND	0.500	7.9	<LM25	0.79	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.79	<LM25	0.79	UGG
				39-SA-03	08/14/1991	39SA0301N	0.500	0.79	<LM25	0.79	UGG
						39SA0302N	1.500	0.79	<LM25	0.79	UGG
			PCB 1262	39-SA-01	08/14/1991	39SA0101Y	0.500	63.0	<LM25	0.3	UGG
						39SA0103YD	0.500	63.0	<LM25	0.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	6.3	<LM25	0.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	6.3	<LM25	0.3	UGG
						39SA0302Y	1.500	6.3	<LM25	0.3	UGG
			TOXAPHENE	39-SA-01	08/14/1991	39SA0101NR	0.500	120.0	*LM25	12.0	UGG
						39SA0103NR	0.500	120.0	*LM25	12.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	12.0	*LM25	12.0	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	12.0	*LM25	12.0	UGG
						39SA0302NR	1.500	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM25	0.032	UGG
						39SA0103YD	0.500	0.32	<LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.2	<LM25	0.22	UGG
						39SA0103YD	0.500	2.2	<LM25	0.22	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.22	<LM25	0.22	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.22	<LM25	0.22	UGG
						39SA0302Y	1.500	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.42	<LM25	0.042	UGG
						39SA0103YD	0.500	0.42	<LM25	0.042	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.042	<LM25	0.042	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.042	<LM25	0.042	UGG
						39SA0302Y	1.500	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	39-SA-01	08/14/1991	39SA0101Y	0.500	5.2	<LM25	0.52	UGG
						39SA0103YD	0.500	5.2	<LM25	0.52	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.52	<LM25	0.52	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.52	<LM25	0.52	UGG
						39SA0302Y	1.500	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.34	<LM25	0.034	UGG
						39SA0103YD	0.500	0.34	<LM25	0.034	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.034	<LM25	0.034	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.034	<LM25	0.034	UGG
						39SA0302Y	1.500	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.75	<LM25	0.075	UGG
						39SA0103YD	0.500	0.75	<LM25	0.075	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.075	<LM25	0.075	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.075	<LM25	0.075	UGG
						39SA0302Y	1.500	0.075	<LM25	0.075	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			2,3,6-TCP	39-SA-01	08/14/1991	39SA0101Y	0.500	6.2	<LM25	0.62	UGG
						39SA0103YD	0.500	6.2	<LM25	0.62	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.62	<LM25	0.62	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.62	<LM25	0.62	UGG
						39SA0302Y	1.500	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	4.9	<LM25	0.49	UGG
						39SA0103YD	0.500	4.9	<LM25	0.49	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.49	<LM25	0.49	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.49	<LM25	0.49	UGG
						39SA0302Y	1.500	0.49	<LM25	0.49	UGG
			2,4,6-TRICHLOROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.61	<LM25	0.061	UGG
						39SA0103YD	0.500	0.61	<LM25	0.061	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.061	<LM25	0.061	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.061	<LM25	0.061	UGG
						39SA0302Y	1.500	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.65	<LM25	0.065	UGG
						39SA0103YD	0.500	0.65	<LM25	0.065	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.065	<LM25	0.065	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.065	<LM25	0.065	UGG
						39SA0302Y	1.500	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	30.0	<LM25	3.0	UGG
						39SA0103YD	0.500	30.0	<LM25	3.0	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	3.0	<LM25	3.0	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	3.0	<LM25	3.0	UGG
						39SA0302Y	1.500	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	47.0	<LM25	4.7	UGG
						39SA0103YD	0.500	47.0	<LM25	4.7	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	4.7	<LM25	4.7	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	4.7	<LM25	4.7	UGG
						39SA0302Y	1.500	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	39-SA-01	08/14/1991	39SA0101Y	0.500	5.7	<LM25	0.57	UGG
						39SA0103YD	0.500	5.7	<LM25	0.57	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.57	<LM25	0.57	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.57	<LM25	0.57	UGG
						39SA0302Y	1.500	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.4	<LM25	0.24	UGG
						39SA0103YD	0.500	2.4	<LM25	0.24	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.24	<LM25	0.24	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.24	<LM25	0.24	UGG
						39SA0302Y	1.500	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.55	<LM25	0.055	UGG
						39SA0103YD	0.500	0.55	<LM25	0.055	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.055	<LM25	0.055	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.055	<LM25	0.055	UGG
						39SA0302Y	1.500	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	39-SA-01	08/14/1991	39SA0101Y	0.500	8.0	<LM25	0.8	UGG
						39SA0103YD	0.500	8.0	<LM25	0.8	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.8	<LM25	0.8	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.8	<LM25	0.8	UGG

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SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						39SA0302Y	1.500	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	39-SA-01	08/14/1991	39SA0101Y	0.500	6.35	=LM25	0.032	UGG
						39SA0103YD	0.500	7.92	=LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.98	<LM25	0.098	UGG
						39SA0103YD	0.500	0.98	<LM25	0.098	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.098	<LM25	0.098	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.098	<LM25	0.098	UGG
						39SA0302Y	1.500	0.098	<LM25	0.098	UGG
			2-NITROANILINE	39-SA-01	08/14/1991	39SA0101NR	0.500	31.0	*LM25	31.0	UGG
						39SA0103NR	0.500	31.0	*LM25	31.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	3.1	*LM25	3.1	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	3.1	*LM25	3.1	UGG
						39SA0302NR	1.500	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	11.0	<LM25	1.1	UGG
						39SA0103YD	0.500	11.0	<LM25	1.1	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.1	<LM25	1.1	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.1	<LM25	1.1	UGG
						39SA0302Y	1.500	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	39-SA-01	08/14/1991	39SA0101Y	0.500	16.0	<LM25	1.6	UGG
						39SA0103YD	0.500	16.0	<LM25	1.6	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.6	<LM25	1.6	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.6	<LM25	1.6	UGG
						39SA0302Y	1.500	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	39-SA-01	08/14/1991	39SA0101Y	0.500	16.0	<LM25	1.6	UGG
						39SA0103YD	0.500	16.0	<LM25	1.6	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.6	<LM25	1.6	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.6	<LM25	1.6	UGG
						39SA0302Y	1.500	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	39-SA-01	08/14/1991	39SA0101Y	0.500	9.3	<LM25	0.93	UGG
						39SA0103YD	0.500	9.3	<LM25	0.93	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.93	<LM25	0.93	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.93	<LM25	0.93	UGG
						39SA0302Y	1.500	0.93	<LM25	0.93	UGG
			3-NITROANILINE	39-SA-01	08/14/1991	39SA0101Y	0.500	30.0	<LM25	3.0	UGG
						39SA0103YD	0.500	30.0	<LM25	3.0	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	3.0	<LM25	3.0	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	3.0	<LM25	3.0	UGG
						39SA0302Y	1.500	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.4	<LM25	0.34	UGG
						39SA0103YD	0.500	3.4	<LM25	0.34	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.34	<LM25	0.34	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.34	<LM25	0.34	UGG
						39SA0302Y	1.500	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	39-SA-01	08/14/1991	39SA0101Y	0.500	0.41	<LM25	0.041	UGG
						39SA0103YD	0.500	0.41	<LM25	0.041	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.041	<LM25	0.041	UGG

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				39-SA-03	08/14/1991	39SA0301Y	0.500	0.041	<LM25	0.041	UGG
						39SA0302Y	1.500	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	39-SA-01	08/14/1991	39SA0101NR	0.500	6.3	*LM25	6.3	UGG
						39SA0103NR	0.500	6.3	*LM25	6.3	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.63	*LM25	0.63	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.63	*LM25	0.63	UGG
						39SA0302NR	1.500	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	39-SA-01	08/14/1991	39SA0101Y	0.500	1.7	<LM25	0.17	UGG
						39SA0103YD	0.500	1.7	<LM25	0.17	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.17	<LM25	0.17	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.17	<LM25	0.17	UGG
						39SA0302Y	1.500	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	39-SA-01	08/14/1991	39SA0101Y	0.500	2.4	<LM25	0.24	UGG
						39SA0103YD	0.500	2.4	<LM25	0.24	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.24	<LM25	0.24	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.24	<LM25	0.24	UGG
						39SA0302Y	1.500	0.24	<LM25	0.24	UGG
			4-NITROANILINE	39-SA-01	08/14/1991	39SA0101NR	0.500	31.0	*LM25	31.0	UGG
						39SA0103NR	0.500	31.0	*LM25	31.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	3.1	*LM25	3.1	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	3.1	*LM25	3.1	UGG
						39SA0302NR	1.500	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	33.0	<LM25	3.3	UGG
						39SA0103YD	0.500	33.0	<LM25	3.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	3.3	<LM25	3.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	3.3	<LM25	3.3	UGG
						39SA0302Y	1.500	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.41	<LM25	0.041	UGG
						39SA0103YD	0.500	0.41	<LM25	0.041	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.041	<LM25	0.041	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.041	<LM25	0.041	UGG
						39SA0302Y	1.500	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.33	<LM25	0.033	UGG
						39SA0103YD	0.500	0.33	<LM25	0.033	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.033	<LM25	0.033	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.033	<LM25	0.033	UGG
						39SA0302Y	1.500	0.033	<LM25	0.033	UGG
			ANTHRACENE	39-SA-01	08/14/1991	39SA0101Y	0.500	7.1	<LM25	0.71	UGG
						39SA0103YD	0.500	7.1	<LM25	0.71	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.71	<LM25	0.71	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.71	<LM25	0.71	UGG
						39SA0302Y	1.500	0.71	<LM25	0.71	UGG
			ATRAZINE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.65	<LM25	0.065	UGG
						39SA0103YD	0.500	0.65	<LM25	0.065	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.065	<LM25	0.065	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.065	<LM25	0.065	UGG
						39SA0302Y	1.500	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.41	<LM25	0.48	UGG
						39SA0103YD	0.500	0.41	<LM25	0.48	UGG

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				39-SA-02	08/14/1991	39SA0201Y	1.500	0.041	<LM25	0.48	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.041	<LM25	0.48	UGG
						39SA0302Y	1.500	0.041	<LM25	0.48	UGG
			BENZO(A)PYRENE	39-SA-01	08/14/1991	39SA0101Y	0.500	12.0	<LM25	1.2	UGG
						39SA0103YD	0.500	12.0	<LM25	1.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.2	<LM25	1.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.2	<LM25	1.2	UGG
						39SA0302Y	1.500	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.1	<LM25	0.31	UGG
						39SA0103YD	0.500	3.1	<LM25	0.31	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.31	<LM25	0.31	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.31	<LM25	0.31	UGG
						39SA0302Y	1.500	0.31	<LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	39-SA-01	08/14/1991	39SA0101Y	0.500	1.8	<LM25	0.18	UGG
						39SA0103YD	0.500	1.8	<LM25	0.18	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.18	<LM25	0.18	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.18	<LM25	0.18	UGG
						39SA0302Y	1.500	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	39-SA-01	08/14/1991	39SA0101Y	0.500	1.3	<LM25	0.13	UGG
						39SA0103YD	0.500	1.3	<LM25	0.13	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.13	<LM25	0.13	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.13	<LM25	0.13	UGG
						39SA0302Y	1.500	0.13	<LM25	0.13	UGG
			BENZOIC ACID	39-SA-01	08/14/1991	39SA0101NR	0.500	31.0	*LM25	31.0	UGG
						39SA0103NR	0.500	31.0	*LM25	31.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	3.1	*LM25	3.1	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	3.1	*LM25	3.1	UGG
						39SA0302NR	1.500	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM25	0.032	UGG
						39SA0103YD	0.500	0.32	<LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	1.9	<LM25	0.19	UGG
						39SA0103YD	0.500	1.9	<LM25	0.19	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.19	<LM25	0.19	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.19	<LM25	0.19	UGG
						39SA0302Y	1.500	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	39-SA-01	08/14/1991	39SA0101Y	0.500	3.6	<LM25	0.36	UGG
						39SA0103YD	0.500	3.6	<LM25	0.36	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.36	<LM25	0.36	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.36	<LM25	0.36	UGG
						39SA0302Y	1.500	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	39-SA-01	08/14/1991	39SA0101Y	0.500	4.4	<LM25	0.44	UGG
						39SA0103YD	0.500	4.4	<LM25	0.44	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.44	<LM25	0.44	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.44	<LM25	0.44	UGG
						39SA0302Y	1.500	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	62.0	>LM25	0.48	UGG

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						39SA0103YD	0.500	62.0	>LM25	0.48	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.48	<LM25	0.48	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.48	<LM25	0.48	UGG
						39SA0302Y	1.500	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	18.0	<LM25	1.8	UGG
						39SA0103YD	0.500	18.0	<LM25	1.8	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.8	<LM25	1.8	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.8	<LM25	1.8	UGG
						39SA0302Y	1.500	1.8	<LM25	1.8	UGG
			CHRYSENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM25	0.032	UGG
						39SA0103YD	0.500	0.32	<LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	13.0	<LM25	1.3	UGG
						39SA0103YD	0.500	13.0	<LM25	1.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.3	<LM25	1.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.3	<LM25	1.3	UGG
						39SA0302Y	1.500	6.28	=LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.3	<LM25	0.23	UGG
						39SA0103YD	0.500	2.3	<LM25	0.23	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.23	<LM25	0.23	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.23	<LM25	0.23	UGG
						39SA0302Y	1.500	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.1	<LM25	0.31	UGG
						39SA0103YD	0.500	3.1	<LM25	0.31	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.31	<LM25	0.31	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.31	<LM25	0.31	UGG
						39SA0302Y	1.500	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	39-SA-01	08/14/1991	39SA0101Y	0.500	0.38	<LM25	0.038	UGG
						39SA0103YD	0.500	0.38	<LM25	0.038	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.038	<LM25	0.038	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.038	<LM25	0.038	UGG
						39SA0302Y	1.500	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.71	<LM25	0.071	UGG
						39SA0103YD	0.500	0.71	<LM25	0.071	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.071	<LM25	0.071	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.071	<LM25	0.071	UGG
						39SA0302Y	1.500	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	39-SA-01	08/14/1991	39SA0101Y	0.500	5.7	<LM25	0.57	UGG
						39SA0103YD	0.500	5.7	<LM25	0.57	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.57	<LM25	0.57	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.57	<LM25	0.57	UGG
						39SA0302Y	1.500	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.4	<LM25	0.24	UGG
						39SA0103YD	0.500	2.4	<LM25	0.24	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.24	<LM25	0.24	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.24	<LM25	0.24	UGG
						39SA0302Y	1.500	0.24	<LM25	0.24	UGG

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			DIMETHYL PHTHALATE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.63	<LM25	0.063	UGG
						39SA0103YD	0.500	0.63	<LM25	0.063	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.063	<LM25	0.063	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.063	<LM25	0.063	UGG
						39SA0302Y	1.500	0.063	<LM25	0.063	UGG
			DITHIANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.65	<LM25	0.065	UGG
						39SA0103YD	0.500	0.65	<LM25	0.065	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.065	<LM25	0.065	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.065	<LM25	0.065	UGG
						39SA0302Y	1.500	0.065	<LM25	0.065	UGG
			ENDOSULFAN SULFATE	39-SA-01	08/14/1991	39SA0101Y	0.500	12.0	<LM25	1.2	UGG
						39SA0103YD	0.500	12.0	<LM25	1.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.2	<LM25	1.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.2	<LM25	1.2	UGG
						39SA0302Y	1.500	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	39-SA-01	08/14/1991	39SA0101Y	0.500	18.0	<LM25	1.8	UGG
						39SA0103YD	0.500	18.0	<LM25	1.8	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.8	<LM25	1.8	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.8	<LM25	1.8	UGG
						39SA0302Y	1.500	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	39-SA-01	08/14/1991	39SA0101NR	0.500	2.8	*LM25	2.8	UGG
						39SA0103NR	0.500	2.8	*LM25	2.8	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.28	*LM25	0.28	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.28	*LM25	0.28	UGG
						39SA0302NR	1.500	0.28	*LM25	0.28	UGG
			FLUORANTHENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM25	0.032	UGG
						39SA0103YD	0.500	0.32	<LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			FLUORENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.65	<LM25	0.065	UGG
						39SA0103YD	0.500	0.65	<LM25	0.065	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.065	<LM25	0.065	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.065	<LM25	0.065	UGG
						39SA0302Y	1.500	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.8	<LM25	0.08	UGG
						39SA0103YD	0.500	0.8	<LM25	0.08	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.08	<LM25	0.08	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.08	<LM25	0.08	UGG
						39SA0302Y	1.500	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	39-SA-01	08/14/1991	39SA0101Y	0.500	9.7	<LM25	0.97	UGG
						39SA0103YD	0.500	9.7	<LM25	0.97	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.97	<LM25	0.97	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.97	<LM25	0.97	UGG
						39SA0302Y	1.500	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	39-SA-01	08/14/1991	39SA0101Y	0.500	5.2	<LM25	0.52	UGG
						39SA0103YD	0.500	5.2	<LM25	0.52	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.52	<LM25	0.52	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.52	<LM25	0.52	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						39SA0302Y	1.500	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	18.0	<LM25	1.8	UGG
						39SA0103YD	0.500	18.0	<LM25	1.8	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.8	<LM25	1.8	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.8	<LM25	1.8	UGG
						39SA0302Y	1.500	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	39-SA-01	08/14/1991	39SA0101Y	0.500	24.0	<LM25	2.4	UGG
						39SA0103YD	0.500	24.0	<LM25	2.4	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	2.4	<LM25	2.4	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	2.4	<LM25	2.4	UGG
						39SA0302Y	1.500	2.4	<LM25	2.4	UGG
			ISOPHORONE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.9	<LM25	0.39	UGG
						39SA0103YD	0.500	3.9	<LM25	0.39	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.39	<LM25	0.39	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.39	<LM25	0.39	UGG
						39SA0302Y	1.500	0.39	<LM25	0.39	UGG
			MALATHION	39-SA-01	08/14/1991	39SA0101Y	0.500	1.8	<LM25	0.18	UGG
						39SA0103YD	0.500	1.8	<LM25	0.18	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.18	<LM25	0.18	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.18	<LM25	0.18	UGG
						39SA0302Y	1.500	0.18	<LM25	0.18	UGG
			MIREX	39-SA-01	08/14/1991	39SA0101Y	0.500	1.4	<LM25	0.14	UGG
						39SA0103YD	0.500	1.4	<LM25	0.14	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.14	<LM25	0.14	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.14	<LM25	0.14	UGG
						39SA0302Y	1.500	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	39-SA-01	08/14/1991	39SA0101Y	0.500	11.0	<LM25	1.1	UGG
						39SA0103YD	0.500	11.0	<LM25	1.1	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.1	<LM25	1.1	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.1	<LM25	1.1	UGG
						39SA0302Y	1.500	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	39-SA-01	08/14/1991	39SA0101Y	0.500	4.6	<LM25	0.46	UGG
						39SA0103YD	0.500	4.6	<LM25	0.46	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.46	<LM25	0.46	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.46	<LM25	0.46	UGG
						39SA0302Y	1.500	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.9	<LM25	0.29	UGG
						39SA0103YD	0.500	2.9	<LM25	0.29	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.29	<LM25	0.29	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.29	<LM25	0.29	UGG
						39SA0302Y	1.500	0.29	<LM25	0.29	UGG
			NAPHTHALENE	39-SA-01	08/14/1991	39SA0101Y	0.500	7.4	<LM25	0.74	UGG
						39SA0103YD	0.500	7.4	<LM25	0.74	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.74	<LM25	0.74	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.74	<LM25	0.74	UGG
						39SA0302Y	1.500	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.97	<LM25	0.097	UGG
						39SA0103YD	0.500	0.97	<LM25	0.097	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.097	<LM25	0.097	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.097	<LM25	0.097	UGG
						39SA0302Y	1.500	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.66	<LM25	0.066	UGG
						39SA0103YD	0.500	0.66	<LM25	0.066	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.066	<LM25	0.066	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.066	<LM25	0.066	UGG
						39SA0302Y	1.500	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.2	<LM25	0.32	UGG
						39SA0103YD	0.500	3.2	<LM25	0.32	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.32	<LM25	0.32	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.32	<LM25	0.32	UGG
						39SA0302Y	1.500	0.32	<LM25	0.32	UGG
			PARATHION	39-SA-01	08/14/1991	39SA0101Y	0.500	17.0	<LM25	1.7	UGG
						39SA0103YD	0.500	17.0	<LM25	1.7	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.7	<LM25	1.7	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.7	<LM25	1.7	UGG
						39SA0302Y	1.500	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	7.6	<LM25	0.76	UGG
						39SA0103YD	0.500	7.6	<LM25	0.76	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.76	<LM25	0.76	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.76	<LM25	0.76	UGG
						39SA0302Y	1.500	0.76	<LM25	0.76	UGG
			PHENANTHRENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM25	0.032	UGG
						39SA0103YD	0.500	0.32	<LM25	0.032	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.032	<LM25	0.032	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.032	<LM25	0.032	UGG
						39SA0302Y	1.500	0.032	<LM25	0.032	UGG
			PHENOL	39-SA-01	08/14/1991	39SA0101Y	0.500	0.52	<LM25	0.052	UGG
						39SA0103YD	0.500	0.52	<LM25	0.052	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.052	<LM25	0.052	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.052	<LM25	0.052	UGG
						39SA0302Y	1.500	0.052	<LM25	0.052	UGG
			PYRENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.83	<LM25	0.083	UGG
						39SA0103YD	0.500	0.83	<LM25	0.083	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.083	<LM25	0.083	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.083	<LM25	0.083	UGG
						39SA0302Y	1.500	0.083	<LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	39-SA-01	08/14/1991	39SA0101Y	0.500	9.2	<LM25	0.92	UGG
						39SA0103YD	0.500	9.2	<LM25	0.92	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.92	<LM25	0.92	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.92	<LM25	0.92	UGG
						39SA0302Y	1.500	0.92	<LM25	0.92	UGG
			VAPONA	39-SA-01	08/14/1991	39SA0101Y	0.500	0.68	<LM25	0.068	UGG
						39SA0103YD	0.500	0.68	<LM25	0.068	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.068	<LM25	0.068	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.068	<LM25	0.068	UGG
						39SA0302Y	1.500	0.068	<LM25	0.068	UGG
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	39-SA-01	08/14/1991	39SA0101Y	0.500	0.5	<LM23	0.5	UGG
						39SA0103YD	0.500	0.5	<LM23	0.5	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.5	<LM23	0.5	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.5	<LM23	0.5	UGG
						39SA0302Y	1.500	0.5	<LM23	0.5	UGG
			1,1,1-TRICHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	10.0	>LM23	0.2	UGG
						39SA0103YD	0.500	10.0	>LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2,2-TETRACHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.2	<LM23	0.2	UGG
						39SA0103YD	0.500	0.2	<LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			1,1,2-TRICHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.33	<LM23	0.33	UGG
						39SA0103YD	0.500	0.33	<LM23	0.33	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.33	<LM23	0.33	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.33	<LM23	0.33	UGG
						39SA0302Y	1.500	0.33	<LM23	0.33	UGG
			1,1-DICHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	6.08	=LM23	0.49	UGG
						39SA0103YD	0.500	8.91	=LM23	0.49	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.49	<LM23	0.49	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.49	<LM23	0.49	UGG
						39SA0302Y	1.500	0.49	<LM23	0.49	UGG
			1,1-DICHLOROETHYLENE/1,1-DICHL	39-SA-01	08/14/1991	39SA0101Y	0.500	1.68	=LM23	0.27	UGG
						39SA0103YD	0.500	1.88	=LM23	0.27	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.27	<LM23	0.27	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.27	<LM23	0.27	UGG
						39SA0302Y	1.500	0.27	<LM23	0.27	UGG
			1,2-DICHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.32	<LM23	0.32	UGG
						39SA0103YD	0.500	0.32	<LM23	0.32	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.32	<LM23	0.32	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.32	<LM23	0.32	UGG
						39SA0302Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROETHENES/1,2-DICHLO	39-SA-01	08/14/1991	39SA0101Y	0.500	1.07	=LM23	0.32	UGG
						39SA0103YD	0.500	2.23	=LM23	0.32	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.32	<LM23	0.32	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.32	<LM23	0.32	UGG
						39SA0302Y	1.500	0.32	<LM23	0.32	UGG
			1,2-DICHLOROPROPANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.53	<LM23	0.53	UGG
						39SA0103YD	0.500	0.53	<LM23	0.53	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.53	<LM23	0.53	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.53	<LM23	0.53	UGG
						39SA0302Y	1.500	0.53	<LM23	0.53	UGG
			1,3-DICHLOROBENZENE	39-SA-01	08/14/1991	39SA0101N	0.500	0.42	<LM25	0.042	UGG
						39SA0101Y	0.500	0.14	<LM23	0.14	UGG
						39SA0103ND	0.500	0.42	<LM25	0.042	UGG
						39SA0103YD	0.500	0.14	<LM23	0.14	UGG
				39-SA-02	08/14/1991	39SA0201N	1.500	0.042	<LM25	0.042	UGG
						39SA0201Y	1.500	0.14	<LM23	0.14	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-03	08/14/1991	39SA0301N	0.500	0.042	<LM25	0.042	UGG
						39SA0301Y	0.500	0.14	<LM23	0.14	UGG
						39SA0302N	1.500	0.042	<LM25	0.042	UGG
						39SA0302Y	1.500	0.14	<LM23	0.14	UGG
			1,3-DICLOROPROPANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.2	<LM23	0.2	UGG
						39SA0103YD	0.500	0.2	<LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			1,3-DIMETHYLBENZENE/M-XYLENE	39-SA-01	08/14/1991	39SA0101Y	0.500	10.0	>LM23	0.23	UGG
						39SA0103YD	0.500	9.39	=LM23	0.23	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.23	<LM23	0.23	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.23	<LM23	0.23	UGG
						39SA0302Y	1.500	0.23	<LM23	0.23	UGG
			ACETIC ACID, VINYL ESTER/VINYL	39-SA-01	08/14/1991	39SA0101NR	0.500	1.0	*LM23	1.0	UGG
						39SA0103NR	0.500	1.0	*LM23	1.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.0	*LM23	1.0	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.0	*LM23	1.0	UGG
						39SA0302NR	1.500	1.0	*LM23	1.0	UGG
			ACETONE	39-SA-01	08/14/1991	39SA0101Y	0.500	3.3	<LM23	3.3	UGG
						39SA0103YD	0.500	3.3	<LM23	3.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	3.3	<LM23	3.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	3.3	<LM23	3.3	UGG
						39SA0302Y	1.500	3.3	<LM23	3.3	UGG
			ACRYLONITRILE	39-SA-01	08/14/1991	39SA0101Y	0.500	2.0	<LM23	2.0	UGG
						39SA0103YD	0.500	2.0	<LM23	2.0	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	2.0	<LM23	2.0	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	2.0	<LM23	2.0	UGG
						39SA0302Y	1.500	2.0	<LM23	2.0	UGG
			BENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.1	<LM23	0.1	UGG
						39SA0103YD	0.500	0.1	<LM23	0.1	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.1	<LM23	0.1	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.1	<LM23	0.1	UGG
						39SA0302Y	1.500	0.1	<LM23	0.1	UGG
			BROMODICHLOROMETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.2	<LM23	0.2	UGG
						39SA0103YD	0.500	0.2	<LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			BROMOFORM	39-SA-01	08/14/1991	39SA0101Y	0.500	0.2	<LM23	0.2	UGG
						39SA0103YD	0.500	0.2	<LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			BROMOMETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.26	<LM23	0.26	UGG
						39SA0103YD	0.500	0.26	<LM23	0.26	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.26	<LM23	0.26	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.26	<LM23	0.26	UGG
						39SA0302Y	1.500	0.26	<LM23	0.26	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			CARBON DISULFIDE	39-SA-01	08/14/1991	39SA0101NR	0.500	0.6	*LM23	0.6	UGG
						39SA0103NR	0.500	0.6	*LM23	0.6	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.6	*LM23	0.6	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.6	*LM23	0.6	UGG
						39SA0302NR	1.500	0.6	*LM23	0.6	UGG
			CARBON TETRACHLORIDE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.31	<LM23	0.31	UGG
						39SA0103YD	0.500	0.31	<LM23	0.31	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.31	<LM23	0.31	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.31	<LM23	0.31	UGG
						39SA0302Y	1.500	0.31	<LM23	0.31	UGG
			CHLORFORM	39-SA-01	08/14/1991	39SA0101Y	0.500	0.24	<LM23	0.24	UGG
						39SA0103YD	0.500	0.24	<LM23	0.24	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.24	<LM23	0.24	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.24	<LM23	0.24	UGG
						39SA0302Y	1.500	0.24	<LM23	0.24	UGG
			CHLOROBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.1	<LM23	0.1	UGG
						39SA0103YD	0.500	0.1	<LM23	0.1	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.1	<LM23	0.1	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.1	<LM23	0.1	UGG
						39SA0302Y	1.500	0.1	<LM23	0.1	UGG
			CHLOROETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.64	<LM23	0.64	UGG
						39SA0103YD	0.500	0.64	<LM23	0.64	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.64	<LM23	0.64	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.64	<LM23	0.64	UGG
						39SA0302Y	1.500	0.64	<LM23	0.64	UGG
			CHLOROETHANE/VINYL CHLORIDE	39-SA-01	08/14/1991	39SA0101Y	0.500	1.8	<LM23	1.8	UGG
						39SA0103YD	0.500	1.8	<LM23	1.8	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	1.8	<LM23	1.8	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	1.8	<LM23	1.8	UGG
						39SA0302Y	1.500	1.8	<LM23	1.8	UGG
			CHLOROMETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.96	<LM23	0.96	UGG
						39SA0103YD	0.500	0.96	<LM23	0.96	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.96	<LM23	0.96	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.96	<LM23	0.96	UGG
						39SA0302Y	1.500	0.96	<LM23	0.96	UGG
			CIS-1,3-DICHLOROPROPYLENE/CIS-	39-SA-01	08/14/1991	39SA0101NR	0.500	0.6	*LM23	0.6	UGG
						39SA0103NR	0.500	0.6	*LM23	0.6	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.6	*LM23	0.6	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.6	*LM23	0.6	UGG
						39SA0302NR	1.500	0.6	*LM23	0.6	UGG
			DIBROMOCHLOROMETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.25	<LM23	0.25	UGG
						39SA0103YD	0.500	0.25	<LM23	0.25	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.25	<LM23	0.25	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.25	<LM23	0.25	UGG
						39SA0302Y	1.500	0.25	<LM23	0.25	UGG
			DICHLOROBENZENE - NONSPECIFIC	39-SA-01	08/14/1991	39SA0101Y	0.500	0.2	<LM23	0.2	UGG
						39SA0103YD	0.500	0.2	<LM23	0.2	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.2	<LM23	0.2	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.2	<LM23	0.2	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						39SA0302Y	1.500	0.2	<LM23	0.2	UGG
			ETHYLBENZENE	39-SA-01	08/14/1991	39SA0101Y	0.500	1.43	=LM23	0.19	UGG
						39SA0103YD	0.500	1.01	=LM23	0.19	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.19	<LM23	0.19	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.19	<LM23	0.19	UGG
						39SA0302Y	1.500	0.19	<LM23	0.19	UGG
			METHYL-N-BUTYL KETONE/2-HEXANO	39-SA-01	08/14/1991	39SA0101NR	0.500	1.0	*LM23	1.0	UGG
						39SA0103NR	0.500	1.0	*LM23	1.0	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	1.0	*LM23	1.0	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	1.0	*LM23	1.0	UGG
						39SA0302NR	1.500	1.0	*LM23	1.0	UGG
			METHYLENE CHLORIDE	39-SA-01	08/14/1991	39SA0101Y	0.500	4.4	<LM23	4.4	UGG
						39SA0103YD	0.500	4.4	<LM23	4.4	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	4.4	<LM23	4.4	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	4.4	<LM23	4.4	UGG
						39SA0302Y	1.500	4.4	<LM23	4.4	UGG
			METHYLETHYL PHENOL/METHYLETHYL	39-SA-01	08/14/1991	39SA0101Y	0.500	4.3	<LM23	4.3	UGG
						39SA0103YD	0.500	4.3	<LM23	4.3	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	4.3	<LM23	4.3	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	4.3	<LM23	4.3	UGG
						39SA0302Y	1.500	4.3	<LM23	4.3	UGG
			METHYLISOBUTYL KETONE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.63	<LM23	0.63	UGG
						39SA0103YD	0.500	0.758	=LM23	0.63	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.63	<LM23	0.63	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.63	<LM23	0.63	UGG
						39SA0302Y	1.500	0.63	<LM23	0.63	UGG
			STYRENE	39-SA-01	08/14/1991	39SA0101NR	0.500	0.6	*LM23	0.6	UGG
						39SA0103NR	0.500	0.6	*LM23	0.6	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.6	*LM23	0.6	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.6	*LM23	0.6	UGG
						39SA0302NR	1.500	0.6	*LM23	0.6	UGG
			TETRACHLOROETHYLENE/TETRACHLOR	39-SA-01	08/14/1991	39SA0101Y	0.500	0.589	=LM23	0.16	UGG
						39SA0103YD	0.500	0.639	=LM23	0.16	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.16	<LM23	0.16	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.16	<LM23	0.16	UGG
						39SA0302Y	1.500	0.16	<LM23	0.16	UGG
			TOLUENE	39-SA-01	08/14/1991	39SA0101Y	0.500	10.0	>LM23	0.1	UGG
						39SA0103YD	0.500	10.0	>LM23	0.1	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.1	<LM23	0.1	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.1	<LM23	0.1	UGG
						39SA0302Y	1.500	0.1	<LM23	0.1	UGG
			TRANS-1,3-DICHLOROPROPENE	39-SA-01	08/14/1991	39SA0101NR	0.500	0.6	*LM23	0.6	UGG
						39SA0103NR	0.500	0.6	*LM23	0.6	UGG
				39-SA-02	08/14/1991	39SA0201NR	1.500	0.6	*LM23	0.6	UGG
				39-SA-03	08/14/1991	39SA0301NR	0.500	0.6	*LM23	0.6	UGG
						39SA0302NR	1.500	0.6	*LM23	0.6	UGG
			TRICHLOROETHYLENE/TRICHLOROETH	39-SA-01	08/14/1991	39SA0101Y	0.500	0.453	=LM23	0.23	UGG
						39SA0103YD	0.500	0.695	=LM23	0.23	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.23	<LM23	0.23	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.23	<LM23	0.23	UGG
						39SA0302Y	1.500	0.23	<LM23	0.23	UGG
			TRICHLOROFLUOROMETHANE	39-SA-01	08/14/1991	39SA0101Y	0.500	0.23	<LM23	0.23	UGG
						39SA0103YD	0.500	0.23	<LM23	0.23	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.23	<LM23	0.23	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.23	<LM23	0.23	UGG
						39SA0302Y	1.500	0.23	<LM23	0.23	UGG
			XYLENES	39-SA-01	08/14/1991	39SA0101Y	0.500	12.2	=LM23	0.78	UGG
						39SA0103YD	0.500	9.44	=LM23	0.78	UGG
				39-SA-02	08/14/1991	39SA0201Y	1.500	0.78	<LM23	0.78	UGG
				39-SA-03	08/14/1991	39SA0301Y	0.500	0.78	<LM23	0.78	UGG
						39SA0302Y	1.500	0.78	<LM23	0.78	UGG

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IAAP40	SO	EXPLOSIVES	2,4-DINITROTOLUENE	40-SA-01	08/16/1991	40SA0101N	1.000	1.4	<LM25	1.4	UGG
						40SA0102N	0.500	1.4	<LM25	1.4	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	1.4	<LM25	1.4	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.4	<LM25	1.4	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.4	<LM25	1.4	UGG
			2,6-DINITROTOLUENE	40-SA-01	08/16/1991	40SA0101N	1.000	0.32	<LM25	0.32	UGG
						40SA0102N	0.500	0.32	<LM25	0.32	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.32	<LM25	0.32	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.32	<LM25	0.32	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.32	<LM25	0.32	UGG
			NITROBENZENE	40-SA-01	08/16/1991	40SA0101N	1.000	1.8	<LM25	1.8	UGG
						40SA0102N	0.500	1.8	<LM25	1.8	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	1.8	<LM25	1.8	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.8	<LM25	1.8	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.8	<LM25	1.8	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	40-SA-01	08/16/1991	40SA0101N	1.000	0.068	<LM25	0.068	UGG
						40SA0102N	0.500	0.068	<LM25	0.068	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.068	<LM25	0.068	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.068	<LM25	0.068	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.068	<LM25	0.068	UGG
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	40-SA-01	08/16/1991	40SA0101N	1.000	0.1	<LM25	0.1	UGG
						40SA0101YU	1.000	0.033	=LH17	0.0034	UGG
						40SA0102N	0.500	0.1	<LM25	0.1	UGG
						40SA0102YU	0.500	0.017	=LH17	0.0034	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.1	<LM25	0.1	UGG
						40SA0202Y	1.500	0.004	<LH17	0.0034	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.1	<LM25	0.1	UGG
						40SA0301Y	0.500	0.004	<LH17	0.0034	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.1	<LM25	0.1	UGG
						40SS0201YC	0.600	0.02	=LH17	0.0034	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	40-SA-01	08/16/1991	40SA0101N	1.000	0.064	<LM25	0.064	UGG
						40SA0102N	0.500	0.064	<LM25	0.064	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.064	<LM25	0.064	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.064	<LM25	0.064	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.064	<LM25	0.064	UGG
			ALDRIN	40-SA-01	08/16/1991	40SA0101N	1.000	1.3	<LM25	1.3	UGG
						40SA0101Y	1.000	0.001	<LH17	0.0014	UGG
						40SA0102N	0.500	1.3	<LM25	1.3	UGG
						40SA0102Y	0.500	0.001	<LH17	0.0014	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	1.3	<LM25	1.3	UGG
						40SA0202Y	1.500	0.001	<LH17	0.0014	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.3	<LM25	1.3	UGG
						40SA0301Y	0.500	0.001	<LH17	0.0014	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.3	<LM25	1.3	UGG
						40SS0201YU	0.600	0.002	=LH17	0.0014	UGG
			ALPHA-BENZENEHEXACHLORIDE	40-SA-01	08/16/1991	40SA0101N	1.000	1.3	<LM25	1.3	UGG
						40SA0101Y	1.000	0.003	<LH17	0.0028	UGG
						40SA0102N	0.500	1.3	<LM25	1.3	UGG
						40SA0102Y	0.500	0.003	<LH17	0.0028	UGG

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				40-SA-02	08/16/1991	40SA0202N	1.500	1.3	<LM25	1.3	UGG
						40SA0202Y	1.500	0.003	<LH17	0.0028	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.3	<LM25	1.3	UGG
						40SA0301Y	0.500	0.003	<LH17	0.0028	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.3	<LM25	1.3	UGG
						40SS0201Y	0.600	0.003	<LH17	0.0028	UGG
			ALPHA-ENDOSULFAN/ENDOSULFAN I	40-SA-01	08/16/1991	40SA0101N	1.000	0.4	<LM25	0.4	UGG
						40SA0102N	0.500	0.4	<LM25	0.4	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.4	<LM25	0.4	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.4	<LM25	0.4	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.4	<LM25	0.4	UGG
			BETA-BENZENEHEXACHLORIDE	40-SA-01	08/16/1991	40SA0101N	1.000	1.3	<LM25	1.3	UGG
						40SA0102N	0.500	1.3	<LM25	1.3	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	1.3	<LM25	1.3	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.3	<LM25	1.3	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.3	<LM25	1.3	UGG
			BETA-ENDOSULFAN/ENDOSULFAN II	40-SA-01	08/16/1991	40SA0101N	1.000	2.4	<LM25	2.4	UGG
						40SA0102N	0.500	2.4	<LM25	2.4	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	2.4	<LM25	2.4	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	2.4	<LM25	2.4	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	2.4	<LM25	2.4	UGG
			CHLORDANE	40-SA-01	08/16/1991	40SA0101N	1.000	0.68	<LM25	0.68	UGG
						40SA0101Y	1.000	0.068	<LH17	0.0684	UGG
						40SA0102N	0.500	0.68	<LM25	0.68	UGG
						40SA0102Y	0.500	0.068	<LH17	0.0684	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.68	<LM25	0.68	UGG
						40SA0202Y	1.500	0.068	<LH17	0.0684	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.68	<LM25	0.68	UGG
						40SA0301Y	0.500	0.068	<LH17	0.0684	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.68	<LM25	0.68	UGG
						40SS0201Y	0.600	0.068	<LH17	0.0684	UGG
			DELTA-BENZENEHEXACHLORIDE	40-SA-01	08/16/1991	40SA0101N	1.000	0.21	<LM25	0.21	UGG
						40SA0101Y	1.000	0.008	<LH17	0.0085	UGG
						40SA0102N	0.500	0.21	<LM25	0.21	UGG
						40SA0102Y	0.500	0.008	<LH17	0.0085	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.21	<LM25	0.21	UGG
						40SA0202Y	1.500	0.008	<LH17	0.0085	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.21	<LM25	0.21	UGG
						40SA0301Y	0.500	0.008	<LH17	0.0085	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.21	<LM25	0.21	UGG
						40SS0201Y	0.600	0.008	<LH17	0.0085	UGG
			DIELDRIN	40-SA-01	08/16/1991	40SA0101N	1.000	0.079	<LM25	0.079	UGG
						40SA0101Y	1.000	0.002	<LH17	0.0016	UGG
						40SA0102N	0.500	0.079	<LM25	0.079	UGG
						40SA0102Y	0.500	0.002	<LH17	0.0016	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.079	<LM25	0.079	UGG
						40SA0202Y	1.500	0.002	<LH17	0.0016	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.079	<LM25	0.079	UGG
						40SA0301Y	0.500	0.002	<LH17	0.0016	UGG

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				40-SS-02	08/16/1991	40SS0201N	0.600	0.079	<LM25	0.079	UGG
						40SS0201Y	0.600	0.002	<LH17	0.0016	UGG
			ENDRIN	40-SA-01	08/16/1991	40SA0101N	1.000	1.3	<LM25	1.3	UGG
						40SA0101Y	1.000	0.007	<LH17	0.0065	UGG
						40SA0102N	0.500	1.3	<LM25	1.3	UGG
						40SA0102Y	0.500	0.007	<LH17	0.0065	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	1.3	<LM25	1.3	UGG
						40SA0202Y	1.500	0.007	<LH17	0.0065	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	1.3	<LM25	1.3	UGG
						40SA0301Y	0.500	0.007	<LH17	0.0065	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	1.3	<LM25	1.3	UGG
						40SS0201Y	0.600	0.007	<LH17	0.0065	UGG
			HEPTACHLOR	40-SA-01	08/16/1991	40SA0101N	1.000	0.24	<LM25	0.24	UGG
						40SA0101Y	1.000	0.002	<LH17	0.0022	UGG
						40SA0102N	0.500	0.24	<LM25	0.24	UGG
						40SA0102Y	0.500	0.002	<LH17	0.0022	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.24	<LM25	0.24	UGG
						40SA0202Y	1.500	0.002	<LH17	0.0022	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.24	<LM25	0.24	UGG
						40SA0301Y	0.500	0.002	<LH17	0.0022	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.24	<LM25	0.24	UGG
						40SS0201Y	0.600	0.002	<LH17	0.0022	UGG
			HEPTACHLOR EPOXIDE	40-SA-01	08/16/1991	40SA0101N	1.000	0.48	<LM25	0.48	UGG
						40SA0102N	0.500	0.48	<LM25	0.48	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.48	<LM25	0.48	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.48	<LM25	0.48	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.48	<LM25	0.48	UGG
			ISODRIN	40-SA-01	08/16/1991	40SA0101N	1.000	0.48	<LM25	0.48	UGG
						40SA0101Y	1.000	0.003	<LH17	0.003	UGG
						40SA0102N	0.500	0.48	<LM25	0.48	UGG
						40SA0102Y	0.500	0.003	<LH17	0.003	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.48	<LM25	0.48	UGG
						40SA0202Y	1.500	0.003	<LH17	0.003	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.48	<LM25	0.48	UGG
						40SA0301Y	0.500	0.003	<LH17	0.003	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.48	<LM25	0.48	UGG
						40SS0201Y	0.600	0.003	<LH17	0.003	UGG
			LINDANE	40-SA-01	08/16/1991	40SA0101N	1.000	0.1	<LM25	0.1	UGG
						40SA0101Y	1.000	0.001	<LH17	0.001	UGG
						40SA0102N	0.500	0.1	<LM25	0.1	UGG
						40SA0102Y	0.500	0.001	<LH17	0.001	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.1	<LM25	0.1	UGG
						40SA0202Y	1.500	0.001	<LH17	0.001	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.1	<LM25	0.1	UGG
						40SA0301Y	0.500	0.001	<LH17	0.001	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.1	<LM25	0.1	UGG
						40SS0201Y	0.600	0.001	<LH17	0.001	UGG
			METHOXYCHLOR	40-SA-01	08/16/1991	40SA0101N	1.000	0.26	<LM25	0.26	UGG
						40SA0102N	0.500	0.26	<LM25	0.26	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				40-SA-02	08/16/1991	40SA0202N	1.500	0.26	<LM25	0.26	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.26	<LM25	0.26	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.26	<LM25	0.26	UGG
			PCB 1016	40-SA-01	08/16/1991	40SA0101N	1.000	0.32	<LM25	0.32	UGG
						40SA0101Y	1.000	0.1	<LH17	0.1	UGG
						40SA0102N	0.500	0.32	<LM25	0.32	UGG
						40SA0102Y	0.500	0.1	<LH17	0.1	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.32	<LM25	0.32	UGG
						40SA0202Y	1.500	0.1	<LH17	0.1	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.32	<LM25	0.32	UGG
						40SA0301Y	0.500	0.1	<LH17	0.1	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.32	<LM25	0.32	UGG
						40SS0201Y	0.600	0.1	<LH17	0.1	UGG
			PCB 1221	40-SA-01	08/16/1991	40SA0101NR	1.000	1.9	*LM25	1.9	UGG
						40SA0102NR	0.500	1.9	*LM25	1.9	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	1.9	*LM25	1.9	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	1.9	*LM25	1.9	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	1.9	*LM25	1.9	UGG
			PCB 1232	40-SA-01	08/16/1991	40SA0101NR	1.000	1.9	*LM25	1.9	UGG
						40SA0102NR	0.500	1.9	*LM25	1.9	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	1.9	*LM25	1.9	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	1.9	*LM25	1.9	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	1.9	*LM25	1.9	UGG
			PCB 1242	40-SA-01	08/16/1991	40SA0101NR	1.000	1.9	*LM25	1.9	UGG
						40SA0102NR	0.500	1.9	*LM25	1.9	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	1.9	*LM25	1.9	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	1.9	*LM25	1.9	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	1.9	*LM25	1.9	UGG
			PCB 1248	40-SA-01	08/16/1991	40SA0101NR	1.000	1.9	*LM25	1.9	UGG
						40SA0102NR	0.500	1.9	*LM25	1.9	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	1.9	*LM25	1.9	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	1.9	*LM25	1.9	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	1.9	*LM25	1.9	UGG
			PCB 1254	40-SA-01	08/16/1991	40SA0101NR	1.000	3.8	*LM25	3.8	UGG
						40SA0102NR	0.500	3.8	*LM25	3.8	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	3.8	*LM25	3.8	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	3.8	*LM25	3.8	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	3.8	*LM25	3.8	UGG
			PCB 1260	40-SA-01	08/16/1991	40SA0101N	1.000	0.79	<LM25	0.79	UGG
						40SA0101YC	1.000	0.13	=LH17	0.0479	UGG
						40SA0102N	0.500	0.79	<LM25	0.79	UGG
						40SA0102YC	0.500	0.104	=LH17	0.0479	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.79	<LM25	0.79	UGG
						40SA0202Y	1.500	0.048	<LH17	0.0479	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.79	<LM25	0.79	UGG
						40SA0301Y	0.500	0.048	<LH17	0.0479	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.79	<LM25	0.79	UGG
						40SS0201YC	0.600	0.067	=LH17	0.0479	UGG
			PCB 1262	40-SA-01	08/16/1991	40SA0101Y	1.000	6.3	<LM25	0.3	UGG

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						40SA0102Y	0.500	6.3	<LM25	0.3	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	6.3	<LM25	0.3	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	6.3	<LM25	0.3	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	6.3	<LM25	0.3	UGG
			TOXAPHENE	40-SA-01	08/16/1991	40SA0101NR	1.000	12.0	*LM25	12.0	UGG
						40SA0102NR	0.500	12.0	*LM25	12.0	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	12.0	*LM25	12.0	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	12.0	*LM25	12.0	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	12.0	*LM25	12.0	UGG
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG
						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.032	<LM25	0.032	UGG
			1,2,4-TRICHLOROBENZENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.22	<LM25	0.22	UGG
						40SA0102Y	0.500	0.22	<LM25	0.22	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.22	<LM25	0.22	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.22	<LM25	0.22	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.22	<LM25	0.22	UGG
			1,2-DICHLOROBENZENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.042	<LM25	0.042	UGG
						40SA0102Y	0.500	0.042	<LM25	0.042	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.042	<LM25	0.042	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.042	<LM25	0.042	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.042	<LM25	0.042	UGG
			1,2-DIPHENYLHYDRAZINE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.52	<LM25	0.52	UGG
						40SA0102Y	0.500	0.52	<LM25	0.52	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.52	<LM25	0.52	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.52	<LM25	0.52	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.52	<LM25	0.52	UGG
			1,4-DICHLOROBENZENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.034	<LM25	0.034	UGG
						40SA0102Y	0.500	0.034	<LM25	0.034	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.034	<LM25	0.034	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.034	<LM25	0.034	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.034	<LM25	0.034	UGG
			1,4-OXATHIANE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.075	<LM25	0.075	UGG
						40SA0102Y	0.500	0.075	<LM25	0.075	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.075	<LM25	0.075	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.075	<LM25	0.075	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.075	<LM25	0.075	UGG
			2,3,6-TCP	40-SA-01	08/16/1991	40SA0101Y	1.000	0.62	<LM25	0.62	UGG
						40SA0102Y	0.500	0.62	<LM25	0.62	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.62	<LM25	0.62	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.62	<LM25	0.62	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.62	<LM25	0.62	UGG
			2,4,5-TRICHLOROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.49	<LM25	0.49	UGG
						40SA0102Y	0.500	0.49	<LM25	0.49	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.49	<LM25	0.49	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.49	<LM25	0.49	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.49	<LM25	0.49	UGG

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			2,4,6-TRICHLOROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.061	<LM25	0.061	UGG
						40SA0102Y	0.500	0.061	<LM25	0.061	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.061	<LM25	0.061	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.061	<LM25	0.061	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.061	<LM25	0.061	UGG
			2,4-DICHLOROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.065	<LM25	0.065	UGG
						40SA0102Y	0.500	0.065	<LM25	0.065	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.065	<LM25	0.065	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.065	<LM25	0.065	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.065	<LM25	0.065	UGG
			2,4-DIMETHYLPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	3.0	<LM25	3.0	UGG
						40SA0102Y	0.500	3.0	<LM25	3.0	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	3.0	<LM25	3.0	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	3.0	<LM25	3.0	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	3.0	<LM25	3.0	UGG
			2,4-DINITROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	4.7	<LM25	4.7	UGG
						40SA0102Y	0.500	4.7	<LM25	4.7	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	4.7	<LM25	4.7	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	4.7	<LM25	4.7	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	4.7	<LM25	4.7	UGG
			2,6-DINITROANILINE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.57	<LM25	0.57	UGG
						40SA0102Y	0.500	0.57	<LM25	0.57	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.57	<LM25	0.57	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.57	<LM25	0.57	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.57	<LM25	0.57	UGG
			2-CHLORONAPHTHALENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.24	<LM25	0.24	UGG
						40SA0102Y	0.500	0.24	<LM25	0.24	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.24	<LM25	0.24	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.24	<LM25	0.24	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.24	<LM25	0.24	UGG
			2-CHLOROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.055	<LM25	0.055	UGG
						40SA0102Y	0.500	0.055	<LM25	0.055	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.055	<LM25	0.055	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.055	<LM25	0.055	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.055	<LM25	0.055	UGG
			2-METHYL-4,6-DINITROPHENOL/4,6	40-SA-01	08/16/1991	40SA0101Y	1.000	0.8	<LM25	0.8	UGG
						40SA0102Y	0.500	0.8	<LM25	0.8	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.8	<LM25	0.8	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.8	<LM25	0.8	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.8	<LM25	0.8	UGG
			2-METHYLNAPHTHALENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG
						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.032	<LM25	0.032	UGG
			2-METHYLPHENOL/2-CRESOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.098	<LM25	0.098	UGG
						40SA0102Y	0.500	0.098	<LM25	0.098	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.098	<LM25	0.098	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.098	<LM25	0.098	UGG

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				40-SS-02	08/16/1991	40SS0201Y	0.600	0.098	<LM25	0.098	UGG
			2-NITROANILINE	40-SA-01	08/16/1991	40SA0101NR	1.000	3.1	*LM25	3.1	UGG
						40SA0102NR	0.500	3.1	*LM25	3.1	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	3.1	*LM25	3.1	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	3.1	*LM25	3.1	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	3.1	*LM25	3.1	UGG
			2-NITROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	1.1	<LM25	1.1	UGG
						40SA0102Y	0.500	1.1	<LM25	1.1	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.1	<LM25	1.1	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.1	<LM25	1.1	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.1	<LM25	1.1	UGG
			3,3'-DICHLOROBENZIDINE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.6	<LM25	1.6	UGG
						40SA0102Y	0.500	1.6	<LM25	1.6	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.6	<LM25	1.6	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.6	<LM25	1.6	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.6	<LM25	1.6	UGG
			3,5-DINITROANILINE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.6	<LM25	1.6	UGG
						40SA0102Y	0.500	1.6	<LM25	1.6	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.6	<LM25	1.6	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.6	<LM25	1.6	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.6	<LM25	1.6	UGG
			3-METHYL-4-CHLOROPHENOL/4-CHLO	40-SA-01	08/16/1991	40SA0101Y	1.000	0.93	<LM25	0.93	UGG
						40SA0102Y	0.500	0.93	<LM25	0.93	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.93	<LM25	0.93	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.93	<LM25	0.93	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.93	<LM25	0.93	UGG
			3-NITROANILINE	40-SA-01	08/16/1991	40SA0101Y	1.000	3.0	<LM25	3.0	UGG
						40SA0102Y	0.500	3.0	<LM25	3.0	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	3.0	<LM25	3.0	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	3.0	<LM25	3.0	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	3.0	<LM25	3.0	UGG
			3-NITROTOLUENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.34	<LM25	0.34	UGG
						40SA0102Y	0.500	0.34	<LM25	0.34	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.34	<LM25	0.34	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.34	<LM25	0.34	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.34	<LM25	0.34	UGG
			4-BROMOPHENYLPHENYL ETHER	40-SA-01	08/16/1991	40SA0101Y	1.000	0.041	<LM25	0.041	UGG
						40SA0102Y	0.500	0.041	<LM25	0.041	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.041	<LM25	0.041	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.041	<LM25	0.041	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.041	<LM25	0.041	UGG
			4-CHLOROANILINE	40-SA-01	08/16/1991	40SA0101NR	1.000	0.63	*LM25	0.63	UGG
						40SA0102NR	0.500	0.63	*LM25	0.63	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	0.63	*LM25	0.63	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	0.63	*LM25	0.63	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	0.63	*LM25	0.63	UGG
			4-CHLOROPHENYLPHENYL ETHER	40-SA-01	08/16/1991	40SA0101Y	1.000	0.17	<LM25	0.17	UGG
						40SA0102Y	0.500	0.17	<LM25	0.17	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.17	<LM25	0.17	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.17	<LM25	0.17	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.17	<LM25	0.17	UGG
			4-METHYLPHENOL/4-CRESOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.24	<LM25	0.24	UGG
						40SA0102Y	0.500	0.24	<LM25	0.24	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.24	<LM25	0.24	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.24	<LM25	0.24	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.24	<LM25	0.24	UGG
			4-NITROANILINE	40-SA-01	08/16/1991	40SA0101NR	1.000	3.1	*LM25	3.1	UGG
						40SA0102NR	0.500	3.1	*LM25	3.1	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	3.1	*LM25	3.1	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	3.1	*LM25	3.1	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	3.1	*LM25	3.1	UGG
			4-NITROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	3.3	<LM25	3.3	UGG
						40SA0102Y	0.500	3.3	<LM25	3.3	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	3.3	<LM25	3.3	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	3.3	<LM25	3.3	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	3.3	<LM25	3.3	UGG
			ACENAPHTHENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.041	<LM25	0.041	UGG
						40SA0102Y	0.500	0.041	<LM25	0.041	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.041	<LM25	0.041	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.041	<LM25	0.041	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.041	<LM25	0.041	UGG
			ACENAPHTHYLENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.033	<LM25	0.033	UGG
						40SA0102Y	0.500	0.033	<LM25	0.033	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.033	<LM25	0.033	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.033	<LM25	0.033	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.033	<LM25	0.033	UGG
			ANTHRACENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.71	<LM25	0.71	UGG
						40SA0102Y	0.500	0.71	<LM25	0.71	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.71	<LM25	0.71	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.71	<LM25	0.71	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.71	<LM25	0.71	UGG
			ATRAZINE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.065	<LM25	0.065	UGG
						40SA0102Y	0.500	0.065	<LM25	0.065	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.065	<LM25	0.065	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.065	<LM25	0.065	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.065	<LM25	0.065	UGG
			BENZO(A)ANTHRACENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.041	<LM25	0.48	UGG
						40SA0102Y	0.500	0.041	<LM25	0.48	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.041	<LM25	0.48	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.041	<LM25	0.48	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.297	=LM25	0.48	UGG
			BENZO(A)PYRENE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.2	<LM25	1.2	UGG
						40SA0102Y	0.500	1.2	<LM25	1.2	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.2	<LM25	1.2	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.2	<LM25	1.2	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.2	<LM25	1.2	UGG
			BENZO(B)FLUORANTHENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.31	<LM25	0.31	UGG
						40SA0102Y	0.500	0.31	<LM25	0.31	UGG

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				40-SA-02	08/16/1991	40SA0202Y	1.500	0.31	<LM25	0.31	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.31	<LM25	0.31	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.27	=LM25	0.31	UGG
			BENZO(G,H,I)PERYLENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.18	<LM25	0.18	UGG
						40SA0102Y	0.500	0.18	<LM25	0.18	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.18	<LM25	0.18	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.18	<LM25	0.18	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.18	<LM25	0.18	UGG
			BENZO(K)FLUORANTHENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.13	<LM25	0.13	UGG
						40SA0102Y	0.500	0.13	<LM25	0.13	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.13	<LM25	0.13	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.13	<LM25	0.13	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.13	<LM25	0.13	UGG
			BENZOIC ACID	40-SA-01	08/16/1991	40SA0101NR	1.000	3.1	*LM25	3.1	UGG
						40SA0102NR	0.500	3.1	*LM25	3.1	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	3.1	*LM25	3.1	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	3.1	*LM25	3.1	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	3.1	*LM25	3.1	UGG
			BENZYL ALCOHOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG
						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.032	<LM25	0.032	UGG
			BIS (2-CHLOROETHOXY) METHANE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.19	<LM25	0.19	UGG
						40SA0102Y	0.500	0.19	<LM25	0.19	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.19	<LM25	0.19	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.19	<LM25	0.19	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.19	<LM25	0.19	UGG
			BIS (2-CHLOROETHYL) ETHER	40-SA-01	08/16/1991	40SA0101Y	1.000	0.36	<LM25	0.36	UGG
						40SA0102Y	0.500	0.36	<LM25	0.36	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.36	<LM25	0.36	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.36	<LM25	0.36	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.36	<LM25	0.36	UGG
			BIS (2-CHLOROISOPROPYL) ETHER	40-SA-01	08/16/1991	40SA0101Y	1.000	0.44	<LM25	0.44	UGG
						40SA0102Y	0.500	0.44	<LM25	0.44	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.44	<LM25	0.44	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.44	<LM25	0.44	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.44	<LM25	0.44	UGG
			BIS (2-ETHYLHEXYL) PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.48	<LM25	0.48	UGG
						40SA0102Y	0.500	0.48	<LM25	0.48	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.48	<LM25	0.48	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.48	<LM25	0.48	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.48	<LM25	0.48	UGG
			BUTYLBENZYL PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.8	<LM25	1.8	UGG
						40SA0102Y	0.500	1.8	<LM25	1.8	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.8	<LM25	1.8	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.8	<LM25	1.8	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.8	<LM25	1.8	UGG
			CHRYSENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG

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						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.707	=LM25	0.032	UGG
			DI-N-BUTYL PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.3	<LM25	1.3	UGG
						40SA0102Y	0.500	1.3	<LM25	1.3	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.3	<LM25	1.3	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.3	<LM25	1.3	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.3	<LM25	1.3	UGG
			DI-N-OCTYL PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.23	<LM25	0.23	UGG
						40SA0102Y	0.500	0.23	<LM25	0.23	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.23	<LM25	0.23	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.23	<LM25	0.23	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.23	<LM25	0.23	UGG
			DIBENZ(A,H)ANTHRACENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.31	<LM25	0.31	UGG
						40SA0102Y	0.500	0.31	<LM25	0.31	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.31	<LM25	0.31	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.31	<LM25	0.31	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.31	<LM25	0.31	UGG
			DIBENZOFURAN	40-SA-01	08/16/1991	40SA0101Y	1.000	0.038	<LM25	0.038	UGG
						40SA0102Y	0.500	0.038	<LM25	0.038	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.038	<LM25	0.038	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.038	<LM25	0.038	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.038	<LM25	0.038	UGG
			DIBROMOCHLOROPROPANE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.071	<LM25	0.071	UGG
						40SA0102Y	0.500	0.071	<LM25	0.071	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.071	<LM25	0.071	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.071	<LM25	0.071	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.071	<LM25	0.071	UGG
			DICYCLOPENTADIENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.57	<LM25	0.57	UGG
						40SA0102Y	0.500	0.57	<LM25	0.57	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.57	<LM25	0.57	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.57	<LM25	0.57	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.57	<LM25	0.57	UGG
			DIETHYL PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.24	<LM25	0.24	UGG
						40SA0102Y	0.500	0.24	<LM25	0.24	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.24	<LM25	0.24	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.24	<LM25	0.24	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.24	<LM25	0.24	UGG
			DIMETHYL PHTHALATE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.063	<LM25	0.063	UGG
						40SA0102Y	0.500	0.063	<LM25	0.063	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.063	<LM25	0.063	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.063	<LM25	0.063	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.063	<LM25	0.063	UGG
			DITHIANE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.065	<LM25	0.065	UGG
						40SA0102Y	0.500	0.065	<LM25	0.065	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.065	<LM25	0.065	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.065	<LM25	0.065	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.065	<LM25	0.065	UGG

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			ENDOSULFAN SULFATE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.2	<LM25	1.2	UGG
						40SA0102Y	0.500	1.2	<LM25	1.2	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.2	<LM25	1.2	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.2	<LM25	1.2	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.2	<LM25	1.2	UGG
			ENDRIN ALDEHYDE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.8	<LM25	1.8	UGG
						40SA0102Y	0.500	1.8	<LM25	1.8	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.8	<LM25	1.8	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.8	<LM25	1.8	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.8	<LM25	1.8	UGG
			ENDRIN KETONE	40-SA-01	08/16/1991	40SA0101NR	1.000	0.28	*LM25	0.28	UGG
						40SA0102NR	0.500	0.28	*LM25	0.28	UGG
				40-SA-02	08/16/1991	40SA0202NR	1.500	0.28	*LM25	0.28	UGG
				40-SA-03	08/16/1991	40SA0301NR	0.500	0.28	*LM25	0.28	UGG
				40-SS-02	08/16/1991	40SS0201NR	0.600	0.28	*LM25	0.28	UGG
			FLUORANTHENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG
						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.418	=LM25	0.032	UGG
			FLUORENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.065	<LM25	0.065	UGG
						40SA0102Y	0.500	0.065	<LM25	0.065	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.065	<LM25	0.065	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.065	<LM25	0.065	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.065	<LM25	0.065	UGG
			HEXACHLOROBENZENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.08	<LM25	0.08	UGG
						40SA0102Y	0.500	0.08	<LM25	0.08	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.08	<LM25	0.08	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.08	<LM25	0.08	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.08	<LM25	0.08	UGG
			HEXACHLOROBUTADIENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.97	<LM25	0.97	UGG
						40SA0102Y	0.500	0.97	<LM25	0.97	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.97	<LM25	0.97	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.97	<LM25	0.97	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.97	<LM25	0.97	UGG
			HEXACHLOROCYCLOPENTADIENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.52	<LM25	0.52	UGG
						40SA0102Y	0.500	0.52	<LM25	0.52	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.52	<LM25	0.52	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.52	<LM25	0.52	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.52	<LM25	0.52	UGG
			HEXACHLOROETHANE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.8	<LM25	1.8	UGG
						40SA0102Y	0.500	1.8	<LM25	1.8	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.8	<LM25	1.8	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.8	<LM25	1.8	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.8	<LM25	1.8	UGG
			INDENO(1,2,3-C,D)PYRENE	40-SA-01	08/16/1991	40SA0101Y	1.000	2.4	<LM25	2.4	UGG
						40SA0102Y	0.500	2.4	<LM25	2.4	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	2.4	<LM25	2.4	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	2.4	<LM25	2.4	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				40-SS-02	08/16/1991	40SS0201Y	0.600	2.4	<LM25	2.4	UGG
			ISOPHORONE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.39	<LM25	0.39	UGG
						40SA0102Y	0.500	0.39	<LM25	0.39	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.39	<LM25	0.39	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.39	<LM25	0.39	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.39	<LM25	0.39	UGG
			MALATHION	40-SA-01	08/16/1991	40SA0101Y	1.000	0.18	<LM25	0.18	UGG
						40SA0102Y	0.500	0.18	<LM25	0.18	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.18	<LM25	0.18	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.18	<LM25	0.18	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.18	<LM25	0.18	UGG
			MIREX	40-SA-01	08/16/1991	40SA0101Y	1.000	0.14	<LM25	0.14	UGG
						40SA0102Y	0.500	0.14	<LM25	0.14	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.14	<LM25	0.14	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.14	<LM25	0.14	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.14	<LM25	0.14	UGG
			N-NITROSODI-N-PROPYLAMINE	40-SA-01	08/16/1991	40SA0101Y	1.000	1.1	<LM25	1.1	UGG
						40SA0102Y	0.500	1.1	<LM25	1.1	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.1	<LM25	1.1	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.1	<LM25	1.1	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.1	<LM25	1.1	UGG
			N-NITROSODIMETHYLAMINE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.46	<LM25	0.46	UGG
						40SA0102Y	0.500	0.46	<LM25	0.46	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.46	<LM25	0.46	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.46	<LM25	0.46	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.46	<LM25	0.46	UGG
			N-NITROSODIPHENYLAMINE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.29	<LM25	0.29	UGG
						40SA0102Y	0.500	0.29	<LM25	0.29	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.29	<LM25	0.29	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.29	<LM25	0.29	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.29	<LM25	0.29	UGG
			NAPHTHALENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.74	<LM25	0.74	UGG
						40SA0102Y	0.500	0.74	<LM25	0.74	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.74	<LM25	0.74	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.74	<LM25	0.74	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.74	<LM25	0.74	UGG
			P-CHLOROPHENYLMETHYL SULFIDE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.097	<LM25	0.097	UGG
						40SA0102Y	0.500	0.097	<LM25	0.097	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.097	<LM25	0.097	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.097	<LM25	0.097	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.097	<LM25	0.097	UGG
			P-CHLOROPHENYLMETHYL SULFONE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.066	<LM25	0.066	UGG
						40SA0102Y	0.500	0.066	<LM25	0.066	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.066	<LM25	0.066	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.066	<LM25	0.066	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.066	<LM25	0.066	UGG
			P-CHLOROPHENYLMETHYL SULFOXIDE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.32	<LM25	0.32	UGG
						40SA0102Y	0.500	0.32	<LM25	0.32	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.32	<LM25	0.32	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.32	<LM25	0.32	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.32	<LM25	0.32	UGG
			PARATHION	40-SA-01	08/16/1991	40SA0101Y	1.000	1.7	<LM25	1.7	UGG
						40SA0102Y	0.500	1.7	<LM25	1.7	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	1.7	<LM25	1.7	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	1.7	<LM25	1.7	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	1.7	<LM25	1.7	UGG
			PENTACHLOROPHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.76	<LM25	0.76	UGG
						40SA0102Y	0.500	0.76	<LM25	0.76	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.76	<LM25	0.76	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.76	<LM25	0.76	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.76	<LM25	0.76	UGG
			PHENANTHRENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.032	<LM25	0.032	UGG
						40SA0102Y	0.500	0.032	<LM25	0.032	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.032	<LM25	0.032	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.032	<LM25	0.032	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.032	<LM25	0.032	UGG
			PHENOL	40-SA-01	08/16/1991	40SA0101Y	1.000	0.052	<LM25	0.052	UGG
						40SA0102Y	0.500	0.052	<LM25	0.052	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.052	<LM25	0.052	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.052	<LM25	0.052	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.052	<LM25	0.052	UGG
			PYRENE	40-SA-01	08/16/1991	40SA0101Y	1.000	0.083	<LM25	0.083	UGG
						40SA0102Y	0.500	0.083	<LM25	0.083	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.083	<LM25	0.083	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.083	<LM25	0.083	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.829	=LM25	0.083	UGG
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	40-SA-01	08/16/1991	40SA0101Y	1.000	0.92	<LM25	0.92	UGG
						40SA0102Y	0.500	0.92	<LM25	0.92	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.92	<LM25	0.92	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.92	<LM25	0.92	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.92	<LM25	0.92	UGG
			VAPONA	40-SA-01	08/16/1991	40SA0101Y	1.000	0.068	<LM25	0.068	UGG
						40SA0102Y	0.500	0.068	<LM25	0.068	UGG
				40-SA-02	08/16/1991	40SA0202Y	1.500	0.068	<LM25	0.068	UGG
				40-SA-03	08/16/1991	40SA0301Y	0.500	0.068	<LM25	0.068	UGG
				40-SS-02	08/16/1991	40SS0201Y	0.600	0.068	<LM25	0.068	UGG
		VOLATILES	1,3-DICHLOROBENZENE	40-SA-01	08/16/1991	40SA0101N	1.000	0.042	<LM25	0.042	UGG
						40SA0102N	0.500	0.042	<LM25	0.042	UGG
				40-SA-02	08/16/1991	40SA0202N	1.500	0.042	<LM25	0.042	UGG
				40-SA-03	08/16/1991	40SA0301N	0.500	0.042	<LM25	0.042	UGG
				40-SS-02	08/16/1991	40SS0201N	0.600	0.042	<LM25	0.042	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP41	SO	ANIONS	NITRITE, NITRATE - NONSPECIFIC	41-SA-01	08/21/1991	41SA0101Y	3.000	2.27	=KF17	1.0	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	1.0	<KF17	1.0	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	1.0	<KF17	1.0	UGG
			SULFATE	41-SA-01	08/21/1991	41SA0101Y	3.000	8.77	=KT07	5.0	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	31.3	=KT07	5.0	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	15.6	=KT07	5.0	UGG
		EXPLOSIVES	1,3,5-TRINITROBENZENE	41-SA-01	08/21/1991	41SA0101Y	3.000	2.1	<LW02	2.09	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	2.1	<LW02	2.09	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	41-SA-01	08/21/1991	41SA0101Y	3.000	0.59	<LW02	0.59	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.59	<LW02	0.59	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.59	<LW02	0.59	UGG
			2,4,6-TNT	41-SA-01	08/21/1991	41SA0101Y	3.000	1.9	<LW02	1.92	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	1.9	<LW02	1.92	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	41-SA-01	08/21/1991	41SA0101Y	3.000	0.42	<LW02	0.42	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.42	<LW02	0.42	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	41-SA-01	08/21/1991	41SA0101Y	3.000	0.4	<LW02	0.4	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.4	<LW02	0.4	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.4	<LW02	0.4	UGG
			HMX	41-SA-01	08/21/1991	41SA0101Y	3.000	1.3	<LW02	1.27	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	1.3	<LW02	1.27	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	1.3	<LW02	1.27	UGG
			NITROBENZENE	41-SA-01	08/21/1991	41SA0101Y	3.000	0.42	<LW02	0.42	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.42	<LW02	0.42	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.42	<LW02	0.42	UGG
			RDX	41-SA-01	08/21/1991	41SA0101Y	3.000	0.98	<LW02	0.98	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.98	<LW02	0.98	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.98	<LW02	0.98	UGG
			TETRYL	41-SA-01	08/21/1991	41SA0101Y	3.000	0.25	<LW02	0.25	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.25	<LW02	0.25	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	41-SA-01	08/21/1991	41SA0101Y	3.000	19.6	<JS12	19.6	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	19.6	<JS12	19.6	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	19.6	<JS12	19.6	UGG
			ARSENIC	41-SA-01	08/21/1991	41SA0101Y	3.000	6.4	=B9	2.5	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	8.23	=B9	2.5	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	2.5	<B9	2.5	UGG
			BARIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	159.0	=JS12	3.29	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	117.0	=JS12	3.29	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	145.0	=JS12	3.29	UGG
			BERYLLIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	0.427	<JS12	0.427	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.427	<JS12	0.427	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.427	<JS12	0.427	UGG
			CADMIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	1.2	<JS12	1.2	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	1.2	<JS12	1.2	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	1.2	<JS12	1.2	UGG
			CHROMIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	32.2	=JS12	1.04	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				41-SA-02	08/21/1991	41SA0201Y	3.000	24.0	=JS12	1.04	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	31.8	=JS12	1.04	UGG
			COPPER	41-SA-01	08/21/1991	41SA0101Y	3.000	17.2	=JS12	2.84	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	15.6	=JS12	2.84	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	13.1	=JS12	2.84	UGG
			LEAD	41-SA-01	08/21/1991	41SA0101Y	3.000	16.0	=JD21	0.467	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	8.0	=JD21	0.467	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	11.0	=JD21	0.467	UGG
			MERCURY	41-SA-01	08/21/1991	41SA0101Y	3.000	0.05	<Y9	0.05	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.05	<Y9	0.05	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.05	<Y9	0.05	UGG
			NICKEL	41-SA-01	08/21/1991	41SA0101Y	3.000	17.5	=JS12	2.74	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	25.7	=JS12	2.74	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	14.7	=JS12	2.74	UGG
			SELENIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	0.449	<JD20	0.449	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.449	<JD20	0.449	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.449	<JD20	0.449	UGG
			SILVER	41-SA-01	08/21/1991	41SA0101Y	3.000	0.803	<JS12	0.803	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	0.803	<JS12	0.803	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	0.803	<JS12	0.803	UGG
			THALLIUM	41-SA-01	08/21/1991	41SA0101Y	3.000	34.3	<JS12	34.3	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	34.3	<JS12	34.3	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	34.3	<JS12	34.3	UGG
			ZINC	41-SA-01	08/21/1991	41SA0101Y	3.000	43.7	=JS12	2.34	UGG
				41-SA-02	08/21/1991	41SA0201Y	3.000	41.3	=JS12	2.34	UGG
				41-SA-03	08/21/1991	41SA0301Y	7.000	42.9	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP42	SD	ANIONS	NITRITE, NITRATE - NONSPECIFIC	42-SD-03	08/21/1991	42SD0301Y	0.300	1.0	<KF17	1.0	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	1.55	=KF17	1.0	UGG
			SULFATE	42-SD-03	08/21/1991	42SD0301Y	0.300	190.0	=KT07	5.0	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	107.0	=KT07	5.0	UGG
		METALS	ANTIMONY	42-SD-03	08/21/1991	42SD0301Y	0.300	19.6	<JS12	19.6	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	19.6	<JS12	19.6	UGG
			ARSENIC	42-SD-03	08/21/1991	42SD0301Y	0.300	2.5	<B9	2.5	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	2.5	<B9	2.5	UGG
			BARIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	19.3	=JS12	3.29	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	47.8	=JS12	3.29	UGG
			BERYLLIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	0.841	=JS12	0.427	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	0.427	<JS12	0.427	UGG
			CADMIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	1.2	<JS12	1.2	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	1.2	<JS12	1.2	UGG
			CHROMIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	10.3	=JS12	1.04	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	12.7	=JS12	1.04	UGG
			COPPER	42-SD-03	08/21/1991	42SD0301Y	0.300	9.38	=JS12	2.84	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	17.6	=JS12	2.84	UGG
			LEAD	42-SD-03	08/21/1991	42SD0301Y	0.300	5.12	=JD21	0.467	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	18.0	=JD21	0.467	UGG
			MERCURY	42-SD-03	08/21/1991	42SD0301Y	0.300	0.112	=Y9	0.05	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	0.859	=Y9	0.05	UGG
			NICKEL	42-SD-03	08/21/1991	42SD0301Y	0.300	2.74	<JS12	2.74	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	6.65	=JS12	2.74	UGG
			SELENIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	0.449	<JD20	0.449	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	0.928	=JD20	0.449	UGG
			SILVER	42-SD-03	08/21/1991	42SD0301Y	0.300	0.803	<JS12	0.803	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	0.803	<JS12	0.803	UGG
			THALLIUM	42-SD-03	08/21/1991	42SD0301Y	0.300	34.3	<JS12	34.3	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	34.3	<JS12	34.3	UGG
			ZINC	42-SD-03	08/21/1991	42SD0301Y	0.300	78.1	=JS12	2.34	UGG
				42-SD-04	08/21/1991	42SD0401Y	0.300	41.9	=JS12	2.34	UGG
	SO	ANIONS	NITRITE, NITRATE - NONSPECIFIC	42-SA-01	08/21/1991	42SA0101Y	0.500	1.71	=KF17	1.0	UGG
						42SA0102Y	4.000	1.0	<KF17	1.0	UGG
						42SA0103Y	6.000	1.0	<KF17	1.0	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	5.11	=KF17	1.0	UGG
						42SA0202Y	3.000	1.0	<KF17	1.0	UGG
			SULFATE	42-SA-01	08/21/1991	42SA0101Y	0.500	1,400.0	=KT07	5.0	UGG
						42SA0102Y	4.000	470.0	=KT07	5.0	UGG
						42SA0103Y	6.000	470.0	=KT07	5.0	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	1,500.0	=KT07	5.0	UGG
						42SA0202Y	3.000	880.0	=KT07	5.0	UGG
		METALS	ANTIMONY	42-SA-01	08/21/1991	42SA0101Y	0.500	19.6	<JS12	19.6	UGG
						42SA0102Y	4.000	19.6	<JS12	19.6	UGG
						42SA0103Y	6.000	19.6	<JS12	19.6	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	19.6	<JS12	19.6	UGG
						42SA0202Y	3.000	19.6	<JS12	19.6	UGG
			ARSENIC	42-SA-01	08/21/1991	42SA0101Y	0.500	12.4	=B9	2.5	UGG
						42SA0102Y	4.000	4.74	=B9	2.5	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						42SA0103Y	6.000	12.0	=B9	2.5	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	8.7	=B9	2.5	UGG
						42SA0202Y	3.000	4.76	=B9	2.5	UGG
			BARIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	62.8	=JS12	3.29	UGG
						42SA0102Y	4.000	274.0	=JS12	3.29	UGG
						42SA0103Y	6.000	152.0	=JS12	3.29	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	159.0	=JS12	3.29	UGG
						42SA0202Y	3.000	225.0	=JS12	3.29	UGG
			BERYLLIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	0.599	=JS12	0.427	UGG
						42SA0102Y	4.000	0.427	<JS12	0.427	UGG
						42SA0103Y	6.000	0.427	<JS12	0.427	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	0.427	<JS12	0.427	UGG
						42SA0202Y	3.000	0.427	<JS12	0.427	UGG
			CADMIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	1.2	<JS12	1.2	UGG
						42SA0102Y	4.000	1.2	<JS12	1.2	UGG
						42SA0103Y	6.000	1.2	<JS12	1.2	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	1.2	<JS12	1.2	UGG
						42SA0202Y	3.000	1.2	<JS12	1.2	UGG
			CHROMIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	12.0	=JS12	1.04	UGG
						42SA0102Y	4.000	30.0	=JS12	1.04	UGG
						42SA0103Y	6.000	29.8	=JS12	1.04	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	19.5	=JS12	1.04	UGG
						42SA0202Y	3.000	34.4	=JS12	1.04	UGG
			COPPER	42-SA-01	08/21/1991	42SA0101Y	0.500	11.3	=JS12	2.84	UGG
						42SA0102Y	4.000	18.2	=JS12	2.84	UGG
						42SA0103Y	6.000	16.7	=JS12	2.84	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	17.2	=JS12	2.84	UGG
						42SA0202Y	3.000	28.7	=JS12	2.84	UGG
			LEAD	42-SA-01	08/21/1991	42SA0101Y	0.500	25.0	=JD21	0.467	UGG
						42SA0102Y	4.000	12.0	=JD21	0.467	UGG
						42SA0103Y	6.000	12.0	=JD21	0.467	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	20.0	=JD21	0.467	UGG
						42SA0202Y	3.000	14.0	=JD21	0.467	UGG
			MERCURY	42-SA-01	08/21/1991	42SA0101Y	0.500	0.156	=Y9	0.05	UGG
						42SA0102Y	4.000	0.05	<Y9	0.05	UGG
						42SA0103Y	6.000	0.05	<Y9	0.05	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	0.083	=Y9	0.05	UGG
						42SA0202Y	3.000	0.05	<Y9	0.05	UGG
			NICKEL	42-SA-01	08/21/1991	42SA0101Y	0.500	6.08	=JS12	2.74	UGG
						42SA0102Y	4.000	22.3	=JS12	2.74	UGG
						42SA0103Y	6.000	16.4	=JS12	2.74	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	8.78	=JS12	2.74	UGG
						42SA0202Y	3.000	17.6	=JS12	2.74	UGG
			SELENIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	1.39	=JD20	0.449	UGG
						42SA0102Y	4.000	0.449	<JD20	0.449	UGG
						42SA0103Y	6.000	0.449	<JD20	0.449	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	1.01	=JD20	0.449	UGG
						42SA0202Y	3.000	0.449	<JD20	0.449	UGG
			SILVER	42-SA-01	08/21/1991	42SA0101Y	0.500	0.803	<JS12	0.803	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						42SA0102Y	4.000	0.803	<JS12	0.803	UGG
						42SA0103Y	6.000	0.803	<JS12	0.803	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	0.803	<JS12	0.803	UGG
						42SA0202Y	3.000	0.803	<JS12	0.803	UGG
			THALLIUM	42-SA-01	08/21/1991	42SA0101Y	0.500	34.3	<JS12	34.3	UGG
						42SA0102Y	4.000	34.3	<JS12	34.3	UGG
						42SA0103Y	6.000	34.3	<JS12	34.3	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	34.3	<JS12	34.3	UGG
						42SA0202Y	3.000	34.3	<JS12	34.3	UGG
			ZINC	42-SA-01	08/21/1991	42SA0101Y	0.500	20.6	=JS12	2.34	UGG
						42SA0102Y	4.000	55.1	=JS12	2.34	UGG
						42SA0103Y	6.000	53.9	=JS12	2.34	UGG
				42-SA-02	08/21/1991	42SA0201Y	6.000	48.3	=JS12	2.34	UGG
						42SA0202Y	3.000	74.5	=JS12	2.34	UGG
	SW	ANIONS	NITRITE, NITRATE - NONSPECIFIC	42-SW-04	08/21/1991	42SW0401Y	0.500	4,600.0	=LL8	10.0	UGL
			SULFATE	42-SW-04	08/21/1991	42SW0401Y	0.500	150,000.0	=TT09	175.0	UGL
		METALS	ANTIMONY	42-SW-04	08/21/1991	42SW0401Y	0.500	60.0	<SS12	60.0	UGL
			ARSENIC	42-SW-04	08/21/1991	42SW0401Y	0.500	2.66	=AX8	2.35	UGL
			BARIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	25.3	=SS12	2.82	UGL
			BERYLLIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	1.12	<SS12	1.12	UGL
			CADMIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	6.78	<SS12	6.78	UGL
			CHROMIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	16.8	<SS12	16.8	UGL
			COPPER	42-SW-04	08/21/1991	42SW0401Y	0.500	18.8	<SS12	18.8	UGL
			LEAD	42-SW-04	08/21/1991	42SW0401Y	0.500	9.23	=SD18	4.47	UGL
			MERCURY	42-SW-04	08/21/1991	42SW0401Y	0.500	2.8	=CC8	0.1	UGL
			NICKEL	42-SW-04	08/21/1991	42SW0401Y	0.500	32.1	<SS12	32.1	UGL
			SELENIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	2.53	<SD25	2.53	UGL
			SILVER	42-SW-04	08/21/1991	42SW0401Y	0.500	10.0	<SS12	10.0	UGL
			THALLIUM	42-SW-04	08/21/1991	42SW0401Y	0.500	125.0	<SS12	125.0	UGL
			ZINC	42-SW-04	08/21/1991	42SW0401Y	0.500	1,030.0	=SS12	18.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAP43	SD	ANIONS	NITRITE, NITRATE - NONSPECIFIC	43-SD-01	08/22/1991	43SD0101Y	0.500	8.59	=KF17	1.0	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	4.62	=KF17	1.0	UGG
			SULFATE	43-SD-01	08/22/1991	43SD0101Y	0.500	98.3	=KT07	5.0	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	160.0	=KT07	5.0	UGG
		EXPLOSIVES	1,3,5-TRINITROBENZENE	43-SD-01	08/22/1991	43SD0101Y	0.500	2.1	<LW02	2.09	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	43-SD-01	08/22/1991	43SD0101Y	0.500	0.59	<LW02	0.59	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	43-SD-01	08/22/1991	43SD0101Y	0.500	1.9	<LW02	1.92	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	43-SD-01	08/22/1991	43SD0101Y	0.500	0.42	<LW02	0.42	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	43-SD-01	08/22/1991	43SD0101Y	0.500	0.4	<LW02	0.4	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.4	<LW02	0.4	UGG
			HMX	43-SD-01	08/22/1991	43SD0101Y	0.500	1.3	<LW02	1.27	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	43-SD-01	08/22/1991	43SD0101Y	0.500	0.42	<LW02	0.42	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.42	<LW02	0.42	UGG
			RDX	43-SD-01	08/22/1991	43SD0101Y	0.500	0.98	<LW02	0.98	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	43-SD-01	08/22/1991	43SD0101Y	0.500	0.25	<LW02	0.25	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	43-SD-01	08/22/1991	43SD0101Y	0.500	19.6	<JS12	19.6	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	19.6	<JS12	19.6	UGG
			ARSENIC	43-SD-01	08/22/1991	43SD0101Y	0.500	4.49	=B9	2.5	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	6.77	=B9	2.5	UGG
			BARIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	178.0	=JS12	3.29	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	116.0	=JS12	3.29	UGG
			BERYLLIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	0.738	=JS12	0.427	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.427	<JS12	0.427	UGG
			CADMIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	1.2	<JS12	1.2	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	1.2	<JS12	1.2	UGG
			CHROMIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	17.7	=JS12	1.04	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	12.0	=JS12	1.04	UGG
			COPPER	43-SD-01	08/22/1991	43SD0101Y	0.500	15.6	=JS12	2.84	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	14.2	=JS12	2.84	UGG
			LEAD	43-SD-01	08/22/1991	43SD0101Y	0.500	21.0	=JD21	0.467	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	15.0	=JD21	0.467	UGG
			MERCURY	43-SD-01	08/22/1991	43SD0101Y	0.500	0.05	<Y9	0.05	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.05	<Y9	0.05	UGG
			NICKEL	43-SD-01	08/22/1991	43SD0101Y	0.500	16.2	=JS12	2.74	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	16.5	=JS12	2.74	UGG
			SELENIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	0.449	<JD20	0.449	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.976	=JD20	0.449	UGG
			SILVER	43-SD-01	08/22/1991	43SD0101Y	0.500	0.803	<JS12	0.803	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	43-SD-01	08/22/1991	43SD0101Y	0.500	34.3	<JS12	34.3	UGG
				43-SD-02	08/22/1991	43SD0201Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	43-SD-01	08/22/1991	43SD0101Y	0.500	62.8	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				43-SD-02	08/22/1991	43SD0201Y	0.500	57.6	=JS12	2.34	UGG
	SO	ANIONS	NITRITE, NITRATE - NONSPECIFIC	43-SA-03	08/22/1991	43SA0301Y	0.500	12.8	=KF17	1.0	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	2.98	=KF17	1.0	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	3.57	=KF17	1.0	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	23.0	=KF17	1.0	UGG
			SULFATE	43-SA-03	08/22/1991	43SA0301Y	0.500	1,200.0	=KT07	5.0	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	23.4	=KT07	5.0	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	8.7	=KT07	5.0	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	560.0	=KT07	5.0	UGG
		EXPLOSIVES	1,3,5-TRINITROBENZENE	43-SA-03	08/22/1991	43SA0301Y	0.500	2.1	<LW02	2.09	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	2.1	<LW02	2.09	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	2.1	<LW02	2.09	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	2.1	<LW02	2.09	UGG
			1,3-DINITROBENZENE	43-SA-03	08/22/1991	43SA0301Y	0.500	0.59	<LW02	0.59	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.59	<LW02	0.59	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.59	<LW02	0.59	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.59	<LW02	0.59	UGG
			2,4,6-TNT	43-SA-03	08/22/1991	43SA0301Y	0.500	1.9	<LW02	1.92	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	1.9	<LW02	1.92	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	1.9	<LW02	1.92	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	1.9	<LW02	1.92	UGG
			2,4-DINITROTOLUENE	43-SA-03	08/22/1991	43SA0301Y	0.500	0.42	<LW02	0.42	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.42	<LW02	0.42	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.42	<LW02	0.42	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.42	<LW02	0.42	UGG
			2,6-DINITROTOLUENE	43-SA-03	08/22/1991	43SA0301Y	0.500	0.4	<LW02	0.4	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.4	<LW02	0.4	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.4	<LW02	0.4	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.4	<LW02	0.4	UGG
			HMX	43-SA-03	08/22/1991	43SA0301Y	0.500	1.3	<LW02	1.27	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	1.3	<LW02	1.27	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	1.3	<LW02	1.27	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	1.3	<LW02	1.27	UGG
			NITROBENZENE	43-SA-03	08/22/1991	43SA0301Y	0.500	0.42	<LW02	0.42	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.42	<LW02	0.42	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.42	<LW02	0.42	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.42	<LW02	0.42	UGG
			RDX	43-SA-03	08/22/1991	43SA0301Y	0.500	0.98	<LW02	0.98	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.98	<LW02	0.98	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.98	<LW02	0.98	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.98	<LW02	0.98	UGG
			TETRYL	43-SA-03	08/22/1991	43SA0301Y	0.500	0.25	<LW02	0.25	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.25	<LW02	0.25	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.25	<LW02	0.25	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.25	<LW02	0.25	UGG
		METALS	ANTIMONY	43-SA-03	08/22/1991	43SA0301Y	0.500	19.6	<JS12	19.6	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	19.6	<JS12	19.6	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	19.6	<JS12	19.6	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	19.6	<JS12	19.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
			ARSENIC	43-SA-03	08/22/1991	43SA0301Y	0.500	20.5	=B9	2.5	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	7.81	=B9	2.5	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	7.9	=B9	2.5	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	10.8	=B9	2.5	UGG
			BARIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	166.0	=JS12	3.29	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	178.0	=JS12	3.29	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	163.0	=JS12	3.29	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	220.0	=JS12	3.29	UGG
			BERYLLIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	2.69	=JS12	0.427	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	1.11	=JS12	0.427	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	1.12	=JS12	0.427	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	2.96	=JS12	0.427	UGG
			CADMIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	1.99	=JS12	1.2	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	1.2	<JS12	1.2	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	1.2	<JS12	1.2	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	1.89	=JS12	1.2	UGG
			CHROMIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	28.2	=JS12	1.04	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	24.1	=JS12	1.04	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	20.3	=JS12	1.04	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	28.7	=JS12	1.04	UGG
			COPPER	43-SA-03	08/22/1991	43SA0301Y	0.500	42.1	=JS12	2.84	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	19.7	=JS12	2.84	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	24.2	=JS12	2.84	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	44.6	=JS12	2.84	UGG
			LEAD	43-SA-03	08/22/1991	43SA0301Y	0.500	42.0	=JD21	0.467	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	19.0	=JD21	0.467	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	17.0	=JD21	0.467	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	29.0	=JD21	0.467	UGG
			MERCURY	43-SA-03	08/22/1991	43SA0301Y	0.500	0.151	=Y9	0.05	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.09	=Y9	0.05	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.099	=Y9	0.05	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.217	=Y9	0.05	UGG
			NICKEL	43-SA-03	08/22/1991	43SA0301Y	0.500	40.7	=JS12	2.74	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	18.3	=JS12	2.74	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	22.0	=JS12	2.74	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	41.2	=JS12	2.74	UGG
			SELENIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	1.4	=JD20	0.449	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.449	<JD20	0.449	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.449	<JD20	0.449	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.997	=JD20	0.449	UGG
			SILVER	43-SA-03	08/22/1991	43SA0301Y	0.500	0.803	<JS12	0.803	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	0.803	<JS12	0.803	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	0.803	<JS12	0.803	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	0.803	<JS12	0.803	UGG
			THALLIUM	43-SA-03	08/22/1991	43SA0301Y	0.500	34.3	<JS12	34.3	UGG
				43-SA-04	08/22/1991	43SA0401Y	1.000	34.3	<JS12	34.3	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	34.3	<JS12	34.3	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	34.3	<JS12	34.3	UGG
			ZINC	43-SA-03	08/22/1991	43SA0301Y	0.500	237.0	=JS12	2.34	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				43-SA-04	08/22/1991	43SA0401Y	1.000	67.5	=JS12	2.34	UGG
				43-SA-05	08/22/1991	43SA0501Y	1.000	78.1	=JS12	2.34	UGG
				43-SS-03	08/22/1991	43SS0301Y	0.500	236.0	=JS12	2.34	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAPQC	QC	ANIONS	NITRITE, NITRATE - NONSPECIFIC	27-EB-07	08/14/1991	27EB0701Y	0.000	119.0	=LL8	10.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1,200.0	=LL8	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.99	=KF17	1.0	UGG
						BKSA0102Y	3.000	1.0	<KF17	1.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.8	=KF17	1.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1,100.0	=KF17	1.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	10.0	<LL8	10.0	UGL
			SULFATE	27-EB-07	08/14/1991	27EB0701Y	0.000	175.0	<TT09	175.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	175.0	<TT09	175.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	14.6	=KT07	5.0	UGG
						BKSA0102Y	3.000	81.7	=KT07	5.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	11.4	=KT07	5.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	23.7	=KT07	5.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	210,000.0	=TT09	175.0	UGL
		CYANIDE	CYANIDE	WELL4YARDJQC	08/12/1991	DECONN	400.000	5.0	<TF34	5.0	UGL
		EXPLOSIVES	1,3,5-TRINITROBENZENE	01-EB-09	08/07/1991	01EB0901Y	0.000	0.56	<UW01	0.56	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.56	<UW01	0.56	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.56	<UW01	0.56	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.56	<UW01	0.56	UGL
				08-EB-14	08/15/1991	08EB1401YG	0.000	0.78	=UW01	0.56	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.56	<UW01	0.56	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.56	<UW01	0.56	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.56	<UW01	0.56	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.56	<UW01	0.56	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.56	<UW01	0.56	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.56	<UW01	0.56	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.91	=UW01	0.56	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.56	<UW01	0.56	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	2.1	<LW02	2.09	UGG
						BKSA0102Y	3.000	2.1	<LW02	2.09	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.1	<LW02	2.09	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	2.1	<LW02	2.09	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.56	<UW01	0.56	UGL
			1,3-DINITROBENZENE	01-EB-09	08/07/1991	01EB0901Y	0.000	0.61	<UW01	0.61	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.61	<UW01	0.61	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.61	<UW01	0.61	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.61	<UW01	0.61	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.61	<UW01	0.61	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.61	<UW01	0.61	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.61	<UW01	0.61	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.61	<UW01	0.61	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.61	<UW01	0.61	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.61	<UW01	0.61	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.61	<UW01	0.61	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.61	<UW01	0.61	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.61	<UW01	0.61	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.59	<LW02	0.59	UGG
						BKSA0102Y	3.000	0.59	<LW02	0.59	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.59	<LW02	0.59	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.59	<LW02	0.59	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.3	=UW01	0.61	UGL
			2,4,6-TNT	01-EB-09	08/07/1991	01EB0901Y	0.000	3.9	=UW01	0.78	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.9	=UW01	0.78	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.78	<UW01	0.78	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.78	<UW01	0.78	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.78	<UW01	0.78	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.78	<UW01	0.78	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.78	<UW01	0.78	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.78	<UW01	0.78	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	64.0	=UW01	0.78	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.78	<UW01	0.78	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.78	<UW01	0.78	UGL
				31-EB-02	08/15/1991	31EB0201YG	0.000	5.1	=UW01	0.78	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.78	<UW01	0.78	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.9	<LW02	1.92	UGG
						BKSA0102Y	3.000	1.9	<LW02	1.92	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.9	<LW02	1.92	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.9	<LW02	1.92	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.78	<UW01	0.78	UGL
			2,4-DINITROTOLUENE	01-EB-09	08/07/1991	01EB0901Y	0.000	0.6	<UW01	0.6	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.6	<UW01	0.6	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.6	<UW01	0.6	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.6	<UW01	0.6	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.6	<UW01	0.6	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.6	<UW01	0.6	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.6	<UW01	0.6	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.6	<UW01	0.6	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.8	=UW01	0.6	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.6	<UW01	0.6	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.6	<UW01	0.6	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.6	<UW01	0.6	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.6	<UW01	0.6	UGL
				BK-SA-01	08/22/1991	BKSA0101N	1.000	1.4	<LM25	1.4	UGG
						BKSA0101Y	1.000	0.42	<LW02	0.42	UGG
						BKSA0102N	3.000	1.4	<LM25	1.4	UGG
						BKSA0102Y	3.000	0.42	<LW02	0.42	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.4	<LM25	1.4	UGG
						BKSA0201Y	1.000	0.42	<LW02	0.42	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.4	<LM25	1.4	UGG
						BKSA0301Y	1.000	0.42	<LW02	0.42	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	5.8	<UM25	5.8	UGL
						DECONY	400.000	0.6	<UW01	0.6	UGL
			2,6-DINITROTOLUENE	01-EB-09	08/07/1991	01EB0901Y	0.000	0.55	<UW01	0.55	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	1.3	=UW01	0.55	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.55	<UW01	0.55	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.55	<UW01	0.55	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.55	<UW01	0.55	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.55	<UW01	0.55	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.55	<UW01	0.55	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.55	<UW01	0.55	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.55	<UW01	0.55	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.55	<UW01	0.55	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.55	<UW01	0.55	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.55	<UW01	0.55	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.55	<UW01	0.55	UGL
				BK-SA-01	08/22/1991	BKSA0101N	1.000	0.32	<LM25	0.32	UGG
						BKSA0101Y	1.000	0.4	<LW02	0.4	UGG
						BKSA0102N	3.000	0.32	<LM25	0.32	UGG
						BKSA0102Y	3.000	0.4	<LW02	0.4	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.32	<LM25	0.32	UGG
						BKSA0201Y	1.000	0.4	<LW02	0.4	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.32	<LM25	0.32	UGG
						BKSA0301Y	1.000	0.4	<LW02	0.4	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	6.7	<UM25	6.7	UGL
						DECONY	400.000	0.55	<UW01	0.55	UGL
			HMX	01-EB-09	08/07/1991	01EB0901Y	0.000	1.3	<UW01	1.3	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	1.3	<UW01	1.3	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	1.3	<UW01	1.3	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	1.3	<UW01	1.3	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	1.3	<UW01	1.3	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	1.3	<UW01	1.3	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	1.3	<UW01	1.3	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.3	<UW01	1.3	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.3	<UW01	1.3	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	1.3	<UW01	1.3	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1.3	<UW01	1.3	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	1.3	<UW01	1.3	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	1.3	<UW01	1.3	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.3	<LW02	1.27	UGG
						BKSA0102Y	3.000	1.3	<LW02	1.27	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.3	<LW02	1.27	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.3	<LW02	1.27	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.3	<UW01	1.3	UGL
			NITROBENZENE	01-EB-09	08/07/1991	01EB0901Y	0.000	2.1	=UW01	1.13	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	1.1	<UW01	1.13	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	1.1	<UW01	1.13	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	1.1	<UW01	1.1	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	1.1	<UW01	1.13	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	1.1	<UW01	1.13	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	1.1	<UW01	1.1	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.1	<UW01	1.1	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.1	<UW01	1.1	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	1.1	<UW01	1.1	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1.1	<UW01	1.1	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	1.1	<UW01	1.13	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	1.1	<UW01	1.13	UGL
				BK-SA-01	08/22/1991	BKSA0101N	1.000	1.8	<LM25	1.8	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0101Y	1.000	0.42	<LW02	0.42	UGG
						BKSA0102N	3.000	1.8	<LM25	1.8	UGG
						BKSA0102Y	3.000	0.42	<LW02	0.42	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.8	<LM25	1.8	UGG
						BKSA0201Y	1.000	0.42	<LW02	0.42	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.8	<LM25	1.8	UGG
						BKSA0301Y	1.000	0.42	<LW02	0.42	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	3.7	<UM25	3.7	UGL
						DECONY	400.000	1.1	<UW01	1.13	UGL
			RDX	01-EB-09	08/07/1991	01EB0901Y	0.000	0.63	<UW01	0.63	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.63	<UW01	0.63	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.63	<UW01	0.63	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.63	<UW01	0.63	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.63	<UW01	0.63	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.63	<UW01	0.63	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.63	<UW01	0.63	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.63	<UW01	0.63	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.63	<UW01	0.63	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.63	<UW01	0.63	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.63	<UW01	0.63	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.63	<UW01	0.63	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.63	<UW01	0.63	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.98	<LW02	0.98	UGG
						BKSA0102Y	3.000	0.98	<LW02	0.98	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.98	<LW02	0.98	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.98	<LW02	0.98	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.63	<UW01	0.63	UGL
			TETRYL	01-EB-09	08/07/1991	01EB0901Y	0.000	0.66	<UW01	0.66	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.66	<UW01	0.66	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	0.66	<UW01	0.66	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	0.66	<UW01	0.66	UGL
				08-EB-14	08/15/1991	08EB1401Y	0.000	0.66	<UW01	0.66	UGL
				08-FB-01	08/09/1991	08FB0101Y	0.000	0.66	<UW01	0.66	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.66	<UW01	0.66	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.66	<UW01	0.66	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.66	<UW01	0.66	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.66	<UW01	0.66	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.66	<UW01	0.66	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	2.0	=UW01	0.66	UGL
				32-EB-03	08/13/1991	32EB0301Y	0.000	0.66	<UW01	0.66	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.25	<LW02	0.25	UGG
						BKSA0102Y	3.000	0.25	<LW02	0.25	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.25	<LW02	0.25	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.25	<LW02	0.25	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.1	=UW01	0.66	UGL
		METALS	ANTIMONY	07-EB-15	08/13/1991	07EB1501Y	0.000	60.0	<SS12	60.0	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	60.0	<SS12	60.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	60.0	<SS12	60.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	60.0	<SS12	60.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				27-EB-07	08/14/1991	27EB0701Y	0.000	60.0	<SS12	60.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	60.0	<SS12	60.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	19.6	<JS12	19.6	UGG
						BKSA0102Y	3.000	19.6	<JS12	19.6	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	19.6	<JS12	19.6	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	19.6	<JS12	19.6	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	60.0	<99	60.0	UGL
			ARSENIC	07-EB-15	08/13/1991	07EB1501Y	0.000	5.39	=AX8	2.35	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	3.59	=AX8	2.35	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	2.35	<AX8	2.35	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.35	<AX8	2.35	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	2.35	<AX8	2.35	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	3.0	=AX8	2.35	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	5.56	=B9	2.5	UGG
						BKSA0102Y	3.000	8.34	=B9	2.5	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	7.15	=B9	2.5	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	6.16	=B9	2.5	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.99	=AX8	2.35	UGL
			BARIUM	07-EB-15	08/13/1991	07EB1501Y	0.000	2.82	<SS12	2.82	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	2.82	<SS12	2.82	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	2.82	<SS12	2.82	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.82	<SS12	2.82	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	2.82	<SS12	2.82	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	2.82	<SS12	2.82	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	217.0	=JS12	3.29	UGG
						BKSA0102Y	3.000	549.0	=JS12	3.29	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	230.0	=JS12	3.29	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	191.0	=JS12	3.29	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	191.0	=99	0.0	UGL
			BERYLLIUM	07-EB-15	08/13/1991	07EB1501Y	0.000	1.12	<SS12	1.12	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	1.12	<SS12	1.12	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.12	<SS12	1.12	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.12	<SS12	1.12	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	1.12	<SS12	1.12	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1.12	<SS12	1.12	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.674	=JS12	0.427	UGG
						BKSA0102Y	3.000	1.14	=JS12	0.427	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.663	=JS12	0.427	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.824	=JS12	0.427	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	1.12	<99	1.12	UGL
			CADMIUM	07-EB-15	08/13/1991	07EB1501Y	0.000	6.78	<SS12	6.78	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	6.78	<SS12	6.78	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	6.78	<SS12	6.78	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	6.78	<SS12	6.78	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	6.78	<SS12	6.78	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	6.78	<SS12	6.78	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.2	<JS12	1.2	UGG
						BKSA0102Y	3.000	1.2	<JS12	1.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.2	<JS12	1.2	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.2	<JS12	1.2	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	6.78	<99	6.78	UGL
			CHROMIUM	07-EB-15	08/13/1991	07EB1501Y	0.000	16.8	<SS12	16.8	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	16.8	<SS12	16.8	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	16.8	<SS12	16.8	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	16.8	<SS12	16.8	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	16.8	<SS12	16.8	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	16.8	<SS12	16.8	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	16.9	=JS12	1.04	UGG
						BKSA0102Y	3.000	29.2	=JS12	1.04	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	15.8	=JS12	1.04	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	22.6	=JS12	1.04	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	16.8	<99	16.8	UGL
			COPPER	07-EB-15	08/13/1991	07EB1501Y	0.000	18.8	<SS12	18.8	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	18.8	<SS12	18.8	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	18.8	<SS12	18.8	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	18.8	<SS12	18.8	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	18.8	<SS12	18.8	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	18.8	<SS12	18.8	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	12.6	=JS12	2.84	UGG
						BKSA0102Y	3.000	30.1	=JS12	2.84	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	12.8	=JS12	2.84	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	20.0	=JS12	2.84	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	18.8	<99	18.8	UGL
			LEAD	07-EB-15	08/13/1991	07EB1501Y	0.000	4.47	<SD18	4.47	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	73.0	=SD18	4.47	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	4.47	<SD18	4.47	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	380.0	=SD18	4.47	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	5.62	=SD18	4.47	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	4.47	<SD18	4.47	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	18.0	=JD21	0.467	UGG
						BKSA0102Y	3.000	14.0	=JD21	0.467	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	27.0	=JD21	0.467	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	18.0	=JD21	0.467	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	4.47	<SD18	4.47	UGL
			MERCURY	07-EB-15	08/13/1991	07EB1501Y	0.000	0.1	<CC8	0.1	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	0.1	<CC8	0.1	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	0.1	<CC8	0.1	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	0.1	<CC8	0.1	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	0.1	<CC8	0.1	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	0.1	<CC8	0.1	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.495	=Y9	0.05	UGG
						BKSA0102Y	3.000	0.069	=Y9	0.05	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.062	=Y9	0.05	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.05	<Y9	0.05	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.1	<CC8	0.1	UGL
			NICKEL	07-EB-15	08/13/1991	07EB1501Y	0.000	32.1	<SS12	32.1	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	32.1	<SS12	32.1	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	32.1	<SS12	32.1	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				20-FB-13	08/22/1991	20FB1301Y	0.000	32.1	<SS12	32.1	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	32.1	<SS12	32.1	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	32.1	<SS12	32.1	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	13.3	=JS12	2.74	UGG
						BKSA0102Y	3.000	49.6	=JS12	2.74	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	12.8	=JS12	2.74	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	18.8	=JS12	2.74	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	32.1	<99	32.1	UGL
			SELENIUM	01-EB-09	08/07/1991	01EB0901Y	0.000	2.53	<SD25	2.53	UGL
				02-EB-09	08/08/1991	02EB0901Y	0.000	2.53	<SD25	2.53	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	2.53	<SD25	2.53	UGL
				05-EB-16	08/08/1991	05EB1601Y	0.000	2.53	<SD25	2.53	UGL
				07-EB-15	08/13/1991	07EB1501Y	0.000	2.53	<SD25	2.53	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	2.53	<SD25	2.53	UGL
				11-EB-13	08/08/1991	11EB1301Y	0.000	2.53	<SD25	2.53	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	2.53	<SD25	2.53	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.53	<SD25	2.53	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	2.53	<SD25	2.53	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	2.53	<SD25	2.53	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.449	<JD20	0.449	UGG
						BKSA0102Y	3.000	0.449	<JD20	0.449	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.449	<JD20	0.449	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.449	<JD20	0.449	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.53	<SD25	2.53	UGL
			SILVER	07-EB-15	08/13/1991	07EB1501Y	0.000	10.0	<SS12	10.0	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	10.0	<SS12	10.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	10.0	<SS12	10.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	10.0	<SS12	10.0	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	10.0	<SS12	10.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	10.0	<SS12	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.803	<JS12	0.803	UGG
						BKSA0102Y	3.000	0.803	<JS12	0.803	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.803	<JS12	0.803	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.803	<JS12	0.803	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	10.0	<99	10.0	UGL
			THALLIUM	07-EB-15	08/13/1991	07EB1501Y	0.000	125.0	<SS12	125.0	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	125.0	<SS12	125.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	125.0	<SS12	125.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	125.0	<SS12	125.0	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	125.0	<SS12	125.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	125.0	<SS12	125.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	34.3	<JS12	34.3	UGG
						BKSA0102Y	3.000	34.3	<JS12	34.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	34.3	<JS12	34.3	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	34.3	<JS12	34.3	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	125.0	<99	125.0	UGL
			ZINC	07-EB-15	08/13/1991	07EB1501Y	0.000	18.0	<SS12	18.0	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	162.0	=SS12	18.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	189.0	=SS12	18.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				20-FB-13	08/22/1991	20FB1301Y	0.000	282.0	=SS12	18.0	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	55.9	=SS12	18.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	190.0	=SS12	18.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	50.0	=JS12	2.34	UGG
						BKSA0102Y	3.000	84.7	=JS12	2.34	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	55.7	=JS12	2.34	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	60.9	=JS12	2.34	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	18.0	<99	18.0	UGL
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-DI	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.068	<LM25	0.068	UGG
						BKSA0102N	3.000	0.068	<LM25	0.068	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.068	<LM25	0.068	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.068	<LM25	0.068	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	14.0	<UM25	14.0	UGL
			2,2-BIS(P-CHLOROPHENYL)-1,1-TR	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.1	<LM25	0.1	UGG
						BKSA0101YU	1.000	0.038	=LH17	0.0034	UGG
						BKSA0102N	3.000	0.1	<LM25	0.1	UGG
						BKSA0102Y	3.000	0.008	=LH17	0.0034	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.1	<LM25	0.1	UGG
						BKSA0201Y	1.000	0.004	<LH17	0.0034	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.1	<LM25	0.1	UGG
						BKSA0301YC	1.000	0.011	=LH17	0.0034	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	18.0	<UM25	18.0	UGL
						DECONY	400.000	0.003	<UH20	0.0025	UGL
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.726	=LM25	0.064	UGG
						BKSA0102N	3.000	0.064	<LM25	0.064	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.064	<LM25	0.064	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.064	<LM25	0.064	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	18.0	<UM25	18.0	UGL
			ALDRIN	BK-SA-01	08/22/1991	BKSA0101N	1.000	1.3	<LM25	1.3	UGG
						BKSA0101Y	1.000	0.001	<LH17	0.0014	UGG
						BKSA0102N	3.000	1.3	<LM25	1.3	UGG
						BKSA0102Y	3.000	0.001	<LH17	0.0014	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.3	<LM25	1.3	UGG
						BKSA0201Y	1.000	0.001	<LH17	0.0014	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.3	<LM25	1.3	UGG
						BKSA0301Y	1.000	0.001	<LH17	0.0014	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	13.0	<UM25	13.0	UGL
						DECONY	400.000	0.007	<UH20	0.0074	UGL
			ALPHA-BENZENEHEXACHLORIDE	BK-SA-01	08/22/1991	BKSA0101N	1.000	1.3	<LM25	1.3	UGG
						BKSA0101Y	1.000	0.003	<LH17	0.0028	UGG
						BKSA0102N	3.000	1.3	<LM25	1.3	UGG
						BKSA0102Y	3.000	0.003	<LH17	0.0028	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.3	<LM25	1.3	UGG
						BKSA0201Y	1.000	0.003	<LH17	0.0028	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.3	<LM25	1.3	UGG
						BKSA0301Y	1.000	0.003	<LH17	0.0028	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	5.3	<UM25	5.3	UGL
						DECONY	400.000	0.003	<UH20	0.0025	UGL
			ALPHA-ENDOSULFAN/ENDOSULFAN I	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.4	<LM25	0.4	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0102N	3.000	0.4	<LM25	0.4	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.4	<LM25	0.4	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.4	<LM25	0.4	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	23.0	<UM25	23.0	UGL
			BETA-BENZENEHEXACHLORIDE	BK-SA-01	08/22/1991	BKSA0101N	1.000	1.3	<LM25	1.3	UGG
						BKSA0102N	3.000	1.3	<LM25	1.3	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.3	<LM25	1.3	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.3	<LM25	1.3	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	17.0	<UM25	17.0	UGL
			BETA-ENDOSULFAN/ENDOSULFAN II	BK-SA-01	08/22/1991	BKSA0101N	1.000	2.4	<LM25	2.4	UGG
						BKSA0102N	3.000	2.4	<LM25	2.4	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	2.4	<LM25	2.4	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	2.4	<LM25	2.4	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	42.0	<UM25	42.0	UGL
			CHLORDANE	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.68	<LM25	0.68	UGG
						BKSA0101Y	1.000	0.068	<LH17	0.0684	UGG
						BKSA0102N	3.000	0.68	<LM25	0.68	UGG
						BKSA0102Y	3.000	0.068	<LH17	0.0684	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.68	<LM25	0.68	UGG
						BKSA0201Y	1.000	0.068	<LH17	0.0684	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.68	<LM25	0.68	UGG
						BKSA0301Y	1.000	0.068	<LH17	0.0684	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	37.0	*UM25	37.0	UGL
						DECONY	400.000	0.031	<UH20	0.0312	UGL
			DELTA-BENZENEHEXACHLORIDE	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.21	<LM25	0.21	UGG
						BKSA0101Y	1.000	0.008	<LH17	0.0085	UGG
						BKSA0102N	3.000	0.21	<LM25	0.21	UGG
						BKSA0102Y	3.000	0.008	<LH17	0.0085	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.21	<LM25	0.21	UGG
						BKSA0201Y	1.000	0.008	<LH17	0.0085	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.21	<LM25	0.21	UGG
						BKSA0301Y	1.000	0.008	<LH17	0.0085	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	3.0	*UM25	3.0	UGL
						DECONY	400.000	0.003	<UH20	0.0034	UGL
			DIELDRIN	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.079	<LM25	0.079	UGG
						BKSA0101Y	1.000	0.002	<LH17	0.0016	UGG
						BKSA0102N	3.000	0.079	<LM25	0.079	UGG
						BKSA0102Y	3.000	0.002	<LH17	0.0016	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.079	<LM25	0.079	UGG
						BKSA0201Y	1.000	0.002	<LH17	0.0016	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.079	<LM25	0.079	UGG
						BKSA0301YC	1.000	0.062	=LH17	0.0016	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	26.0	<UM25	26.0	UGL
						DECONY	400.000	0.007	<UH20	0.0074	UGL
			ENDRIN	BK-SA-01	08/22/1991	BKSA0101N	1.000	1.3	<LM25	1.3	UGG
						BKSA0101Y	1.000	0.007	<LH17	0.0065	UGG
						BKSA0102N	3.000	1.3	<LM25	1.3	UGG
						BKSA0102Y	3.000	0.007	<LH17	0.0065	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	1.3	<LM25	1.3	UGG

IAAP SI DATA RESULTS

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0201Y	1.000	0.007	<LH17	0.0065	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	1.3	<LM25	1.3	UGG
						BKSA0301Y	1.000	0.007	<LH17	0.0065	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	18.0	<UM25	18.0	UGL
						DECONY	400.000	0.018	<UH20	0.0176	UGL
			HEPTACHLOR	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.24	<LM25	0.24	UGG
						BKSA0101Y	1.000	0.002	<LH17	0.0022	UGG
						BKSA0102N	3.000	0.24	<LM25	0.24	UGG
						BKSA0102Y	3.000	0.002	<LH17	0.0022	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.24	<LM25	0.24	UGG
						BKSA0201Y	1.000	0.002	<LH17	0.0022	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.24	<LM25	0.24	UGG
						BKSA0301Y	1.000	0.002	<LH17	0.0022	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	38.0	<UM25	38.0	UGL
			HEPTACHLOR EPOXIDE	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.48	<LM25	0.48	UGG
						BKSA0102N	3.000	0.48	<LM25	0.48	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.48	<LM25	0.48	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.48	<LM25	0.48	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	28.0	<UM25	0.28	UGL
			ISODRIN	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.48	<LM25	0.48	UGG
						BKSA0101Y	1.000	0.003	<LH17	0.003	UGG
						BKSA0102N	3.000	0.48	<LM25	0.48	UGG
						BKSA0102Y	3.000	0.003	<LH17	0.003	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.48	<LM25	0.48	UGG
						BKSA0201Y	1.000	0.003	<LH17	0.003	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.48	<LM25	0.48	UGG
						BKSA0301Y	1.000	0.003	<LH17	0.003	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	7.8	<UM25	7.8	UGL
						DECONY	400.000	0.003	<UH20	0.0025	UGL
			LINDANE	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.1	<LM25	0.1	UGG
						BKSA0101Y	1.000	0.001	<LH17	0.001	UGG
						BKSA0102N	3.000	0.1	<LM25	0.1	UGG
						BKSA0102Y	3.000	0.001	<LH17	0.001	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.1	<LM25	0.1	UGG
						BKSA0201Y	1.000	0.001	<LH17	0.001	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.1	<LM25	0.1	UGG
						BKSA0301Y	1.000	0.001	<LH17	0.001	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	7.2	<UM25	7.2	UGL
						DECONY	400.000	0.003	<UH20	0.0025	UGL
			METHOXYCHLOR	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.26	<LM25	0.26	UGG
						BKSA0102N	3.000	0.26	<LM25	0.26	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.26	<LM25	0.26	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.26	<LM25	0.26	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	11.0	<UM25	11.0	UGL
			PCB 1016	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.32	<LM25	0.32	UGG
						BKSA0101Y	1.000	0.1	<LH17	0.1	UGG
						BKSA0102N	3.000	0.32	<LM25	0.32	UGG
						BKSA0102Y	3.000	0.1	<LH17	0.1	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.32	<LM25	0.32	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0201Y	1.000	0.1	<LH17	0.1	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.32	<LM25	0.32	UGG
						BKSA0301Y	1.000	0.1	<LH17	0.1	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	9.1	*UM25	9.1	UGL
						DECONY	400.000	0.385	<UH20	0.385	UGL
			PCB 1221	BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.9	*LM25	1.9	UGG
						BKSA0102NR	3.000	1.9	*LM25	1.9	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.9	*LM25	1.9	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.9	*LM25	1.9	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	7.2	*UM25	7.2	UGL
			PCB 1232	BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.9	*LM25	1.9	UGG
						BKSA0102NR	3.000	1.9	*LM25	1.9	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.9	*LM25	1.9	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.9	*LM25	1.9	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	9.9	*UM25	9.9	UGL
			PCB 1242	BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.9	*LM25	1.9	UGG
						BKSA0102NR	3.000	1.9	*LM25	1.9	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.9	*LM25	1.9	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.9	*LM25	1.9	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	5.2	*UM25	5.2	UGL
			PCB 1248	BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.9	*LM25	1.9	UGG
						BKSA0102NR	3.000	1.9	*LM25	1.9	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.9	*LM25	1.9	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.9	*LM25	1.9	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	38.0	*UM25	38.0	UGL
			PCB 1254	BK-SA-01	08/22/1991	BKSA0101NR	1.000	3.8	*LM25	3.8	UGG
						BKSA0102NR	3.000	3.8	*LM25	3.8	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	3.8	*LM25	3.8	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	3.8	*LM25	3.8	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	33.0	*UM25	33.0	UGL
			PCB 1260	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.79	<LM25	0.79	UGG
						BKSA0101Y	1.000	0.048	<LH17	0.0479	UGG
						BKSA0102N	3.000	0.79	<LM25	0.79	UGG
						BKSA0102Y	3.000	0.048	<LH17	0.0479	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.79	<LM25	0.79	UGG
						BKSA0201Y	1.000	0.048	<LH17	0.0479	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.79	<LM25	0.79	UGG
						BKSA0301Y	1.000	0.048	<LH17	0.0479	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	13.0	*UM25	13.0	UGL
						DECONY	400.000	0.176	<UH20	0.176	UGL
			PCB 1262	BK-SA-01	08/22/1991	BKSA0101Y	1.000	6.3	<LM25	0.3	UGG
						BKSA0102Y	3.000	6.3	<LM25	0.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	6.3	<LM25	0.3	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	6.3	<LM25	0.3	UGG
			TOXAPHENE	BK-SA-01	08/22/1991	BKSA0101NR	1.000	12.0	*LM25	12.0	UGG
						BKSA0102NR	3.000	12.0	*LM25	12.0	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	12.0	*LM25	12.0	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	12.0	*LM25	12.0	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	17.0	*UM25	17.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
		RADIONUCLIDES	GAMMA SCAN / GAMMA SCREEN	01-EB-09	08/07/1991	01EB0901N	0.000	2.0	<99	2.0	PCL
		SEMIVOLATILES	1,2,3-TRICHLOROBENZENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.8	<UM25	5.8	UGL
			1,2,4-TRICHLOROBENZENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.22	<LM25	0.22	UGG
						BKSA0102Y	3.000	0.22	<LM25	0.22	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.22	<LM25	0.22	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.22	<LM25	0.22	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.4	<UM25	2.4	UGL
			1,2-DICHLOROBENZENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.042	<LM25	0.042	UGG
						BKSA0102Y	3.000	0.042	<LM25	0.042	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.042	<LM25	0.042	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.042	<LM25	0.042	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.2	<UM25	1.2	UGL
			1,2-DIPHENYLHYDRAZINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.52	<LM25	0.52	UGG
						BKSA0102Y	3.000	0.52	<LM25	0.52	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.52	<LM25	0.52	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.52	<LM25	0.52	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	13.0	<UM25	13.0	UGL
			1,4-DICHLOROBENZENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.034	<LM25	0.034	UGG
						BKSA0102Y	3.000	0.034	<LM25	0.034	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.034	<LM25	0.034	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.034	<LM25	0.034	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.5	<UM25	1.5	UGL
			1,4-OXATHIANE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.075	<LM25	0.075	UGG
						BKSA0102Y	3.000	0.075	<LM25	0.075	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.075	<LM25	0.075	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.075	<LM25	0.075	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	27.0	<UM25	27.0	UGL
			2,3,6-TCP	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.62	<LM25	0.62	UGG
						BKSA0102Y	3.000	0.62	<LM25	0.62	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.62	<LM25	0.62	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.62	<LM25	0.62	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.7	<UM25	1.7	UGL
			2,4,5-TRICHLOROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.49	<LM25	0.49	UGG
						BKSA0102Y	3.000	0.49	<LM25	0.49	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.49	<LM25	0.49	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.49	<LM25	0.49	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.8	<UM25	2.8	UGL
			2,4,6-TRICHLOROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.061	<LM25	0.061	UGG
						BKSA0102Y	3.000	0.061	<LM25	0.061	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.061	<LM25	0.061	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.061	<LM25	0.061	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	3.6	<UM25	3.6	UGL
			2,4-DICHLOROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.065	<LM25	0.065	UGG
						BKSA0102Y	3.000	0.065	<LM25	0.065	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.065	<LM25	0.065	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.065	<LM25	0.065	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.4	<UM25	8.4	UGL
			2,4-DIMETHYLPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.0	<LM25	3.0	UGG
						BKSA0102Y	3.000	3.0	<LM25	3.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	3.0	<LM25	3.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	3.0	<LM25	3.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	4.4	<UM25	4.4	UGL
			2,4-DINITROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	4.7	<LM25	4.7	UGG
						BKSA0102Y	3.000	4.7	<LM25	4.7	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	4.7	<LM25	4.7	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	4.7	<LM25	4.7	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	176.0	<UM25	176.0	UGL
			2,6-DINITROANILINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.57	<LM25	0.57	UGG
						BKSA0102Y	3.000	0.57	<LM25	0.57	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.57	<LM25	0.57	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.57	<LM25	0.57	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.8	<UM25	8.8	UGL
			2-CHLORONAPHTHALENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.24	<LM25	0.24	UGG
						BKSA0102Y	3.000	0.24	<LM25	0.24	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.24	<LM25	0.24	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.24	<LM25	0.24	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.6	<UM25	2.6	UGL
			2-CHLOROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.055	<LM25	0.055	UGG
						BKSA0102Y	3.000	0.055	<LM25	0.055	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.055	<LM25	0.055	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.055	<LM25	0.055	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.8	<UM25	2.8	UGL
			2-METHYL-4,6-DINITROPHENOL/4,6	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.8	<LM25	0.8	UGG
						BKSA0102Y	3.000	0.8	<LM25	0.8	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.8	<LM25	0.8	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.8	<LM25	0.8	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	50.0	*UM25	50.0	UGL
			2-METHYLNAPHTHALENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.3	<UM25	1.3	UGL
			2-METHYLPHENOL/2-CRESOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.098	<LM25	0.098	UGG
						BKSA0102Y	3.000	0.098	<LM25	0.098	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.098	<LM25	0.098	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.098	<LM25	0.098	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	3.6	<UM25	3.6	UGL
			2-NITROANILINE	BK-SA-01	08/22/1991	BKSA0101NR	1.000	3.1	*LM25	3.1	UGG
						BKSA0102NR	3.000	3.1	*LM25	3.1	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	3.1	*LM25	3.1	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	3.1	*LM25	3.1	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	31.0	*UM25	31.0	UGL
			2-NITROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.1	<LM25	1.1	UGG
						BKSA0102Y	3.000	1.1	<LM25	1.1	UGG

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				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.1	<LM25	1.1	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.1	<LM25	1.1	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.2	<UM25	8.2	UGL
			3,3'-DICHLOROBENZIDINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.6	<LM25	1.6	UGG
						BKSA0102Y	3.000	1.6	<LM25	1.6	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.6	<LM25	1.6	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.6	<LM25	1.6	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.0	<UM25	5.0	UGL
			3,5-DINITROANILINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.6	<LM25	1.6	UGG
						BKSA0102Y	3.000	1.6	<LM25	1.6	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.6	<LM25	1.6	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.6	<LM25	1.6	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	21.0	<UM25	21.0	UGL
			3-METHYL-4-CHLOROPHENOL/4-CHLO	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.93	<LM25	0.93	UGG
						BKSA0102Y	3.000	0.93	<LM25	0.93	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.93	<LM25	0.93	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.93	<LM25	0.93	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.5	<UM25	8.5	UGL
			3-NITROANILINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.0	<LM25	3.0	UGG
						BKSA0102Y	3.000	3.0	<LM25	3.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	3.0	<LM25	3.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	3.0	<LM25	3.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	15.0	<UM25	15.0	UGL
			3-NITROTOLUENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.34	<LM25	0.34	UGG
						BKSA0102Y	3.000	0.34	<LM25	0.34	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.34	<LM25	0.34	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.34	<LM25	0.34	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.9	<UM25	2.9	UGL
			4-BROMOPHENYLPHENYL ETHER	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.041	<LM25	0.041	UGG
						BKSA0102Y	3.000	0.041	<LM25	0.041	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.041	<LM25	0.041	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.041	<LM25	0.041	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	22.0	<UM25	22.0	UGL
			4-CHLOROANILINE	BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.63	*LM25	0.63	UGG
						BKSA0102NR	3.000	0.63	*LM25	0.63	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.63	*LM25	0.63	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.63	*LM25	0.63	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	1.0	*UM25	1.0	UGL
			4-CHLOROPHENYLPHENYL ETHER	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.17	<LM25	0.17	UGG
						BKSA0102Y	3.000	0.17	<LM25	0.17	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.17	<LM25	0.17	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.17	<LM25	0.17	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	23.0	<UM25	23.0	UGL
			4-METHYLPHENOL/4-CRESOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.24	<LM25	0.24	UGG
						BKSA0102Y	3.000	0.24	<LM25	0.24	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.24	<LM25	0.24	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.24	<LM25	0.24	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.8	<UM25	2.8	UGL
			4-NITROANILINE	BK-SA-01	08/22/1991	BKSA0101NR	1.000	3.1	*LM25	3.1	UGG

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						BKSA0102NR	3.000	3.1	*LM25	3.1	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	3.1	*LM25	3.1	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	3.1	*LM25	3.1	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	31.0	*UM25	31.0	UGL
			4-NITROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.3	<LM25	3.3	UGG
						BKSA0102Y	3.000	3.3	<LM25	3.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	3.3	<LM25	3.3	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	3.3	<LM25	3.3	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	96.0	<UM25	96.0	UGL
			ACENAPHTHENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.041	<LM25	0.041	UGG
						BKSA0102Y	3.000	0.041	<LM25	0.041	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.041	<LM25	0.041	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.041	<LM25	0.041	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.8	<UM25	5.8	UGL
			ACENAPHTHYLENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.033	<LM25	0.033	UGG
						BKSA0102Y	3.000	0.033	<LM25	0.033	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.033	<LM25	0.033	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.033	<LM25	0.033	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.1	<UM25	5.1	UGL
			ANTHRACENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.71	<LM25	0.71	UGG
						BKSA0102Y	3.000	0.71	<LM25	0.71	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.71	<LM25	0.71	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.71	<LM25	0.71	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.2	<UM25	5.2	UGL
			ATRAZINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.065	<LM25	0.065	UGG
						BKSA0102Y	3.000	0.065	<LM25	0.065	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.065	<LM25	0.065	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.065	<LM25	0.065	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.9	<UM25	5.9	UGL
			BENZO(A)ANTHRACENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.041	<LM25	0.48	UGG
						BKSA0102Y	3.000	0.041	<LM25	0.48	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.041	<LM25	0.48	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.041	<LM25	0.48	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	9.8	<UM25	9.8	UGL
			BENZO(A)PYRENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.2	<LM25	1.2	UGG
						BKSA0102Y	3.000	1.2	<LM25	1.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.2	<LM25	1.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.2	<LM25	1.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	14.0	<UM25	14.0	UGL
			BENZO(B)FLUORANTHENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.31	<LM25	0.31	UGG
						BKSA0102Y	3.000	0.31	<LM25	0.31	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.31	<LM25	0.31	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.31	<LM25	0.31	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	10.0	<UM25	10.0	UGL
			BENZO(G,H,I)PERYLENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.18	<LM25	0.18	UGG
						BKSA0102Y	3.000	0.18	<LM25	0.18	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.18	<LM25	0.18	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.18	<LM25	0.18	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	15.0	<UM25	15.0	UGL

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			BENZO(K)FLUORANTHENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.13	<LM25	0.13	UGG
						BKSA0102Y	3.000	0.13	<LM25	0.13	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.13	<LM25	0.13	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.13	<LM25	0.13	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	10.0	<UM25	10.0	UGL
			BENZOIC ACID	BK-SA-01	08/22/1991	BKSA0101NR	1.000	3.1	*LM25	3.1	UGG
						BKSA0102NR	3.000	3.1	*LM25	3.1	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	3.1	*LM25	3.1	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	3.1	*LM25	3.1	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	3.1	*UM25	3.1	UGL
			BENZYL ALCOHOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	4.0	<UM25	4.0	UGL
			BIS (2-CHLOROETHOXY) METHANE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.19	<LM25	0.19	UGG
						BKSA0102Y	3.000	0.19	<LM25	0.19	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.19	<LM25	0.19	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.19	<LM25	0.19	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	6.8	<UM25	6.8	UGL
			BIS (2-CHLOROETHYL) ETHER	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.36	<LM25	0.36	UGG
						BKSA0102Y	3.000	0.36	<LM25	0.36	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.36	<LM25	0.36	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.36	<LM25	0.36	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.68	<UM25	0.68	UGL
			BIS (2-CHLOROISOPROPYL) ETHER	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.44	<LM25	0.44	UGG
						BKSA0102Y	3.000	0.44	<LM25	0.44	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.44	<LM25	0.44	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.44	<LM25	0.44	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.0	<UM25	5.0	UGL
			BIS (2-ETHYLHEXYL) PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.48	<LM25	0.48	UGG
						BKSA0102Y	3.000	0.48	<LM25	0.48	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.76	=LM25	0.48	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.48	<LM25	0.48	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	7.7	<UM25	0.48	UGL
			BROMACIL	WELL4YARDJQC	08/12/1991	DECONY	400.000	2.9	<UM25	2.9	UGL
			BUTYLBENZYL PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.8	<LM25	1.8	UGG
						BKSA0102Y	3.000	1.8	<LM25	1.8	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.8	<LM25	1.8	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.8	<LM25	1.8	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	28.0	<UM25	28.0	UGL
			CHRYSENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	7.4	<UM25	7.4	UGL
			DI-N-BUTYL PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.3	<LM25	1.3	UGG
						BKSA0102Y	3.000	1.3	<LM25	1.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.3	<LM25	1.3	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.3	<LM25	1.3	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	33.0	<UM25	33.0	UGL
			DI-N-OCTYL PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.23	<LM25	0.23	UGG
						BKSA0102Y	3.000	0.23	<LM25	0.23	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.23	<LM25	0.23	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.23	<LM25	0.23	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.5	<UM25	1.5	UGL
			DIBENZ(A,H)ANTHRACENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.31	<LM25	0.31	UGG
						BKSA0102Y	3.000	0.31	<LM25	0.31	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.31	<LM25	0.31	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.31	<LM25	0.31	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	12.0	<UM25	12.0	UGL
			DIBENZOFURAN	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.038	<LM25	0.038	UGG
						BKSA0102Y	3.000	0.038	<LM25	0.038	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.038	<LM25	0.038	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.038	<LM25	0.038	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.1	<UM25	5.1	UGL
			DIBROMOCHLOROPROPANE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.071	<LM25	0.071	UGG
						BKSA0102Y	3.000	0.071	<LM25	0.071	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.071	<LM25	0.071	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.071	<LM25	0.071	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	12.0	<UM25	12.0	UGL
			DICYCLOPENTADIENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.57	<LM25	0.57	UGG
						BKSA0102Y	3.000	0.57	<LM25	0.57	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.57	<LM25	0.57	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.57	<LM25	0.57	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.5	<UM25	5.5	UGL
			DIETHYL PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.24	<LM25	0.24	UGG
						BKSA0102Y	3.000	0.24	<LM25	0.24	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.24	<LM25	0.24	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.24	<LM25	0.24	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.9	<UM25	5.9	UGL
			DIISOPROPYL METHYLPHOSPHONATE	WELL4YARDJQC	08/12/1991	DECONY	400.000	21.0	<UM25	21.0	UGL
			DIMETHYL METHYLPHOSPHATE	WELL4YARDJQC	08/12/1991	DECONY	400.000	130.0	<UM25	130.0	UGL
			DIMETHYL PHTHALATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.063	<LM25	0.063	UGG
						BKSA0102Y	3.000	0.063	<LM25	0.063	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.063	<LM25	0.063	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.063	<LM25	0.063	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.2	<UM25	2.2	UGL
			DITHIANE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.065	<LM25	0.065	UGG
						BKSA0102Y	3.000	0.065	<LM25	0.065	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.065	<LM25	0.065	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.065	<LM25	0.065	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	3.3	<UM25	3.3	UGL
			ENDOSULFAN SULFATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.2	<LM25	1.2	UGG
						BKSA0102Y	3.000	1.2	<LM25	1.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.2	<LM25	1.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.2	<LM25	1.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	50.0	<UM25	50.0	UGL

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			ENDRIN ALDEHYDE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.8	<LM25	1.8	UGG
						BKSA0102Y	3.000	1.8	<LM25	1.8	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.8	<LM25	1.8	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.8	<LM25	1.8	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	5.0	<UM25	5.0	UGL
			ENDRIN KETONE	BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.28	*LM25	0.28	UGG
						BKSA0102NR	3.000	0.28	*LM25	0.28	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.28	*LM25	0.28	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.28	*LM25	0.28	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	6.0	*UM25	6.0	UGL
			FLUORANTHENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	24.0	<UM25	24.0	UGL
			FLUORENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.065	<LM25	0.065	UGG
						BKSA0102Y	3.000	0.065	<LM25	0.065	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.065	<LM25	0.065	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.065	<LM25	0.065	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	9.2	<UM25	9.2	UGL
			HEXACHLOROBENZENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.08	<LM25	0.08	UGG
						BKSA0102Y	3.000	0.08	<LM25	0.08	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.08	<LM25	0.08	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.08	<LM25	0.08	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	12.0	<UM25	12.0	UGL
			HEXACHLOROBUTADIENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.97	<LM25	0.97	UGG
						BKSA0102Y	3.000	0.97	<LM25	0.97	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.97	<LM25	0.97	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.97	<LM25	0.97	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.7	<UM25	8.7	UGL
			HEXACHLOROCYCLOPENTADIENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.52	<LM25	0.52	UGG
						BKSA0102Y	3.000	0.52	<LM25	0.52	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.52	<LM25	0.52	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.52	<LM25	0.52	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	54.0	<UM25	54.0	UGL
			HEXACHLOROETHANE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.8	<LM25	1.8	UGG
						BKSA0102Y	3.000	1.8	<LM25	1.8	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.8	<LM25	1.8	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.8	<LM25	1.8	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.3	<UM25	8.3	UGL
			INDENO(1,2,3-C,D)PYRENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	2.4	<LM25	2.4	UGG
						BKSA0102Y	3.000	2.4	<LM25	2.4	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.4	<LM25	2.4	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	2.4	<LM25	2.4	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	21.0	<UM25	0.21	UGL
			ISOPHORONE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.39	<LM25	0.39	UGG
						BKSA0102Y	3.000	0.39	<LM25	0.39	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1,000	0.39	<LM25	0.39	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.39	<LM25	0.39	UGG

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				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.4	<UM25	2.4	UGL
			MALATHION	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.18	<LM25	0.18	UGG
						BKSA0102Y	3.000	0.18	<LM25	0.18	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.18	<LM25	0.18	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.18	<LM25	0.18	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	21.0	<UM25	21.0	UGL
			MIREX	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.14	<LM25	0.14	UGG
						BKSA0102Y	3.000	0.14	<LM25	0.14	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.14	<LM25	0.14	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.14	<LM25	0.14	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	24.0	<UM25	24.0	UGL
			N-NITROSODI-N-PROPYLAMINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.1	<LM25	1.1	UGG
						BKSA0102Y	3.000	1.1	<LM25	1.1	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.1	<LM25	1.1	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.1	<LM25	1.1	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	6.8	<UM25	6.8	UGL
			N-NITROSODIMETHYLAMINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.46	<LM25	0.46	UGG
						BKSA0102Y	3.000	0.46	<LM25	0.46	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.46	<LM25	0.46	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.46	<LM25	0.46	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	9.7	<UM25	9.7	UGL
			N-NITROSODIPHENYLAMINE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.29	<LM25	0.29	UGG
						BKSA0102Y	3.000	0.29	<LM25	0.29	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.29	<LM25	0.29	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.29	<LM25	0.29	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	3.7	<UM25	3.7	UGL
			NAPHTHALENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.74	<LM25	0.74	UGG
						BKSA0102Y	3.000	0.74	<LM25	0.74	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.74	<LM25	0.74	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.74	<LM25	0.74	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	0.5	<UM25	0.5	UGL
			P-CHLOROPHENYLMETHYL SULFIDE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.097	<LM25	0.097	UGG
						BKSA0102Y	3.000	0.097	<LM25	0.097	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.097	<LM25	0.097	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.097	<LM25	0.097	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	10.0	<UM25	10.0	UGL
			P-CHLOROPHENYLMETHYL SULFONE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.066	<LM25	0.066	UGG
						BKSA0102Y	3.000	0.066	<LM25	0.066	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.066	<LM25	0.066	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.066	<LM25	0.066	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.3	<UM25	5.3	UGL
			P-CHLOROPHENYLMETHYL SULFOXIDE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.32	<LM25	0.32	UGG
						BKSA0102Y	3.000	0.32	<LM25	0.32	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.32	<LM25	0.32	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.32	<LM25	0.32	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	15.0	<UM25	15.0	UGL
			PARATHION	BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.7	<LM25	1.7	UGG
						BKSA0102Y	3.000	1.7	<LM25	1.7	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.7	<LM25	1.7	UGG

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				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.7	<LM25	1.7	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	37.0	<UM25	37.0	UGL
			PENTACHLOROPHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.76	<LM25	0.76	UGG
						BKSA0102Y	3.000	0.76	<LM25	0.76	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.76	<LM25	0.76	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.76	<LM25	0.76	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	9.1	<UM25	9.1	UGL
			PHENANTHRENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.032	<LM25	0.032	UGG
						BKSA0102Y	3.000	0.032	<LM25	0.032	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.032	<LM25	0.032	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.032	<LM25	0.032	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	9.9	<UM25	9.9	UGL
			PHENOL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.052	<LM25	0.052	UGG
						BKSA0102Y	3.000	0.052	<LM25	0.052	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.052	<LM25	0.052	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.052	<LM25	0.052	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.2	<UM25	2.2	UGL
			PYRENE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.083	<LM25	0.083	UGG
						BKSA0102Y	3.000	0.083	<LM25	0.083	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.083	<LM25	0.083	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.083	<LM25	0.083	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	17.0	<UM25	17.0	UGL
			SUPONA/2-CHLORO-1-(2,4-DICHLOR	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.92	<LM25	0.92	UGG
						BKSA0102Y	3.000	0.92	<LM25	0.92	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.92	<LM25	0.92	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.92	<LM25	0.92	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	19.0	<UM25	19.0	UGL
			VAPONA	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.068	<LM25	0.068	UGG
						BKSA0102Y	3.000	0.068	<LM25	0.068	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.068	<LM25	0.068	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.068	<LM25	0.068	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.5	<UM25	8.5	UGL
		VOLATILES	(2-CHLOROETHOXY) ETHENE/2-CHLO	10-EB-08	08/13/1991	10EB0801Y	0.000	3.5	<UM21	3.5	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	3.5	<UM21	3.5	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	3.5	<UM21	3.5	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.5	<LM23	0.5	UGG
						BKSA0102Y	3.000	0.5	<LM23	0.5	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.5	<LM23	0.5	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.5	<LM23	0.5	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	3.5	<UM21	3.5	UGL
			1,1,1-TRICHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,1,2,2-TETRACHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.5	<UM21	1.5	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.5	<UM21	1.5	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.5	<UM21	1.5	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.5	<UM21	1.5	UGL
			1,1,2-TRICHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.33	<LM23	0.33	UGG
						BKSA0102Y	3.000	0.33	<LM23	0.33	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.33	<LM23	0.33	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.33	<LM23	0.33	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,1-DICHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.49	<LM23	0.49	UGG
						BKSA0102Y	3.000	0.49	<LM23	0.49	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.49	<LM23	0.49	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.49	<LM23	0.49	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,1-DICHLOROETHYLENE/1,1-DICHL	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.27	<LM23	0.27	UGG
						BKSA0102Y	3.000	0.27	<LM23	0.27	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.27	<LM23	0.27	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.27	<LM23	0.27	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,2-DICHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.32	<LM23	0.32	UGG
						BKSA0102Y	3.000	0.32	<LM23	0.32	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.32	<LM23	0.32	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.32	<LM23	0.32	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,2-DICHLOROETHANE-D4	10-EB-08	08/13/1991	10EB0801Y	0.000	45.5	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.5	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	49.5	=UM21	1.0	UGL
			1,2-DICHLOROETHENES/1,2-DICHLO	10-EB-08	08/13/1991	10EB0801Y	0.000	5.0	<UM21	5.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	5.0	<UM21	5.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	5.0	<UM21	5.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.32	<LM23	0.32	UGG
						BKSA0102Y	3.000	0.32	<LM23	0.32	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.32	<LM23	0.32	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.32	<LM23	0.32	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.0	<UM21	5.0	UGL
			1,2-DICHLOROPROPANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.53	<LM23	0.53	UGG
						BKSA0102Y	3.000	0.53	<LM23	0.53	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.53	<LM23	0.53	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.53	<LM23	0.53	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			1,3-DICHLOROBENZENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101N	1.000	0.042	<LM25	0.042	UGG
						BKSA0101Y	1.000	0.14	<LM23	0.14	UGG
						BKSA0102N	3.000	0.042	<LM25	0.042	UGG
						BKSA0102Y	3.000	0.14	<LM23	0.14	UGG
				BK-SA-02	08/22/1991	BKSA0201N	1.000	0.042	<LM25	0.042	UGG
						BKSA0201Y	1.000	0.14	<LM23	0.14	UGG
				BK-SA-03	08/22/1991	BKSA0301N	1.000	0.042	<LM25	0.042	UGG
						BKSA0301Y	1.000	0.14	<LM23	0.14	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	3.4	<UM25	3.4	UGL
						DECONY	400.000	1.0	<UM21	1.0	UGL
			1,3-DICLOROPROPANE	10-EB-08	08/13/1991	10EB0801Y	0.000	4.8	<UM21	4.8	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	4.8	<UM21	4.8	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	4.8	<UM21	4.8	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	4.8	<UM21	4.8	UGL
			1,3-DIMETHYLBENZENE/M-XYLENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.23	<LM23	0.23	UGG
						BKSA0102Y	3.000	0.23	<LM23	0.23	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.23	<LM23	0.23	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.23	<LM23	0.23	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			ACETIC ACID, VINYL ESTER/VINYL	10-EB-08	08/13/1991	10EB0801Y	0.000	10.0	*UM21	10.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	10.0	*UM21	10.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	10.0	*UM21	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.0	*LM23	1.0	UGG
						BKSA0102NR	3.000	1.0	*LM23	1.0	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.0	*LM23	1.0	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.0	*LM23	1.0	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	10.0	*UM21	10.0	UGL
			ACETONE	10-EB-08	08/13/1991	10EB0801Y	0.000	8.0	<UM21	8.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	8.0	<UM21	8.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	8.0	<UM21	8.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.3	<LM23	3.3	UGG
						BKSA0102Y	3.000	3.3	<LM23	3.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	3.3	<LM23	3.3	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	3.3	<LM23	3.3	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.0	<UM21	8.0	UGL
			ACRYLONITRILE	10-EB-08	08/13/1991	10EB0801Y	0.000	8.4	<UM21	8.4	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	8.4	<UM21	8.4	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	8.4	<UM21	8.4	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	2.0	<LM23	2.0	UGG
						BKSA0102Y	3.000	2.0	<LM23	2.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.0	<LM23	2.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	2.0	<LM23	2.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.4	<UM21	8.4	UGL
			BENZENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.1	<LM23	0.1	UGG
						BKSA0102Y	3.000	0.1	<LM23	0.1	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.1	<LM23	0.1	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.1	<LM23	0.1	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			BROMODICHLOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	6.55	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	3.64	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			BROMOFORM	10-EB-08	08/13/1991	10EB0801Y	0.000	11.0	<UM21	11.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	11.0	<UM21	11.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	11.0	<UM21	11.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	11.0	<UM21	11.0	UGL
			BROMOMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	14.0	<UM21	14.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	14.0	<UM21	14.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	14.0	<UM21	14.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.26	<LM23	0.26	UGG
						BKSA0102Y	3.000	0.26	<LM23	0.26	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.26	<LM23	0.26	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.26	<LM23	0.26	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	14.0	<UM21	14.0	UGL
			CARBON DISULFIDE	10-EB-08	08/13/1991	10EB0801Y	0.000	5.0	*UM21	5.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	7.8	*UM21	7.8	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	8.9	*UM21	8.9	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.6	*LM23	0.6	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0102NR	3.000	0.6	*LM23	0.6	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.6	*LM23	0.6	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.6	*LM23	0.6	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	5.0	*UM21	5.0	UGL
			CARBON TETRACHLORIDE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.31	<LM23	0.31	UGG
						BKSA0102Y	3.000	0.31	<LM23	0.31	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.31	<LM23	0.31	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.31	<LM23	0.31	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.1	=UM21	1.0	UGL
			CHLORFORM	10-EB-08	08/13/1991	10EB0801Y	0.000	83.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	46.0	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.24	<LM23	0.24	UGG
						BKSA0102Y	3.000	0.24	<LM23	0.24	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.24	<LM23	0.24	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.24	<LM23	0.24	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			CHLOROBENZENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.1	<LM23	0.1	UGG
						BKSA0102Y	3.000	0.1	<LM23	0.1	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.1	<LM23	0.1	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.1	<LM23	0.1	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			CHLOROETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	8.0	<UM21	8.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	8.0	<UM21	8.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	8.0	<UM21	8.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.64	<LM23	0.64	UGG
						BKSA0102Y	3.000	0.64	<LM23	0.64	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.64	<LM23	0.64	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.64	<LM23	0.64	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	8.0	<UM21	8.0	UGL
			CHLOROETHANE/VINYL CHLORIDE	10-EB-08	08/13/1991	10EB0801Y	0.000	12.0	<UM21	12.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	12.0	<UM21	12.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	12.0	<UM21	12.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	1.8	<LM23	1.8	UGG
						BKSA0102Y	3.000	1.8	<LM23	1.8	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.8	<LM23	1.8	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1.8	<LM23	1.8	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	12.0	<UM21	12.0	UGL
			CHLOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.2	<UM21	1.2	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.2	<UM21	1.2	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.62	=UM21	1.2	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.96	<LM23	0.96	UGG
						BKSA0102Y	3.000	0.96	<LM23	0.96	UGG

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.96	<LM23	0.96	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.96	<LM23	0.96	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.2	<UM21	1.2	UGL
			CIS-1,3-DICHLOROPROPYLENE/CIS-	10-EB-08	08/13/1991	10EB0801Y	0.000	5.0	*UM21	5.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	5.0	*UM21	5.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	5.0	*UM21	5.0	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.6	*LM23	0.6	UGG
						BKSA0102NR	3.000	0.6	*LM23	0.6	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.6	*LM23	0.6	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.6	*LM23	0.6	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	5.0	*UM21	5.0	UGL
			DIBROMOCHLOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.25	<LM23	0.25	UGG
						BKSA0102Y	3.000	0.25	<LM23	0.25	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.25	<LM23	0.25	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.25	<LM23	0.25	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			DICHLOROBENZENE - NONSPECIFIC	10-EB-08	08/13/1991	10EB0801Y	0.000	2.0	<UM21	2.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	2.0	<UM21	2.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.0	<UM21	2.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.2	<LM23	0.2	UGG
						BKSA0102Y	3.000	0.2	<LM23	0.2	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.2	<LM23	0.2	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.2	<LM23	0.2	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.0	<UM21	2.0	UGL
			ETHYLBENZENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.19	<LM23	0.19	UGG
						BKSA0102Y	3.000	0.19	<LM23	0.19	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.19	<LM23	0.19	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.19	<LM23	0.19	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			ETHYLBENZENE-D10	10-EB-08	08/13/1991	10EB0801Y	0.000	49.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.1	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	52.1	=UM21	1.0	UGL
			METHYL-N-BUTYL KETONE/2-HEXANO	10-EB-08	08/13/1991	10EB0801Y	0.000	10.0	*UM21	10.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	10.0	*UM21	10.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	10.0	*UM21	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	1.0	*LM23	1.0	UGG
						BKSA0102NR	3.000	1.0	*LM23	1.0	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	1.0	*LM23	1.0	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	1.0	*LM23	1.0	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	10.0	*UM21	10.0	UGL
			METHYLENE CHLORIDE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	4.4	<LM23	4.4	UGG
						BKSA0102Y	3.000	4.4	<LM23	4.4	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	4.4	<LM23	4.4	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	4.4	<LM23	4.4	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			METHYLENE CHLORIDE-D2	10-EB-08	08/13/1991	10EB0801Y	0.000	50.4	=UM21	9.7	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.4	=UM21	9.7	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.4	=UM21	9.7	UGL
			METHYLETHYL PHENOL/METHYLETHYL	10-EB-08	08/13/1991	10EB0801Y	0.000	10.0	<UM21	10.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	10.0	<UM21	10.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	10.0	<UM21	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	4.3	<LM23	4.3	UGG
						BKSA0102Y	3.000	4.3	<LM23	4.3	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	4.3	<LM23	4.3	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	4.3	<LM23	4.3	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	10.0	<UM21	10.0	UGL
			METHYLISOBUTYL KETONE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.4	<UM21	1.4	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.4	<UM21	1.4	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.4	<UM21	1.4	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.63	<LM23	0.63	UGG
						BKSA0102Y	3.000	0.63	<LM23	0.63	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.63	<LM23	0.63	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.63	<LM23	0.63	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.4	<UM21	1.4	UGL
			STYRENE	10-EB-08	08/13/1991	10EB0801Y	0.000	5.0	*UM21	5.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	5.0	*UM21	5.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	5.0	*UM21	5.0	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.6	*LM23	0.6	UGG
						BKSA0102NR	3.000	0.6	*LM23	0.6	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.6	*LM23	0.6	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.6	*LM23	0.6	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	5.0	*UM21	5.0	UGL
			TETRACHLOROETHYLENE/TETRACHLOR	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.16	<LM23	0.16	UGG
						BKSA0102Y	3.000	0.16	<LM23	0.16	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.16	<LM23	0.16	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.16	<LM23	0.16	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			TOLUENE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.1	<LM23	0.1	UGG
						BKSA0102Y	3.000	0.1	<LM23	0.1	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.1	<LM23	0.1	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.1	<LM23	0.1	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			TOLUENE-D8	10-EB-08	08/13/1991	10EB0801Y	0.000	47.0	=UM21	1.0	UGL

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.0	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.0	=UM21	1.0	UGL
			TRANS-1,3-DICHLOROPROPENE	10-EB-08	08/13/1991	10EB0801Y	0.000	5.0	*UM21	5.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	5.0	*UM21	5.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	5.0	*UM21	5.0	UGL
				BK-SA-01	08/22/1991	BKSA0101NR	1.000	0.6	*LM23	0.6	UGG
						BKSA0102NR	3.000	0.6	*LM23	0.6	UGG
				BK-SA-02	08/22/1991	BKSA0201NR	1.000	0.6	*LM23	0.6	UGG
				BK-SA-03	08/22/1991	BKSA0301NR	1.000	0.6	*LM23	0.6	UGG
				WELL4YARDJQC	08/12/1991	DECONNR	400.000	5.0	*UM21	5.0	UGL
			TRICHLOROETHYLENE/TRICHLOROETH	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	1.0	<UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.23	<LM23	0.23	UGG
						BKSA0102Y	3.000	0.23	<LM23	0.23	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.23	<LM23	0.23	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.23	<LM23	0.23	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			TRICHLOROFLUOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	1.0	<UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	1.0	<UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	3.65	=UM21	1.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.23	<LM23	0.23	UGG
						BKSA0102Y	3.000	0.23	<LM23	0.23	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.23	<LM23	0.23	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.23	<LM23	0.23	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	1.0	<UM21	1.0	UGL
			XYLENES	10-EB-08	08/13/1991	10EB0801Y	0.000	2.0	<UM21	2.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	2.0	<UM21	2.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	2.0	<UM21	2.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.78	<LM23	0.78	UGG
						BKSA0102Y	3.000	0.78	<LM23	0.78	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.78	<LM23	0.78	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.78	<LM23	0.78	UGG

Table 3-QC

IAAP-QC Results Above Certified Reporting Limit (CRL)

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAPQC	QC	ANIONS	NITRITE, NITRATE - NONSPECIFIC	27-EB-07	08/14/1991	27EB0701Y	0.000	119.0	=LL8	10.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1,200.0	=LL8	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.99	=KF17	1.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.8	=KF17	1.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1,100.0	=KF17	1.0	UGG
			SULFATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	14.6	=KT07	5.0	UGG
						BKSA0102Y	3.000	81.7	=KT07	5.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	11.4	=KT07	5.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	23.7	=KT07	5.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	210,000.0	=TT09	175.0	UGL
		EXPLOSIVES	1,3,5-TRINITROBENZENE	08-EB-14	08/15/1991	08EB1401YG	0.000	0.78	=UW01	0.56	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.91	=UW01	0.56	UGL
			1,3-DINITROBENZENE	WELL4YARDJQC	08/12/1991	DECONY	400.000	2.3	=UW01	0.61	UGL
			2,4,6-TNT	01-EB-09	08/07/1991	01EB0901Y	0.000	3.9	=UW01	0.78	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.9	=UW01	0.78	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	64.0	=UW01	0.78	UGL
				31-EB-02	08/15/1991	31EB0201YG	0.000	5.1	=UW01	0.78	UGL
			2,4-DINITROTOLUENE	20-FB-13	08/22/1991	20FB1301Y	0.000	0.8	=UW01	0.6	UGL
			2,6-DINITROTOLUENE	04-EB-15	08/07/1991	04EB1501Y	0.000	1.3	=UW01	0.55	UGL
			NITROBENZENE	01-EB-09	08/07/1991	01EB0901Y	0.000	2.1	=UW01	1.13	UGL
			TETRYL	31-EB-02	08/15/1991	31EB0201Y	0.000	2.0	=UW01	0.66	UGL
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.1	=UW01	0.66	UGL
		METALS	ARSENIC	07-EB-15	08/13/1991	07EB1501Y	0.000	5.39	=AX8	2.35	UGL
				10-EB-08	08/13/1991	10EB0801Y	0.000	3.59	=AX8	2.35	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	3.0	=AX8	2.35	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	5.56	=B9	2.5	UGG
						BKSA0102Y	3.000	8.34	=B9	2.5	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	7.15	=B9	2.5	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	6.16	=B9	2.5	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	2.99	=AX8	2.35	UGL
			BARIUM	BK-SA-01	08/22/1991	BKSA0101Y	1.000	217.0	=JS12	3.29	UGG
						BKSA0102Y	3.000	549.0	=JS12	3.29	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	230.0	=JS12	3.29	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	191.0	=JS12	3.29	UGG
				WELL4YARDJQC	08/12/1991	DECONN	400.000	191.0	=99	2.82	UGL
			BERYLLIUM	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.674	=JS12	0.427	UGG
						BKSA0102Y	3.000	1.14	=JS12	0.427	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.663	=JS12	0.427	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	0.824	=JS12	0.427	UGG
			CHROMIUM	BK-SA-01	08/22/1991	BKSA0101Y	1.000	16.9	=JS12	1.04	UGG
						BKSA0102Y	3.000	29.2	=JS12	1.04	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	15.8	=JS12	1.04	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	22.6	=JS12	1.04	UGG
			COPPER	BK-SA-01	08/22/1991	BKSA0101Y	1.000	12.6	=JS12	2.84	UGG
						BKSA0102Y	3.000	30.1	=JS12	2.84	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	12.8	=JS12	2.84	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	20.0	=JS12	2.84	UGG
			LEAD	10-EB-08	08/13/1991	10EB0801Y	0.000	73.0	=SD18	4.47	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	380.0	=SD18	4.47	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	5.62	=SD18	4.47	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	18.0	=JD21	0.467	UGG

Table 3-QC

IAAP-QC Results Above Certified Reporting Limit (CRL)

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
						BKSA0102Y	3.000	14.0	=JD21	0.467	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	27.0	=JD21	0.467	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	18.0	=JD21	0.467	UGG
			MERCURY	BK-SA-01	08/22/1991	BKSA0101Y	1.000	0.495	=Y9	0.05	UGG
						BKSA0102Y	3.000	0.069	=Y9	0.05	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	0.062	=Y9	0.05	UGG
			NICKEL	BK-SA-01	08/22/1991	BKSA0101Y	1.000	13.3	=JS12	2.74	UGG
						BKSA0102Y	3.000	49.6	=JS12	2.74	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	12.8	=JS12	2.74	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	18.8	=JS12	2.74	UGG
			ZINC	10-EB-08	08/13/1991	10EB0801Y	0.000	162.0	=SS12	18.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	189.0	=SS12	18.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	282.0	=SS12	18.0	UGL
				27-EB-07	08/14/1991	27EB0701Y	0.000	55.9	=SS12	18.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	190.0	=SS12	18.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	50.0	=JS12	2.34	UGG
						BKSA0102Y	3.000	84.7	=JS12	2.34	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	55.7	=JS12	2.34	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	60.9	=JS12	2.34	UGG
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-TR	BK-SA-01	08/22/1991	BKSA0101YU	1.000	0.038	=LH17	0.0034	UGG
						BKSA0102Y	3.000	0.008	=LH17	0.0034	UGG
				BK-SA-03	08/22/1991	BKSA0301YC	1.000	0.011	=LH17	0.0034	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.726	=LM25	0.064	UGG
			DIELDRIN	BK-SA-03	08/22/1991	BKSA0301YC	1.000	0.062	=LH17	0.0016	UGG
		SEMIVOLATILES	BIS (2-ETHYLHEXYL) PHTHALATE	BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.76	=LM25	0.48	UGG
		VOLATILES	1,2-DICHLOROETHANE-D4	10-EB-08	08/13/1991	10EB0801Y	0.000	45.5	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.5	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	49.5	=UM21	1.0	UGL
			BROMODICHLOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	6.55	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	3.64	=UM21	1.0	UGL
			CARBON TETRACHLORIDE	WELL4YARDJQC	08/12/1991	DECONY	400.000	1.1	=UM21	1.0	UGL
			CHLORFORM	10-EB-08	08/13/1991	10EB0801Y	0.000	83.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	46.0	=UM21	1.0	UGL
			CHLOROMETHANE	20-FB-13	08/22/1991	20FB1301Y	0.000	2.62	=UM21	1.2	UGL
			ETHYLBENZENE-D10	10-EB-08	08/13/1991	10EB0801Y	0.000	49.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.1	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	52.1	=UM21	1.0	UGL
			METHYLENE CHLORIDE-D2	10-EB-08	08/13/1991	10EB0801Y	0.000	50.4	=UM21	9.7	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.4	=UM21	9.7	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.4	=UM21	9.7	UGL
			TOLUENE-D8	10-EB-08	08/13/1991	10EB0801Y	0.000	47.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.0	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.0	=UM21	1.0	UGL
			TRICHLOROFLUOROMETHANE	20-FB-13	08/22/1991	20FB1301Y	0.000	3.65	=UM21	1.0	UGL

Table 3-QCa

IAAP-QC Results Above Evaluation Criteria

SWMU	MEDIA	PARAMETER GROUP	COMPOUND	FACILITY ID	DATE	SAMPLE ID	DEPTH	RESULT VALUE	BOOL METHOD	CRL	UNITS
IAAPQC	QC	ANIONS	NITRITE, NITRATE - NONSPECIFIC	27-EB-07	08/14/1991	27EB0701Y	0.000	119.0	=LL8	10.0	UGL
				27-EB-08	08/15/1991	27EB0801Y	0.000	1,200.0	=LL8	10.0	UGL
				BK-SA-01	08/22/1991	BKSA0101Y	1.000	3.99	=KF17	1.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	2.8	=KF17	1.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	1,100.0	=KF17	1.0	UGG
			SULFATE	BK-SA-01	08/22/1991	BKSA0101Y	1.000	14.6	=KT07	5.0	UGG
						BKSA0102Y	3.000	81.7	=KT07	5.0	UGG
				BK-SA-02	08/22/1991	BKSA0201Y	1.000	11.4	=KT07	5.0	UGG
				BK-SA-03	08/22/1991	BKSA0301Y	1.000	23.7	=KT07	5.0	UGG
				WELL4YARDJQC	08/12/1991	DECONY	400.000	210,000.0	=TT09	175.0	UGL
		EXPLOSIVES	1,3,5-TRINITROBENZENE	08-EB-14	08/15/1991	08EB1401YG	0.000	0.78	=UW01	0.56	UGL
				31-EB-02	08/15/1991	31EB0201Y	0.000	0.91	=UW01	0.56	UGL
			1,3-DINITROBENZENE	WELL4YARDJQC	08/12/1991	DECONY	400.000	2.3	=UW01	0.61	UGL
			2,4,6-TNT	01-EB-09	08/07/1991	01EB0901Y	0.000	3.9	=UW01	0.78	UGL
				04-EB-15	08/07/1991	04EB1501Y	0.000	0.9	=UW01	0.78	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	64.0	=UW01	0.78	UGL
				31-EB-02	08/15/1991	31EB0201YG	0.000	5.1	=UW01	0.78	UGL
			2,4-DINITROTOLUENE	20-FB-13	08/22/1991	20FB1301Y	0.000	0.8	=UW01	0.6	UGL
			2,6-DINITROTOLUENE	04-EB-15	08/07/1991	04EB1501Y	0.000	1.3	=UW01	0.55	UGL
			NITROBENZENE	01-EB-09	08/07/1991	01EB0901Y	0.000	2.1	=UW01	1.13	UGL
			TETRYL	31-EB-02	08/15/1991	31EB0201Y	0.000	2.0	=UW01	0.66	UGL
				WELL4YARDJQC	08/12/1991	DECONY	400.000	5.1	=UW01	0.66	UGL
		METALS	LEAD	10-EB-08	08/13/1991	10EB0801Y	0.000	73.0	=SD18	4.47	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	380.0	=SD18	4.47	UGL
		PEST-PCBS	2,2-BIS(P-CHLOROPHENYL)-1,1-TR	BK-SA-01	08/22/1991	BKSA0101YU	1.000	0.038	=LH17	0.0034	UGG
						BKSA0102Y	3.000	0.008	=LH17	0.0034	UGG
				BK-SA-03	08/22/1991	BKSA0301YC	1.000	0.011	=LH17	0.0034	UGG
			2,2-BIS(P-CHOLROPHENYL)-1,1-DI	BK-SA-01	08/22/1991	BKSA0101N	1.000	0.726	=LM25	0.064	UGG
			DIELDRIN	BK-SA-03	08/22/1991	BKSA0301YC	1.000	0.062	=LH17	0.0016	UGG
		SEMIVOLATILES	BIS (2-ETHYLHEXYL) PHTHALATE	BK-SA-02	08/22/1991	BKSA0201Y	1.000	1.76	=LM25	0.48	UGG
		VOLATILES	1,2-DICHLOROETHANE-D4	10-EB-08	08/13/1991	10EB0801Y	0.000	45.5	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.5	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	49.5	=UM21	1.0	UGL
			BROMODICHLOROMETHANE	10-EB-08	08/13/1991	10EB0801Y	0.000	6.55	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	3.64	=UM21	1.0	UGL
			CARBON TETRACHLORIDE	WELL4YARDJQC	08/12/1991	DECONY	400.000	1.1	=UM21	1.0	UGL
			CHLORFORM	10-EB-08	08/13/1991	10EB0801Y	0.000	83.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	46.0	=UM21	1.0	UGL
			CHLOROMETHANE	20-FB-13	08/22/1991	20FB1301Y	0.000	2.62	=UM21	1.2	UGL
			ETHYLBENZENE-D10	10-EB-08	08/13/1991	10EB0801Y	0.000	49.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.1	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	52.1	=UM21	1.0	UGL
			METHYLENE CHLORIDE-D2	10-EB-08	08/13/1991	10EB0801Y	0.000	50.4	=UM21	9.7	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	50.4	=UM21	9.7	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.4	=UM21	9.7	UGL
			TOLUENE-D8	10-EB-08	08/13/1991	10EB0801Y	0.000	47.0	=UM21	1.0	UGL
				20-EB-12	08/22/1991	20EB1201Y	0.000	49.0	=UM21	1.0	UGL
				20-FB-13	08/22/1991	20FB1301Y	0.000	50.0	=UM21	1.0	UGL
			TRICHLOROFLUOROMETHANE	20-FB-13	08/22/1991	20FB1301Y	0.000	3.65	=UM21	1.0	UGL

TRIP BLANKS

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB1	UM21	111TCE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	112TCE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	11DCE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	11DCLE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	12DCD4	CQC	#	0.000		06/08/1991		50.500		1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	12DCE	CQC	#	0.000		06/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	12DCLE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	12DCLP	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	13DCLB	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	13DCP	CQC	#	0.000		06/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PGQ	002
TB1	UM21	13DMB	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	2CLEVE	CQC	#	0.000		06/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PGQ	002
TB1	UM21	ACET	CQC	#	0.000		06/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	ACRYLO	CQC	#	0.000		06/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PGQ	002
TB1	UM21	BRDCLM	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	C13DCP	CQC	#	0.000		06/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	C2AVE	CQC	#	0.000		06/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	C2H3CL	CQC	#	0.000		06/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	C2H5CL	CQC	#	0.000		06/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	C6H6	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CCL3F	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CCL4	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CD2CL2	CQC	#	0.000		06/08/1991		54.700		9.7000	1.000	UGL	UB	PGQ	002
TB1	UM21	CH2CL2	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CH3BR	CQC	#	0.000		06/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CH3CL	CQC	#	0.000		06/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PGQ	002
TB1	UM21	CHBR3	CQC	#	0.000		06/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CHCL3	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CLC6H5	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	CS2	CQC	#	0.000		06/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	DBRCLM	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	DCLB	CQC	#	0.000		06/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	ETBD10	CQC	#	0.000		06/08/1991		51.100		1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	ETC6H5	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	MEC6D8	CQC	#	0.000		06/08/1991		49.000		1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	MEC6H5	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	MEK	CQC	#	0.000		06/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	MIBK	CQC	#	0.000		06/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PGQ	002
TB1	UM21	MNBK	CQC	#	0.000		06/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	STYR	CQC	#	0.000		06/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	T13DCP	CQC	#	0.000		06/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	002
TB1	UM21	TCLEA	CQC	#	0.000		06/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PGQ	002
TB1	UM21	TCLEE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	TRCLE	CQC	#	0.000		06/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	002
TB1	UM21	XYLEN	CQC	#	0.000		06/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	002

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB2	UM21	111TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	112TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	11DCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	11DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	12DCD4	CQC	#	0.000		07/08/1991		49.500		1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	12DCE	CQC	#	0.000		07/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	12DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	12DCLP	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	13DCLB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	13DCP	CQC	#	0.000		07/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PGQ	006
TB2	UM21	13DMB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	2CLEVE	CQC	#	0.000		07/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PGQ	006
TB2	UM21	ACET	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	ACRYLO	CQC	#	0.000		07/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PGQ	006
TB2	UM21	BRDCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	C13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	C2AVE	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	C2H3CL	CQC	#	0.000		07/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	C2H5CL	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	C6H6	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CCL3F	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CCL4	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CD2CL2	CQC	#	0.000		07/08/1991		56.900		9.7000	1.000	UGL	UB	PGQ	006
TB2	UM21	CH2CL2	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CH3BR	CQC	#	0.000		07/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CH3CL	CQC	#	0.000		07/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PGQ	006
TB2	UM21	CHBR3	CQC	#	0.000		07/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CHCL3	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CLC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	CS2	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	DBRCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	DCLB	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	ETBD10	CQC	#	0.000		07/08/1991		53.200		1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	ETC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	MEC6D8	CQC	#	0.000		07/08/1991		50.000		1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	MEC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	MEK	CQC	#	0.000		07/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	MIBK	CQC	#	0.000		07/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PGQ	006
TB2	UM21	MNBK	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	STYR	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	T13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	006
TB2	UM21	TCLEA	CQC	#	0.000		07/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PGQ	006
TB2	UM21	TCLEE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	TRCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	006
TB2	UM21	XYLEN	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	006

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB3	UM21	111TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	112TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	11DCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	11DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	12DCD4	CQC	#	0.000		07/08/1991		50.500		1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	12DCE	CQC	#	0.000		07/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	12DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	12DCLP	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	13DCLB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	13DCP	CQC	#	0.000		07/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PGQ	008
TB3	UM21	13DMB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	2CLEVE	CQC	#	0.000		07/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PGQ	008
TB3	UM21	ACET	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	ACRYLO	CQC	#	0.000		07/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PGQ	008
TB3	UM21	BRDCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	C13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	C2AVE	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	C2H3CL	CQC	#	0.000		07/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	C2H5CL	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	C6H6	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CCL3F	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CCL4	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CD2CL2	CQC	#	0.000		07/08/1991		56.900		9.7000	1.000	UGL	UB	PGQ	008
TB3	UM21	CH2CL2	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CH3BR	CQC	#	0.000		07/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CH3CL	CQC	#	0.000		07/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PGQ	008
TB3	UM21	CHBR3	CQC	#	0.000		07/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CHCL3	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CLC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	CS2	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	DBRCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	DCLB	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	ETBD10	CQC	#	0.000		07/08/1991		48.000		1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	ETC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	MEC6D8	CQC	#	0.000		07/08/1991		47.000		1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	MEC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	MEK	CQC	#	0.000		07/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	MIBK	CQC	#	0.000		07/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PGQ	008
TB3	UM21	MNBK	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	STYR	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	T13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	008
TB3	UM21	TCLEA	CQC	#	0.000		07/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PGQ	008
TB3	UM21	TCLEE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	TRCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	008
TB3	UM21	XYLEN	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	008

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB4	UM21	111TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	112TCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	11DCE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	11DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	12DCD4	CQC	#	0.000		07/08/1991		49.500		1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	12DCE	CQC	#	0.000		07/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	12DCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	12DCLP	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	13DCLB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	13DCP	CQC	#	0.000		07/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PGQ	007
TB4	UM21	13DMB	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	2CLEVE	CQC	#	0.000		07/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PGQ	007
TB4	UM21	ACET	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	ACRYLO	CQC	#	0.000		07/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PGQ	007
TB4	UM21	BRDCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	C13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	C2AVE	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	C2H3CL	CQC	#	0.000		07/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	C2H5CL	CQC	#	0.000		07/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	C6H6	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CCL3F	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CCL4	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CD2CL2	CQC	#	0.000		07/08/1991		56.900		9.7000	1.000	UGL	UB	PGQ	007
TB4	UM21	CH2CL2	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CH3BR	CQC	#	0.000		07/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CH3CL	CQC	#	0.000		07/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PGQ	007
TB4	UM21	CHBR3	CQC	#	0.000		07/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CHCL3	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CLC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	CS2	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	DBRCLM	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	DCLB	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	ETBD10	CQC	#	0.000		07/08/1991		52.100		1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	ETC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	MEC6D8	CQC	#	0.000		07/08/1991		49.000		1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	MEC6H5	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	MEK	CQC	#	0.000		07/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	MIBK	CQC	#	0.000		07/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PGQ	007
TB4	UM21	MNBK	CQC	#	0.000		07/08/1991	R	10.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	STYR	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	T13DCP	CQC	#	0.000		07/08/1991	R	5.000	ND	*	1.000	UGL	UB	PGQ	007
TB4	UM21	TCLEA	CQC	#	0.000		07/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PGQ	007
TB4	UM21	TCLEE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	TRCLE	CQC	#	0.000		07/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PGQ	007
TB4	UM21	XYLEN	CQC	#	0.000		07/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PGQ	007

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB5	UM21	111TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	112TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	11DCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	11DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	12DCD4	CQC	#	0.000		08/08/1991		51.500		1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	12DCE	CQC	#	0.000		08/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHL	005
TB5	UM21	12DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	12DCLP	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	13DCLB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	13DCP	CQC	#	0.000		08/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHL	005
TB5	UM21	13DMB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	2CLEVE	CQC	#	0.000		08/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHL	005
TB5	UM21	ACET	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	005
TB5	UM21	ACRYLO	CQC	#	0.000		08/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHL	005
TB5	UM21	BRDCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	C13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	C2AVE	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	C2H3CL	CQC	#	0.000		08/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHL	005
TB5	UM21	C2H5CL	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	005
TB5	UM21	C6H6	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CCL3F	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CCL4	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CD2CL2	CQC	#	0.000		08/08/1991		57.900		9.7000	1.000	UGL	UB	PHL	005
TB5	UM21	CH2CL2	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CH3BR	CQC	#	0.000		08/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CH3CL	CQC	#	0.000		08/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHL	005
TB5	UM21	CHBR3	CQC	#	0.000		08/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CHCL3	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CLC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	CS2	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	DBRCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	DCLB	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	005
TB5	UM21	ETBD10	CQC	#	0.000		08/08/1991		52.100		1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	ETC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	MEC6D8	CQC	#	0.000		08/08/1991		49.000		1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	MEC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	MEK	CQC	#	0.000		08/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHL	005
TB5	UM21	MIBK	CQC	#	0.000		08/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHL	005
TB5	UM21	MNBK	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	STYR	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	T13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	005
TB5	UM21	TCLEA	CQC	#	0.000		08/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHL	005
TB5	UM21	TCLEE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	TRCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	005
TB5	UM21	XYLEN	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	005

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB6	UM21	111TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	112TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	11DCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	11DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	12DCD4	CQC	#	0.000		08/08/1991		48.500		1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	12DCE	CQC	#	0.000		08/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHL	006
TB6	UM21	12DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	12DCLP	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	13DCLB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	13DCP	CQC	#	0.000		08/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHL	006
TB6	UM21	13DMB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	2CLEVE	CQC	#	0.000		08/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHL	006
TB6	UM21	ACET	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	006
TB6	UM21	ACRYLO	CQC	#	0.000		08/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHL	006
TB6	UM21	BRDCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	C13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	C2AVE	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	C2H3CL	CQC	#	0.000		08/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHL	006
TB6	UM21	C2H5CL	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	006
TB6	UM21	C6H6	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CCL3F	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CCL4	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CD2CL2	CQC	#	0.000		08/08/1991		56.900		9.7000	1.000	UGL	UB	PHL	006
TB6	UM21	CH2CL2	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CH3BR	CQC	#	0.000		08/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CH3CL	CQC	#	0.000		08/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHL	006
TB6	UM21	CHBR3	CQC	#	0.000		08/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CHCL3	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CLC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	CS2	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	DBRCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	DCLB	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	006
TB6	UM21	ETBD10	CQC	#	0.000		08/08/1991		51.100		1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	ETC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	MEC6D8	CQC	#	0.000		08/08/1991		48.000		1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	MEC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	MEK	CQC	#	0.000		08/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHL	006
TB6	UM21	MIBK	CQC	#	0.000		08/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHL	006
TB6	UM21	MNBK	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	STYR	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	T13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	006
TB6	UM21	TCLEA	CQC	#	0.000		08/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHL	006
TB6	UM21	TCLEE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	TRCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	006
TB6	UM21	XYLEN	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	006

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB7	UM21	111TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	112TCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	11DCE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	11DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	12DCD4	CQC	#	0.000		08/08/1991		49.500		1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	12DCE	CQC	#	0.000		08/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHL	009
TB7	UM21	12DCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	12DCLP	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	13DCLB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	13DCP	CQC	#	0.000		08/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHL	009
TB7	UM21	13DMB	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	2CLEVE	CQC	#	0.000		08/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHL	009
TB7	UM21	ACET	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	009
TB7	UM21	ACRYLO	CQC	#	0.000		08/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHL	009
TB7	UM21	BRDCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	C13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	C2AVE	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	C2H3CL	CQC	#	0.000		08/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHL	009
TB7	UM21	C2H5CL	CQC	#	0.000		08/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHL	009
TB7	UM21	C6H6	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CCL3F	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CCL4	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CD2CL2	CQC	#	0.000		08/08/1991		59.000		9.7000	1.000	UGL	UB	PHL	009
TB7	UM21	CH2CL2	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CH3BR	CQC	#	0.000		08/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CH3CL	CQC	#	0.000		08/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHL	009
TB7	UM21	CHBR3	CQC	#	0.000		08/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CHCL3	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CLC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	CS2	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	DBRCLM	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	DCLB	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	009
TB7	UM21	ETBD10	CQC	#	0.000		08/08/1991		52.100		1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	ETC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	MEC6D8	CQC	#	0.000		08/08/1991		49.000		1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	MEC6H5	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	MEK	CQC	#	0.000		08/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHL	009
TB7	UM21	MIBK	CQC	#	0.000		08/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHL	009
TB7	UM21	MNBK	CQC	#	0.000		08/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	STYR	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	T13DCP	CQC	#	0.000		08/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHL	009
TB7	UM21	TCLEA	CQC	#	0.000		08/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHL	009
TB7	UM21	TCLEE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	TRCLE	CQC	#	0.000		08/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHL	009
TB7	UM21	XYLEN	CQC	#	0.000		08/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHL	009

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB8	UM21	111TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	112TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	11DCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	11DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	12DCD4	CQC	#	0.000		09/08/1991		50.500		1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	12DCE	CQC	#	0.000		09/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	003
TB8	UM21	12DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	12DCLP	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	13DCLB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	13DCP	CQC	#	0.000		09/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	003
TB8	UM21	13DMB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	2CLEVE	CQC	#	0.000		09/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	003
TB8	UM21	ACET	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	003
TB8	UM21	ACRYLO	CQC	#	0.000		09/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	003
TB8	UM21	BRDCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	C13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	C2AVE	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	C2H3CL	CQC	#	0.000		09/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	003
TB8	UM21	C2H5CL	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	003
TB8	UM21	C6H6	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CCL3F	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CCL4	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CD2CL2	CQC	#	0.000		09/08/1991		55.800		9.7000	1.000	UGL	UB	PHR	003
TB8	UM21	CH2CL2	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CH3BR	CQC	#	0.000		09/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CH3CL	CQC	#	0.000		09/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	003
TB8	UM21	CHBR3	CQC	#	0.000		09/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CHCL3	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CLC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	CS2	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	DBRCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	DCLB	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	003
TB8	UM21	ETBD10	CQC	#	0.000		09/08/1991		54.200		1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	ETC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	MEC6D8	CQC	#	0.000		09/08/1991		53.000		1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	MEC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	MEK	CQC	#	0.000		09/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	003
TB8	UM21	MIBK	CQC	#	0.000		09/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	003
TB8	UM21	MNBK	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	STYR	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	T13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	003
TB8	UM21	TCLEA	CQC	#	0.000		09/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	003
TB8	UM21	TCLEE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	TRCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	003
TB8	UM21	XYLEN	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	003

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB9	UM21	111TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	112TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	11DCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	11DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	12DCD4	CQC	#	0.000		09/08/1991		49.500		1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	12DCE	CQC	#	0.000		09/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	004
TB9	UM21	12DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	12DCLP	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	13DCLB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	13DCP	CQC	#	0.000		09/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	004
TB9	UM21	13DMB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	2CLEVE	CQC	#	0.000		09/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	004
TB9	UM21	ACET	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	004
TB9	UM21	ACRYLO	CQC	#	0.000		09/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	004
TB9	UM21	BRDCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	C13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	C2AVE	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	C2H3CL	CQC	#	0.000		09/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	004
TB9	UM21	C2H5CL	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	004
TB9	UM21	C6H6	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CCL3F	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CCL4	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CD2CL2	CQC	#	0.000		09/08/1991		52.600		9.7000	1.000	UGL	UB	PHR	004
TB9	UM21	CH2CL2	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CH3BR	CQC	#	0.000		09/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CH3CL	CQC	#	0.000		09/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	004
TB9	UM21	CHBR3	CQC	#	0.000		09/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CHCL3	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CLC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	CS2	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	DBRCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	DCLB	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	004
TB9	UM21	ETBD10	CQC	#	0.000		09/08/1991		51.100		1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	ETC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	MEC6D8	CQC	#	0.000		09/08/1991		49.000		1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	MEC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	MEK	CQC	#	0.000		09/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	004
TB9	UM21	MIBK	CQC	#	0.000		09/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	004
TB9	UM21	MNBK	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	STYR	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	T13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	004
TB9	UM21	TCLEA	CQC	#	0.000		09/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	004
TB9	UM21	TCLEE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	TRCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	004
TB9	UM21	XYLEN	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	004

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB10	UM21	111TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	112TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	11DCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	11DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	12DCD4	CQC	#	0.000		09/08/1991		49.500		1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	12DCE	CQC	#	0.000		09/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	005
TB10	UM21	12DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	12DCLP	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	13DCLB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	13DCP	CQC	#	0.000		09/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	005
TB10	UM21	13DMB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	2CLEVE	CQC	#	0.000		09/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	005
TB10	UM21	ACET	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	005
TB10	UM21	ACRYLO	CQC	#	0.000		09/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	005
TB10	UM21	BRDCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	C13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	C2AVE	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	C2H3CL	CQC	#	0.000		09/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	005
TB10	UM21	C2H5CL	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	005
TB10	UM21	C6H6	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CCL3F	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CCL4	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CD2CL2	CQC	#	0.000		09/08/1991		57.900		9.7000	1.000	UGL	UB	PHR	005
TB10	UM21	CH2CL2	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CH3BR	CQC	#	0.000		09/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CH3CL	CQC	#	0.000		09/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	005
TB10	UM21	CHBR3	CQC	#	0.000		09/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CHCL3	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CLC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	CS2	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	DBRCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	DCLB	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	005
TB10	UM21	ETBD10	CQC	#	0.000		09/08/1991		53.200		1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	ETC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	MEC6D8	CQC	#	0.000		09/08/1991		51.000		1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	MEC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	MEK	CQC	#	0.000		09/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	005
TB10	UM21	MIBK	CQC	#	0.000		09/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	005
TB10	UM21	MNBK	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	STYR	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	T13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	005
TB10	UM21	TCLEA	CQC	#	0.000		09/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	005
TB10	UM21	TCLEE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	TRCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	005
TB10	UM21	XYLEN	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	005

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB11	UM21	111TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	112TCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	11DCE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	11DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	12DCD4	CQC	#	0.000		09/08/1991		52.500		1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	12DCE	CQC	#	0.000		09/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	002
TB11	UM21	12DCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	12DCLP	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	13DCLB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	13DCP	CQC	#	0.000		09/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	002
TB11	UM21	13DMB	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	2CLEVE	CQC	#	0.000		09/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	002
TB11	UM21	ACET	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	002
TB11	UM21	ACRYLO	CQC	#	0.000		09/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	002
TB11	UM21	BRDCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	C13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	C2AVE	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	C2H3CL	CQC	#	0.000		09/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	002
TB11	UM21	C2H5CL	CQC	#	0.000		09/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	002
TB11	UM21	C6H6	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CCL3F	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CCL4	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CD2CL2	CQC	#	0.000		09/08/1991		54.700		9.7000	1.000	UGL	UB	PHR	002
TB11	UM21	CH2CL2	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CH3BR	CQC	#	0.000		09/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CH3CL	CQC	#	0.000		09/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	002
TB11	UM21	CHBR3	CQC	#	0.000		09/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CHCL3	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CLC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	CS2	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	DBRCLM	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	DCLB	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	002
TB11	UM21	ETBD10	CQC	#	0.000		09/08/1991		58.400		1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	ETC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	MEC6D8	CQC	#	0.000		09/08/1991		56.000		1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	MEC6H5	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	MEK	CQC	#	0.000		09/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	002
TB11	UM21	MIBK	CQC	#	0.000		09/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	002
TB11	UM21	MNBK	CQC	#	0.000		09/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	STYR	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	T13DCP	CQC	#	0.000		09/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	002
TB11	UM21	TCLEA	CQC	#	0.000		09/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	002
TB11	UM21	TCLEE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	TRCLE	CQC	#	0.000		09/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	002
TB11	UM21	XYLEN	CQC	#	0.000		09/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	002

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB12	UM21	111TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	112TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	11DCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	11DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	12DCD4	CQC	#	0.000		12/08/1991		47.500		1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	12DCE	CQC	#	0.000		12/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	009
TB12	UM21	12DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	12DCLP	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	13DCLB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	13DCP	CQC	#	0.000		12/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	009
TB12	UM21	13DMB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	2CLEVE	CQC	#	0.000		12/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	009
TB12	UM21	ACET	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	009
TB12	UM21	ACRYLO	CQC	#	0.000		12/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	009
TB12	UM21	BRDCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	C13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	C2AVE	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	C2H3CL	CQC	#	0.000		12/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	009
TB12	UM21	C2H5CL	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	009
TB12	UM21	C6H6	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CCL3F	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CCL4	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CD2CL2	CQC	#	0.000		12/08/1991		56.900		9.7000	1.000	UGL	UB	PHR	009
TB12	UM21	CH2CL2	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CH3BR	CQC	#	0.000		12/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CH3CL	CQC	#	0.000		12/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	009
TB12	UM21	CHBR3	CQC	#	0.000		12/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CHCL3	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CLC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	CS2	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	DBRCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	DCLB	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	009
TB12	UM21	ETBD10	CQC	#	0.000		12/08/1991		51.100		1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	ETC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	MEC6D8	CQC	#	0.000		12/08/1991		48.000		1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	MEC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	MEK	CQC	#	0.000		12/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	009
TB12	UM21	MIBK	CQC	#	0.000		12/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	009
TB12	UM21	MNBK	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	STYR	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	T13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	009
TB12	UM21	TCLEA	CQC	#	0.000		12/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	009
TB12	UM21	TCLEE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	TRCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	009
TB12	UM21	XYLEN	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	009

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB13	UM21	111TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	112TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	11DCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	11DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	12DCD4	CQC	#	0.000		12/08/1991		49.500		1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	12DCE	CQC	#	0.000		12/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	010
TB13	UM21	12DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	12DCLP	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	13DCLB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	13DCP	CQC	#	0.000		12/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	010
TB13	UM21	13DMB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	2CLEVE	CQC	#	0.000		12/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	010
TB13	UM21	ACET	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	010
TB13	UM21	ACRYLO	CQC	#	0.000		12/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	010
TB13	UM21	BRDCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	C13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	C2AVE	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	C2H3CL	CQC	#	0.000		12/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	010
TB13	UM21	C2H5CL	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	010
TB13	UM21	C6H6	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CCL3F	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CCL4	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CD2CL2	CQC	#	0.000		12/08/1991		60.100		9.7000	1.000	UGL	UB	PHR	010
TB13	UM21	CH2CL2	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CH3BR	CQC	#	0.000		12/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CH3CL	CQC	#	0.000		12/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	010
TB13	UM21	CHBR3	CQC	#	0.000		12/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CHCL3	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CLC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	CS2	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	DBRCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	DCLB	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	010
TB13	UM21	ETBD10	CQC	#	0.000		12/08/1991		51.100		1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	ETC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	MEC6D8	CQC	#	0.000		12/08/1991		50.000		1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	MEC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	MEK	CQC	#	0.000		12/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	010
TB13	UM21	MIBK	CQC	#	0.000		12/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	010
TB13	UM21	MNBK	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	STYR	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	T13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	010
TB13	UM21	TCLEA	CQC	#	0.000		12/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	010
TB13	UM21	TCLEE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	TRCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	010
TB13	UM21	XYLEN	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	010

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB14	UM21	111TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	112TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	11DCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	11DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	12DCD4	CQC	#	0.000		13/08/1991		1.680		1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	12DCE	CQC	#	0.000		13/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKG	002
TB14	UM21	12DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	12DCLP	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	13DCLB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	13DCP	CQC	#	0.000		13/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKG	002
TB14	UM21	13DMB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	2CLEVE	CQC	#	0.000		13/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKG	002
TB14	UM21	ACET	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	002
TB14	UM21	ACRYLO	CQC	#	0.000		13/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKG	002
TB14	UM21	BRDCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	C13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	C2AVE	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	C2H3CL	CQC	#	0.000		13/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKG	002
TB14	UM21	C2H5CL	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	002
TB14	UM21	C6H6	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CCL3F	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CCL4	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CD2CL2	CQC	#	0.000		13/08/1991		1.930		9.7000	1.000	UGL	UB	PKG	002
TB14	UM21	CH2CL2	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CH3BR	CQC	#	0.000		13/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CH3CL	CQC	#	0.000		13/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKG	002
TB14	UM21	CHBR3	CQC	#	0.000		13/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CHCL3	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CLC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	CS2	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	DBRCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	DCLB	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	002
TB14	UM21	ETBD10	CQC	#	0.000		13/08/1991		1.880		1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	ETC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	MEC6D8	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	MEC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	MEK	CQC	#	0.000		13/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKG	002
TB14	UM21	MIBK	CQC	#	0.000		13/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKG	002
TB14	UM21	MNBK	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	STYR	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	T13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	002
TB14	UM21	TCLEA	CQC	#	0.000		13/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKG	002
TB14	UM21	TCLEE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	TRCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	002
TB14	UM21	UNK131	CQC	#	0.000		13/08/1991	S	4.000		*	1.000	UGL	UB	PKG	002
TB14	UM21	XYLEN	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	002

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB15	UM21	111TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	112TCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	11DCE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	11DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	12DCD4	CQC	#	0.000		12/08/1991		48.500		1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	12DCE	CQC	#	0.000		12/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PHR	008
TB15	UM21	12DCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	12DCLP	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	13DCLB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	13DCP	CQC	#	0.000		12/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PHR	008
TB15	UM21	13DMB	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	2CLEVE	CQC	#	0.000		12/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PHR	008
TB15	UM21	ACET	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	008
TB15	UM21	ACRYLO	CQC	#	0.000		12/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PHR	008
TB15	UM21	BRDCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	C13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	C2AVE	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	C2H3CL	CQC	#	0.000		12/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PHR	008
TB15	UM21	C2H5CL	CQC	#	0.000		12/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PHR	008
TB15	UM21	C6H6	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CCL3F	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CCL4	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CD2CL2	CQC	#	0.000		12/08/1991		52.600		9.7000	1.000	UGL	UB	PHR	008
TB15	UM21	CH2CL2	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CH3BR	CQC	#	0.000		12/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CH3CL	CQC	#	0.000		12/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PHR	008
TB15	UM21	CHBR3	CQC	#	0.000		12/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CHCL3	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CLC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	CS2	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	DBRCLM	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	DCLB	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	008
TB15	UM21	ETBD10	CQC	#	0.000		12/08/1991		52.100		1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	ETC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	MEC6D8	CQC	#	0.000		12/08/1991		49.000		1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	MEC6H5	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	MEK	CQC	#	0.000		12/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PHR	008
TB15	UM21	MIBK	CQC	#	0.000		12/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PHR	008
TB15	UM21	MNBK	CQC	#	0.000		12/08/1991	R	10.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	STYR	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	T13DCP	CQC	#	0.000		12/08/1991	R	5.000	ND	*	1.000	UGL	UB	PHR	008
TB15	UM21	TCLEA	CQC	#	0.000		12/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PHR	008
TB15	UM21	TCLEE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	TRCLE	CQC	#	0.000		12/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PHR	008
TB15	UM21	XYLEN	CQC	#	0.000		12/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PHR	008

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB16	UM21	111TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	112TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	11DCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	11DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	12DCD4	CQC	#	0.000		13/08/1991		48.500		1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	12DCE	CQC	#	0.000		13/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKG	004
TB16	UM21	12DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	12DCLP	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	13DCLB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	13DCP	CQC	#	0.000		13/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKG	004
TB16	UM21	13DMB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	2CLEVE	CQC	#	0.000		13/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKG	004
TB16	UM21	ACET	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	004
TB16	UM21	ACRYLO	CQC	#	0.000		13/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKG	004
TB16	UM21	BRDCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	C13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	C2AVE	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	C2H3CL	CQC	#	0.000		13/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKG	004
TB16	UM21	C2H5CL	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	004
TB16	UM21	C6H6	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CCL3F	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CCL4	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CD2CL2	CQC	#	0.000		13/08/1991		53.600		9.7000	1.000	UGL	UB	PKG	004
TB16	UM21	CH2CL2	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CH3BR	CQC	#	0.000		13/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CH3CL	CQC	#	0.000		13/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKG	004
TB16	UM21	CHBR3	CQC	#	0.000		13/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CHCL3	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CLC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	CS2	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	DBRCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	DCLB	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	004
TB16	UM21	ETBD10	CQC	#	0.000		13/08/1991		52.100		1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	ETC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	MEC6D8	CQC	#	0.000		13/08/1991		49.000		1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	MEC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	MEK	CQC	#	0.000		13/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKG	004
TB16	UM21	MIBK	CQC	#	0.000		13/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKG	004
TB16	UM21	MNBK	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	STYR	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	T13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	004
TB16	UM21	TCLEA	CQC	#	0.000		13/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKG	004
TB16	UM21	TCLEE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	TRCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	004
TB16	UM21	XYLEN	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	004

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB17	UM21	111TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	112TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	11DCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	11DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	12DCD4	CQC	#	0.000		13/08/1991		48.500		1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	12DCE	CQC	#	0.000		13/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKG	005
TB17	UM21	12DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	12DCLP	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	13DCLB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	13DCP	CQC	#	0.000		13/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKG	005
TB17	UM21	13DMB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	2CLEVE	CQC	#	0.000		13/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKG	005
TB17	UM21	ACET	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	005
TB17	UM21	ACRYLO	CQC	#	0.000		13/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKG	005
TB17	UM21	BRDCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	C13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	C2AVE	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	C2H3CL	CQC	#	0.000		13/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKG	005
TB17	UM21	C2H5CL	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	005
TB17	UM21	C6H6	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CCL3F	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CCL4	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CD2CL2	CQC	#	0.000		13/08/1991		54.700		9.7000	1.000	UGL	UB	PKG	005
TB17	UM21	CH2CL2	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CH3BR	CQC	#	0.000		13/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CH3CL	CQC	#	0.000		13/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKG	005
TB17	UM21	CHBR3	CQC	#	0.000		13/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CHCL3	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CLC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	CS2	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	DBRCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	DCLB	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	005
TB17	UM21	ETBD10	CQC	#	0.000		13/08/1991		54.200		1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	ETC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	MEC6D8	CQC	#	0.000		13/08/1991		50.000		1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	MEC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	MEK	CQC	#	0.000		13/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKG	005
TB17	UM21	MIBK	CQC	#	0.000		13/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKG	005
TB17	UM21	MNBK	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	STYR	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	T13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	005
TB17	UM21	TCLEA	CQC	#	0.000		13/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKG	005
TB17	UM21	TCLEE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	TRCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	005
TB17	UM21	XYLEN	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	005

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB18	UM21	111TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	112TCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	11DCE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	11DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	12DCD4	CQC	#	0.000		13/08/1991		45.500		1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	12DCE	CQC	#	0.000		13/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKG	003
TB18	UM21	12DCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	12DCLP	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	13DCLB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	13DCP	CQC	#	0.000		13/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKG	003
TB18	UM21	13DMB	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	2CLEVE	CQC	#	0.000		13/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKG	003
TB18	UM21	ACET	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	003
TB18	UM21	ACRYLO	CQC	#	0.000		13/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKG	003
TB18	UM21	BRDCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	C13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	C2AVE	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	C2H3CL	CQC	#	0.000		13/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKG	003
TB18	UM21	C2H5CL	CQC	#	0.000		13/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKG	003
TB18	UM21	C6H6	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CCL3F	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CCL4	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CD2CL2	CQC	#	0.000		13/08/1991		49.400		9.7000	1.000	UGL	UB	PKG	003
TB18	UM21	CH2CL2	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CH3BR	CQC	#	0.000		13/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CH3CL	CQC	#	0.000		13/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKG	003
TB18	UM21	CHBR3	CQC	#	0.000		13/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CHCL3	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CLC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	CS2	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	DBRCLM	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	DCLB	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	003
TB18	UM21	ETBD10	CQC	#	0.000		13/08/1991		49.000		1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	ETC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	MEC6D8	CQC	#	0.000		13/08/1991		47.000		1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	MEC6H5	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	MEK	CQC	#	0.000		13/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKG	003
TB18	UM21	MIBK	CQC	#	0.000		13/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKG	003
TB18	UM21	MNBK	CQC	#	0.000		13/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	STYR	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	T13DCP	CQC	#	0.000		13/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKG	003
TB18	UM21	TCLEA	CQC	#	0.000		13/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKG	003
TB18	UM21	TCLEE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	TRCLE	CQC	#	0.000		13/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKG	003
TB18	UM21	XYLEN	CQC	#	0.000		13/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKG	003

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB19	UM21	111TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	112TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	11DCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	11DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	12DCD4	CQC	#	0.000		14/08/1991		48.500		1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	12DCE	CQC	#	0.000		14/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKT	004
TB19	UM21	12DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	12DCLP	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	13DCLB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	13DCP	CQC	#	0.000		14/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKT	004
TB19	UM21	13DMB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	2CLEVE	CQC	#	0.000		14/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKT	004
TB19	UM21	ACET	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	004
TB19	UM21	ACRYLO	CQC	#	0.000		14/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKT	004
TB19	UM21	BRDCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	C13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	C2AVE	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	C2H3CL	CQC	#	0.000		14/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKT	004
TB19	UM21	C2H5CL	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	004
TB19	UM21	C6H6	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CCL3F	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CCL4	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CD2CL2	CQC	#	0.000		14/08/1991		51.500		9.7000	1.000	UGL	UB	PKT	004
TB19	UM21	CH2CL2	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CH3BR	CQC	#	0.000		14/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CH3CL	CQC	#	0.000		14/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKT	004
TB19	UM21	CHBR3	CQC	#	0.000		14/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CHCL3	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CLC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	CS2	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	DBRCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	DCLB	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	004
TB19	UM21	ETBD10	CQC	#	0.000		14/08/1991		52.100		1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	ETC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	MEC6D8	CQC	#	0.000		14/08/1991		48.000		1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	MEC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	MEK	CQC	#	0.000		14/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKT	004
TB19	UM21	MIBK	CQC	#	0.000		14/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKT	004
TB19	UM21	MNBK	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	STYR	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	T13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	004
TB19	UM21	TCLEA	CQC	#	0.000		14/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKT	004
TB19	UM21	TCLEE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	TRCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	004
TB19	UM21	XYLEN	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	004

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB20	UM21	111TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	112TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	11DCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	11DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	12DCD4	CQC	#	0.000		14/08/1991		52.500		1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	12DCE	CQC	#	0.000		14/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKT	002
TB20	UM21	12DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	12DCLP	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	13DCLB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	13DCP	CQC	#	0.000		14/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKT	002
TB20	UM21	13DMB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	2CLEVE	CQC	#	0.000		14/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKT	002
TB20	UM21	ACET	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	002
TB20	UM21	ACRYLO	CQC	#	0.000		14/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKT	002
TB20	UM21	BRDCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	C13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	C2AVE	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	C2H3CL	CQC	#	0.000		14/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKT	002
TB20	UM21	C2H5CL	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	002
TB20	UM21	C6H6	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CCL3F	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CCL4	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CD2CL2	CQC	#	0.000		14/08/1991		53.600		9.7000	1.000	UGL	UB	PKT	002
TB20	UM21	CH2CL2	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CH3BR	CQC	#	0.000		14/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CH3CL	CQC	#	0.000		14/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKT	002
TB20	UM21	CHBR3	CQC	#	0.000		14/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CHCL3	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CLC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	CS2	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	DBRCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	DCLB	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	002
TB20	UM21	ETBD10	CQC	#	0.000		14/08/1991		61.500		1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	ETC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	MEC6D8	CQC	#	0.000		14/08/1991		57.000		1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	MEC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	MEK	CQC	#	0.000		14/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKT	002
TB20	UM21	MIBK	CQC	#	0.000		14/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKT	002
TB20	UM21	MNBK	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	STYR	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	T13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	002
TB20	UM21	TCLEA	CQC	#	0.000		14/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKT	002
TB20	UM21	TCLEE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	TRCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	002
TB20	UM21	XYLEN	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	002

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB21	UM21	111TCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	112TCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	11DCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	11DCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	12DCD4	CQC	#	0.000		15/08/1991		49.500		1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	12DCE	CQC	#	0.000		15/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKT	009
TB21	UM21	12DCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	12DCLP	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	13DCLB	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	13DCP	CQC	#	0.000		15/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKT	009
TB21	UM21	13DMB	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	2CLEVE	CQC	#	0.000		15/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKT	009
TB21	UM21	ACET	CQC	#	0.000		15/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	009
TB21	UM21	ACRYLO	CQC	#	0.000		15/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKT	009
TB21	UM21	BRDCLM	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	C13DCP	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	C2AVE	CQC	#	0.000		15/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	C2H3CL	CQC	#	0.000		15/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKT	009
TB21	UM21	C2H5CL	CQC	#	0.000		15/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	009
TB21	UM21	C6H6	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CCL3F	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CCL4	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CD2CL2	CQC	#	0.000		15/08/1991		51.500		9.7000	1.000	UGL	UB	PKT	009
TB21	UM21	CH2CL2	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CH3BR	CQC	#	0.000		15/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CH3CL	CQC	#	0.000		15/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKT	009
TB21	UM21	CHBR3	CQC	#	0.000		15/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CHCL3	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CLC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	CS2	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	DBRCLM	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	DCLB	CQC	#	0.000		15/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	009
TB21	UM21	ETBD10	CQC	#	0.000		15/08/1991		50.100		1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	ETC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	MEC6D8	CQC	#	0.000		15/08/1991		47.000		1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	MEC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	MEK	CQC	#	0.000		15/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKT	009
TB21	UM21	MIBK	CQC	#	0.000		15/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKT	009
TB21	UM21	MNBK	CQC	#	0.000		15/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	STYR	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	T13DCP	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	009
TB21	UM21	TCLEA	CQC	#	0.000		15/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKT	009
TB21	UM21	TCLEE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	TRCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	009
TB21	UM21	XYLEN	CQC	#	0.000		15/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	009

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB22	UM21	111TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	112TCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	11DCE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	11DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	12DCD4	CQC	#	0.000		14/08/1991		49.500		1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	12DCE	CQC	#	0.000		14/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKT	005
TB22	UM21	12DCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	12DCLP	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	13DCLB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	13DCP	CQC	#	0.000		14/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKT	005
TB22	UM21	13DMB	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	2CLEVE	CQC	#	0.000		14/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKT	005
TB22	UM21	ACET	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	005
TB22	UM21	ACRYLO	CQC	#	0.000		14/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKT	005
TB22	UM21	BRDCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	C13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	C2AVE	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	C2H3CL	CQC	#	0.000		14/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKT	005
TB22	UM21	C2H5CL	CQC	#	0.000		14/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	005
TB22	UM21	C6H6	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CCL3F	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CCL4	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CD2CL2	CQC	#	0.000		14/08/1991		52.600		9.7000	1.000	UGL	UB	PKT	005
TB22	UM21	CH2CL2	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CH3BR	CQC	#	0.000		14/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CH3CL	CQC	#	0.000		14/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKT	005
TB22	UM21	CHBR3	CQC	#	0.000		14/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CHCL3	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CLC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	CS2	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	DBRCLM	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	DCLB	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	005
TB22	UM21	ETBD10	CQC	#	0.000		14/08/1991		52.100		1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	ETC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	MEC6D8	CQC	#	0.000		14/08/1991		49.000		1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	MEC6H5	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	MEK	CQC	#	0.000		14/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKT	005
TB22	UM21	MIBK	CQC	#	0.000		14/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKT	005
TB22	UM21	MNBK	CQC	#	0.000		14/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	STYR	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	T13DCP	CQC	#	0.000		14/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	005
TB22	UM21	TCLEA	CQC	#	0.000		14/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKT	005
TB22	UM21	TCLEE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	TRCLE	CQC	#	0.000		14/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	005
TB22	UM21	XYLEN	CQC	#	0.000		14/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	005

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB23	UM21	111TCE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	112TCE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	11DCE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	11DCLE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	12DCD4	CQC	#	0.000		21/08/1991		55.400		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	12DCE	CQC	#	0.000		21/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PNK	002
TB23	UM21	12DCLE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	12DCLP	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	13DCLB	CQC	#	0.000		21/08/1991		1.330		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	13DCP	CQC	#	0.000		21/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PNK	002
TB23	UM21	13DMB	CQC	#	0.000		21/08/1991		1.610		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	2CLEVE	CQC	#	0.000		21/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PNK	002
TB23	UM21	ACET	CQC	#	0.000		21/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	002
TB23	UM21	ACRYLO	CQC	#	0.000		21/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PNK	002
TB23	UM21	BRDCLM	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	C13DCP	CQC	#	0.000		21/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	C2AVE	CQC	#	0.000		21/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	C2H3CL	CQC	#	0.000		21/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PNK	002
TB23	UM21	C2H5CL	CQC	#	0.000		21/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	002
TB23	UM21	C6H6	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CCL3F	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CCL4	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CD2CL2	CQC	#	0.000		21/08/1991		59.000		9.7000	1.000	UGL	UB	PNK	002
TB23	UM21	CH2CL2	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CH3BR	CQC	#	0.000		21/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CH3CL	CQC	#	0.000		21/08/1991		3.300		1.2000	1.000	UGL	UB	PNK	002
TB23	UM21	CHBR3	CQC	#	0.000		21/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CHCL3	CQC	#	0.000		21/08/1991		1.100		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CLC6H5	CQC	#	0.000		21/08/1991		1.350		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	CS2	CQC	#	0.000		21/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	DBRCLM	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	DCLB	CQC	#	0.000		21/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PNK	002
TB23	UM21	ETBD10	CQC	#	0.000		21/08/1991		65.700		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	ETC6H5	CQC	#	0.000		21/08/1991		1.700		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	MEC6D8	CQC	#	0.000		21/08/1991		63.000		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	MEC6H5	CQC	#	0.000		21/08/1991		1.300		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	MEK	CQC	#	0.000		21/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PNK	002
TB23	UM21	MIBK	CQC	#	0.000		21/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PNK	002
TB23	UM21	MNBK	CQC	#	0.000		21/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	STYR	CQC	#	0.000		21/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	T13DCP	CQC	#	0.000		21/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	002
TB23	UM21	TCLEA	CQC	#	0.000		21/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PNK	002
TB23	UM21	TCLEE	CQC	#	0.000		21/08/1991		1.390		1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	TRCLE	CQC	#	0.000		21/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	002
TB23	UM21	XYLEN	CQC	#	0.000		21/08/1991		3.070		2.0000	1.000	UGL	UB	PNK	002

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB24	UM21	111TCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	111TCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	112TCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	112TCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	11DCE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	11DCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	11DCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	11DCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	12DCD4	CQC	#	0.000		15/08/1991		49.500		1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	12DCD4	CQC	#	0.000		22/08/1991		49.500		1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	12DCE	CQC	#	0.000		15/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PKT	008
TB24	UM21	12DCE	CQC	#	0.000		22/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PNK	006
TB24	UM21	12DCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	12DCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	12DCLP	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	12DCLP	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	13DCLB	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	13DCLB	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	13DCP	CQC	#	0.000		15/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PKT	008
TB24	UM21	13DCP	CQC	#	0.000		22/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PNK	006
TB24	UM21	13DMB	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	13DMB	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	2CLEVE	CQC	#	0.000		15/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PKT	008
TB24	UM21	2CLEVE	CQC	#	0.000		22/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PNK	006
TB24	UM21	ACET	CQC	#	0.000		15/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	008
TB24	UM21	ACET	CQC	#	0.000		22/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	006
TB24	UM21	ACRYLO	CQC	#	0.000		15/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PKT	008
TB24	UM21	ACRYLO	CQC	#	0.000		22/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PNK	006
TB24	UM21	BRDCLM	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	BRDCLM	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	C13DCP	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	008
TB24	UM21	C13DCP	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	C2AVE	CQC	#	0.000		15/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	008
TB24	UM21	C2AVE	CQC	#	0.000		22/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	C2H3CL	CQC	#	0.000		15/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PKT	008
TB24	UM21	C2H3CL	CQC	#	0.000		22/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PNK	006
TB24	UM21	C2H5CL	CQC	#	0.000		15/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PKT	008
TB24	UM21	C2H5CL	CQC	#	0.000		22/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	006
TB24	UM21	C6H6	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	C6H6	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CCL3F	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CCL3F	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CCL4	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CCL4	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CD2CL2	CQC	#	0.000		15/08/1991		54.700		9.7000	1.000	UGL	UB	PKT	008
TB24	UM21	CD2CL2	CQC	#	0.000		22/08/1991		51.500		9.7000	1.000	UGL	UB	PNK	006
TB24	UM21	CH2CL2	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CH2CL2	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CH3BR	CQC	#	0.000		15/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CH3BR	CQC	#	0.000		22/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CH3CL	CQC	#	0.000		15/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PKT	008
TB24	UM21	CH3CL	CQC	#	0.000		22/08/1991		2.730		1.2000	1.000	UGL	UB	PNK	006
TB24	UM21	CHBR3	CQC	#	0.000		15/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CHBR3	CQC	#	0.000		22/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CHCL3	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CHCL3	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CLC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	CLC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	CS2	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	008

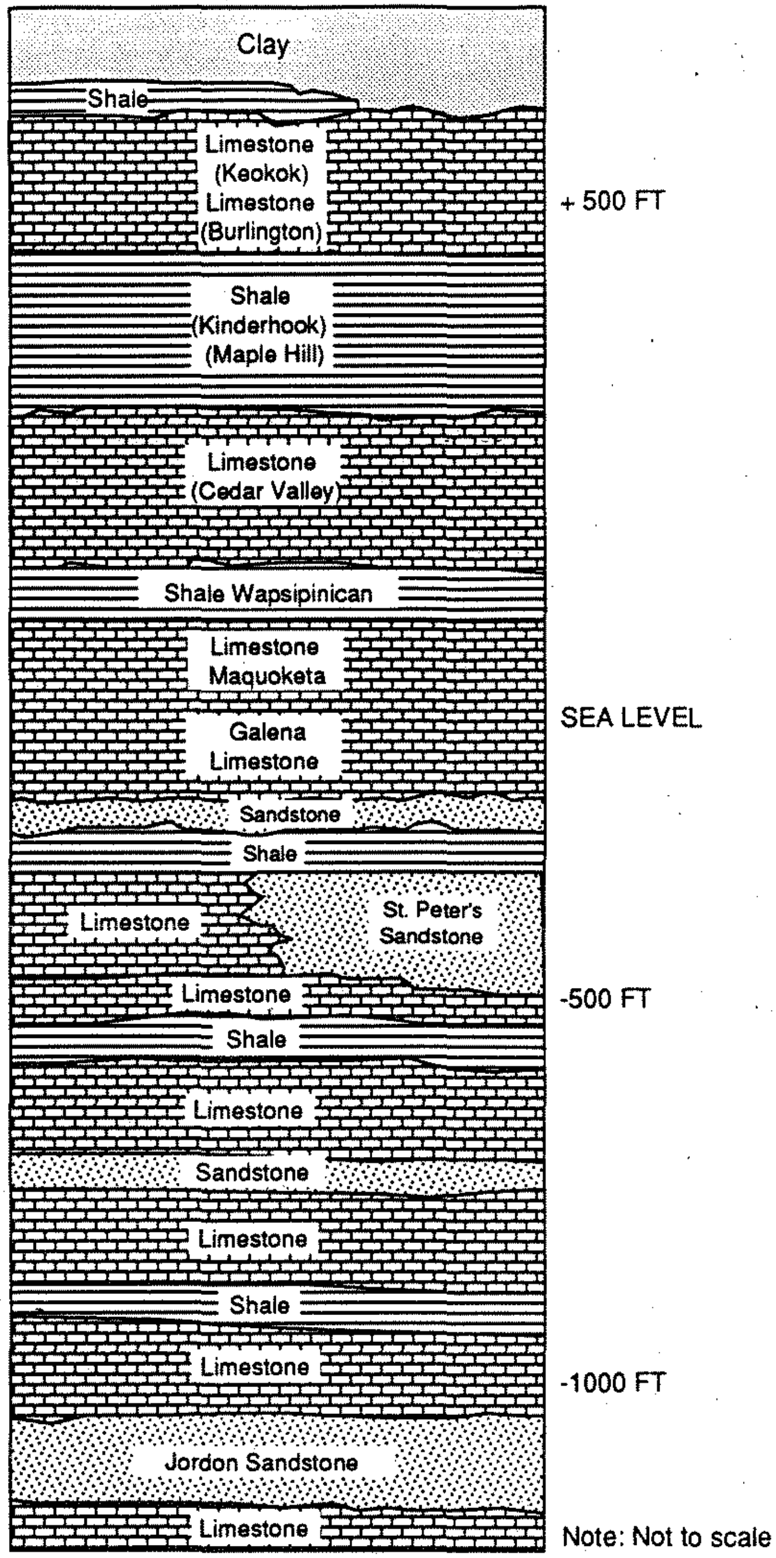
f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB24	UM21	CS2	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	DBRCLM	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	DBRCLM	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	DCLB	CQC	#	0.000		15/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	008
TB24	UM21	DCLB	CQC	#	0.000		22/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PNK	006
TB24	UM21	ETBD10	CQC	#	0.000		15/08/1991		53.200		1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	ETBD10	CQC	#	0.000		22/08/1991		53.200		1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	ETC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	ETC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	MEC6D8	CQC	#	0.000		15/08/1991		49.000		1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	MEC6D8	CQC	#	0.000		22/08/1991		51.000		1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	MEC6H5	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	MEC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	MEK	CQC	#	0.000		15/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PKT	008
TB24	UM21	MEK	CQC	#	0.000		22/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PNK	006
TB24	UM21	MIBK	CQC	#	0.000		15/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PKT	008
TB24	UM21	MIBK	CQC	#	0.000		22/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PNK	006
TB24	UM21	MNBK	CQC	#	0.000		15/08/1991	R	10.000	ND	*	1.000	UGL	UB	PKT	008
TB24	UM21	MNBK	CQC	#	0.000		22/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	STYR	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	008
TB24	UM21	STYR	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	T13DCP	CQC	#	0.000		15/08/1991	R	5.000	ND	*	1.000	UGL	UB	PKT	008
TB24	UM21	T13DCP	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	006
TB24	UM21	TCLEA	CQC	#	0.000		15/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PKT	008
TB24	UM21	TCLEA	CQC	#	0.000		22/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PNK	006
TB24	UM21	TCLEE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	TCLEE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	TRCLE	CQC	#	0.000		15/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PKT	008
TB24	UM21	TRCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	006
TB24	UM21	XYLEN	CQC	#	0.000		15/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PKT	008
TB24	UM21	XYLEN	CQC	#	0.000		22/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PNK	006

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB25	UM21	111TCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	112TCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	11DCE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	11DCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	12DCD4	CQC	#	0.000		22/08/1991		50.500		1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	12DCE	CQC	#	0.000		22/08/1991		5.000	LT	5.0000	1.000	UGL	UB	PNK	008
TB25	UM21	12DCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	12DCLP	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	13DCLB	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	13DCP	CQC	#	0.000		22/08/1991		4.800	LT	4.8000	1.000	UGL	UB	PNK	008
TB25	UM21	13DMB	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	2CLEVE	CQC	#	0.000		22/08/1991		3.500	LT	3.5000	1.000	UGL	UB	PNK	008
TB25	UM21	ACET	CQC	#	0.000		22/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	008
TB25	UM21	ACRYLO	CQC	#	0.000		22/08/1991		8.400	LT	8.4000	1.000	UGL	UB	PNK	008
TB25	UM21	BRDCLM	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	C13DCP	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	C2AVE	CQC	#	0.000		22/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	C2H3CL	CQC	#	0.000		22/08/1991		12.000	LT	12.0000	1.000	UGL	UB	PNK	008
TB25	UM21	C2H5CL	CQC	#	0.000		22/08/1991		8.000	LT	8.0000	1.000	UGL	UB	PNK	008
TB25	UM21	C6H6	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CCL3F	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CCL4	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CD2CL2	CQC	#	0.000		22/08/1991		52.600		9.7000	1.000	UGL	UB	PNK	008
TB25	UM21	CH2CL2	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CH3BR	CQC	#	0.000		22/08/1991		14.000	LT	14.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CH3CL	CQC	#	0.000		22/08/1991		1.200	LT	1.2000	1.000	UGL	UB	PNK	008
TB25	UM21	CHBR3	CQC	#	0.000		22/08/1991		11.000	LT	11.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CHCL3	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CLC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	CS2	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	DBRCLM	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	DCLB	CQC	#	0.000		22/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PNK	008
TB25	UM21	ETBD10	CQC	#	0.000		22/08/1991		53.200		1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	ETC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	MEC6D8	CQC	#	0.000		22/08/1991		51.000		1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	MEC6H5	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	MEK	CQC	#	0.000		22/08/1991		10.000	LT	10.0000	1.000	UGL	UB	PNK	008
TB25	UM21	MIBK	CQC	#	0.000		22/08/1991		1.400	LT	1.4000	1.000	UGL	UB	PNK	008
TB25	UM21	MNBK	CQC	#	0.000		22/08/1991	R	10.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	STYR	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	T13DCP	CQC	#	0.000		22/08/1991	R	5.000	ND	*	1.000	UGL	UB	PNK	008
TB25	UM21	TCLEA	CQC	#	0.000		22/08/1991		1.500	LT	1.5000	1.000	UGL	UB	PNK	008
TB25	UM21	TCLEE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	TRCLE	CQC	#	0.000		22/08/1991		1.000	LT	1.0000	1.000	UGL	UB	PNK	008
TB25	UM21	XYLEN	CQC	#	0.000		22/08/1991		2.000	LT	2.0000	1.000	UGL	UB	PNK	008

f_sample	meth	test_n	media_	site_t	depth	site_id	samp_date	i_s_c	value	meas_b	crl	dil_fact	unit_m	lab	lot	samp_n
TB26	UM21	111TCE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	112TCE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	11DCE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	11DCLE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	12DCD4	CQC	#	0.000		23/08/1991		47.500		1.0000	1.000	UGL	UB	POF	005
TB26	UM21	12DCE	CQC	#	0.000		23/08/1991		5.000	LT	5.0000	1.000	UGL	UB	POF	005
TB26	UM21	12DCLE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	12DCLP	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	13DCLB	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	13DCP	CQC	#	0.000		23/08/1991		4.800	LT	4.8000	1.000	UGL	UB	POF	005
TB26	UM21	13DMB	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	2CLEVE	CQC	#	0.000		23/08/1991		3.500	LT	3.5000	1.000	UGL	UB	POF	005
TB26	UM21	ACET	CQC	#	0.000		23/08/1991		8.000	LT	8.0000	1.000	UGL	UB	POF	005
TB26	UM21	ACRYLO	CQC	#	0.000		23/08/1991		8.400	LT	8.4000	1.000	UGL	UB	POF	005
TB26	UM21	BRDCLM	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	C13DCP	CQC	#	0.000		23/08/1991	R	5.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	C2AVE	CQC	#	0.000		23/08/1991	R	10.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	C2H3CL	CQC	#	0.000		23/08/1991		12.000	LT	12.0000	1.000	UGL	UB	POF	005
TB26	UM21	C2H5CL	CQC	#	0.000		23/08/1991		8.000	LT	8.0000	1.000	UGL	UB	POF	005
TB26	UM21	C6H6	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CCL3F	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CCL4	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CD2CL2	CQC	#	0.000		23/08/1991		48.300		9.7000	1.000	UGL	UB	POF	005
TB26	UM21	CH2CL2	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CH3BR	CQC	#	0.000		23/08/1991		14.000	LT	14.0000	1.000	UGL	UB	POF	005
TB26	UM21	CH3CL	CQC	#	0.000		23/08/1991		2.390		1.2000	1.000	UGL	UB	POF	005
TB26	UM21	CHBR3	CQC	#	0.000		23/08/1991		11.000	LT	11.0000	1.000	UGL	UB	POF	005
TB26	UM21	CHCL3	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CLC6H5	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	CS2	CQC	#	0.000		23/08/1991	R	5.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	DBRCLM	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	DCLB	CQC	#	0.000		23/08/1991		2.000	LT	2.0000	1.000	UGL	UB	POF	005
TB26	UM21	ETBD10	CQC	#	0.000		23/08/1991		53.200		1.0000	1.000	UGL	UB	POF	005
TB26	UM21	ETC6H5	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	MEC6D8	CQC	#	0.000		23/08/1991		50.000		1.0000	1.000	UGL	UB	POF	005
TB26	UM21	MEC6H5	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	MEK	CQC	#	0.000		23/08/1991		10.000	LT	10.0000	1.000	UGL	UB	POF	005
TB26	UM21	MIBK	CQC	#	0.000		23/08/1991		1.400	LT	1.4000	1.000	UGL	UB	POF	005
TB26	UM21	MNBK	CQC	#	0.000		23/08/1991	R	10.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	STYR	CQC	#	0.000		23/08/1991	R	5.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	T13DCP	CQC	#	0.000		23/08/1991	R	5.000	ND	*	1.000	UGL	UB	POF	005
TB26	UM21	TCLEA	CQC	#	0.000		23/08/1991		1.500	LT	1.5000	1.000	UGL	UB	POF	005
TB26	UM21	TCLEE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	TRCLE	CQC	#	0.000		23/08/1991		1.000	LT	1.0000	1.000	UGL	UB	POF	005
TB26	UM21	XYLEN	CQC	#	0.000		23/08/1991		2.000	LT	2.0000	1.000	UGL	UB	POF	005

APPENDIX C

GENERALIZED BEDROCK STRATIGRAPHY
IAAP MONITORING WELL SUMMARY
AVAILABLE BORING LOGS



Generalized Bedrock Stratigraphy

Source: Groundwater Quality Assessment Plan, June 1985

Prepared by:

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

for:

JAYCOR

IAAP MONITORING WELL SUMMARY

Facility ID	Ground Elevation	TOC Elevation	Well Depth	Top. of Screen (Depth)	Bottom of Screen (Depth)	Primary Aquifer	Diameter	Prime Co	Completion Date
DA-01	673.00	675.70	21	11.00	20.60	LIMESTON	4.0	USACOE	07/18/1984
DA-02	678.00	680.70	25	15.00	24.50	LIMESTON	4.0	USACOE	07/23/1984
DM-1	729.00	728.39	16	5.00	15.00	LOESS/TI	4.0	DAMES & MOORE	10/12/1989
DM-10	728.60	727.56	17	5.30	15.30	LOESS/TI	4.0	DAMES & MOORE	10/12/1989
DM-2	729.00	728.12	38	30.00	35.00	TILL	4.0	DAMES & MOORE	10/26/1989
DM-3	728.80	727.80	55	50.00	55.00	TILL	4.0	DAMES & MOORE	
DM-4	729.10	728.70	17	5.00	15.00	LOESS/TI	4.0	DAMES & MOORE	10/12/1989
DM-5	729.10	728.70	38	30.00	35.00	TILL	4.0	DAMES & MOORE	10/26/1989
DM-6	729.10	728.50	58	48.00	54.00	TILL	4.0	DAMES & MOORE	10/27/1989
DM-7	729.40	728.80	18	5.00	15.00	LOESS/TI	4.0	DAMES & MOORE	10/11/1989
DM-8	728.80	728.23	15	5.00	15.00	LOESS/TI	4.0	DAMES & MOORE	10/11/1989
DM-9	729.00	728.43	17	5.00	15.00	LOESS/TI	4.0	DAMES & MOORE	10/11/1989
EDA-01	692.10	694.80	26	16.00	25.80	LOESS/TI	4.0	USACOE	07/12/1984
EDA-02	671.20	673.50	27	17.80	27.40	LIMESTON	4.0	USACOE	07/11/1984
EDA-03	674.10	676.80	37	28.00	37.60	TILL/LS	4.0	USACOE	07/10/1984
EDA-04	682.70	685.30	19	9.40	18.40	LOESS/TI	4.0	USACOE	06/29/1984
G-1	716.20	719.70	20	10.00	20.00	LOESS/TI	4.0	SOIL TESTING	02/17/1981
G-10	677.00	680.60	24	14.00	24.00	DOLOMITE	4.0	SOIL TESTING	03/16/1981
G-11	691.70	695.10	37	26.00	36.00	DOLOMITE	4.0	SOIL TESTING	03/13/1981
G-12	663.50	666.30	20	9.50	19.50	LOESS/TI	4.0	SOIL TESTING	03/02/1981
G-13	647.10	650.00	30	18.50	28.50	LIMESTON	4.0	SOIL TESTING	03/04/1981
G-14	676.00	678.40	38	26.00	36.00	TILL	4.0	SOIL TESTING	02/24/1981
G-15	656.30	659.80	18	6.50	16.50	TILL	4.0	SOIL TESTING	03/10/1981
G-16	693.60	696.10	20	10.00	20.00	LOESS/TI	4.0	SOIL TESTING	02/20/1981
G-17	681.20	683.80	20	9.00	19.00	LOESS/TI	4.0	SOIL TESTING	03/03/1981
G-18	680.20	682.60	20	9.00	19.00	LOESS/TI	4.0	SOIL TESTING	03/03/1981
G-19	680.30	683.00	20	9.50	19.50	LOESS/TI	4.0	SOIL TESTING	03/02/1981
G-2	718.10	720.50	18	8.00	18.00	LOESS/TI	4.0	SOIL TESTING	02/27/1981
G-20	683.20	685.70	20	9.00	19.00	LOESS/TI	4.0	SOIL TESTING	03/02/1981
G-21	537.90	540.90	18	7.00	17.00	ALLUVIAL	4.0	SOIL TESTING	03/16/198
G-22	679.20	681.90	42	32.00	42.00	TILL	4.0	SOIL TESTING	03/04/19
G-23	669.30	672.00	20	9.00	19.00	LOESS/TI	4.0	SOIL TESTING	03/05/19
G-24	599.50	602.30	17	6.00	16.00	LIMESTON	4.0	SOIL TESTING	03/17/1981
G-25	628.40	631.20	81	71.00	81.00	TILL	4.0	SOIL TESTING	03/19/1981
G-26	656.60	659.70	100	90.00	100.00	TILL	4.0	SOIL TESTING	03/21/1981
G-27	663.00	665.90	24	14.00	24.00	LOESS/TI	4.0	SOIL TESTING	03/19/1981
G-28	674.70	678.00	20	10.00	20.00	LOESS/TI	4.0	SOIL TESTING	03/19/1981
G-29	681.80	684.10	20	8.00	18.00	LOESS/TI	4.0	SOIL TESTING	02/27/1981
G-3	684.40	686.90	30	20.50	30.50	LOESS/TI	4.0	SOIL TESTING	02/18/1981
G-30	652.10	654.90	17	7.00	17.00	LIMESTON	4.0	SOIL TESTING	02/26/1981
G-31	666.80	669.50	16	5.50	15.50	LOESS/TI	4.0	SOIL TESTING	03/21/1981
G-4	706.00	708.30	26	16.00	26.00	LOESS/TI	4.0	SOIL TESTING	02/24/1981
G-40	682.30	684.30	83	73.25	83.25	TILL	4.0	BATELLE	11/17/1983
G-41	682.10	684.20	22	9.80	19.80	LOESS/TI	4.0	BATELLE	11/15/1983
G-42	683.20	685.20	77	66.50	76.50	TILL	4.0	BATELLE	11/23/1983
G-43	683.10	685.60	42	32.10	42.10	TILL	4.0	BATELLE	11/28/1983
G-44	679.70	681.90	80	68.00	78.00	TILL	4.0	BATELLE	12/09/1983
G-45	679.50	681.50	40	30.00	40.00	TILL	4.0	BATELLE	11/15/1983
G-46	678.30	680.50	68	58.00	68.00	TILL	4.0	BATELLE	11/15/1983
G-47	678.60	680.60	26	16.00	26.00	LOESS/TI	4.0	BATELLE	11/15/1983
G-48	681.60	684.19	31	20.41	30.42	TILL	4.0	DAMES & MOORE	09/25/1987
G-49	721.30	723.60	32	19.49	29.50	TILL	4.0	DAMES & MOORE	09/08/1987
G-5	689.10	692.20	50	40.00	50.00	TILL	4.0	SOIL TESING	02/20/1981
G-50	644.30	646.99	82	76.21	81.20	LIMESTON	4.0	DAMES & MOORE	10/09/1987
G-51	644.30	646.66	16	10.20	15.00	TILL	4.0	DAMES & MOORE	10/05/1987
G-52	634.80	637.26	39	31.66	36.65	LIMESTON	4.0	DAMES & MOORE	09/24/1987
G-53	634.60	637.00	11	5.00	10.00	ALLUVIAL	4.0	DAMES & MOORE	09/17/1987
G-54	611.60	614.39	65	59.22	64.21	LIMESTON	4.0	DAMES & MOORE	10/01/1987
G-55	611.10	613.72	16	10.30	15.32	ALLUVIAL	4.0	DAMES & MOORE	09/21/1987
G-56	680.10	682.13	31	18.50	28.51	LOESS/TI	4.0	DAMES & MOORE	09/03/1987
G-57	680.60	682.54	31	19.95	29.96	LOESS/TI	4.0	DAMES & MOORE	09/09/1987
G-58	680.20	683.05	31	20.11	30.08	LOESS/TI	4.0	DAMES & MOORE	09/11/1987
G-6	700.20	703.20	28	17.00	27.00	LOESS/TI	4.0	SOIL TESTING	02/19/1981
G-7	692.60	695.40	42	32.00	42.00	TILL	4.0	SOIL TESTING	02/23/1981
G-8	611.10	614.50	16	5.00	15.00	TILL	4.0	SOIL TESTING	03/12/1981
G-9	692.40	695.10	28	16.50	26.50	TILL	4.0	SOIL TESTING	02/26/1981
GZ-1	682.10	685.80	51	40.00	50.00	TILL	4.0	SCS ENGINEERS	12/03/1980
GZ-2	670.70	673.70	30	20.00	30.00	TILL	4.0	SCS ENGINEERS	12/22/1980
GZ-2A	671.00	673.90	10	5.00	10.00	LOESS/TI	4.0	SCS ENGINEERS	12/22/1980

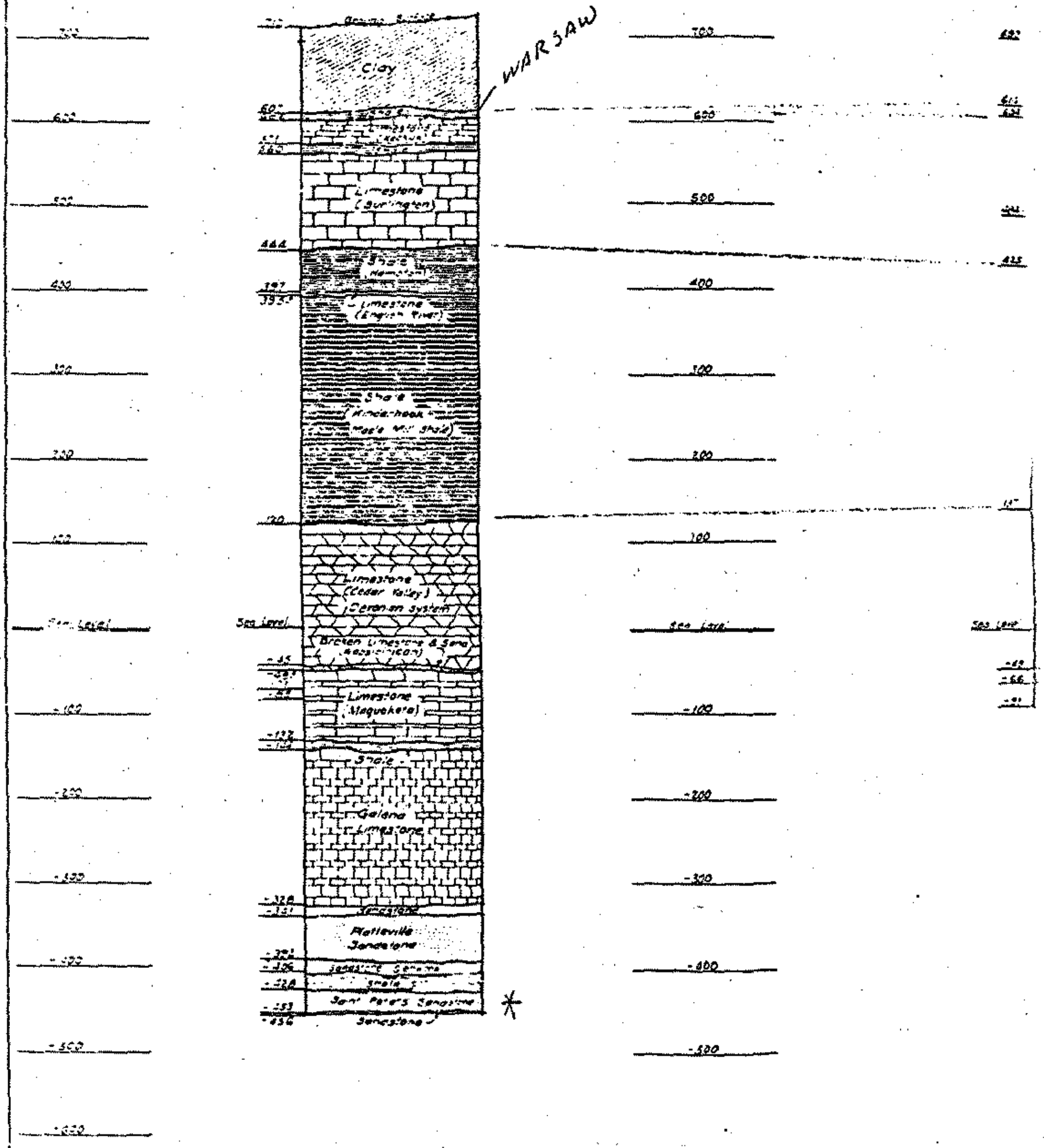
Facility ID	Ground Elevation	TOC Elevation	Well Depth	Top. of Screen (Depth)	Bottom of Screen (Depth)	Primary Aquifer	Diameter	Prime Co	Completion Date
GZ-3	677.60	680.70	50	36.00	46.00	TILL	4.0	SCS ENGINEERS	12/04/1980
GZ-6	683.50	687.30	54	39.00	49.00	TILL	4.0	SCS ENGINEERS	12/02/1980
GZ2-01	722.70	725.40	58	44.00	54.00	TILL	4.0	SCS ENGINEERS	11/25/1980
GZ2-02	698.40	698.60	30	20.00	30.00	LOESS/TI	4.0	SCS ENGINEERS	12/11/1980
GZ2-18	712.40	716.00	50	40.00	50.00	TILL	4.0	SCS ENGINEERS	12/10/1980
GZ2-18A	712.50	716.90	10	5.00	10.00	LOESS	4.0	SCS ENGINEERS	12/10/1980
GZ2-19	712.60	715.90	50	40.00	50.00	TILL	4.0	SCS ENGINEERS	12/11/1980
GZ3-01	723.60	726.40	21	9.00	19.00	LOESS	4.0	SCS ENGINEERS	12/05/1980
GZ3-02	723.90	727.10	10	3.00	8.00	LOESS	4.0	SCS ENGINEERS	12/05/1980
GZ3-03	720.90	722.10	13	5.50	11.50	LOESS	4.0	SCS ENGINEERS	12/09/1980
GZ3-04	720.90	725.40	28	18.00	28.00	LOESS/TI	4.0	SCS ENGINEERS	12/12/1980
GZ3-05	722.20	725.80	20	8.50	18.50	LOESS/TI	4.0	SCS ENGINEERS	12/09/1980
PW-1	712.00	?	456	0.00	0.00	BEDROCK	6.0	WELL	02/01/1942
PW-2	699.00	?	91	0.00	0.00	BEDROCK	6.0	WELL	02/01/1942
PW-3	717.00	?	497	0.00	0.00	BEDROCK	6.0	WELL	02/02/1942
PW-4	726.00	?	1198	0.00	0.00	BEDROCK	6.0	WELL	02/01/1942
PW-5	?	?	300	0.00	0.00	BEDROCK	6.0	WELL	11/01/1973
PW-6	667.00	?	?	0.00	0.00	BEDROCK	0.0	WELL	
RFA-031	?	?	?	0.00	0.00		0.0		
SL-81	678.81	681.14	11	5.51	10.50	ALLUVIAL	2.0	DAMES & MOORE	10/19/1987
SL-87	673.29	674.73	11	6.50	11.52	TILL	2.0	DAMES & MOORE	10/20/1987
SL-91	672.40	673.82	11	6.50	11.52	TILL	2.0	DAMES & MOORE	
T-01	710.90	712.74	35	25.00	35.00	TILL	4.0	TERRACON	05/25/1988
T-02	710.80	713.37	35	25.00	35.00	TILL	4.0	TERRACON	06/24/1988
T-03	710.30	713.15	35	25.00	35.00	TILL	4.0	TERRACON	04/19/1988
T-04	704.00	706.56	40	30.00	40.00	TILL	4.0	TERRACON	06/24/1988
T-05	707.10	709.71	40	30.00	40.00	TILL	4.0	TERRACON	06/24/1988
T-06	710.60	713.00	129	118.50	128.50	WARSAW F	2.0	TERRACON	06/24/1988
T-07	710.20	712.75	130	120.00	130.00	WARSAW F	2.0	TERRACON	05/12/1988
T-08	705.70	708.32	128	117.50	127.50	WARSAW F	2.0	TERRACON	06/24/1988
T-09	701.00	703.40	137	127.00	137.00	WARSAW F	2.0	TERRACON	06/24/1988
T-10	722.50	725.10	25	14.00	24.50	LOESS/TI	4.0	TERRACON	04/15/1988
T-11	722.30	724.59	70	60.00	70.00	TILL	4.0	TERRACON	04/15/1988
T-12	722.60	725.23	121	111.00	121.00	WARSAW F	2.0	TERRACON	05/12/1988
T-13	717.40	719.93	30	20.00	30.00	TILL	4.0	TERRACON	06/24/1988
T-14	717.20	719.79	70	60.00	70.00	TILL	4.0	TERRACON	05/24/1988
T-15	717.30	719.80	107	96.50	106.50	WARSAW F	2.0	TERRACON	08/04/1988
T-16	715.20	717.82	20	10.00	20.00	TILL	4.0	TERRACON	05/12/1988
T-17	715.20	717.76	70	60.00	70.00	TILL	4.0	TERRACON	06/24/1988
T-18	715.00	717.56	115	100.00	115.00	WARSAW F	2.0	TERRACON	06/24/1988
T-19	714.60	717.24	20	10.00	20.00	LOESS/TI	4.0	TERRACON	05/12/1988
T-20	714.30	717.08	70	60.00	70.00	TILL	4.0	TERRACON	05/12/1988
T-21	714.40	717.06	121	111.00	121.00	WARSAW F	2.0	TERRACON	05/12/1988
T-22	713.30	715.78	25	15.00	25.00	LOESS/TI	4.0	TERRACON	04/19/1988
T-23	713.10	715.73	70	60.00	70.00	TILL	4.0	TERRACON	04/19/1988
T-24	713.40	715.80	125	115.00	125.00	WARSAW F	2.0	TERRACON	04/19/1988
T-25	712.80	715.59	20	10.00	20.00	LOESS/TI	4.0	TERRACON	05/12/1988
T-26	713.10	715.63	70	60.00	70.00	TILL	4.0	TERRACON	05/12/1988
T-27	713.50	715.78	140	130.00	140.00	WARSAW F	2.0	TERRACON	05/12/1988
T-28	713.60	715.89	20	10.00	20.00	LOESS/TI	4.0	TERRACON	05/12/1988
T-29	713.60	715.86	70	60.00	70.00	TILL	4.0	TERRACON	05/12/1988
T-30	713.80	716.21	149	139.00	149.00	WARSAW F	2.0	TERRACON	05/12/1988
T-31	713.00	715.44	20	10.00	20.00	LOESS/TI	4.0	TERRACON	05/12/1988
T-32	712.70	715.37	70	60.00	70.00	TILL	4.0	TERRACON	05/12/1988
T-33	713.40	715.60	139	128.50	138.50	WARSAW F	2.0	TERRACON	08/04/1988
T-34	712.50	715.21	20	10.00	20.00	LOESS/TI	4.0	TERRACON	06/24/1988
T-35	712.50	715.23	70	60.00	70.00	TILL	4.0	TERRACON	06/24/1988
T-36	712.30	715.14	160	149.50	159.50	WARSAW F	2.0	TERRACON	06/24/1988

(17.6-3)

1301-07c- Environ/Geology/Subsurface Geology (Iowa)

U 21/8/79

WELL No. 1
500-165-1
AT POWER HOUSE AREA



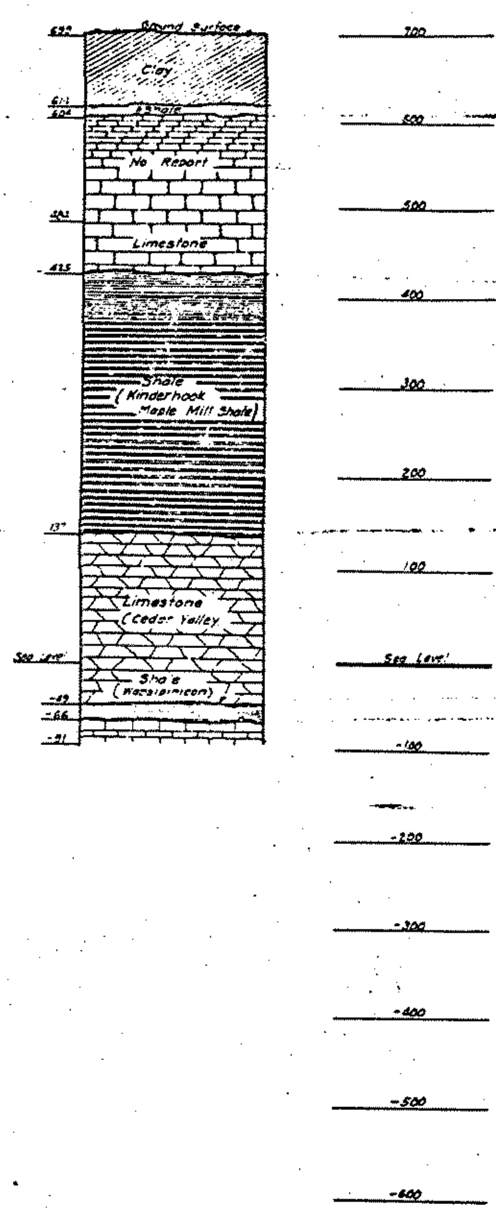
Total depth 1168' Ft
Casing 22" 122 Ft
" 16" 733' Ft
" 12½" 80 Ft
Pump Test
Approximately 400 Gal per Min.
Total Solids 3636 Parts per Million
This water may be used to
Supplement reservoir.
Approximately 15 feet of overburden has been removed since origional construction.
There is an overlap of approximately 33-feet between the 16" and 12½" casings.
The 16" overlaps the 22" casing for the entire length of the 22" casing.
The bottom of 12½ casing is ...

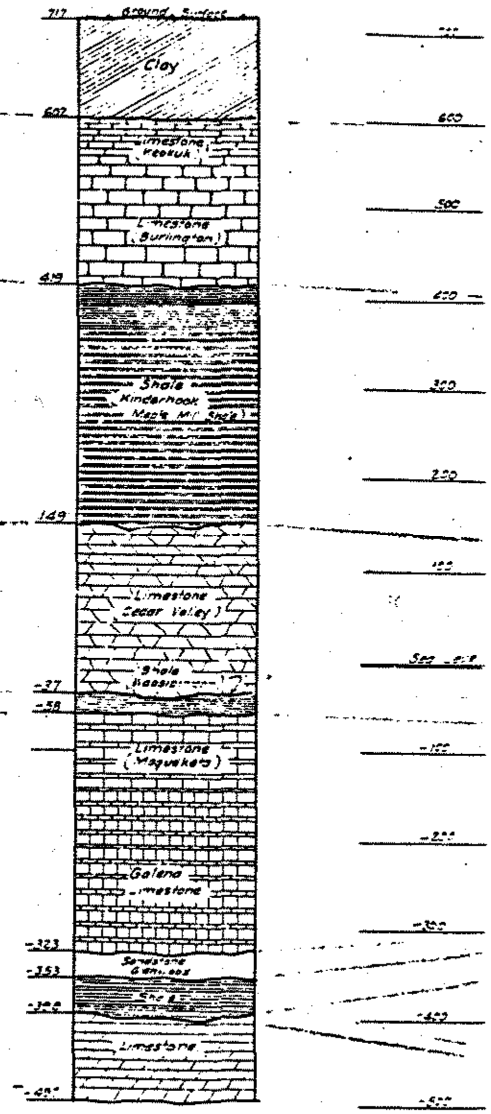
Total de...
Casing ...
Pump Tes...
Approxim...
Total Sol...
Not incom...
to last fee...

IOWA AAP
IE 3 5 Well logs

WELL No. 2
500-165-2
EAST OF PRIMER LINE
GRAY

WELL No. 3
500-165-3
EAST OF FUZE LINE
GRAY

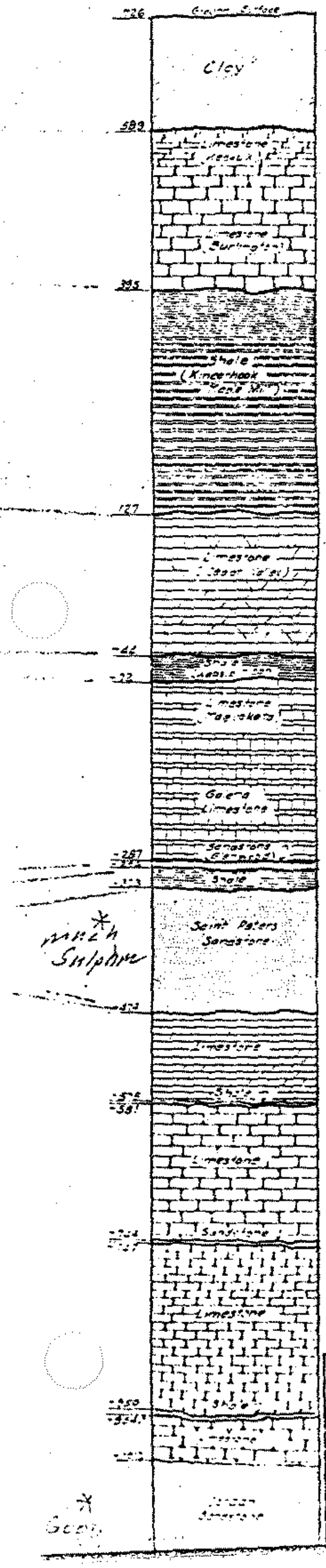




Total depth Approx. 800 Ft.
Casing 20" - 8½ Ft. at top of hole.
Pump Test
Approximately 50 Gal. per Min.
Total Solids - No test made.
Well incomplete at this date due to lost tools from 8-11-41 to 1-9-42.

Total depth 1205 Ft.
Casing 20" 132± Ft.
" 16" 854± Ft.
Pump test — 400 Gal per Min.
Total Solids - 3443 Parts per Million
There are possibly three breaks in this casing which were discovered after unsuccessful attempt to grout by Halliburton Process. With a minimum amount of pipe connection this well could be used to supplement the reservoir.
The 16" overlaps the 20" casing for the entire 132.5
Bottom of 16" casing approximately 854' below ground surface

WELL No. 4
500-165-4
NORTHEAST YARD'J.



726
589
137

589
395
194

395
127
268

+333
726
1059

474
323
151

WELL NO. 4.
Total depth 1932 ± Ft
Casing 20" – 154.5 Ft
" 16" – 864.3 Ft
" 12½ – 362.83 Ft
Pump test – 480 Gal. per Min
Total Solids – 1184 Parts per Million.

Pump set connected to main line and pump house erected
Dr. H.G. Hershey of the Iowa Geological Survey is satisfied
that the water comes from the Jordan Sand.
By mixing with lake water 50-55 it can be used for
boiler water by making approximately 25 percent blend
as the chloride and sulphate cannot be eliminated in
the Water Treatment Plant.
There is an overlap of approximately 45 feet
between the 16" and 12½" casings.
The 16" overlaps the 20" casing for the entire
length of the 20" casing.
The bottom of the 12½" casing is approximately
1180 feet below the ground surface.

1162
1012
150

1012

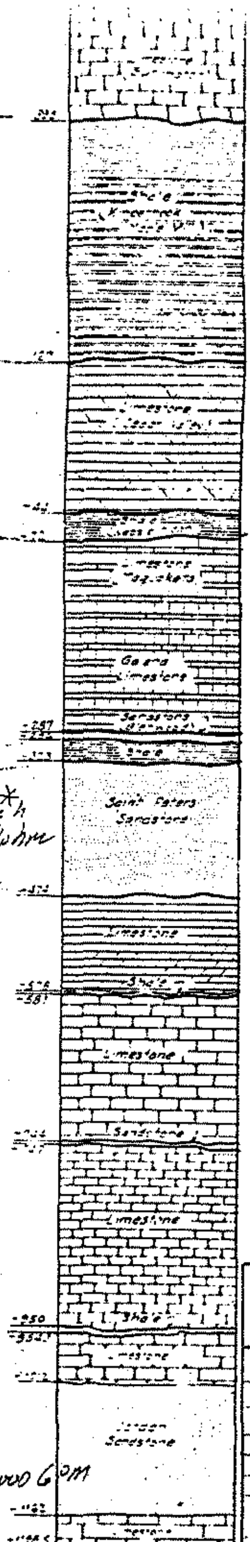
DAY

SCAL

REVIS

345
19

395
127
265



*much
Sulphur

*
GOOD
up to 1000 GPM

+333
726
1059

474
323
151

WELL NO. 4.
Total depth 1932± Ft
Casing 20" - 154.5 Ft
" 16" - 864.5 Ft
" 12½ - 362.83 Ft
Pump test - 480 Gal. per Min.
Total Solids - 1184 Parts per Million.

Pump set connected to main line and pump house erected.
Dr. H.G. Hershey of the Iowa Geological Survey is satisfied
that the water comes from the Jordan Zone.
By mixing with lake water 50-50 it can be used for
boiler water by making approximately 25 percent blowdown
as the chloride and sulphate cannot be eliminated in
the Water Treatment Plant.
There is an overlap of approximately 45 feet
between the 16" and 12½" casings.
The 16" overlaps the 20" casing for the entire
length of the 20" casing.
The bottom of the 12½" casing is approximately
1180 feet below the ground surface.

1162
1012
150

1012
726
1738

DAY & ZIMMERMANN. INC.
ENGINEERS
PHILADELPHIA, PA.

SCALE	CONSTRUCTION DIVISION OFFICE OF THE QUARTERMASTER GENERAL
1" = 100 Vertically	IOWA ORDNANCE PLANT
REVISIONS	LOG OF DEEP WELLS NUMBERED 500-165-1 : 500-165-2 : 500-165-3 : 500-165-4

DRAWN BY	CHECKED BY	APPROVED BY DIRECTION	DATE
J.R.T.	C.V.B.	[signature]	2-23-42
TRACED BY R.A.S.			PLAN NUMBER 6987
			Q.M.C. 1523

IOWA GEOLOGICAL SURVEY
in Cooperation with
U.S. GEOLOGICAL SURVEY
Iowa City, Iowa

1978

17.6-3

Name	State
I A A P	Iowa

Town	County	Loc.
Middletown	Des Moines	1 mi. S., 1 mi. W. of Middletown

Contractor	Driller	Sec. Yard F
Silas Mason	Lloyd Bjaiklund C.L. Jennings Inc.	35 (S.E)

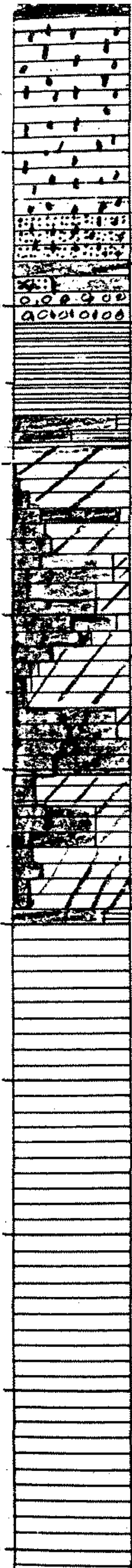
Drilling Dates	
Nov. 1973	T. 70 N., R. 4 W

Casing Record
155' of 6" pipe

S.W.L.	G.P.M.	D.D.
87'	2	208'

Remarks	Elev.
Cable Tool	
	T.D. 300'

Logged by	I.G.S. No.
J. Case	W-23300



100
200
300
400
500

Pleistocene

Mississippian
Osage
Warsaw

Keokuk

Burlington
Cedar Fork

Burlington
Haight Creek

Burlington
Dolbee Creek

Mississippian
Kinderhook
Prospect Hill

I E 3b

Explanation of Colors

- Soil
- Loess, Silt or Siltstone
- Drift
- Sand & Gravel
- Shale
- Sandstone
- Limestone
- Dolomite
- Chert
- Gypsum or Anhydrite
- Coal
- Clay
- N/S No Samples

filed cfo 1/11/79

B 07.03

TABLE 3
IAAP SUPPLY WELLS INFORMATION

	Well No. 1 500-165-1 at Powerhouse Area	Well No. 2(1) 500-165-2 East of Primer Line	Well No. 3 500-165-3 East of Fuze Line	Well No. 4 500-165-4 Northeast Yard J
Approximate Groundsurface elevation (in feet MSL)	712	699	717	726
Approximate bedrock elevation (in feet MSL)	607	614	602	589
Uppermost bedrock formation description	Five feet of shale over 31 feet of Keokuk Limestone	Ten feet of shale over 179 feet of Limestone (assumed to be Keokuk and Burlington Limestone	183 feet of Keokuk and Burlington Limestones	194 feet of Keokuk and Burlington Limestones
Bottom of well at elevation (in feet MSL)	-456	-91	-497	-1198.5
Non-cased elevations (in feet, MSL)	-118 to -456	618 to -91	-137 to -497	-454 to -1198.5
Approximate formation interval not cased	Galena Limestone to Saint Peters Sandstone	Keokuk Limestone to Maquoketa Limestone	Maquoketa Limestone to (Unknown)(2)	Saint Peters Sandstone to St. Lawrence Dolomite
Pump test result (in gallons per minute)	400	50	400	480
Total solids in groundwater (in parts per million)	3636	No test performed	3443	1184

(1) Well No. 2 was unfinished as of date logs prepared (2/23/42).
(2) Elevation approximately corresponds to the St. Peters Sandstone elevation logged in Well No. 4. That elevation is logged as a limestone, however in W--l No. 3.

17.06-03

20 Aug 84

Monitoring Wells, Iowa AAP

	NORTH	EAST	ELEVATION
EDA-01	302514	2637594	694.6
EDA-02	301738	2637160	673.2
EDA-03	301516	2637405	676.5
EDA-04	302315	2638124	685.1
DA-01	290977	2614121	675.5
DA-02	290470	2614960	680.5

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

Table No. 4 - Summary of Classification Tests

Project: Iowa AAP - OD/OD Grounds Monitoring Wells MRD Lab No. 84/276

Holes EDA-1 through EDA-4

Note: By visual examination and classification, samples not tested were compared and grouped with typical test samples as described below:

(a) Lean clay, CL. Dark brown. Tough at plastic limit. Similar to Sample 1, Hole EDA-1 (LL-46, PI-26).

(b) Fat clay, CH. Gray-brown. Tough at plastic limit. Similar to Sample 2, Hole EDA-1 (LL-72, PI-54).

(c) Lean clay, CL. Gray-brown. Tough at plastic limit. Similar to Sample 4, Hole EDA-1 (LL-40, PI-25).

(d) Lean clay, CL. Light brown. Medium tough at plastic limit. Similar to Sample 6, Hole EDA-1 (LL-25, PI-12).

(e) Fat clay, CH. Light brown. Tough at plastic limit. Similar to Sample 7, Hole EDA-1 (LL-53, PI-37).

(f) Sandy clay, CL. Light brown. Fine to medium sand. Tough at plastic limit. Similar to Sample 8, Hole EDA-1 (65% Fines, 35% sand; LL-37, PI-24).

(g) Sandy clay, CL. Gray. Fine sand. Tough at plastic limit. Similar to Sample 10, Hole EDA-1 (70% Fines, 30% sand; LL-48, PI-26).

(h) Fat clay, CH. Gray-brown. Tough at plastic limit. Similar to Sample 1, Hole EDA-2 (LL-54, PI-36).

(i) Clayey sand, SC. Rust. Fine to coarse sand. Tough at plastic limit. Similar to Sample 4, Hole EDA-2 (45% Fines, 47% sand, 8% gravel; LL-43, PI-32).

(j) Sandy clay, CL. Gray-brown. Fine sand. Tough at plastic limit. Similar to Sample 6, Hole EDA-2 (64% Fines, 36% sand; LL-47, PI-35).

(k) Sandy clay, CL. Tan. Fine to medium sand. Tough at plastic limit. Similar to Sample 9, Hole EDA-2 (62% Fines, 38% sand; LL-29, PI-18).

(l) Limestone. Gray. Similar to Sample 10, Hole EDA-2 (No test).

(m) Lean clay, CL. Gray-brown. Tough at plastic limit. Similar to Sample 2, Hole EDA-3 (LL-42, PI-28).

(n) Lean clay, CL. Gray. Tough at plastic limit. Similar to Sample 3, Hole EDA-3 (LL-33, PI-22).

(o) Lean clay, CL. Gray and rust. Tough at plastic limit. Similar to Sample 6, Hole EDA-3 (LL-48, PI-34).

(p) Sandy clay, CH. Gray. Fine to medium sand. Tough at plastic limit. Similar to Sample 9, Hole EDA-3 (63% Fines, 28% sand, 9% gravel; LL-52, PI-39).

(q) Fat clay, CH. Brown. Tough at plastic limit. Similar to Sample 2, Hole EDA-4 (LL-64, PI-47).

(r) Fat clay, CH. Gray-brown. Tough at plastic limit. Similar to Sample 3, Hole EDA-4 (LL-56, PI-41).

(s) Fat clay, CH. Gray. Some fine sand. Tough at plastic limit. Similar to Sample 5, Hole EDA-4 (85% Fines, 15% sand; LL-68, PI-51).

(t) Lean clay, CL. Light gray. Tough at plastic limit. Similar to Sample 6, Hole EDA-4 (LL-49, PI-34).

(u) Lean clay, CL. Gray-brown. Tough at plastic limit. Similar to Sample 7, Hole EDA-4 (LL-33, PI-21).

(v) Sandy clay, CL. Gray-brown. Fine to medium sand. Tough at plastic limit. Similar to Sample 8, Hole EDA-4 (68% Fines, 32% sand; LL-32, PI-21).

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

Table No. B2 - Summary of Classification Tests

Project: Iowa AAP — MRD Lab No. 84/276
12 SEP 1984

Holes DA-01 and DA-02

Note: By visual examination and classification, samples not tested were compared and grouped with typical test samples as described below:

(a) Sandy clay, CL Brown. Fine sand. Tough at plastic limit. Similar to Sample 1, Hole DA - 01 (70% fines, 30% sand; LL-28, PI-17).

(b) Sandy clay, CL brown. Fine to medium sand. Tough at plastic limit. Similar to sample 3, Hole DA-01 (62% fines, 38% sand; LL-34, PI-22).

(c) Sandy clay, CL brown. Fine to medium sand. Tough at plastic limit. Similar to sample 5, Hole DA-01 (63% fines, 37% sand; LL-37, PI-25).

(d) Sandy clay, CL brown. Fine sand. Tough at plastic limit. Similar to Sample 3, Hole DA-02 (71% fines, 29% sand; LL-32, PI-20).

(e) Sandy clay, CL brown with gray seams. Fine sand. Tough at plastic limit. Similar to sample 5, hole DA-02 (67% fines, 33% sand; LL-32, PI-19).

DRILLING LOG	DIVISION ~~[illegible]~~ Huntsville	INSTALLATION ~~[illegible]~~	SHEET 1 OF 3 SHEETS

1. PROJECT: JOWA AAP MONITORING WELL	10. SIZE AND TYPE OF BIT: 6" DIA FLIGHT AUGER
2. LOCATION (Coordinates or Station): N 302514 E 2627594	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US-CE-C -Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75
4. HOLE NO. (As shown on drawing title and file number): EDA 01	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 10 [illegible] 10 TSS; UNDISTURBED 2 SHELBY
5. NAME OF DRILLER: O'MALLEY	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: WL. 16.25 DEPTH
	16. DATE HOLE: STARTED 7 11 84; COMPLETED 7 11 84
7. THICKNESS OF OVERBURDEN: 26.5'	17. ELEVATION TOP OF HOLE: 692.1
8. DEPTH DRILLED INTO ROCK: 0'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
9. TOTAL DEPTH OF HOLE: 26.5'	19. SIGNATURE OF INSPECTOR: Richard P. [illegible]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0	CL	SILTY LEAN CLAY (CL) ORGANIC TOP SOIL MED STIFF MED-LOW PLAST NON CALC SL. MOIST DK. GRAY BROWN W/ OCCAS ROOT FRAG		M-1 P[illegible] 0.0 0.3; D-1 0.3 0.6	BEGAN DRILLING W/ 6" DIA FLIGHT AUGER; REC 0.4'; REF 0.0'-1.3'; PENETROMETER 7 4.5 TSF; N=7	S 3 / 3 3 / S 4
690.8	1.3						
	2.0	CH	SILTY LEAN CLAY (CL) STIFF LOW PLAST NON CALC MOIST LT. GRAY W/ OCCAS ROOT FRAG W/ OCCAS FE OXIDE STAINS		M-2 N755 1.5 2.0; D-2 2.0 2.5	REC 1.0'; REF 1.5'-3.0'; PENETROMETER 2.5 TSF; N=11	S 4 / S 5 / S 6
	3.0				M-3 PL25 3.0 3.5; D-3 3.5 4.5	REC 1.5'; REF 3.0'-4.5'; PENETROMETER 1.5 TSF	S 3 / S 3
	4.0	CH				N=6	S 3
687.6			COLOR CHANGE LT. ORANGE V SOFT V. MOIST.		M-4 P309 4.5 5.0; D-4 5.0 6.0	REC 1.5'; REF 4.5'-6.0'; PENETROMETER 0.5 TSF	S 0 / S 1
	5.0						
		CL				N=3	S 2
	6.0				M-5 PK4 6.0 6.5; D-5 6.5 7.5	REC 1.5'; REF 6.0'-7.5'; PENETROMETER 2.25 TSF	S 2 / S 2
	7.0	CL				N=5	S 3
					M-6 292 7.5 8.0; D-6 8.0 9.0	REC 1.5'; REF 7.5'-9.0'; PENETROMETER 1.5 TSF	S 3 / S 4 / S 4
	8.0	CL				N=16	
	9.0		MOIST W/ OCCAS FINE SAND.		M-7 P19 9.0 9.5	REC 1.5'; REF 9.0'-10.5'	S 2 / S 4
	10.0	CH					

ENG FORM	PROJECT		HOLE NO.

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE					Hole No. EDM-01
PROJECT: IOWA ARMY MONITORING WELL			INSTALLATION: OMAHA			SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0		SILTY LEAN CLAY (CL) stiff low plast non calc. moist lt. orange w/ occas fine sand		D-7 9.5 10.5	Penetrometer 2.25 TSF; 2, 7, N = 11; 10.5
	11.0					
	12.0					
	13.0					
	14.0					
	15.0					15.0; 5, 4
		CL			M-8 S197 15.0 15.5	Rec 1.5' Rep 15.0'-16.25'; 5, 2
	16.0					
675.85	16.25		saturated med plast Med. stiff calc.		D-8 15.5 16.5	Penetrometer 1.5 TSF; 5, 2, N = 4; 16.5
	17.0				U.1 17.0-18.9	PSI 1500 for 5 sec last 2" harder End of tube slightly bent
	18.0					
					D 2.0 R 2.9	
	19.0					
	20.0				M-9 P997 20.0 20.5	20.0; Rep 16.25'-22.0' Rec 1.5'; 5, 3
					D-9 20.5 21.5	Penetrometer 3.25 TSF; 5, 5
	21.0	CL				5, 7, N=12; 21.5
	22.0					

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE

Hole No. EDA-01

PROJECT: IOWA AAP MONITORING WELLS | INSTALLATION: OMAHA | SHEET 3 OF 3 SHEETS

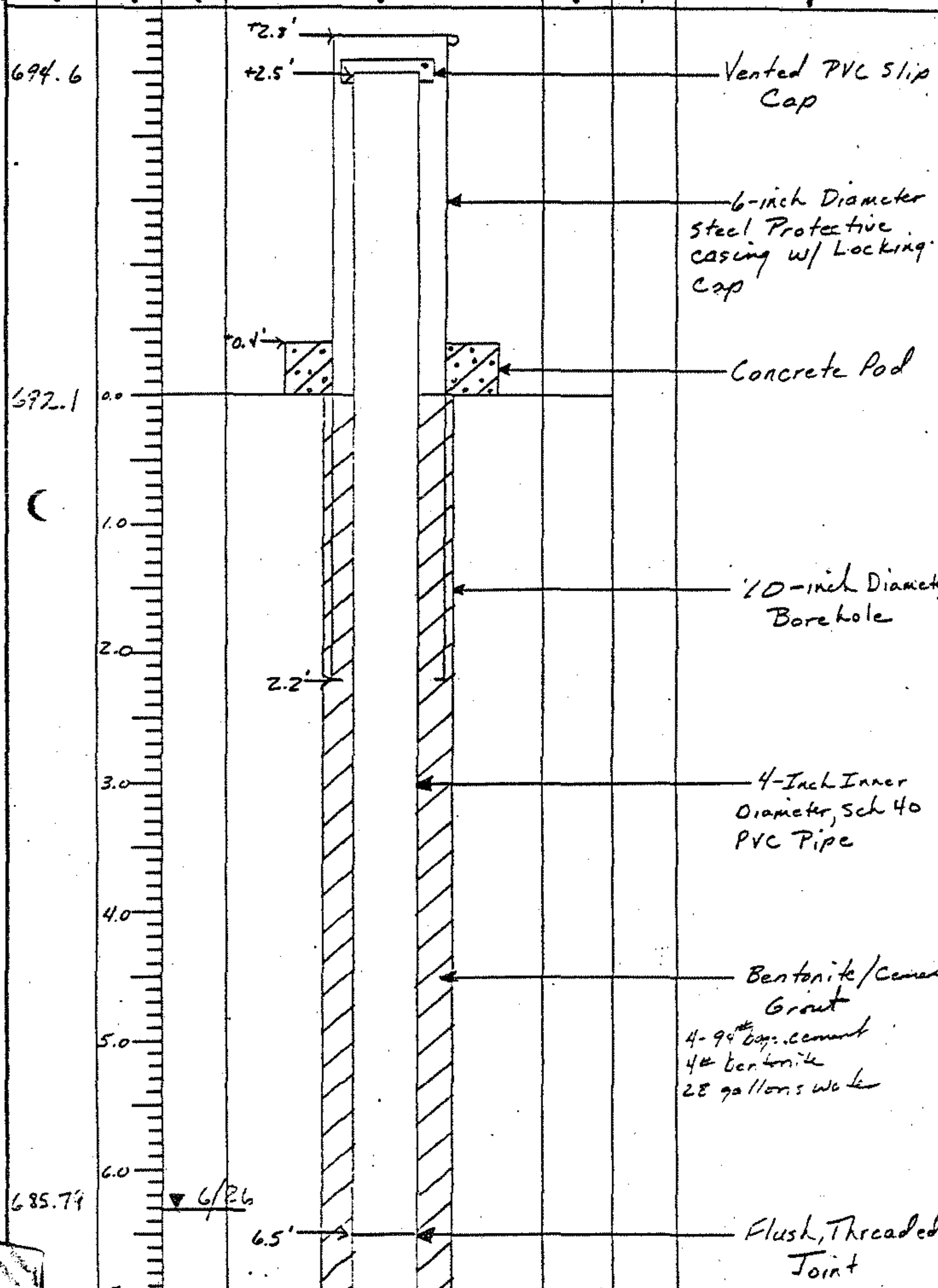
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	22.0		SILTY LEAN CLAY (CL) MED PLAST MED STIFF CALC.			
	23.0		SATURATED LT ORANGE W/SOME FINE SAND		U-2 230 - 250	1200 LBS PSI FOR 5 SEC
	24.0		W/OCCAS MED-COARSE SAND. ≈ 3-5% SAND W/ OCCAS SANDY STREAMERS. ≈ 0.01-0.02' THICK			
	25.0				220 R20	250
					A-7 PEG3 250 25.9	REP. 220 - 26.5 REC 0.9 PENETROMETER 3.25TSF	S 0
	26.0	CL			D-10 25.4 25.7	N=5	S 0 S 5
665.6	26.5					BOTTOM OF HOLE 26.5 @ 26.5' WL: 12.75 END SHIFT @ 5:50
	27.0					BEGIN SHIFT 8:30 WL 6.27 7-12-94 HOLE DEPTH 11.5' REAMED HOLE W/ 10" DIA auger TO 26.6' LIMESTONE FRAG ON BOTTOM OF AUGER ≈ 3" DIA
	28.0					
	29.0					
	30.0					
	31.0					
	32.0					
	33.0					
	34.0					

Hole No. [illegible]

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Fort ... OB/OC Grounds Monitoring ...
2. LOCATION (Coordinates or Station): N 2?25111 E 263756?
3. DRILLING AGENCY: US-CE-C Omaha District
4. HOLE NO. (As shown on drawing title and file number): EOA-01
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 7/12/84 COMPLETED 7/12/84
17. ELEVATION TOP OF HOLE: 692.1
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

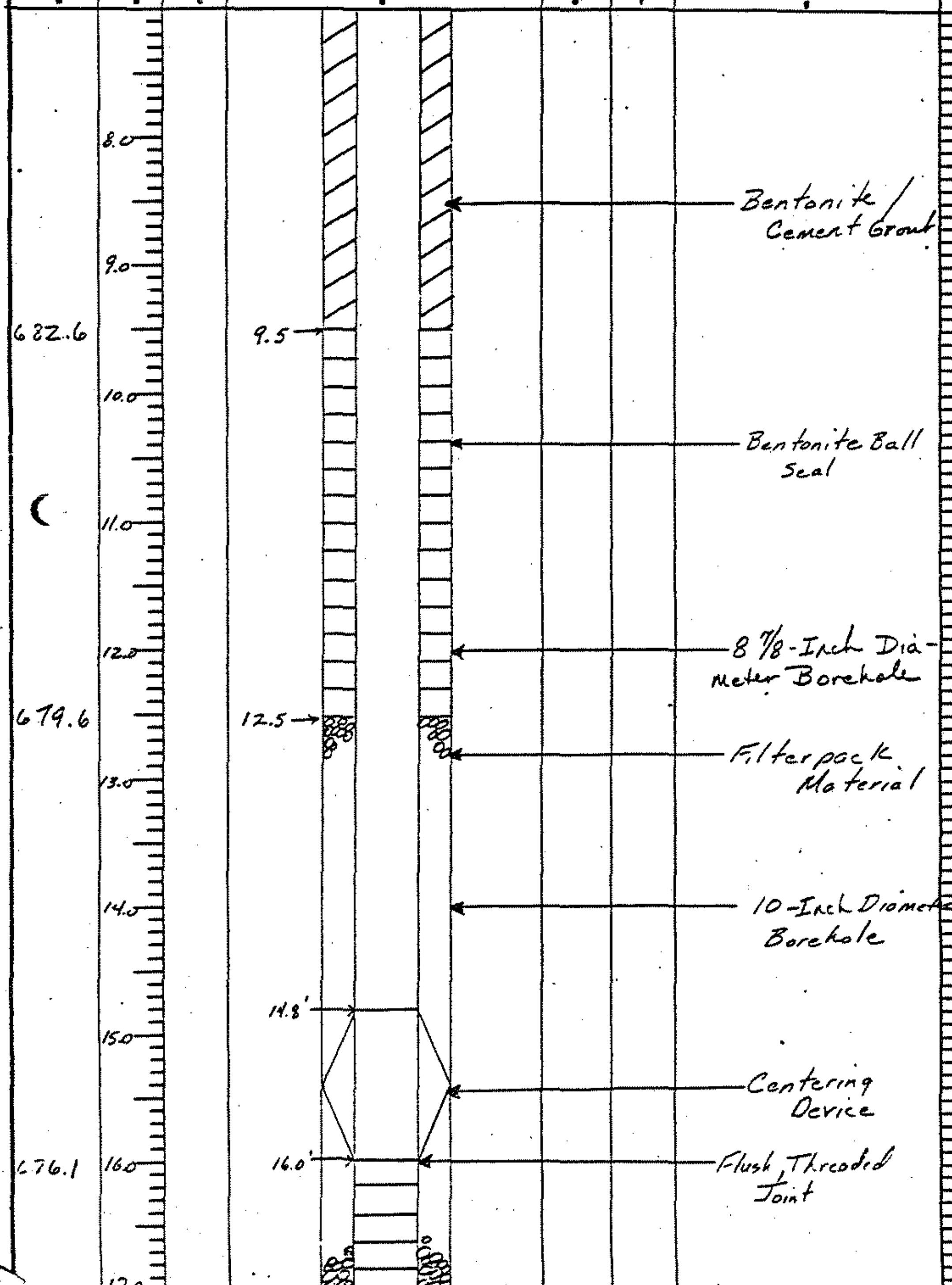


Hole No. E/ ...

DRILLING LOG

DIVISION	Huntsville
INSTALLATION	
SHEET	2 OF 3 SHEETS
1. PROJECT	Iowa AAP OB/OD Grounds Monitoring Wells
10. SIZE AND TYPE OF BIT	
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
2. LOCATION (Coordinates or Station)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
3. DRILLING AGENCY	US-CE-C Omaha District
4. HOLE NO. (As shown on drawing title and file number)	EDA-01
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER	
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
16. DATE HOLE	STARTED: — COMPLETED: —
17. ELEVATION TOP OF HOLE	
7. THICKNESS OF OVERBURDEN	
18. TOTAL CORE RECOVERY FOR BORING	%
8. DEPTH DRILLED INTO ROCK	
19. SIGNATURE OF INSPECTOR	
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

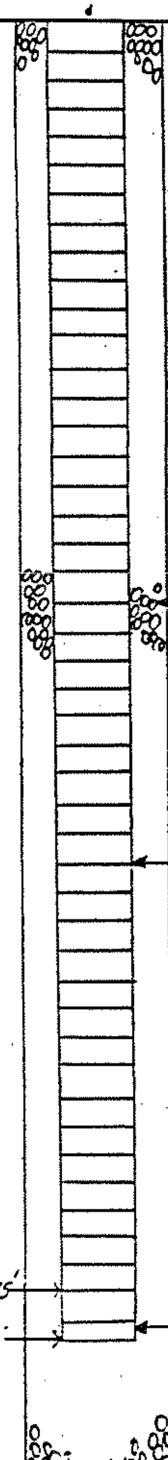


Hole No. EL - -

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 3 OF 3 SHEETS

1. PROJECT Fours AFP 00/00 Grounds Monitoring	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY US-CE-L Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) EOA-01	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	18.0					
	19.0					10" Diameter Borehole
	20.0					
	21.0					Filterpack Material
	22.0					
	23.0					4-inch Inner Diameter, PVC, Sch 40 Preslotted Well Screen, 0.020-inch slots
	24.0					
	25.0		25.75'			
666.0	26.0		26.1'			PVC, Flush Joint, Threaded End Cap
	27.0					▼ W.L. Measured before develop.



Hole No. EDA-02

DRILLING LOG	DIVISION ~~MRD~~ Huntsville	INSTALLATION ~~Omaha~~	SHEET 1 OF 3 SHEETS

1. PROJECT: IOWA AAP MONITORING WELL
2. LOCATION (Coordinates or Station): N 301739 E 2637160
3. DRILLING AGENCY: MS-CE-C Omaha District
4. HOLE NO. (As shown on drawing title and file number): EDA-02
5. NAME OF DRILLER: O'MALLEY
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 17.2
8. DEPTH DRILLED INTO ROCK: 14.4
9. TOTAL DEPTH OF HOLE: 31.6
10. SIZE AND TYPE OF BIT: 6" DIA FLIGHT AUGER
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME-55
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 21 ; UNDISTURBED W/A SHELBY
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER: 654.0
16. DATE HOLE: STARTED 7 3 84 ; COMPLETED 7 4 84
17. ELEVATION TOP OF HOLE: 671.2
18. TOTAL CORE RECOVERY FOR BORING: 100 %
19. SIGNATURE OF INSPECTOR: Richard [illegible]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0	CH	SILTY LEAN CLAY (CL) STIFF MED-LOW PLAST NON CALC. DRY-SL MOIST LT. ORANGE BROWN W/ OCCAS ROOT FRAG.		D-1 0.0 0.3	6" diameter flight auger. DTS N=14 REC 0.3 REP 0.0-1.5 PENETROMETER 7 4.5 1.5	5 5 5 7 5 7
	1.0						
	2.0	CH			D-2 1.5 1.9	REC 0.4 REP 1.5-3.0 PENETROMETER 7 4.5 N=9 3.0	5 5 5 5 5 4
	3.0	CH	DECREASE IN ROOT FRAG		M-3 [illegible] 3.0 3.5 D-3 3.5 4.1	REC 1.1 REP 3.0-4.5 PENETROMETER 2.0 TSF N=7 4.5	5 2 5 3 5 4
	4.0						
	5.0	SC	W OCCAS FINE SAND MAX DIA 1/16 SUBANGULAR-SUBROUNDED		M-4 [illegible] 4.5 5.0 D-4 5.0 6.0	REC 1.5 REP 4.5-5.7 PENETROMETER = 3.0 TSF N=14 6.0	5 3 5 6 5 8
	6.0	SC			M-5 P445 6.0 6.5 D-5 6.5 7.0	REC 1.0 REP 5.7-8.0 PENETROMETER = 4.0 TSF N=15 7.5	5 4 5 6 5 9
	7.0						
663.2	8.0	CL	D. SILTY LEAN CLAY CL DENSE LOW PLAST NON CALC. SL MOIST - MOIST LT. ORANGE BROWN - LT. GRAY MOTTLED		M-6 P325 7.5 8.0 D-6 8.0 8.9	REC 1.4 REP 8.0-9.0 PENETROMETER 4.0 TSF N=15 9.0	5 8 5 7 5 8
	9.0	CL			M-7 [illegible] 9.0 9.4 D-7 9.4 [illegible]	REC 0.8' REP 9.0-10.0 PENETROMETER 4.5 TSF	5 4 5 5
	10.0						

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE

Hole No. EDAO-4

PROJECT: IOWA AAP MONITORING WELL

INSTALLATION: OMAHA

SHEET 5 OF 7 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0		V. SILTY LEAN CLAY (CL) DENSE LOW PLAST. NON CALC. MOIST LT. ORANGE BROWN W/ OCCAS FINE SAND.			N = 11 5 6 10.5
	11.0					
	12.0					
	13.0					
	14.0		BURLINGTON LIMESTONE HARD V. HIGHLY WEATHERED HIGHLY FRACTURED V. CALC. DOLOMITIC FOSSILIFEROUS LT. TAN - CREAM SATURATED			
	15.0					15.5 5 3
	16.0	CL			M.S Pla 15.5 16.0 B.S 160 17.0	REP. 11.0 - 17.2 REC 1.5 5 6 N = 14 5 8
	17.0					17.0
654.0	17.2					DRILL CHATTER @ 17.2 CHIPS OF LIME STONE CAME UP IN CUTTINGS SWITCHED TO 6" DIA HOLLOW STEM HIT VOID FILLED W CLAY
	18.0		V. SILTY LEAN CLAY (CL) DENSE LOW PLAST ~~SL~~ CALC. SATURATED LT. ORANGE BROWN			
	19.0					
651.4	19.8					
	20.0		BURLINGTON LIMESTONE HARD V. HIGHLY WEATHERED HIGHLY FRACTURED V. CALC. DOLOMITIC FOSSILIFEROUS LT. TAN - CREAM			
	21.0					
649.4	21.8					
	22					

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE

Hole No. E040-2

PROJECT	INSTALLATION	SHEET
IOWA AAP MONITORING WELL	OMAHA	3 OF 5 SHEETS

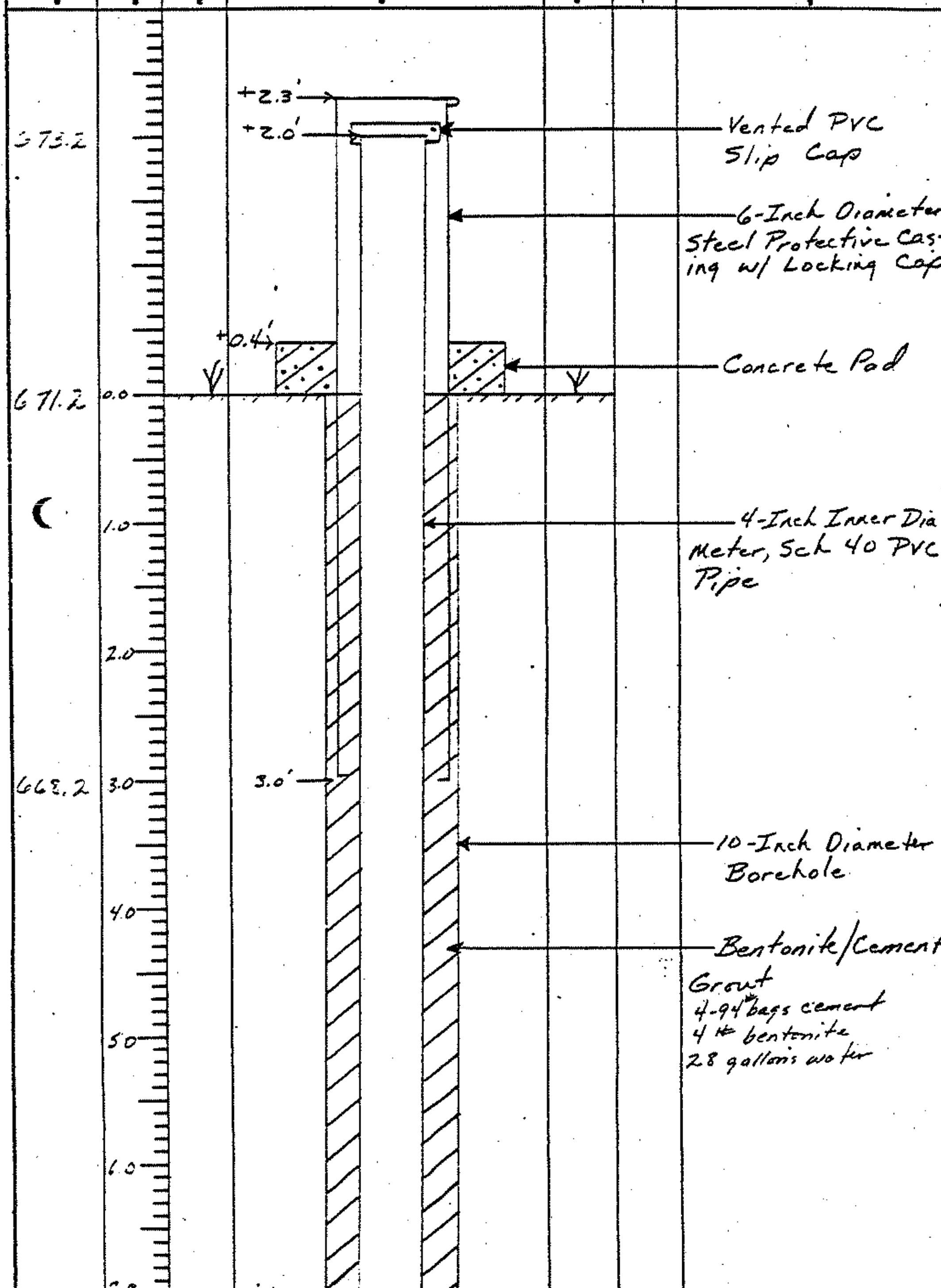
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	22.0		BURLINGTON LIMESTONE HARD V. HIGHLY WEATHERED HIGHLY FRACTURED V. CALC. DOLOMITIC FOSSILIFEROUS LT. TAN - CREAM			HOLE DEPTH 22.6 DRY HOLE @ 2.30 END SHIFT 22.6
648.79 646.6	22.1 22.6 23.0	CL				BEGIN SHIFT 7.30 DRY HOLE HOLE DEPTH 22.6' TAGGED HOLO STEM 17.42 WL 8:05 HOLE DEPTH 22.5 REFUSAL @ 22.7
	24.0		SILTY LEAN CLAY DENSE LOW PLAST - MED PLAST CALC. SATURATED LT. ORANGE BROWN		D-1 22.6 22.7	REF 22.6 - 31.6
			LIMESTONE (BURLINGTON) HARD HIGHLY WEATHERED SL. FRACTURED V. CALC. DOLOMITIC LT. GRAY		RUN #1	DRILLED TO 22.0' SWITCHED TO HOLLOW STEM DRILLED TO 24.5' Switched to NX core barrel w/ diamond bit
	25.0 25.2 25.3	MEC FRAC				
645.5	25.7 25.77	MEC FRAC	LIMESTONE MOD HARD HIGHLY WEATHERED SL FRACT V. CALC. SHALEY LT. GRAY			
645.0	26.0 26.1 26.2					
	26.8 27.0	MEC FRAC	LIMESTONE (BURLINGTON) HARD HIGHLY WEATHERED SL. FRACT V. CALC. DOLOMITIC LT. GRAY	100%		
	27.45 28.0 28.1 28.2	MEC FRAC				
	28.5 28.7 28.8 29.0	MEC FRAC			D 44 R 44	
	29.1 29.3 29.35	MEC FRAC				
	30.0 30.2	MEC FRAC	LIMESTONE MOD HARD HIGHLY WEATHERED SL. FRACT. V. CALC. SHALEY LT. GRAY			
640.8	30.4					
	30.9 31.0	MEC FRAC	LIMESTONE (BURLINGTON) HARD HIGHLY WEATHERED SL. FRACT V. CALC. DOLOMITIC LT GRAY		D 2.7 R 2.0	0.7' LEFT IN HOLE
639.6	31.6 32.0					BOTTOM OF HOLE @ 30.4' REAMED HOLE TO 17.2' W 10" DIA FLIGHT AUGER REAMED TO 29.5 W/ 8 7/8" DIA TRICONE ROLLER BIT.
	33.0					
	34.0					

HOLE NO. EDA-02

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 1 OF 4 SHEETS

1. PROJECT Eva... AAP OB/OD Grounds Monitoring Well	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station) N 301738 E 2637160	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY US-CE-C -Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) EDA-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER M. O' Malley	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	16. DATE HOLE — STARTED 7/10/84 — COMPLETED 7/11/84
	17. ELEVATION TOP OF HOLE 671.2
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR Richard P. Lucas
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

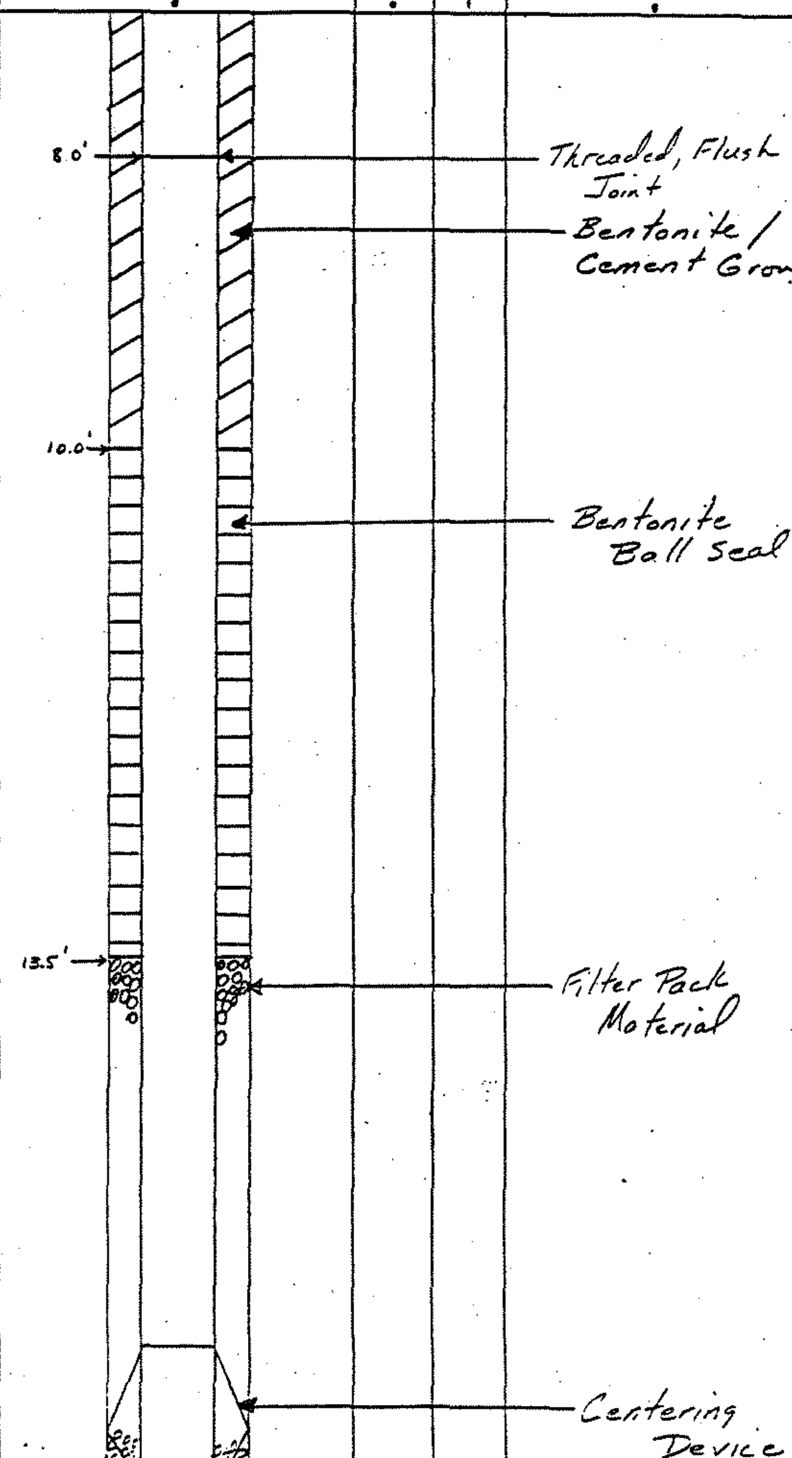


PROJECT | HOLE NO.

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 2 OF 4 SHEETS

1. PROJECT: Iowa AAP OB/OD Grounds Monitoring Wells
2. LOCATION (Coordinates or Station):
3. DRILLING AGENCY: US-CE-C -Omaha District
4. HOLE NO. (As shown on drawing title and file number): EOA-02
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	8.0		8.0'			
	9.0					
661.2	10.0		10.0'			
	11.0					
	12.0					
	13.0					
657.7			13.5'			
	14.0					
	15.0					
	16.0					
	17.0					

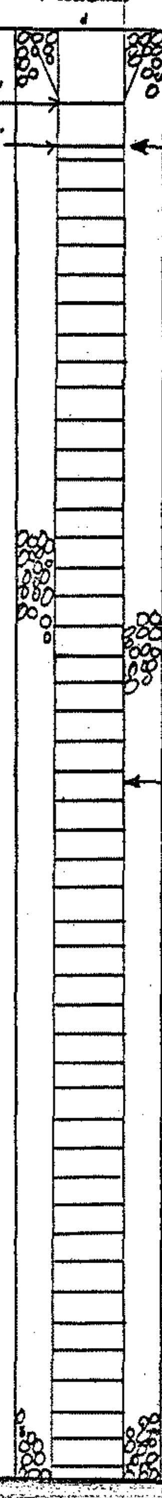


Hole No. EDA-02

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 3 OF 4 SHEETS

1. PROJECT Fort AAF OB/OD Groundw Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY US-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) EDA-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	17.0					
653.4			17.5'			
			17.8'			Threaded, Flush Joint
653.15	18.0	7/26				
	19.0					
	20.0					
	21.0					Filter pack Material
	22.0					4-Inch Inner Diameter, sch 40, pre-slotted well screen, 0.020-inch slots
	23.0					
	24.0					10-Inch Diameter Bore hole
	25.0					
	26.0					
	27.0					

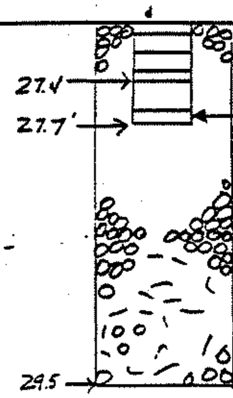


Hole No. E[illegible]

DRILLING LOG | DIVISION: Huntsville | INSTALLATION: | SHEET [illegible] OF 4 SHEETS

1. PROJECT: Iowa AAP OB/OD Ground. Monitoring Wells
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY: US-CE-C Omaha District
4. HOLE NO. (As shown on drawing title and file number): EDA-02
5. NAME OF DRILLER
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
643.5						PVC, Threaded, Flush Joint, End Cap
	28.0					Filter Pack Material
	29.0					Filter Pack Material + Slough
						NX Core taken to 31.6 feet.
						▼ W.L. as measured before slug test.



Hole No. EDA-03

DRILLING LOG	DIVISION: ~~MRD~~ Huntsville	INSTALLATION: ~~[illegible]~~	SHEET 1 OF 3 SHEETS

1. PROJECT: Iowa AAP Monitoring Wells	10. SIZE AND TYPE OF BIT: 6" DIA FLIGHT AUGER
2. LOCATION (Coordinates or Station): N 301516 E 2637405	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75
4. HOLE NO. (As shown on drawing title and file number): EDA-03	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 1.5 JAR, 11 [illegible]; UNDISTURBED [illegible]
5. NAME OF DRILLER: O'MALLEY	14. TOTAL NUMBER CORE BOXES: NA
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 27.7
	16. DATE HOLE: STARTED 7-6-84; COMPLETED 7-6-84
7. THICKNESS OF OVERBURDEN: 25.6	17. ELEVATION TOP OF HOLE: 674.1
8. DEPTH DRILLED INTO ROCK: 13.9	18. TOTAL CORE RECOVERY FOR BORING: NA %
9. TOTAL DEPTH OF HOLE: 39.5	19. SIGNATURE OF INSPECTOR: Richard G. [illegible]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0	CH	SILTY LEAN CLAY (CL) + STIFF, LOW-MED PLAST, NON CALC., SL. MOIST, MOTTLED LT. GRAY BROWN - LT. ORANGE BROWN W/ DECREAS ROOT FRAG		D-1 0.0 0.4	BEGAN DRILLING W 6" DIA FLIGHT AUGER; N=8; REP 0.0-1.5 REC 0.4 PENETROMETER 7.45 TSF 1.5	S 4 / S 5 / S 3
672.6	1.5	CL	DECREASE IN ROOT FRAG		M-2 P947 1.5 1.9; D-2 1.9 2.5	N=5; REP 1.5-3.0 REC 0.8 PENETROMETER 2.75 TSF 3.0	S 3 / S 2 / S 3
671.1	3.0	CL	COLOR CHANGE TO LT ORANGE-BROWN MOIST. MED-PLAST		M-3 P17 3.0 3.5; D-3 3.5 4.5	N=5; REP 3.0-4.6 REC 1.5 PENETROMETER 2.0 TSF 4.5	S 2 / S 2 / S 3
	4.6	CL	COLOR CHANGE LT-GRAY BROWN		M-4 585 4.5 5.0; D-4 5.0 5.9	N=8; REP 4.6-6.0 REC 1.4 PENETROMETER 2.0 TSF 6.0	S 2 / S 4 / S 4 / S 3
	7.0	CH			M-5 P797 6.0 6.5; D-5 6.5 7.5	N=11; REP 6.0-7.5 REC 1.5 PENETROMETER 2.5 TSF 7.5	S 4 / S 7 / S 3
665.6	8.5	CL	W/ FE OXIDE STAINS		M-6 P271 7.5 8.0; D-6 8.0 9.0	N=11; REP 7.5-9.0 REC 1.5 PENETROMETER 2.5 TSF 9.0	S 4 / S 7 / S 3
	10.0				M-7 5278 [illegible]		S 5

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. EDR-03

PROJECT: IDWARAF MONITORING WELL | INSTALLATION: MRD | SHEET 2 OF SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0	CL	SILTY LEAN CLAY (CL) -STIFF MED PLAST NON CALC. MOIST LT. GRAY BROWN W/ FEOXIDE STAINS AND FRAG CARBON		D-7 9.5 10.0	REP 9.0-12.7 REC 1.5 PENETROMETER 3.0 TSF N=12 (5, 7) 10.5
	11.0					
	12.0					
	12.7		COLOR CHANGE TO LT. ORANGE BROWN			
	13.0					
	14.0					
	15.0				D-8 P135 15.0 15.5	15.0 (5, 3)
	16.0	CL			D-8 15.5 16.4	REC 1.4 REP 12.7-18.3 PENETROMETER 3.5 TSF N=13 (5, 5) (5, 8) 16.5
	17.0					
	18.0					
	19.0					
	18.3		MOTTLED LT ORANGE BROWN AND LT GRAY BROWN			
	20.0				M-9 P442 20.0 20.5	20.0 N = 14 (5, 4) (5, 6)
	21.0	CH			D-9 20.5 21.5	REC 1.5 REP 18.3-25.0 PENETROMETER 3.5 TSF (5, 8) 21.5
	21.5					

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE

Hole No. EDA-03

PROJECT: IOWA AAP MONITORING WELL.
INSTALLATION: MRD
SHEET 3 OF 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	22.0		SILTY LEAN CLAY (CL) Med. Stiff MED PLAST NON CALC. MOIST MOTTLED. LT. ORANGE BROWN AND LT. GRAY BROWN			
	23.0					
	24.0					
	25.0		W FRAG OF LIME STONE MAX DIA 3/8' CALC.		M-10 H234 25.0 25.6	REC 0.4 REF 25.0-25.6 YIELD [illegible] 8.6 FT REF 25.6-30.05 REFUSAL 25.9
			LIMESTONE V. HIGHLY WEATHERED LT. GRAY-CREAM V. CALC SHALEY HIGHLY FRACTURED VUGGY W/MANY SMALL VUGS OF 0.1' OR LESS		D-10 25.6 25.9	
	26.0					
	27.0					
	27.7		SATURATED			
Cav-ered	27.8 28.0		CLAY FILLED VUG			
	28.6 28.7		CLAY FILLED VUG			
	29.0					WATER LEVEL 27.7' @ 12:15
	30.0 30.05		VOID			
			SILTY LEAN CLAY (CL) DENSE LOW PLAST V CALC SATURATED LT. ORANGE W/ V SMALL FINE SAND SIZE LIME STONE FRAG		M-11 P155 30.0 30.5 D-11 30.0 31.5	REC 1.1 REF 30.05- N= 45
	31.0					
	32.0					
	32.6		LIMESTONE V. HIGHLY WEATHERED LT. GRAY V. CALC MASSIVE V. HIGHLY FRACT W FRACTURES TO 0.1'-0.4'			DRILL CHATTER STARTED ~ 32.6.
	33.0					TRIED SHELBY REFUSAL 1800 PSI @ 33.0' END EARLY EENT WL 25.35 BEGIN SHIFT 7:35 WL 19.3' HOLE DEPTH 22.2'
	34.0					

Sample blows (column beside remarks): 25.6 — 5, 6, 5, 50 — 26.5; 30.0 — 5, 23, 5, 46, 5, 29 — 31.5

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. EDA-03

PROJECT: Iowa AAP Monitoring Well | INSTALLATION: MRD | SHEET 4 OF 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	34.0		LIMESTONE V. HIGHLY Weathered LT. GRAY V. CALC. MASSIVE V. HIGHLY FRACT W/ FRACT ≈ EVERY 0.1'-0.4'			@ 7:30 NO CUTTINGS IN RETURNS LT GRAY GRANULAR LIMESTONE FRAG. ON AUGER WHEN PULLED FROM HOLE
	35.0					
	36.0					
	37.0					
	38.0					
	38.5		DECREASE IN FRACT			SOLID BED ROCK
	39.0					
	39.5		Bottom of Hole			USED 6" DIA FLIGHT AUGER TO 39.5' REAMED HOLE W/ 8 3/4" TRI CONE ROCK BIT
	40.0					
	41.0					
	42.0					
	43.0					
	44.0					
	45.0					
	46.0					

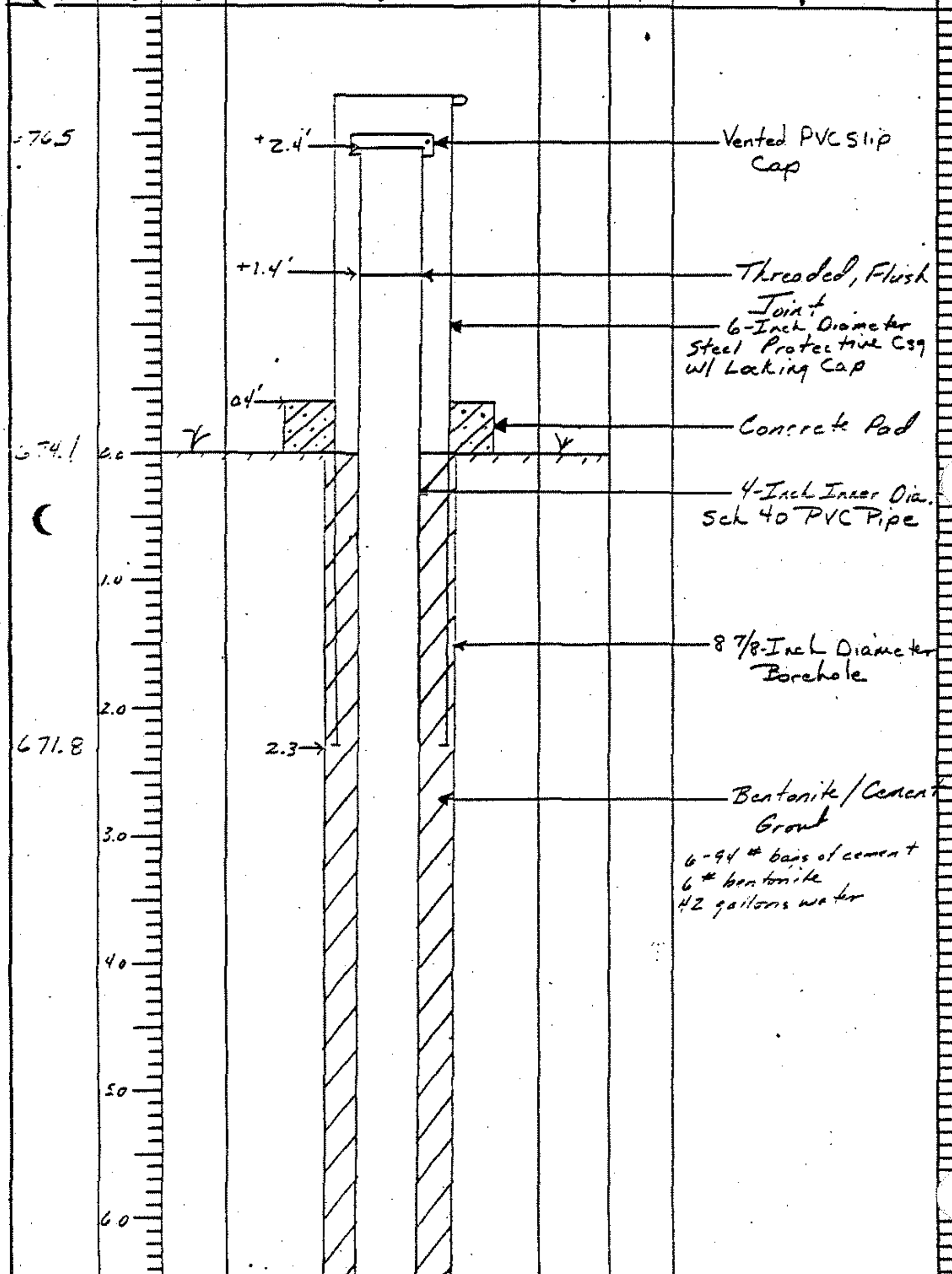
ENG FORM ... PROJECT Iowa AAP | HOLE NO.

Hole No. —

DRILLING LOG

Field	Entry
DIVISION	Huntsville
INSTALLATION	
SHEET 1 OF 5 SHEETS	
1. PROJECT	Tan Alpoe/20 Grounds Monitoring Wells
2. LOCATION (Coordinates or Station)	N 301516 E 2637405
3. DRILLING AGENCY	U.S.-CE-C - Omaha District
4. HOLE NO. (As shown on drawing title and file number)	EDA-03
5. NAME OF DRILLER	M. O'Malley
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: — UNDISTURBED: —
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 7-9-84 COMPLETED 7-10-84
17. ELEVATION TOP OF HOLE	674.1
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	Richard P. Lucas

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g

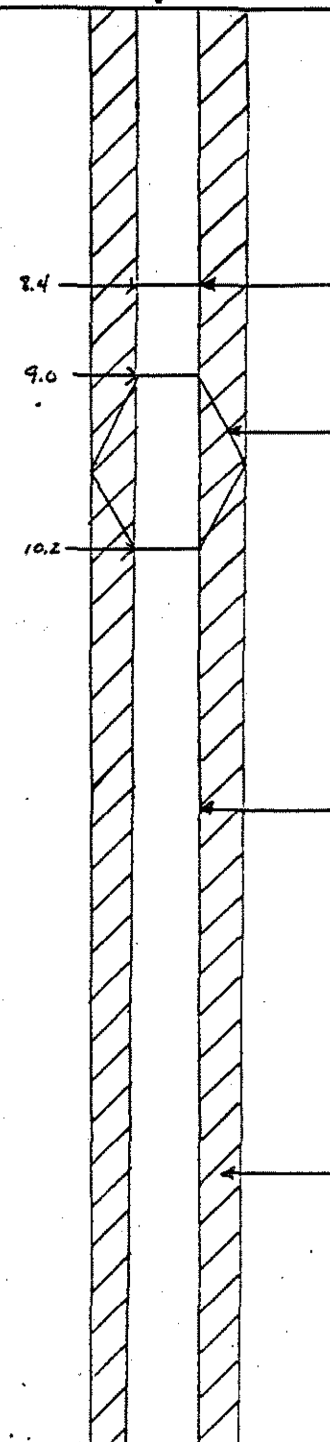


Hole No. ECA-[illegible]

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET — OF - SHEETS

1. PROJECT Iowa AAP [illegible] Ground Monitoring Well	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY U.S.-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	7.0					
	8.0		8.4			Threaded, Flush Joint
	9.0		9.0			Centering Device
	10.0		10.2			
	11.0					
	12.0					4-Inch Inner Dia. Sch. 40 PVC Pipe
	13.0					
	14.0					Bentonite/Cement Grout
	15.0					
	16.0					



Hole No. [illegible]

DRILLING LOG	DIVISION: Huntsville	INSTALLATION:	SHEET ___ OF 5 SHEETS

1. PROJECT: Iowa AAP SR/00 Grounds Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY: US-CE-C - OMAHA District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number): EDA-03	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED: / UNDISTURBED:
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED: / COMPLETED:
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

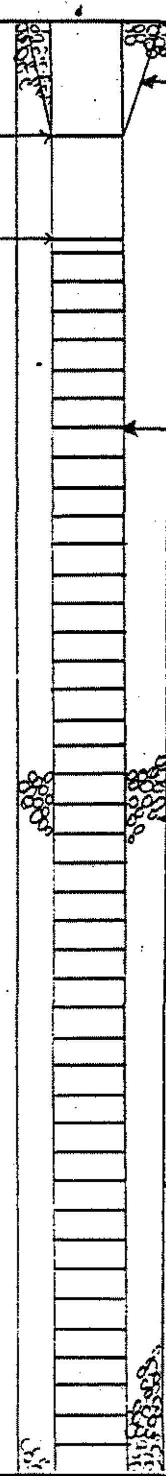
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	17.0					
656	18.0	▽ 7/19	18.2			Flush, Threaded Joint
	19.0					
	20.0					8 7/8-Inch Diameter Borehole
	21.0					4-Inch Inner Diameter, Sch. 40 PVC Pipe
	22.0					
651.1	23.0		23.0			
	24.0					Bentonite Ball Seal
649.2	25.0		24.9 25.0			
	26.0					Centering Device

Hole No. —

DRILLING LOG	DIVISION [illegible]	INSTALLATION	SHEET — OF [illegible] SHEETS

1. PROJECT [illegible] Well
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY [illegible]
4. HOLE NO. (As shown on drawing title and file number) [illegible]
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	27.0					Centering Device
			27.3			
646.1	28.0		28.0			
	29.0					4-Inch Inner Diameter sch 40 PVC Well Screen, 0.020 inch slots
	30.0					
	31.0					
	32.0					Filter Pack Material
	33.0					
	34.0					8⅝-Inch Diameter Borehole
	35.0					
	36.0					



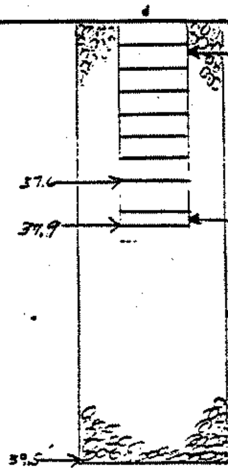
HOLE NO.

Hole No.

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) ECK-23	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						4-Inch Inner Diameter sch. 40 PVC Well Screen 0.020 inch slots
	37.0					
			37.6			
636.2	38.0		37.9			Threaded End Cap
						8½ Inch Diameter Boring
	39.0					Filter Pack Material
			39.5			
	40.0					
						▼ W.L. measured before slug test



Hole No. EDAO-

DRILLING LOG

DRILLING LOG	DIVISION ~~MRD~~ Huntsville	INSTALLATION ~~Omaha~~	SHEET 1 OF 2 SHEETS

1. PROJECT: IOWA AAP MONITORING WELLS
2. LOCATION (Coordinates or Station): N 302315 E 2638124
3. DRILLING AGENCY: US-CE-C Omaha District
4. HOLE NO. (As shown on drawing title and file number): EDAO-4
5. NAME OF DRILLER: O'MALLEY
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 21.5'
10. SIZE AND TYPE OF BIT: 7" DIA FLIGHT AUGER
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 75
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED [illegible] UNDISTURBED 2 SHELBY
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: 5.0' DEPTH
16. DATE HOLE: STARTED 6-28-84 COMPLETED 6-29-84
17. ELEVATION TOP OF HOLE: [illegible]
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: [illegible]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	BLOWS
	0.0	CL	SILTY LEAN CLAY (CL) ORGANIC TOPSOIL MED-LOW PLAST NON CALC. SL. MOIST DK. GRAY BROWN W/ DECAS ROOT FRAG			BEGAN DRILLING W/CME 75 W/ 7" DIA FLIGHT AUGER PENETROMETER 3.25 TSF	S 4, S 6, S 6
	1.0				M-1 P454 0.0 0.3	N=12	
[illegible]	1.3	CH	SILTY LEAN CLAY (CL) MED. STIFF MED-LOW PLAST NON CALC. MOIST LT. ORANGE BROWN		D-1 0.3 0.6	REC 0.0-1.3 1.5' REC. 0.6	S 3, S 3
	2.0				M-2 S217 1.5 1.9	N=9 REC 1.3-3.5 REC 0.7'	S 3, S 4
	3.0				D-2 1.9 2.3	PENETROMETER 2.25 TSF 3.0'	S 3
[illegible]		CH	COLOR CHANGE TO DK GRAY BROWN. MED DENSE		M3 P241 3.0 3.5	N=10 REC 1.4' 4.5'	S 4, S 6
	4.0				D-3 3.5 4.4	REC 3.5-4.5 PENETROMETER 3.0 TSF	S 4
	5.0	CH			M-4 P191 4.5 5.0	N=13 REC. 1.3 REC 4.5-5.9 6.0'	S 5, S 8
	5.9 / 6.0		W/ DECAS FINE SAND		D-3 5.0 5.8	PENETROMETER 2.75 TSF	S 6, S 7
	7.0	CH			M-5 S185 6.0 6.5	N=15 7.5' REC 1.5 REC 5.9-7.5	S 8
	7.5		DECREASE IN SAND		D-5 6.5 7.5	PENETROMETER 4.0 TSF	S 3, S 5
	8.0	CL	V. SILTY LEAN CLAY Med stiff LOW PLAST V. SL. CALC. SATURATED LT YELLOW TAN W/ V. FINE SAND			N=10	S 5, S 5
[illegible]	9.0				M-6 P273 7.5 [illegible] D-6 [illegible]	9.0' REC 1.5' REC 7.5-9.0 PENETROMETER 2.5 TSF	S 0, S 2
	10.0						

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. EDAO-4

PROJECT: IOWA AAP MONITORING WELLS | INSTALLATION: OMAHA | SHEET 2 OF SHEETS

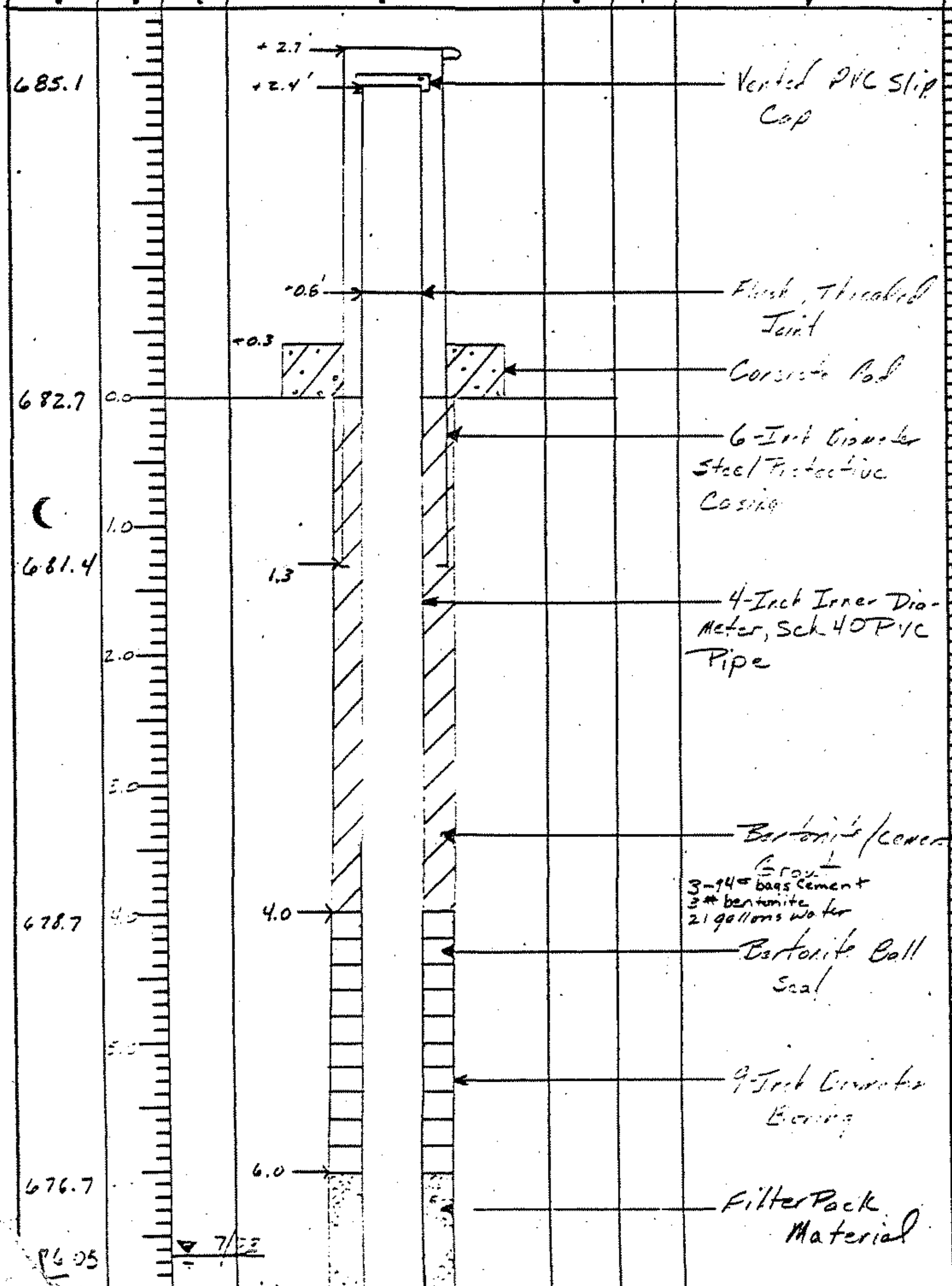
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0	CL	V. SILTY LEAN CLAY/CL Med. stiff Low plast V. SL. CALC.		A-7 5248 9.0 9.5	REC 1.5' N=4 REF 9.0-10.0 (5/2)
172.1	10.5		SATURATED LT. YELLOW TAN WITH FINE SAND COLOR CHANGE TO LT. ORANGE BROWN CALC.		D-7 9.5 10.5	PENETROMETER 1.25 TSF WL 8.9± (10.5)
	11.0					
	12.0					
	13.0					
	14.0					WL 13.5 @ 11:45 HOLE DEPTH 15.0 END SHIFT 6-28-84
	15.0				15.0	
					A.1	WL 10.7 @ 1:05 HOLE DEPTH 15.9' 6-29-84 BEGIN SHIFT
	16.0					1100 PSI FOR 5 SEC REC FROM SHELBY = 2.0'
					D 2.0 R 2.0	
	17.0				17.0 17.2	
					A.2	1250 PSI FOR 5 SEC REC FROM SHELBY = 2.0
	18.0					
	19.0				D 2.0 R 2.0 19.2	
	20.0				A-8 5265 20.0 20.5	(20.0) 5 4
	21.0					PENETROMETER 1.75 TSF (3 4)
		CL			D-8 20.5 21.5	N=13 REC 1.5 REF 10.6-21.5 (5 9)
2	21.5		BOTTOM OF HOLE @ 21.5			WL 17.50 @ 1:50 6-28-84 Reamed hole w/ 10" Auger (21.5)
	22.0					

Hole No. —

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 1 OF 2 SHEETS

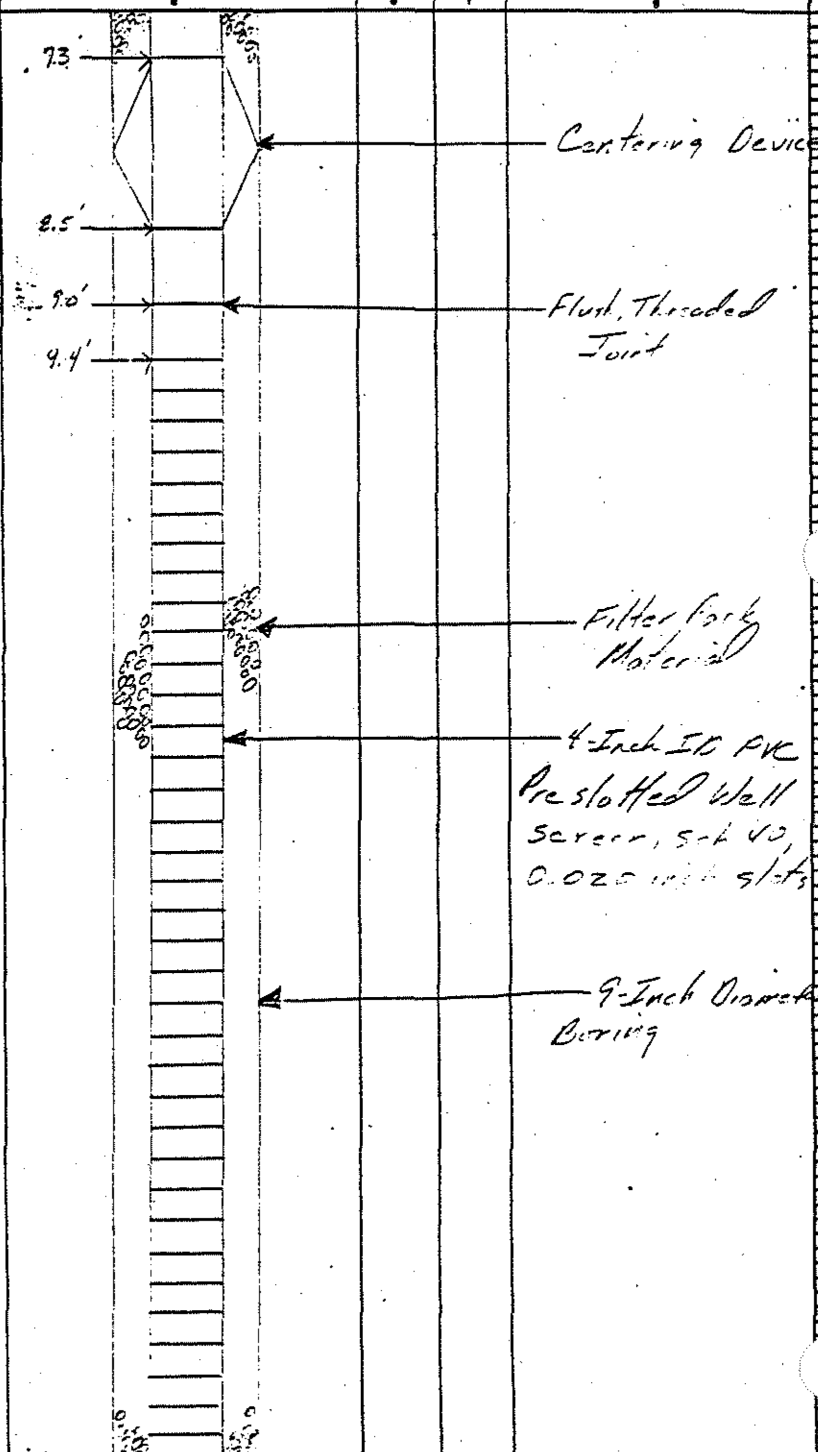
1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station) N 302315 E 263P124	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) ECK-04	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER M. O'Mollen	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED 6-29-84 — COMPLETED 6-29-84
	17. ELEVATION TOP OF HOLE 682.7
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR Richard P. Lewis
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g



DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 2 OF 3 SHEETS

1. PROJECT [illegible]	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY [illegible]	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) EGK-64	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
673.3	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0					

HOLE NO.

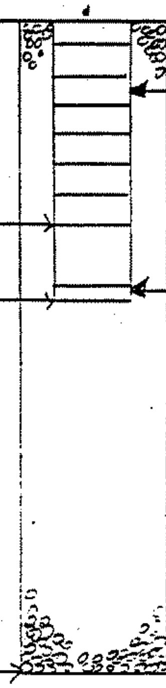
Hole No. —

DRILLING LOG

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 2 OF 2 SHEETS

1. PROJECT [illegible]	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station) [illegible]	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY [illegible]	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) EUK-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						4-Inch Diameter Preslotted PVC Well Screen 0.020 Inch slots
	18.0		18.4'			
			19.0			Threaded PVC Cap
663.7	19.5					
	20.0					
	21.0					Filter Pack Material
661.2			21.5'			
	22.0					▼ W.L. measured before slug test



Hole No. DA-0

DRILLING LOG	DIVISION: ~~SARD~~ Huntsville	INSTALLATION: ~~[illegible]~~	SHEET 1 OF 3 SHEETS

1. PROJECT: IOWA AAP MONITORING WELL	10. SIZE AND TYPE OF BIT: 6" DIA [illegible]
2. LOCATION (Coordinates or Station): N 209771 E 2614121	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL: CME
4. HOLE NO. (As shown on drawing title and file number): DA-01	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7 JAR; UNDISTURBED [illegible]
5. NAME OF DRILLER: O'MALLEY	14. TOTAL NUMBER CORE BOXES: 1
6. DIRECTION OF HOLE: [x] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 10.7' FROM TOP OF [illegible]
	16. DATE HOLE: STARTED 7 17 84; COMPLETED 7 18 84
7. THICKNESS OF OVERBURDEN: 7.9	17. ELEVATION TOP OF HOLE: 673.0
8. DEPTH DRILLED INTO ROCK: 15.6	18. TOTAL CORE RECOVERY FOR BORING: 62.2 %
9. TOTAL DEPTH OF HOLE: 23.5	19. SIGNATURE OF INSPECTOR: Richard O. [illegible]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0		SILTY LEAN CLAY(CL) MED DENSE MED PLAST. NON CALC. SL MOIST LT ORANGE BROWN W/ TRACE FINE SAND		M-1 P199 0.0 0.5		S 5, S 5
	1.0	CL			D-1 0.5 2.5	REC 1.5 REP 0.0-1.5 PENETROMETER 3.25 TSF N=12	S 5, S 8
					M-2 P39L 1.5 2.0		S 3
	2.0	CL			D-2 2.0 3.0	REC 1.5 REP 1.5-3.0 PENETROMETER 2.5 TSF N=13	S 6, S 7
	3.0				M-3 P694 3.0 3.5		S 4
	4.0	CL			D-3 3.5 4.4	REC 1.4' REP 3.0-5.0 PENETROMETER 3.0 TSF N=15	S 5, S 10
					M-4 P192 4.5 5.0		S 4
	5.0	CL	COLOR CHANGE TO LT. GRAY W/ FE OXIDE STAINING W/ OCCAS FINE-COARSE SAND		D-4 5.0 5.5	REC 1.5 REP 5.0-6.0 PENETROMETER 4.5 TSF DRILL CHATTER N=16	S 7, S 9
	6.0		COLOR CHANGE LT. ORANGE BROWN		M-5 M3.4 6.0 6.5		S 4
	7.0	CL			D-5 6.5 7.3	REC 1.3 REP 6.0-7.9 PENETROMETER 2.5 TSF N=15	S 6, S 9
	7.9				M-6 P734 7.5 7.9		S 4
665.1	8.0		BURLINGTON LIMESTONE HARD V.CALC. MOD WEATHERED CHERTY SL FRACT. LT. CREAM		D-6 7.9 8.4	REC 0.9 REP 7.9-9.0 PENETROMETER 1.5 N=96	S 36, S 50
	9.0					REFUSAL @ 9.1' REFUSAL @ 9.1'	60
	10.0				D-7 9.0 9.1	REC 0.1 REP 9.0- ~~PENETROMETER~~	

DRILLING LOG

DRILLING LOG	DIVISION: MRD	INSTALLATION: OMAHA	SHEET 2 OF 3 SHEETS

1. PROJECT: IOWA AAP MONITORING WELL	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number): DA-09	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR: Richard P. [signature]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0		FRACT CLOSED BURLINGTON		Run #1	DRILLED TO 10.0' W/
	10.1		LIMESTONE			6" DIA FLIGHT
	10.35		FRACT OPEN HARD			AUGER SWITCHED
	10.45		MASSIVE			TO NX CORE BBL
	10.6		MOD WEATHERED			W/ DIAMOND BIT
	10.7		OPEN V. HIGHLY FRACT			
	11.0		V. FRACTURED			GRADUAL
	11.1		V. CALC			WATER LOSS
	11.2		FRACT OPEN CREAMY color			
	11.4					
	11.6					
	11.75					
	12.0		V. HIGHLY FRACT			
	12.5		FRACT OPEN			
	13					
	13.8					
	14.0					
	14.05		FRACT OPEN			
	14.25				D 4.5 R 2.8	
	14.5		FRACT		Run 2	
	14.6		W/ FRACT			
	14.85					
	15.0		FRACT OPEN			CORAL FOSSIL
	15.25					@ 15.0'
			FRACT CLOSED W/ OCCASIONAL VUGS			
			VUGS AND FRACTURES			
	16		FILLED W/ GREEN			
			FRACT OPEN GLAUCONITIC			
	16.4		FRACT CLOSED CLAY.			
	17					
	17.05		FRACT CLOSED			
	17.15					
	17.2					
	17.45					
	17.5					
	18		FRACT OPEN			
	18.3		GRANULAR W/ OCCAS VUGS CRYSTAL LINED V. WEATHERED			
	18.9					
	19		FRACT CLOSED			
	19.1		SMALL QUARTZ CRYSTAL FILLED VUG			
	19.5		FRACT OPEN		D 5.0 R 5.0	
	20.0				Run #3	

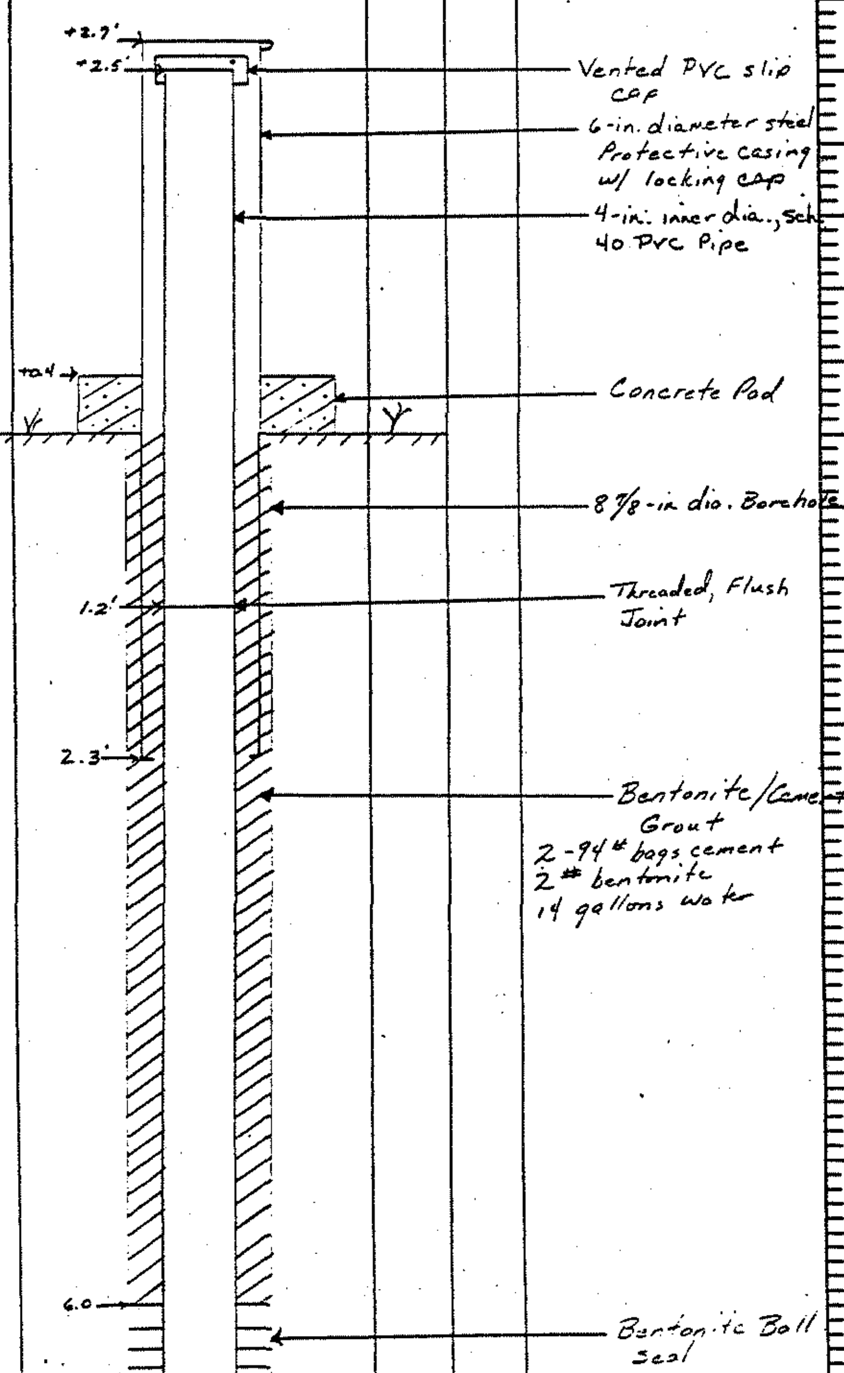
PROJECT | HOLE NO.

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE					Hole No. Dh-01
PROJECT JOWA ALY MONITORING WELL		INSTALLATION OMAHA				SHEET 2 OF SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20.0		LIME STONE MOD HARD GRANULAR MASSIVE V. WEATHERED V. FRACTURED V. CALC CREAMY Color	RUN 13		
	21.0					
	22.0					
	23.0		FRACT MEC	0.40 R30%		CORE FELL OUT TRIED TO RETRIEVE AND GRAVEL FELL IN FROM SIDE OF HOLE AND GROUND UPCORE
649.5	23.5					
	24.0					REAMED HOLE W 8 7/8" DIA TRICONE ROCK BIT. FROM 0.0 – 13.6
	25.0					BAILED HOLE TO 13.57 @ 3:00 END SHIFT 7-17-84
	26.0					WL 8.4' HOLE DEPTH 12.6' 7-18-84
	27.0					REAMED HOLE W 8 7/8" DIA TRICONE ROCK BIT TO 21.2'
	28.0					CORE IS IN 1 CORE BOX
	29.0					
	30.0					
	31.0					
	32.0					

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 1 OF 5 SHEETS
1. PROJECT Iowa AAP OB/OD Grounds Monitoring Wells		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station) N 290977 E 2614121		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY US-CE-C - Omaha District		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number) DA-01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER M. O'Molley		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED 7/18/84 COMPLETED 7/19/84
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE 673.0	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR Richard P. Lucas	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
675.5						
673.0	0.0					
	1.0					
	2.0					
670.7						
	3.0					
	4.0					
	5.0					
667.0	6.0					

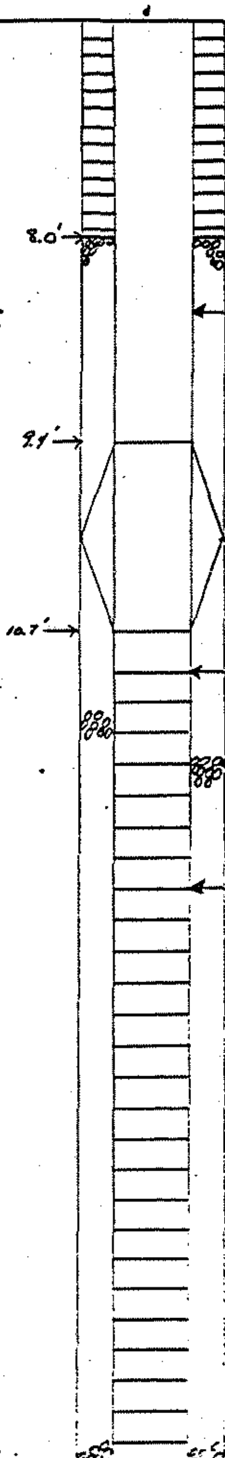


Hole No. [illegible]

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 2 OF 3 SHEETS

1. PROJECT Iowa AAP OB/OD Ground. Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY US-CE-C -OMAHA DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER M. O'Malley	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR Richard P Lucas

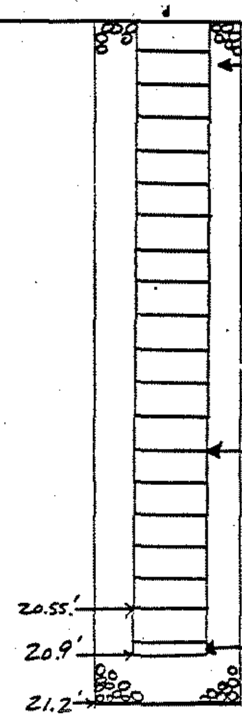
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	7.0					Bentonite Ball Seal
665.0	8.0		8.0'			
664.4		▽ 7/26				4-in. inner dia. sch 40 PVC Pipe.
	9.0		9.1'			
	10.0					Centering Device
			10.7'			
662.0	11.0					Threaded, Flush Joint
						Filterpack material.
	12.0					4-in. inner diameter sch. 40 PVC preslotted well screen, 0.020-inch slots
	13.0					
	14.0					
	15.0					
	16.0					



DRILLING LOG | DIVISION: Huntsville | INSTALLATION: | SHEET 2 OF 2 SHEETS

1. PROJECT: Iowa AAP OB/OD Grounds Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US-CE-C - Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number): DA-01	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER: M. O'Malley	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED: — COMPLETED:
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR: Richard P. Lucas

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	17.0					Filterpack Material
	18.0					8 7/8-inch diameter borehole
	19.0					4-inch Inner Dia., Sch. 40, PVC, Preslotted Well Screen, 0.020-inch slots
	20.0		20.55'			
652.1	21.0		20.9'			4-inch dia. flush joint, threaded end cap, PVC
			21.2'			
	22.0					Slough filled NX sized core hole to 23.5 feet
						▼ W.L. measured before slug test



PROJECT | HOLE NO.

Hole No. DA-02

DRILLING LOG	DIVISION ~~MRD~~ Huntsville	INSTALLATION ~~[illegible]~~	SHEET 1 OF ~ SHEETS

1. PROJECT: IOWA AAP MONITORING WELL	10. SIZE AND TYPE OF BIT: 6" DIA FLIGHT AUGER
2. LOCATION (Coordinates or Station): N 290470 E 2614960	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL: CME-75
4. HOLE NO. (As shown on drawing title and file number): DA-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7 [illegible] / UNDISTURBED NA
5. NAME OF DRILLER: O'MALLEY	14. TOTAL NUMBER CORE BOXES: NA
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 14.74 DEPTH
	16. DATE HOLE: STARTED 7-20-84 / COMPLETED 7-23-84
7. THICKNESS OF OVERBURDEN: 11.8	17. ELEVATION TOP OF HOLE: 678
8. DEPTH DRILLED INTO ROCK: 74.5	18. TOTAL CORE RECOVERY FOR BORING: NA %
9. TOTAL DEPTH OF HOLE: 76.1	19. SIGNATURE OF INSPECTOR: Richard Y. Zucas

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0		SILTY LEAN CLAY (CL) MED STIFF-STIFF MED PLAST. NON CALC. LT. ORANGE BROWN W/ TRACE FINE SAND W/ OCCAS ROOT FRAG. SL MOIST		M-1 PM5 0.0 0.4	Began drilling w/ 6" dia. flight auger.	S 5 / S 9
	1.0	CL			D-1 0.4 0.9	REC 0.9 REP 0.0-1.5 PENETROMETER 3.2 TSF N=13	S 4
	2.0	CL			D-2 P960 1.5 1.8		S 2
675.7	2.3		W/ OCCAS FINE-MED SAND MED ORANGE		D-2 1.8 2.1	REC 0.6 REP 1.5-2.3 PENETROMETER 2.75 TSF N=7	S 3 / S 4
	3.0				M-3 [illegible] 2.0 3.5		S 3
	4.0	CL			D-3 3.5 4.5	REC 1.5 REP 2.3-4.5 PENETROMETER 2.75 TSF N=13	S 5 / S 8
	5.0				M-4 P200 4.5 5.0		S 4
		CL			D-4 5.0 5.9	REC 1.4 REP 4.5-6.0 PENETROMETER 3.0 TSF N=18	S 7 / S 11
672.0	6.0		COLOR CHANGE MOTTLED MED ORANGE AND LT GRAY W/ LIMESTONE FRAG MAX DIA 1/4" SUBANGULAR MOIST W/ SOME FINE-COARSE SAND SUBANGULAR-SUBROUNDED MAX DIA 5/8"		M-5 P966 6.0 6.5		S 3 / S 6
	7.0	CL			D-5 6.5 7.3	REC 1.3 REP 6.0-7.5 PENETROMETER 2.45 TSF N=16	S 10
	8.0				M-6 P[illegible] 7.5 8.0		S 5
					D-6 8.0 9.0	REC 1.5 REP 7.5-9.0 PENETROMETER 3.75 TSF N=16	S 6 / S 10
	9.0				M-7 P260 9.0 9.5	REC 1.5 REP 9.0- PENETROMETER 4.0 TSF	S 4 / S 7
	10.0						

ENG FORM	PROJECT	HOLE NO.

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE

Hole No. DA-02

PROJECT: Iowa AAP monitoring well · INSTALLATION: OMAHA · SHEET 2 of 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.0		SILTY LEAN CLAY (CL) V. STIFF MED PLAST MOTTLED MED ORANGE AND LT. GRAY NON CALC. MOIST W/ SOME FINE-COARSE SAND AND LIMESTONE FRAG SUBANGULAR-SUBROUNDED MAX DIA 5/8"		D.7 9.5 10.5	N=17 10 10.5
	11.0					
666.2	11.8		LIMESTONE HARD			DRILL CHATTER @ 11.8'
	12.0					
	12.2	U FRACT	U. CALC		Run 1	REC 0.0' 12.2
		FRACT	U. FRACT. U. CALC. ~~HIGHLY~~ WEATHERED LT. ORANGE TAN GRITTY MASSIVE			
	13.0					
	14.0	U FRACT GROUND OUT				U. FRACT BED ROUGH 3' FRACT 0.1 ≈
663.26	14.74		SATURATED		D 2.7 RD.7	
	15.0				Run 2	
	16.0					
	16.9					
	17.0					
	17.5					
	18.0				D 3.4 RD 9	
					Run 3	
	19.0					
	20.0				D 1.6 R2.1	End shift WL 6.6' HD 12.4' @ 8:30 7-23-84
			LIMESTONE HARD U. CALC. U. FRACT CHERTY CLEAR/- LT GRAY MASSIVE			
	21.0					7-24-84 WL 6.6' HD. 12.4' STARTED TO CLEAN OUT HOLE W/ NX CORE BIT DIAMOND BIT BROKE OFF see note sheet 4
	22.0					

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. DA-02

PROJECT: Jones Ahy monitoring wells | INSTALLATION: Omaha | SHEET 3 OF 4 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	22.0		LIMESTONE HARD U. CALC U. FRACT HIGHLY WEATHERED CHERTY CREAMY - LT. GRAY MASSIVE			OFFSET HOLE 5' EAST OF ORIGINAL DRILLED FROM 0.0' TO 15.3' W/ 6" DIA FLIGHT AUGER HIT BEDROCK @ 11.7' HIT SOLID BEDROCK @ 15.3' GROUTED OLD HOLE WL @ 14.74' 18.9 - 20.2' U. FRACT. WL 14.74 HOLE DEPTH 25.2' END SHIFT 7-21-84
	23.0					
	24.0					
	25.0					7-23-84 WL 4.2' HD 25.2
			LIMESTONE U FRACT. EASY DRILLING			
	26.0		LIME STONE LESS FRACT HARD DRILLING			DRILLED HOLE TO 26.6' W/ 3⅞" DIA TRI CONE ROCK BIT
651.4	26.6					BOTTOM OF HOLE @ 26.6'
	27.0					
	28.0					
	29.0					
	30.0					
	31.0					
	32.0					
	33.0					
	34.0					

Hole No. [illegible]

DRILLING LOG	DIVISION MRD	INSTALLATION OMAHA	SHEET 4 OF 4 SHEETS

1. PROJECT: IOWA AAP MONITORING WELL
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number): DA-02
5. NAME OF DRILLER
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR: [signature]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						DUE TO LACK OF WATER CIRCULATION DUE TO FAULTY WATER SWIVEL DIAMOND BIT LOCKED INTO BED ROCK AND SNAPPED OFF CORE BX ATTEMPTED TO RETRIVE BY ROCKBITTING TO DIAMOND BIT AND USING AW OVER SHOT TRIED TO RETRIVE, UNSUCCESSFUL LEFT DIAMOND POINT BIT, S/N SPBZ586, IN HOLE GROUTED HOLE.

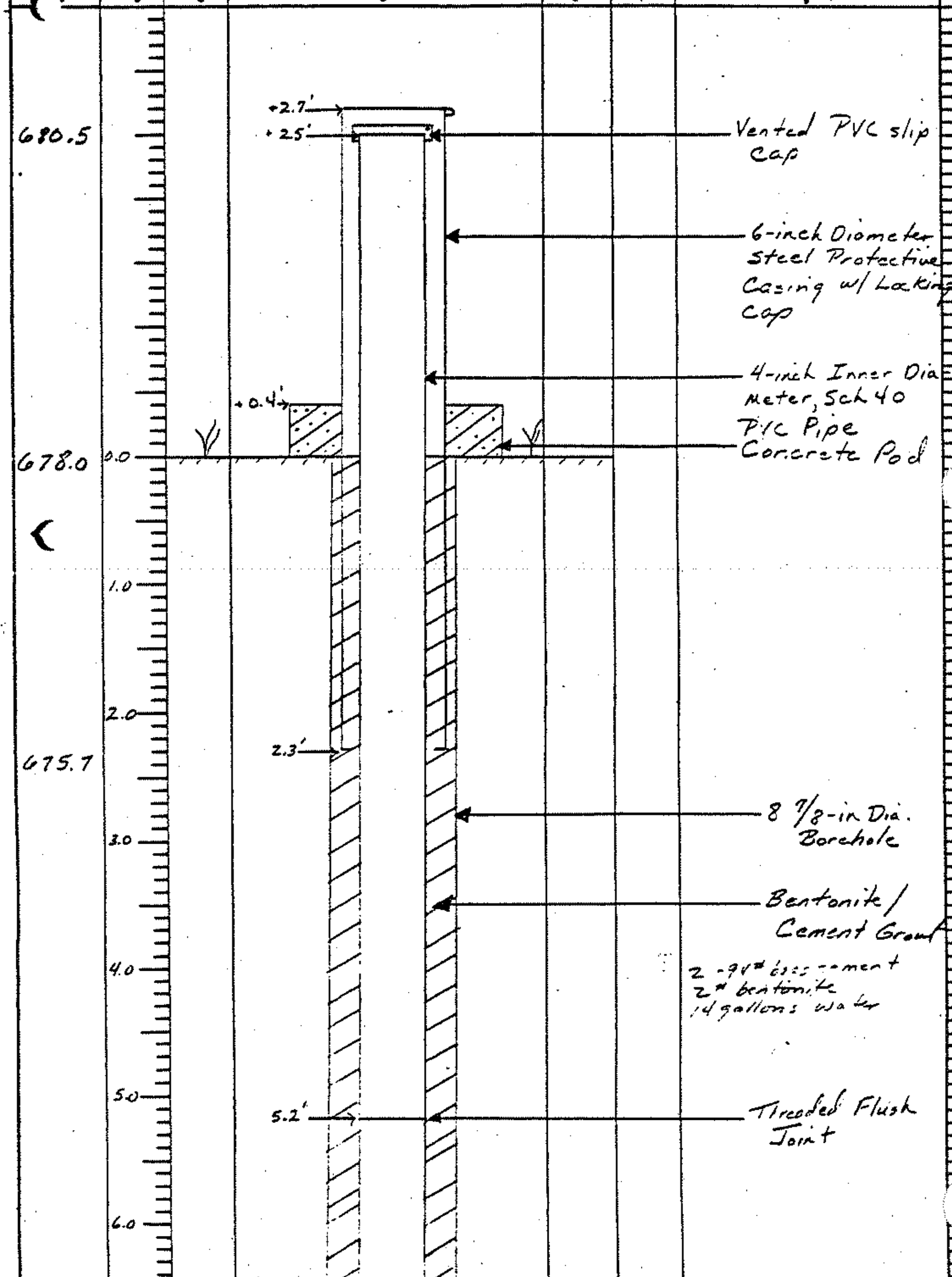
PROJECT | HOLE NO.

Hole No. [illegible]

DRILLING LOG	DIVISION: Huntsville	INSTALLATION:	SHEET 1 OF 3 SHEETS

1. PROJECT: Iowa AAP OE/OO Ground Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station): N 290470 E 2614960	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number): OA-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER: M. O'Malley	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED: 7/23/84 — COMPLETED: 7/23/84
	17. ELEVATION TOP OF HOLE: 678.0
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR: Richard P. Lucas
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g



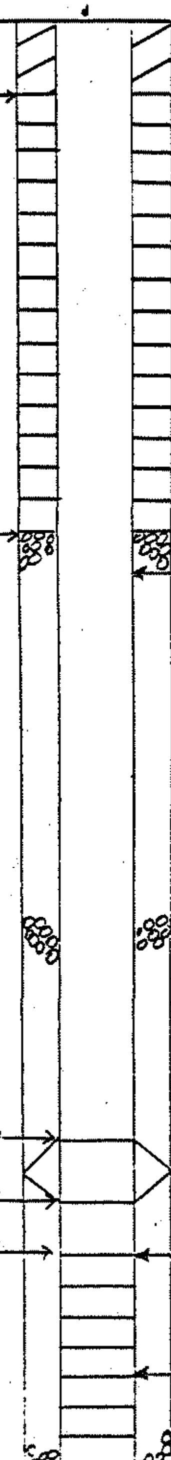
PROJECT | HOLE NO.

Hole No.

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET OF 3 SHEETS

1. PROJECT Iowa AAP OB/OD Ground. Monitoring	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY US-CE-C Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) DA-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
671.0	7.0		7.0			
	8.0					Bentonite Ball Seal
	9.0					
668.0	10.0		10.0			4-Inch Inner Diameter, Sch 40, PVC Pipe
	11.0					8 7/8-Inch Diameter Bore hole
	12.0					
665.15		7/26				Filterpack Material
	13.0					
	14.0		14.2'			Centering Device
			14.65'			
663.0	15.0		15.0'			Threaded, flush Joint
	16.0					4-inch Inner Diameter, Sch 40, PVC, Preslotted well screen, 0.020 inch slot

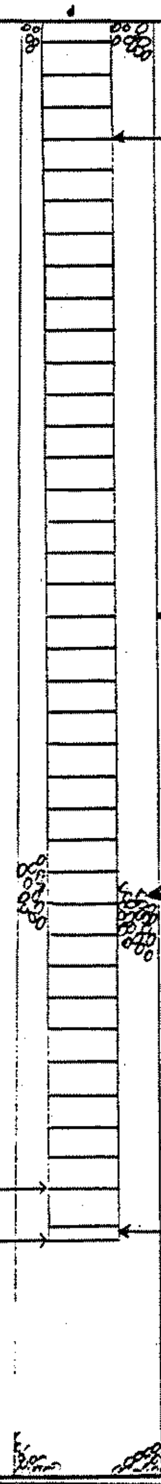


Hole No.

DRILLING LOG	DIVISION Huntsville	INSTALLATION	SHEET 2 OF 3 SHEETS

1. PROJECT Iowa AAP Below Grounds Monitoring Wells	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY US-CE - Omaha District	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number) OK-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER M. O'Malley	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	17.0					4-inch Inner Diameter sch 40, PVC Preslotted Well Screen, 0.020 inch slots
	18.0					
	19.0					
	20.0					8⅝-inch diameter borehole
	21.0					
	22.0					Filterpack Material
	23.0					
	24.0		24.53'			
653.1	25.0		24.9'			PVC, Flush Joint, Threaded End Cap
	26					Bottom of Boring @ 26.6 feet



PROJECT | HOLE NO.

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	062020.2	IOWA ARMY AMMO PLANT	MIDDLETOWN IA

DRILLING METHOD: 3 1/4" ID HSA
CME 55 RIG

BORING NO. SL 81

SHEET 1 OF 1

SAMPLING METHOD: 24" SPT 140# 30" FALL
18" DIA U SAMPLER 300# 24" FALL

WATER LEVEL	9.79' TOC	2.33' STIC
TIME	11:27	
DATE	10/20/87	
CASING DEPTH		

DRILLING	START	FINISH
TIME	11:13	13:35
DATE	10/19/87	10/19/8[illegible]

DATUM   ELEVATION

DRILLING CONTR. HANNIBAL TESTING
TPM [illegible]

No. 67465

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
SS	24/8		1/0	1		0		ORGANIC SILT, 10YR 3/1	SAMPLED 11:16 0-2
				3				MOIST SOFT-M STIFF	
				6		1	OL	LOW PLASTICITY ROOTMAT	
								NO APPARENT BEDDING	
								TOPSOIL	
SS	24/6		2/2	4		2			
				6				~~10YR 4/4~~	2-4 SAMPLED 11:26
				6		3			
				7					
SS	24/8		3/4	3		4		SILT, LOW PLASTICITY 10YR 4/1	4-6 SAMPLED 11:41
				4				20% ORANGE MOTTLING.	
				4		5	ML	MOIST NO APPARENT	
				5				BEDDING 2% F SAND, TILL	
			4/6	T		6		M STIFF 5% ORGANIC MOTTLE	
								SILTY SAND 10YR 6/4	6-8 SAMPLED 11:55
SS	24/12			1/12		7	SM	30% SILT 70% FINE SAND, FLUVIAL	V SOFT
				1				SATURATED ORANGE MOTTLING	NO APPARENT BEDDING
			5/8	1			ML	SILT, MOIST 2.5Y 6/2 V SOFT	LOW PLASTICITY TILL 12:00 L
				1		8	ML	SILT, SANDY 2.5Y 4/4	13:18 SAMPLED 8-10 13:16
SS	24/11			4		9		WITH 10% GRAY SILT, 30%	
				7				FINE SAND MOIST M STIFF	
			6/10	0		10		NO APPARENT BEDDING ~~GLACIAL~~ TILL	DRILLED TO 10
				3				5% F-MEDIUM GRAVEL (ROUNDED)	SAMPLED 10-11.5 13:35
U	18/15			4		1		FLUVIAL	
				6					
						2		BOTTOM OF HOLE	

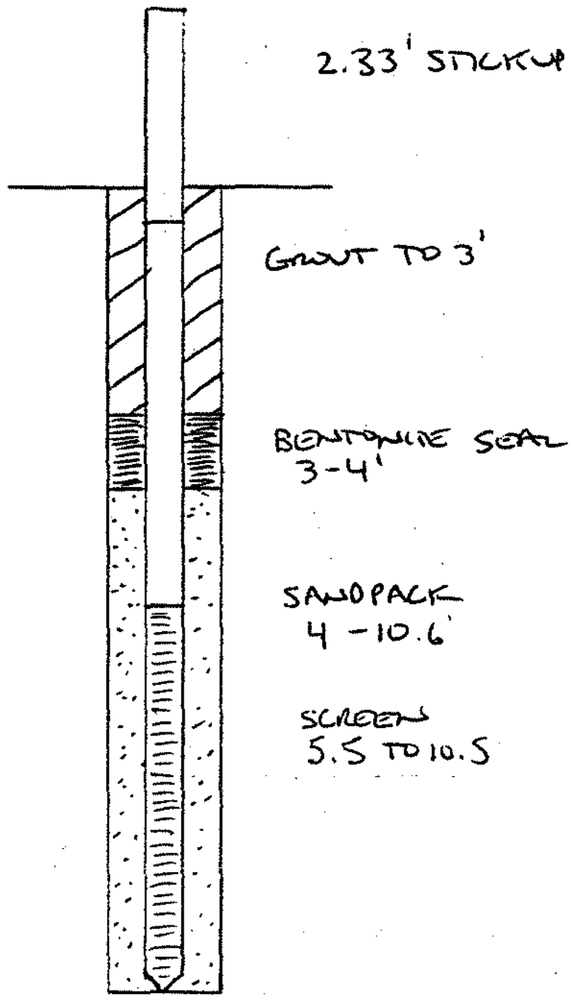
BY [illegible signature] DATE 10/19/87 CHK'D BY

628.1 (3) (REV. 11-80)

JOAN:
ORIGS FOR
IOWA AAP
I have a xerox copy

FILE 06702012
SUBJECT IAAP PIEZOMETER INSTALLATION
SHEET ___ OF

SL 81



REVISIONS
BY ______ DATE ______ TO EO ______
BY ______ DATE ______ TO EO ______

BY DAW DATE 10/19/87
CHECKED BY ______
COPY TO EO ______

Dames & Moore

Dames & Moore

LOCATION OF BORING	JOB NO. 06702012	CLIENT IAAP	LOCATION Middletown IA

DRILLING METHOD: 3 1/4" ID HSA

BORING NO. SL87

SHEET 1 OF 1

SAMPLING METHOD: 24" SPT 140# 30" FALL
18" DIA U SAMPLER 300# 24" FALL

WATER LEVEL	1.10' TOC	1.44' STKP
TIME	11:21	
DATE	10/30/87	
CASING DEPTH		

DRILLING

	START	FINISH
TIME	9:47	10:45
DATE	10/20/87	10/20

DATUM — ELEVATION

DRILLING CONTR. HANNIBAL TESTING LABS TOM CLAY

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	
SS	24/10		1/0	2 2		0	OL	SILT, ORGANIC 10YR 3/2 TOPSOIL MOIST SOFT ROOTMAT, NO APPARENT BEDDING LOW PLASTICITY	9:47 SAMPLED 0-2
				2 3		1	ML	SANDY SILT 10YR 5/6 35% FINE SAND 5% F GRAVEL MOIST SOFT SLIGHT PLASTICITY	
SS	24/18		2/2	3		2		FLUVIAL <1% ORGANICS(ROOTS)	10:04 SAMPLED 2-4
				4 5		3			
SS	24/18		3/4	6 2		4		5% ORGANIC MOTTLING AT 4-5'	HOLLOW GETTING PVC 10:15 SAMPLED 4-6
				4 5		5		STRINGER OF FINE SAND AT 5' WET.	
			4/6	8 1		6		5% ORGANIC MOTTLING AT 6-6.5'	10:25 SAMPLED 6-8
SS	24/18			4 4		7			
			5/8	5		8		GRAVELLY SANDY CLAY 5Y 7/2 AND 10YR 5/6 30% F GRAVEL	10:38 SAMPLED 8-10
SS	24/18			1 3		9	CL	AND COARSE SAND MOIST LOW PLASTICITY SOFT FLUVIAL	
			6/10	4 5		0		NO APPARENT BEDDING	
U	18/18			1 3 5	6	1	ML	GRAVELLY SANDY SILT 10YR 5/6 MOIST COMPACT 2% POCKETS OF	10:45 SAMPLED 10-11.5 WITH U SAMPLER
						2		CLEAN MEDIUM SAND (WET) 5% FINE GRAVEL SOFT,	BOTTOM OF HOLE 11.5'
						3		LOW PLASTICITY GLACIAL TILL	
						4			
						5			
						6			
						7			
						8			
						9			
						0			

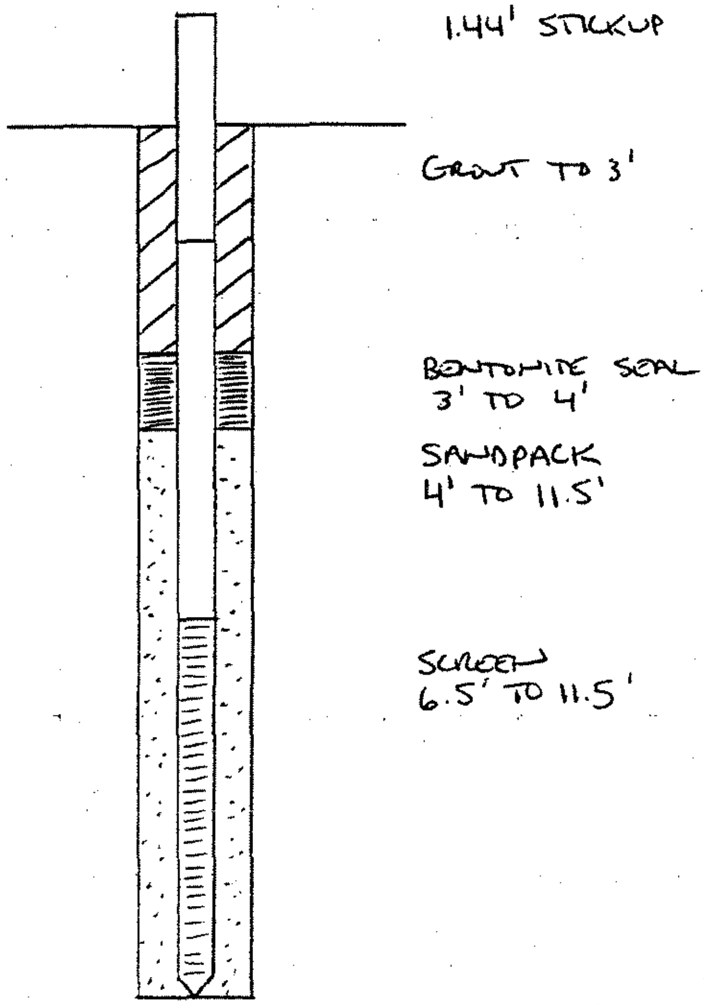
No. 67467

BY Neil W. Lange DATE 10/20/87 CHK'D BY

82B (REV. 11/80)

FILE 06702012
SUBJECT IAAP PIEZOMETER INSTALLATION
SHEET ____ OF

SL 87



REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

BY DAW DATE 10/20/87
CHECKED BY ____
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Dames & Moore

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LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETOWN IA

DRILLING METHOD: 3 1/4" ID HSA
CME 55 RIG

BORING NO. SL 91

SHEET 1 OF 1

SAMPLING METHOD: 24" SPT 140# HAMMER 30" FALL
18" D+M U SAMPLER 300# 24" FALL

* SL
DM

WATER LEVEL	11.22'		1.42' STRP
TIME	11:15		
DATE	10/3/87		
CASING DEPTH			

DRILLING	
START	FINISH
TIME 15:25	TIME 16:30
DATE 10/19/87 ~~16:30~~	DATE 10/19/87

DATUM — ELEVATION

DRILLING CONTR. HAWKINS TESTING / TOM CRAIG

No. 67466

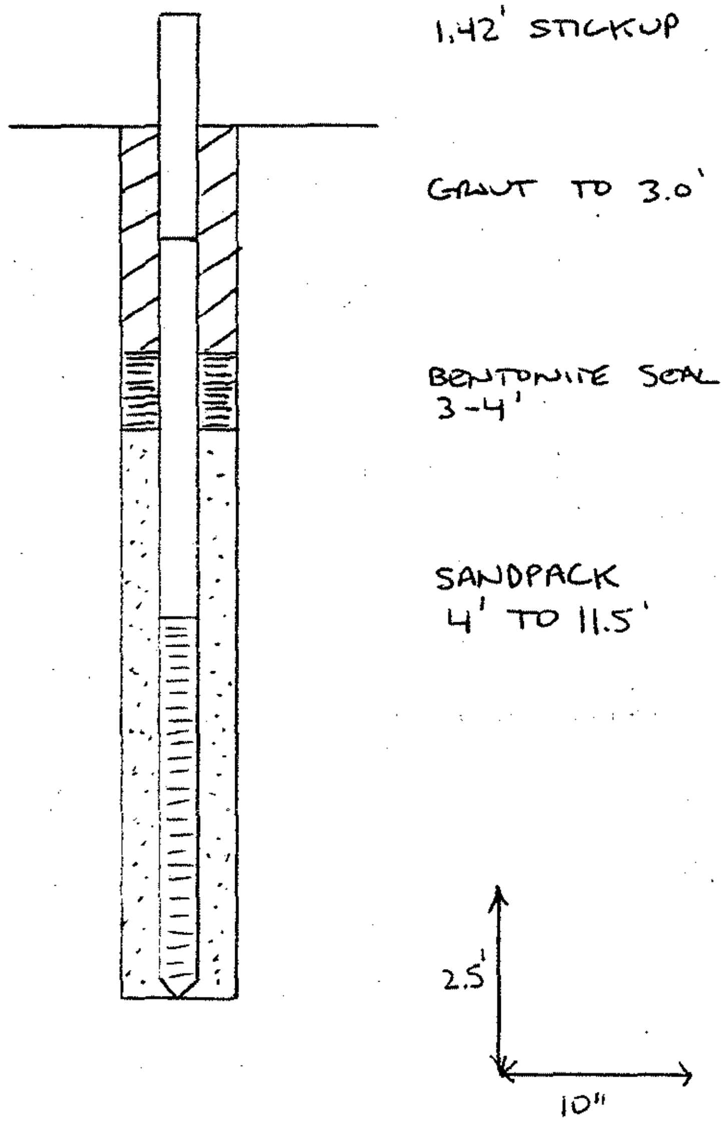
SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	NOTES
	24/14		1/0	1		0		SANDY SILT 10YR 5/6	SAMPLED 0-2 15:25
				3 3		1	ML	35% FINE SAND 5% FINE GRAVEL TR GRAY SILT	
			2/2	4 5		2		MOIST SOFT SLIGHT PLASTICITY 5% ORGANIC SPOTTING	15:37 SAMPLED 2-4
	24/16			6 8		3		STAINING AT 2' NO APPARENT BEDDING, FLUVIAL	
			3/4	2		4		LESS THAN 1% ORGANIC MOTTLING AT 4-6'	15:45 SAMPLED 4-6
	24/18			5 8 9		5			SHARP HORIZONTAL CONTACT
			4/6	2		6		SILT 2.5Y 6/2 MOIST MED STIFF	15:57 SAMPLED 6-8'
	24/18			3 5 7		7	ML	LOW PLASTICITY, NO APPARENT BEDDING	<1% ORGANIC SPOTTING TILL
			5/8	2		8		SANDY SILT 10YR 6/6 Hoye?	16:12 SAMPLED 8-10
	24/18			3 6 9		9		10% FINE SAND <1% COARSE SAND MOIST MED STIFF LOW PLASTICITY NO APPARENT BEDDING GLACIAL TILL	DRILLED TO 10'
			6/10	2		0		SANDY CLAY, MEDIUM PLASTICITY	SAMPLED TO BOTTOM
	18/18			3 4	6	1	CL	MOIST SOFT NO APPARENT BEDDING 10YR 6/1 WITH 50% ORANGE	AT 11.5' 16:30
						2		MOTTLING 10YR 5/8 10% FINE SAND GLACIAL TILL <1% CSAND	
						3			BOTTOM AT 11.5'
						4			
						5			
						6			
						7			
						8			
						9			
						0			

BY Neb A. Wayne DATE 10/19/87 CHK'D BY

FILE 06702012
SUBJECT IAAP PIEZOMETER INSTALLATION
SHEET

SL 91



2" TRILOC PVC CASING

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

BY DAW DATE 10/19/87
CHECKED BY ____
COPY TO EO ____

Dames & Moore

9461 PRINTED IN U.S.A.

LOG OF BORING NO. T01

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

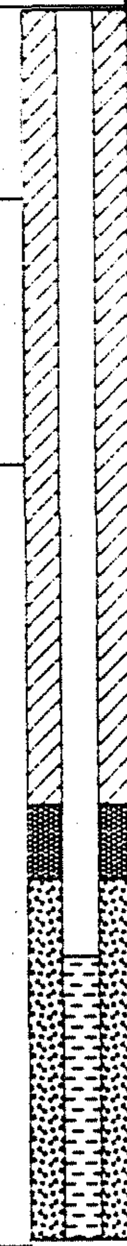
SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 712.74 ft.
G.S. Elevation = 710.9 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft²	Water Content - %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY Dark Brown
									5	705.9 (5.0)	
1	SS	18	15	9		28.9					FAT CLAY Brown-Gray
	HS							CH	10		
										698.9 (12.0)	
								CL	15, 20, 25		(TILL) SANDY LEAN CLAY Trace Gravel Brown
									30		
2	SS	18	10	19		14.4					
	HS									678.4 (32.5)	

Monitoring Well Details



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			BORING STARTED	5/23/88
W.L. 21'	W.S. OR W.D.	A.B.	BORING COMPLETED	5/24/88
W.L.	B.C.R.	A.C.R.	RIG CME 55	FOREMAN JRJ
W.L.			APPROVED	JOB # 40875134

Terracon

Form 106—1-87

LOG OF BORING NO. T01

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 1 OF 2	
										678.4 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
										672.9 (38.0)		
									40		BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/23/88
BORING COMPLETED	5/24/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB #40875134

LOG OF BORING NO. ✓ T02

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Description
T.O.C. Elevation = 713.37 ft.
G.S. Elevation = 710.8 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							SC-CL			(FILL) LEAN CLAY WITH SAND, Trace Gravel Brown	
									6.0	704.8		
								SC-CL			(FILL) LEAN CLAY WITH SAND, Trace Gravel and Rubble Brown and Gray	
1	SS	24	18	14	3000*	24						
									17.0	693.8		
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
2	SS	24	22	25	6000*	17.8						
									32.5	678.3		

*Calibrated Hand Penetrometer

Continued on Page 2 of 2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 21.0'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	6/22/88
BORING COMPLETED	6/22/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875134

Form 106—1-87

LOG OF BORING NO. T02

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 2	
										678.3 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
										674.8 (36.0)		
											BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	21.0'	W.S. OR W.D.	A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 6/22/88	
BORING COMPLETED 6/22/88	
RIG CME 850	FOREMAN REF
APPROVED	JOB #40875134

Form 106—1-87

LOG OF BORING NO. √T03

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 713.15 ft.
G.S. Elevation = 710.3 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft²	Water Content - %	Dry Density - lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL			(FILL) SANDY LEAN CLAY Brown and Gray
									5	704.3	(6.0)
								CL			(FILL) SANDY LEAN CLAY TRACE RUBBLE Brown and Gray
									10		
									15		
										692.3	(18.0)
								CL			(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown
1	SS	24	24	15		18.6			20		
	HS										
									25		
									30	680.3	(30.0)
2	SS	24	23	17		14.2		CL			(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown and Gray
	HS										
									35	675.3	(35.0) BOTTOM OF BORING

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS					
W.L.	NONE	W.S. OR W.D.	NONE	A.B.	
W.L.		B.C.R.		A.C.R.	
W.L.					

Terracon

BORING STARTED	4/6/88		
BORING COMPLETED	4/6/88		
RIG	CME 850	FOREMAN	REF
APPROVED	DMS	JOB #	40875134

Form 106—6-85

LOG OF BORING NO. T04

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 706.56 ft.
G.S. Elevation = 704.0 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL		703.0 (1.0)	LEAN CLAY Dark Brown	
											LEAN CLAY Brown	
									5			
									10			
										691.0 (13.0)		
									15		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
							CL					
									20			
1	SS	24	20	15	3000*	16.4						
	HS											
									25	678.0 (26.0)		
							CL				(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									30			
										671.5 (32.5)		

*Calibrated Hand Penetrometer

Continued on Page 2 of 2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L. 13.0'	W.S. OR W.D.		A.B.	
W.L.		B.C.R.	A.C.R.	
W.L.				

Terracon

BORING STARTED	6/22/88
BORING COMPLETED	6/22/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875134

Form 106—1-87

OWNER IOWA ARMY AMMUNITION PLANT	ARCHITECT
SITE INERT LANDFILL	PROJECT NAME GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 2	
										671.5 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
2	SS	24	24	19	4000*	20.3				667.0 (37.0)		
	HS								40	663.0 (41.0)	(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
		*Calibrated Hand Penetrometer									BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L. 13.0'	W.S. OR W.D.	A.B.	BORING STARTED	6/22/88
W.L.	B.C.R.	A.C.R.	BORING COMPLETED	6/22/88
W.L.			RIG CME 850	FOREMAN REF
			APPROVED	JOB # 40875134

Terracon

Form 106—1-87

LOG OF BORING NO. T05

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Description:
T.O.C. Elevation = 709.71 ft.
G.S. Elevation = 707.1 ft.

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol
	HS							CL
1	SS	24	24	7	2000*	21.6		
	HS							
2	SS	24	24	37		18.6		

Elevation (Depth)	Description
705.6 (1.5)	LEAN CLAY Dark Brown
699.1 (8.0)	LEAN CLAY Gray Brown
692.1 (15.0)	(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown
674.6 (32.5)	(TILL) SANDY LEAN CLAY Trace Gravel, with occasional sand seams at 16.0 and 16.8 Gray Brown

*Calibrated Hand Penetrometer

Continued on Page 2 of 2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 16.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/23/88
BORING COMPLETED	6/23/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875134

Form 106—1-87

LOG OF BORING NO. T05

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 2	
										674.6 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel and Sand Seams Gray Brown	
									40	666.1 (41.0)		
											BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 16.0' W.S. OR W.D.		A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/23/88
BORING COMPLETED	6/23/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875134

Form 106—1-87

LOG OF BORING NO. T06

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description T.O.C. Elevation = 713.00 ft. G.S. Elevation = 710.6 ft.	Monitoring Well Details
	HS							CL		708.6 (2.0)	LEAN CLAY Brown	
2A	SS	18	18	11		20.5				707.6 (3.0)	LEAN CLAY Dark Brown	
	HS							CL	5	702.6 (8.0)	LEAN CLAY Gray Brown	
								CL	10		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									15			
									20			
									25			
									30			
									32.5	678.1 (32.5)		

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS					
W.L.	21.0'	W.S. OR W.D.	A.B.	BORING STARTED	3/29/88
W.L.		B.C.R.	A.C.R.	BORING COMPLETED	4/05/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB # 40875133

Terracon

Form 106—1-87

LOG OF BORING NO. T06

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 1 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
									32.5	678.1		
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									39.0	671.6		
											(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
1	SS	18	17	54		12.4						
	HS											
									62.5	648.1		

Depth scale: 35, 40, 45, 50, 55, 60

Continued on Page 3 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 21.0'	W.S. OR W.D.	A.B.		BORING STARTED	3/29/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	4/05/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T06

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 2 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
									62.5	648.1	(62.5)	
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									76.0	634.6	(76.0)	
											WEATHERED LIMESTONE Light Brown	
									79.4	631.2	(79.4)	
C1	DB	39	18								LIMESTONE Light Gray, Vuggy Calcite Crystal Inclusions, Jointed Cherty in Part	
C2	DB	85.2	25.2									
									89.1	621.5	(89.1)	
C3	DB	25.2	19.2								LIMESTONE Light Gray-Brown, Jointed, with Clay Inclusions	
									91.2	619.4	(91.2)	
C4	DB	94.8	15.6						92.5	618.1	(92.5) (See Description Next Page)	

Continued on Page 4 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	3/29/88
BORING COMPLETED	4/05/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T06

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 3 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
										618.1 (92.5)	
C4	DB	94.8	15.6					CT	95		LIMESTONE Light Brown-Gray with Extensive Green Clay and Orange Chert Inclusions
										611.5 (99.1)	
C5	DB	120	105.6					SL	100, 105		SHALE Gray, Fissile, Firm-Soft
										601.2 (109.4)	
C6	DB	120	120					DL, SL	110, 115		DOLOMITE Gray-Light Gray, Very Shaley, Shale Laminated, Jointed, Pyritic in Part, Cherty in Part
										591.8 (118.8)	
C7	DB	112.8	111.6					C	120		LIMESTONE Gray-Orange Brown, Pin Point Porosity Fossiliferous, Jointed
										588.1 (122.5)	

Continued on Page 5 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	3/29/88
BORING COMPLETED	4/05/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form .06—1-87

LOG OF BORING NO. T06

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
										588.1	(122.5)	
										586.5	(124.1) See Note 1	
C7	DB	112.8	111.6					Sh	125		SHALE Gray, Soft	
										584.5	(126.1)	
								Ls			LIMESTONE Light Gray, Fossiliferous, Jointed, Dense	
	RB								130	580.6	(130.0)	

BOTTOM OF BORING

NOTE 1: Lost 2500 gallons of water while drilling 121.7' to 128.5'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED 3/29/88	
BORING COMPLETED 4/05/88	
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. √T07

OWNER
IOWA ARMY AMMUNITION PLANT

ARCHITECT

SITE
INERT LANDFILL

PROJECT NAME
GROUNDWATER QUALITY ASSESSMENT, IAAP

Description
T.O.C. Elevation = 712.75 ft.
G.S. Elevation = 710.2 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL			(FILL) SANDY LEAN CLAY Brown and Gray	
									5			
1	SS	24	12	12	5000*							
									7.5	702.7	(7.5)	
2	SS	18	6	12	4500*							
3	SS	18	6	11	3500*				10		(FILL) SANDY LEAN CLAY TRACE RUBBLE Brown and Gray	
	HS							CL				
									15			
4	SS	24	12	12	6000*							
									17.3	692.9	(17.3)	
5	SS	18	14	18	4000*			CL			(TILL) SANDY LEAN CLAY Brown	
6	SS	18	18	18	1500*				20			
	HS											
									25			
7	SS	24	12	14	1500*							
8	SS	18	16	24	1500*							
9	SS	18	18	26	1500*				30			
	HS											
									32.5	677.7	(32.5)	

*Calibrated Hand Penetrometer

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	3/29/88
BORING COMPLETED	4/05/88
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #40875133

Form 106—6-85

LOG OF BORING NO. T07

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
										677.7	(32.5)	
	HS							CL			(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown	
10	SS	24	20	24	8000*				35			
11	SS	18	18	41	9000*	12.2						
										671.2	(39.0)	
12	SS	18	14	39	6500*				40			
	HS							CL			(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
13	SS	24	24	23	7500*				45			
14	SS	18	18	43	5000-* 9000							
15	SS	18	18	80	1000-* 7000				50		4" Brown medium-coarse sand layer from 49.7 to 50.0'	
	HS											
									55	654.7	(55.5)	
16	SS	24	24	69	8000*	13.3		CL			(TILL) SANDY LEAN CLAY Dark Gray, 1/8" sand seam at 56.7	
17	SS	18	18	261	4000*					652.3	(57.9)	
	HS							CL-SC-CL	60		(TILL) FINE TO COARSE SAND WITH LEAN CLAY LAYERS Brown	
										649.2	(61.0)	
								CL			(TILL) SANDY LEAN CLAY Dark Gray	
										647.7	(62.5)	

*Calibrated Hand Penetrometer

Continued on Page 3 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 21'	W.S. OR W.D.	A.B.		BORING STARTED	3/29/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	4/05/88
W.L.				RIG CME850	FOREMAN REF
				APPROVED DMS	JOB #40875133

Form 106—6-85

LOG OF BORING NO. T07

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
										647.7	(62.5)	
	HS							CL	65		(TILL) SANDY LEAN CLAY Dark Gray, Hard	
18	SS	36	36	165	9000+*							
19	SS	24	110	16	8500*				70			
	HS								75			
20	SS	24	24	58	9000*							
21	SS	24	18	148	8500*							
22	SS	12	12	250	5000*				80			
	HS								85	625.2	(85.0)	
23	SS	11	7	125 (5")	5500*						WEATHERED LIMESTONE Brown to Gray	
	HS									621.7	(88.5)	
C1	DB	118.8	30						90		WEATHERED LIMESTONE WITH CLAY AND SHALE SEAMS Gray, jointed	
										618.2	(92.0)	
										617.7	(92.5) (see description next pg)	
											Continued on Page 4 of 5	

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	3/29/88
BORING COMPLETED	4/05/88
RIG CME850	FOREMAN REF
APPROVED DMS	JOB 40875133

Form 106—6-85

LOG OF BORING NO. T07

OWNER: IOWA ARMY AMMUNITION PLANT
ARCHITECT:

SITE: INERT LANDFILL
PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 3 of 5	
									(92.5)	617.7		
C1	DB	118.8	30					SL	95		FISSILE SHALE Gray to Dark Gray	
C2	DB	60	60						100		Lost 13 gallons water while drilling 99.5' to 104.5'	
C3	DB	120	108						105, 110			
									(111.5)	598.7		
								GT-LL			DOLOMITE Gray, jointed vuggy in part pinpoint porosity in part shaley in part	
C4	DB	122.4	112.8						115, 120			
									(122.5)	587.7		
											Continued on Page 5 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 21'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	3/29/88
BORING COMPLETED	4/05/88
RIG CME850	FOREMAN REF
APPROVED DMS	JOB # 40875133

Form 106—6-85

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 4 of 5
										587.7	(122.5)
C4	DB	122.4	112.8								DOLOMITE Gray, jointed, vuggy in part, pinpoint porosity in part, shaley in part
									125		
										583.9	(126.3)
C5	DB	73.2	72.0							583.3	(126.9) See Note 1
										582.1	(128.1) See Note 2
											LIMESTONE Light Gray, jointed
									130		
	RB										
										577.7	(132.5)
											BOTTOM OF BORING
									135		

NOTE 1: LIMESTONE
Gray, jointed

NOTE 2: SHALE
Dark Gray to Green, Clay seams in part

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	21′	W.S. OR W.D.	A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 3/29/88
BORING COMPLETED 4/05/88
RIG CME850 FOREMAN REF
APPROVED DMS JOB #40875133

Form 106—6-85

LOG OF BORING NO. T08

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 708.32 ft.
G.S. Elevation = 705.7 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL	0–6.0		(FILL) SANDY LEAN CLAY, Trace Gravel, Brown	
							cl		6.0	699.7	(6.0)	
									6.0–12.0		(FILL) SANDY LEAN CLAY, Trace Gravel, Gray	
							cl		12.0	693.7	(12.0)	
									12.0–32.5		(TILL) SANDY LEAN CLAY, Trace Gravel, Gray Brown	
1	SS	24	15	26	8000*	13.2			30			
									32.5	673.2	(32.5)	

*Calibrated Hand Penetrometer

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 28'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/15/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T08

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
									(32.5)	673.2		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									40			
									45			
									(48.0)	657.7		
									50		(TILL) SANDY LEAN CLAY Trace Gravel Gray, With Cobbles	
									55			
									60			
2	SS	24	24	150	9000*	12.3						
									(62.5)	643.2		

*Calibrated Hand Penetrometer

Continued on Page 3 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 28′	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/15/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T08

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
									(62.5)	643.2		
	HS							CL	65 – 92.5		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									(92.5)	613.2		
											Continued on Page 4 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 28'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	6/15/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T08

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 3 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	(92.5) – 95	613.2 – 610.7	(TILL) SANDY LEAN CLAY, Trace Gravel, Gray
C1	DB	38.4	31.2				C.T		(95.0) – (99.2)	610.7 – 606.5	SHALE, Gray, Fissile, Firm-Soft
C2	DB	98.4	96.0				CT		(99.2) – (108.0)	606.5 – 597.7	SHALE, Gray, Soft
C3	DB	120.0	120.0				DL		(108.0) – (117.8)	597.7 – 587.9	DOLOMITE, Light Gray-Light Brown, Very Shaley in Part, Shale Laminated, Jointed, Cherty in Part
C4	DB	123.6	123.6						(117.8) – (122.5)	587.9 – 583.2	DOLOMITE, Red Brown-Light Gray, Pinpoint Porosity, Slightly Vuggy, Fossiliferous, Very Calcareous in Part, Shale Laminated

Continued on Page 5 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 28'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/15/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB #40875133

Form 106—1-87

LOG OF BORING NO. T08

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
										583.2	(122.5	
C4	DB	123.6	123.6					SL		581.4	(124.3) SEE NOTE 1	
									125		LIMESTONE Light Gray, Fossiliferous with 1" Shale Layers	
								C1				
	RB									577.4	(128.3)	
											BOTTOM OF BORING	

NOTE 1: SHALE
Green-Gray
Fissile with Limestone
Stringers

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 28'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/15/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

LOG OF BORING NO. T09

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description (T.O.C. Elevation = 703.40 ft. G.S. Elevation = 701.0 ft.)	Monitoring Well Details
	HS							CL	(0.5)	700.5	LEAN CLAY, Dark Brown	
									0.5–12.0		LEAN CLAY Brown	
									(12.0)	689.0	(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray Brown	
1	SS	24	24	14	4000*	16.0			~20			
	HS											
									(25.0)	676.0	(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray with Cobbles	
									(32.5)	668.5		

*Calibrated Hand Penetrometer

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 13.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/09/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T09

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
										668.5	(32.5)	
	HS							CL	35		(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray	
									40			
									45			
									50			
									55			
									60			
										638.5	(62.5)	
											Continued on Page 3 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 13.0'	W.S. OR W.D.	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.			

Terracon

BORING STARTED	6/09/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

LOG OF BORING NO. T09

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
										638.5	(62.5)	
	HS							CL	65		(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray	
									70	631.0	(70.0)	
2	SS	24	24	80	9000*	14.2					(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray	
	HS								75, 80, 85, 90			
									92.5	608.5	(92.5)	
		*Calibrated Hand Penetrometer									Continued on Page 4 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 13.0'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	6/09/88
BORING COMPLETED	6/15/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T09

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: INERT LANDFILL

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 3 of 5	
										608.5	(92.5)	
	HS							CL	95		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									100			
									105			
									110			
									115	585.0	(116.0)	
	RB									584.0	(117.0) WEATHERED LIMESTONE	
C1	DB	80.4	63.6								LIMESTONE, Red Brown-Light Gray, Pinpoint Porosity, Fossiliferous	
									120	581.6	(119.4) SHALE Green-Gray, Soft	
										579.0	(122.0)	
									122.5	578.5	(122.5) SEE DESCRIPTION NEXT PG.	
											Continued on Page 5 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 13.0′	W.S. OR W.D.		A.B.
W.L.	B.C.R.		A.C.R.
W.L.			

Terracon

BORING STARTED 6/09/88	
BORING COMPLETED 6/15/88	
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T09

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
INERT LANDFILL	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
										578.5	(122.5)	
C1	DB	80.4	63.6									
C2	DB	61.2	61.2						125			
											LIMESTONE Light Gray-Light Brown Fossiliferous, Jointed, Very Shaley in Part, Shale Laminated in Part	
C3	DB	98.4	98.4						130			
									135			
	RB											
									140	561.0	(140.0)	
											BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				BORING STARTED	6/09/88
W.L. 13.0′	W.S. OR W.D.	A.B.	Terracon	BORING COMPLETED	6/15/88
W.L.	B.C.R.	A.C.R.		RIG CME 850	FOREMAN REF
W.L.				APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T10 PAGE 1 OF 1

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 725.10 ft.
G.S. Elevation = 722.5 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS								(1.5)	721.0	LEAN CLAY Dark Brown
											(LOESS)LEAN CLAY WITH SAND Light Brown
									10		Becoming Reddish Brown at 10'
1	SS	24	24	7		20.1					
	HS								(16.0)	706.5	(TILL) LEAN CLAY SILT WITH SAND Light Brown with sand seams
2	SS	24	24	8		23.3		CL-ML	20		
	HS								(23.0)	699.5	(TILL) LEAN CLAY WITH SAND Gray
									(25.0)	697.5	BOTTOM OF BORING

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 4/14/88	
BORING COMPLETED 4/15/88	
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T-11

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 724.59 ft.
G.S. Elevation = 722.3 ft.

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft²	Water Content - %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL		720.8 (1.5)	LEAN CLAY, With Sand Dark Brown	
											(LOESS) LEAN CLAY Light Brown	
									10		Becoming Reddish-Brown at 10'	
										706.3 (16.0)	(TILL) LEAN CLAY-SILT With Sand Light Brown with sand seams	
								CL-ML	20			
								CL		699.3 (23.0)	(TILL) LEAN CLAY With Sand, Gray	
									25	697.3 (25.0)	(TILL) SANDY LEAN CLAY Trace Gravel Gray-brown	
										689.8 (32.5)		

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6'	W.S. OR W.D.	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.			

Terracon

BORING STARTED	4/14/88
BORING COMPLETED	4/15/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T-11

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
										689.8 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray - Brown	
									40			
1	SS	24	24	19	9000+*	14.1						
	HS								45			
									50			
									55			
									60			
										659.8 (62.5)		

* CALIBRATED PENETROMETER TEST

Continued on Page 3 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/14/88
BORING COMPLETED	4/15/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T-11

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT - IAAP

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
										659.8 (62.5)		
	HS							CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Gray - Brown	
2	SS	24	24	25	5000*	16.6						
	HS								70	652.3 (70.0)		
											BOTTOM OF BORING	
									75			

* CALIBRATED PENETROMETER TEST

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L. 6'	W.S. OR W.D.	A.B.	BORING STARTED	4/14/88
W.L.	B.C.R.	A.C.R.	BORING COMPLETED	4/15/88
W.L.			RIG CME 850	FOREMAN REF
			APPROVED DMS	JOB # 40875135

Terracon

Form 106—6-85

LOG OF BORING NO. T-12

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 725.23 ft.
G.S. Elevation = 722.6 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	(1.5)	721.1	LEAN CLAY, With Sand Dark Brown
											(LOESS) LEAN CLAY Light Brown
1	SS	24	24	5	1500*	28.3					
	HS										Becoming Reddish-Brown at 10'
									(16.0)	706.6	(TILL) LEAN CLAY-SILT With Sand Light Brown with sand seams
									(23.0)	699.6	(TILL) LEAN CLAY With Sand, Gray
									(25.0)	697.6	(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown
									(32.5)	690.1	

*Calibrated Penetrometer Test

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6'	W.S. OR W.D.	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.			

Terracon

BORING STARTED 4/15/88
BORING COMPLETED 4/20/88
RIG CME 850 FOREMAN REF
APPROVED DMS JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T-12 PAGE 2 OF 4

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
										690.1 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray - Brown	
									40			
									45			
									50			
									52			
									60			
										660.1 (62.5)		
											Continued on Page 3 of 3	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				BORING STARTED	4/15/88
W.L. 6'	W.S. OR W.D.		A.B.	BORING COMPLETED	4/20/88
W.L.	B.C.R.		A.C.R.	RIG CME 850	FOREMAN REF
W.L.				APPROVED DMS	JOB # 40875135

Terracon

Form 106—6-85

LOG OF BORING NO. T-12

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft²	Water Content - %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
									62.5	660.1	(62.5)	
	HS							CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Gray - Brown	
									70			
									75	647.6	(75.0)	
								ML			(TILL) SANDY SILT Trace Gravel Gray	
									80			
2	SS	24	24	197	9000+	10.1						
	HS								85			
									90			
									92.5	630.1	(92.5)	

*Calibrated Penetrometer Test

Continued on Page 4 of 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/15/88
BORING COMPLETED	4/20/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T-12

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, I...

Continued from Page 3 of 4

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
										630.1	(92.5)	
	HS							ML	95		(TILL) SANDY LEAN CLAY With Sand, Trace Gravel Gray	
										625.6	(97.0) WEATHERED LIMESTONE Gray	
	RB								100	621.3	(101.3) WEATHERED SHALE Gray	
C1	DB	51.6	14.4							618.2	(104.4)	
C2	DB	120.0	116.4						105		LIMESTONE Gray, jointed fossiliferous, with shale Laminations	
									110	612.3	(110.3) SHALE Dark gray, fissile, calcareous with occasional limestone stringers	
C3	DB	68.4	68.4						115	607.5	(115.1) LIMESTONE Light Gray, fossiliferous with shale laminations	
										603.7	(118.9)	
	RB								120		DOLOMITE Gray, shaley in part calcareous and pinpoint porosity in part	
										599.1	(123.5) BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6.0'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/15/88
BORING COMPLETED	4/20/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T13

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER CONTAMINATION ASSESSMENT, IAAP

T.O.C. Elevation = 719.93 ft.
G.S. Elevation = 717.4 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL		714.9 (2.5)	LEAN CLAY, Dark Brown
1	SS	24	20	8	1000*	27.2			5		(LOESS) LEAN CLAY, Gray Brown
	HS								10	705.4 (12.0)	
									15		(TILL) SANDY LEAN CLAY, Trace Gravel, Brown
								CL-ML	20	697.4 (20.0)	(TILL) SANDY LEAN CLAY-SILT, TRACE GRAVEL, Gray Brown
2	SS	24	22	17	2000*	18.6			25		
	HS								30	686.4 (31.0)	BOTTOM OF BORING

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 16.0'	W.S. OR W.D.		A.B.
W.L.	B.C.R.		A.C.R.
W.L.			

Terracon

BORING STARTED	6/20/88
BORING COMPLETED	6/21/88
RIG CME 850	FOREMAN REF
APPROVED	JOB 40875135

Form 106—1-87

LOG OF BORING NO. T14

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description (T.O.C. Elevation = 719.79 ft. G.S. Elevation = 717.2 ft.)	Monitoring Well Details
	HS							CL			LEAN CLAY Dark Brown	
									(2.5)	714.7		
											(LOESS) LEAN CLAY Gray Brown	
									(12.0)	705.2		
											(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									(20.0)	697.2		
											(TILL) SANDY LEAN CLAY SILT, TRACE GRAVEL Gray Brown	
									32.5 (32.5)	684.7		

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 16.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/21/88
BORING COMPLETED	6/21/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T14

OWNER: IOWA ARMY AMMUNITION PLANT
ARCHITECT:

SITE: LINE 6
PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
									32.5	684.7	(32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY SILT, TRACE GRAVEL Gray Brown	
									40		(40.0)	
1	SS	24	22	33	2000*	12.8						
	HS								45		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									50	665.7	(51.5)	
									55		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray	
									60			
									62.5	654.7	(62.5)	
											Continued on Page 3 of 3	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		Terracon		
W.L. 16.0' W.S. OR W.D.	A.B.		BORING STARTED	6/21/88
W.L. B.C.R.	A.C.R.		BORING COMPLETED	6/21/88
W.L.			RIG CME 850	FOREMAN REF
			APPROVED	JOB #40875133

Form 106—1-87

LOG OF BORING NO. T14

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: ~~[illegible]~~ ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
										654.7 (62.5)		
	HS							CL				
									65		(TILL) SANDY LEAN CLAY	
2	SS	24	24	37	7000*	17.4					Trace Gravel	
											Gray	
	HS											
									70			
										646.2 (71.0)		
											BOTTOM OF BORING	

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 16.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	6/21/88
BORING COMPLETED	6/21/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875133

Form 106—1-87

LOG OF BORING NO. T15

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER ASSESSMENT, IAAP

T.O.C. ELEVATION = 719.8
G.S. ELEVATION = 717.3

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
								CL			LEAN CLAY Dark Brown
	HS									714.8 (2.5)	
									5		(LOESS) LEAN CLAY Gray Brown
									10	705.3 (12.0)	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown
									15		
1	SS	24	24	17	5200	21.9					
	HS										
									20	697.3 (20.0)	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown
									25		
									30		
										684.8 (32.5)	

Monitoring Well Details

CONTINUED ON PAGE 2 OF 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 16'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	8/2/88
BORING COMPLETED	8/4/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T15

OWNER
IOWA ARMY AMMUNITION PLANT

ARCHITECT

SITE
LINE 6

PROJECT NAME
GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 1 OF 4	
										684.8 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
									40			
									45			
									50			
2	SS	24	24	22	5400	21.2				665.8 (51.5)		
	HS								55		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray	
									60			
										654.8 (62.5)		

CONTINUED ON PAGE 3 OF 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				Terracon		
W.L. 16'	W.S. OR W.D.	A.B.			BORING STARTED	8/2/88
W.L.	B.C.R.	A.C.R.			BORING COMPLETED	8/4/88
W.L.					RIG CME 850	FOREMAN REF
					APPROVED	JOB #40875135

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OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 2 OF 4	
										654.8 (62.5)		
	HS							CL	65		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray	
									70			
									75			
									80			
									85			
										631.3 (86.0)		
	RB									(87.1)	SEE NOTE 1	
CI	DB	79.2	48							630.2	SHALE, Light Gray-Gray Soft	
										628.4 (88.9)		
									90		SHALE, Dark Gray, Firm-Hard, Fissile, Jointed, Dolomitic in Part	
										624.8 (92.5)		
											CONTINUED ON PAGE 4 OF 4	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 16'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	8/2/88
BORING COMPLETED	8/4/88
RIG CME 850	FOREMAN REF
APPROVED	JOB #40875135

LOG OF BORING NO. T15

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 3 OF 4	
										624.8 (92.5)		
C1	DB	79.2	48							624.1 (93.2)	SEE NOTE 2	
										623.7 (93.6)	SEE NOTE 3	
C2	DB	100.8	96						95		SHALE, Light Gray-Dark Gray, Soft-Firm Fissile in Part	
										621.4 (95.9)	LIMESTONE Light Gray-Light Brown, Fossiliferous, Jointed, Pinpoint, Porosity Shale Layer 96.5-96.6	
									100			
										615.2 (102.1)		
C3	DB	60	50.4						105		LIMESTONE Light Gray, Dense, Fossiliferous, Shale Laminated, Shale Bedded	
	RB											
									110	607.8 (109.5)	BOTTOM OF BORING	

NOTE 1: LIMESTONE, Light Brown-Light Gray, Pinpoint Porosity, Light Blue Chert Inclusions Fossiliferous

NOTE 2: See Previous Page for Description

NOTE 3: LIMESTONE, Light Gray-Gray, Jointed Fossiliferous, Dense

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 16'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	8/2/88
BORING COMPLETED	8/4/88
RIG CME 850	FOREMAN RLF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T-16

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 717.82 ft.
G.S. Elevation = 715.2 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY Dark Brown
									(3.5)	711.7	
								CL			(LOESS) LEAN CLAY Brown-Gray
1	SS	18	18	7		29.3					
	HS										
									(10.0)	705.2	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown
									(17.0)	698.2	
											(TILL) SANDY LEAN CLAY Trace Gravel Brown
2	SS	18	18	8		18.1					
	HS										
									(21.0)	694.2	
											BOTTOM OF BORING

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				BORING STARTED	5/10/88
W.L. 10'	W.S. OR W.D.		A.B.	BORING COMPLETED	5/12/88
W.L.		B.C.R.	A.C.R.	RIG CME 55	FOREMAN JRJ
W.L.				APPROVED	JOB # 40875135

Terracon

Form 106—1-87

LOG OF BORING NO. T17

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 717.76 ft.
G.S. Elevation = 715.2 ft.

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft²	Water Content - %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY Dark Brown
									(3.5)	711.7	
								CL	5		(LOESS) LEAN CLAY Brown
									10 (10.0)	705.2	
											(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown
									15		
1	SS	18	18	6		21.5					
									(17.0)	698.2	
									20		
									25		(TILL) SANDY LEAN CLAY Trace Gravel Brown
									30		
	HS								(32.5)	682.7	

CONTINUED ON PAGE 2 OF 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 10'	W.S. OR W.D.	A.B.		BORING STARTED	5/11/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	5/12/88
W.L.				RIG CME 55	FOREMAN JRJ
				APPROVED	JOB #40875135

LOG OF BORING NO. T17

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 1 OF 3	
										682.7	(32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									40			
									45			
									50	665.2	(50.0)	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown	
									55			
									60			
										652.7	(62.5)	
											CONTINUED ON PAGE 3 OF 3	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	10'	W.S. OR W.D.	A.B.	
W.L.		B.C.R.	A.C.R.	
W.L.				

Terracon

BORING STARTED	5/11/88
BORING COMPLETED	5/12/88
RIG	CME 55
FOREMAN	JRJ
APPROVED	
JOB #	40875135

LOG OF BORING NO. T17

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

CONTINUED FROM PAGE 2 OF 3

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
										652.7	(62.5)	
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown	
									65			
2	SS	18	16	41		16.0						
	HS											
									70			
										644.2	(71.0)	
											BOTTOM OF BORING	
									75			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 10'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/11/88
BORING COMPLETED	5/12/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

Form 106

LOG OF BORING NO. T19

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 717.24 ft.
G.S. Elevation = 714.6 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	(1.5)	713.1	LEAN CLAY Dark Brown
											(LOESS) LEAN CLAY Light Brown
1	SS	24	24	5		32.6					
	HS								(16.5)	698.1	
2	SS	24	24	13		16.8					(TILL) SANDY LEAN CLAY Trace Gravel Brown
	HS								(21.0)	693.6	
											BOTTOM OF BORING

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/21/88
BORING COMPLETED	4/21/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

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LOG OF BORING NO. T18

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. = Elevation = 717.56 ft.
G.S. Elevation = 715.0 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS										FAT CLAY Dark Brown	
2A	SS	18	18	8		28.5				711.5	(3.5)	
	HS							CL	5		(LOESS) LEAN CLAY Brown	
									10	705.0	(10.0) (TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown	
									15	698.0	(17.0) (TILL) SANDY LEAN CLAY TRACE GRAVEL Brown	
									20			
									25			
									30	682.5	(32.5)	

CONTINUED ON PAGE 2 OF 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 10'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/12/88
BORING COMPLETED	5/20/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T18

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

CONTINUED FROM PAGE 1 OF 4

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
									32.5	682.5	(32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									50	665.0	(50.0)	
1	SS	18	17	12		21.9					(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown	
	HS											
									62.5	652.5	(62.5)	

Depth scale: 35, 40, 45, 50, 55, 60

CONTINUED ON PAGE 3 OF 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 10'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/12/88
BORING COMPLETED	5/20/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T 18

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content - %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 2 OF 4	
										652.5 (62.5)		
	HS							CL	65		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown	
									70			
									75			
									80			
									85			
										627.0 (88.0)	WEATHERED LIMESTONE Light Gray	
2	SS	1	1	100					90			
										622.5 (92.5)		
											CONTINUED ON PAGE 4 OF 4	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 10'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/12/88
BORING COMPLETED	5/20/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T18

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											CONTINUED FROM PAGE 3 OF 4	
										622.5	(92.5)	
C1	DB	30	30								SHALE, Firm-Soft, Slightly Calcareous, Fissile	
									95	620.1	(94.9)	
C2	DB	56.4	44								LIMESTONE Light Gray, Jointed, Fossiliferous Pyritic in Part	
C3	DB	75.6	76						100			
										613.7	(101.4)	
									105		LIMESTONE, Light Gray-Gray, Fossiliferous, Shale Laminated, with Alternating Shale Layers SHALE, Fissile, Firm, Calcareous	
C4	DB	105.6	105									
									110	605.7	(109.3)	
											DOLOMITE, Light Gray-Light Brown, Slightly Vuggy, Pinpoint Porosity, Very Shaley in Part	
									115	600.3	(114.7)	
											BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 10'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED 5/12/88	
BORING COMPLETED 5/20/88	
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T-20

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 717.08 ft.
G.S. Elevation = 714.3 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	(1.5)	712.8	LEAN CLAY Dark Brown
									(16.5)	697.8	(LOESS) LEAN CLAY Light Brown
									(24.0)	690.3	(TILL) SANDY LEAN CLAY Trace Gravel Brown
1	SS	24	20	15	5000*	17.6			(32.5)	681.8	(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray-Brown

*Calibrated Penetrometer Test

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 9'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/21/88
BORING COMPLETED	4/21/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T-20

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 1 of 3
									(32.5)	681.8	
	HS							CL			(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray-Brown
									(50.0)	664.3	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown
2	SS	24	24	31	5500*	15.3					
									(62.5)	651.8	
											Continued on Page 3 of 3

*Calibrated Penetrometer Test

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 9'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED 4/21/88	
BORING COMPLETED 4/21/88	
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T-20

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
									(62.5)	651.8		
	HS							CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown	
									70			
									(71.0)	643.3	BOTTOM OF BORING	
									75			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	9'	W.S. OR W.D.	A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/21/88		
BORING COMPLETED	4/21/88		
RIG	CME 850	FOREMAN	REF
APPROVED	DMS	JOB #	40875135

Form 106—6-85

LOG OF BORING NO. I-21

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description T.O.C. Elevation = 717.06 ft. G.S. Elevation = 714.4 ft.	Monitoring Well Details
	HS							CL			LEAN CLAY	
									(1.5)	712.9	Dark Brown	
									5		(LOESS) LEAN CLAY Light Brown	
									10			
									15			
									(16.5)	697.9		
									20		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									(24.0)	690.4		
									25		(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray-Brown	
									30			
									(32.5)	681.9		

Continued on Page 2 of 4

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/22/88
BORING COMPLETED	4/26/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB # 40875135

Form 136—6-85

LOG OF BORING NO. T-21

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE: LINE 6	PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 4	
	HS							CL	(32.5)	681.9	(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray-Brown	
1	SS	24	20	14	4000*	19.1			(50.0)	664.4	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown	
	HS											
									(62.5)	651.9	Continued on Page 3 of 4	

*Calibrated hand penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/22/88
BORING COMPLETED	4/26/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T-21

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 4	
									(62.5)	651.9		
	HS							CL	65		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray - Brown	
									70			
									(75.0) 75	639.4		
											(TILL) LEAN CLAY WITH SAND, TRACE GRAVEL Gray	
									80			
									85			
									90			
									(92.5)	621.9		
											Continued on Page 4 of 4	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/22/88
BORING COMPLETED	4/26/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

LOG OF BORING NO. T-21

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 3 of 4

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Classification Symbol	Depth	Elevation	Description
										621.9 (92.5)	
	HS							CL	95		(TILL) LEAN CLAY With Sand, Trace Gravel Gray
2	SS	24	21	26	4200*	18.7					
	HS									615.4 (99.0)	
									100		WEATHERED LIMESTONE Brown - Gray
C1	DB	79.2	43.2						105	609.5 (104.9)	
											LIMESTONE Light Brown - Gray jointed, fossiliferous, pinpoint porosity
C2	DB	120	114						110	602.7 (111.7)	
									115		DOLOMITE Gray - Light Brown, jointed, shaley with shale laminations, slightly vuggy in part
										597.5 (116.9)	SHALE Dark Gray, with 2 inch limestone at 119.2'
C3	DB	44.4	40.8						120	594.7 (119.7)	LIMESTONE Light Gray, fossiliferous shaley in part, with shale laminations, dolomitic in part
	RB									590.4 (124.0)	BOTTOM OF BORING

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9'	W.S. OR W.D.		A.B.
W.L.	B.C.R.		A.C.R.
W.L.			

Terracon

BORING STARTED	4/22/88
BORING COMPLETED	4/26/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—5-85

LOG OF BORING NO. T22

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

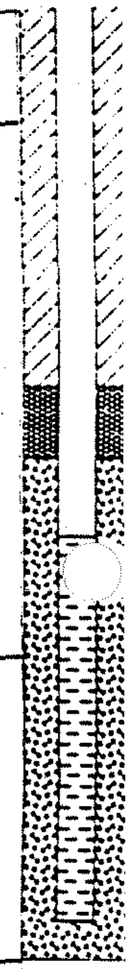
SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.78 ft.
G.S. Elevation = 713.3 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	0		LEAN CLAY, Dark Brown
									3.0	710.3	(LOESS) LEAN CLAY WITH SAND, Brown-Gray
1	SS	24	24	7	1500*	26.9			10		
	HS										
									17.0	696.3	(TILL) SANDY LEAN CLAY TRACE GRAVEL, Gray Brown
2	SS	24	24	8	4000*	15.3			20		
	HS										
									25.0	688.3	BOTTOM OF BORING

Monitoring Well Details



*Calibrated Hand Penetrometer Test

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 5.0	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 4/12/88
BORING COMPLETED 4/14/88
RIG CME850 FOREMAN REF
APPROVED DMS JOB #40875135

Form 106—6-85

LOG OF BORING NO. T23

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.73 ft.
G.S. Elevation = 713.1 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL			LEAN CLAY Dark Brown	
									(3.0)	710.1	(LOESS) LEAN CLAY WITH SAND Brown - Gray	
									(17.0)	696.1	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
									(32.5)	680.6		

Depth scale: 5, 10, 15, 20, 25, 30

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 5.0 '	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 4/13/88	
BORING COMPLETED 4/14/88	
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #0875135

LOG OF BORING NO. T23

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 1 of 3
										680.6 (32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown
1	SS	24	24	33		12.0			40		With occasional sand seams
	HS										
									45	668.1 (45.0)	(TILL) FAT LEAN CLAY TRACE GRAVEL Brown Gray
										666.1 (47.0)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown Gray
									50		
									55	658.1 (55.0)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown 1" sand seam at 58.4'
										653.8 (59.3)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown
									60		
										650.6 (62.5)	
											Continued on Page 3 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 5.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/13/88
BORING COMPLETED	4/14/88
RIG CME850	FOREMAN
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T23

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE: LINE 6	PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 2 of 3

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
										650.6	(62.5)	
	HS							CL	65		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
2	SS	24	24	45		13.2				646.7	(66.4)	
										645.7	(67.4) See Note 1	
	HS										(69.0) See Note 2	
										644.1	(69.6) See Note 3	
									70	643.5	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray	
										640.1	(73.0)	
									75		BOTTOM OF BORING	

NOTE 1: CLAYEY FINE-MEDIUM SAND Brown
Lost 10 Gallons Water

NOTE 2: (TILL) SANDY LEAN CLAY, TRACE GRAVEL
Brown Gray, fine-medium sand seams 68.0 to68.3 and 68.5 to 69.0

NOTE 3: (TILL) SANDY LEAN CLAY, TRACE GRAVEL
Brown Gray

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	5.0	W.S. OR W.D.	A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/13/88		
BORING COMPLETED	4/14/88		
RIG	CME850	FOREMAN	REF
APPROVED	DMS	JOB #	40875135

Form 106—6-85

LOG OF BORING NO. T24

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											T.O.C. Elevation = 715.80 ft. G.S. Elevation = 713.4 ft.	
	HS							CL			LEAN CLAY Dark Brown	
									3.0	710.4	(LOESS) LEAN CLAY WITH SAND Brown Gray	
									5			
1	SS	24	24	6	2000*							
2	SS	18	18	8	500*							
3	SS	18	18	9	1000*							
									10			
	HS											
									15			
4	SS	24	24	5	1000*							
									17.0	696.4	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
5	SS	18	18	16	7000*							
6	SS	18	17	23	5000*							
									20			
	HS											
									25			
7	SS	24	24	16	7000*							
8	SS	18	18	20	8000*							
9	SS	18	16	26	7000*							
									30			
	HS											
									32.5	680.9		

* CALIBRATED HAND PENETROMETER TEST

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 5'	W.S. OR W.D.		A.B.
W.L.	B.C.R.		A.C.R.
W.L.			

Terracon

BORING STARTED	4/06/88
BORING COMPLETED	4/12/88
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T24

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 1 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
										680.9 (32.5)		
	HS									679.9 (33.5)	See Note 1	
									35		(TILL) SANDY LEAN CLAY With Sand, Trace Gravel Brown	
10	SS	24	24	6	2000*							
11	SS	18	18	8	500*						Becoming Brown Gray at 38.5	
12	SS	18	18	9	1000*						NOTE 1: (TILL) SANDY LEAN CLAY, TRACE GRAVEL Brown Gray	
	HS								40			
									45	668.4 (45.0)	(TILL) FAT LEAN CLAY TRACE GRAVEL Brown Gray	
13	SS	24	24	5	1000*					666.4 (47.0)		
14	SS	18	18	16	7000*						(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown Gray	
15	SS	18	6	23	5000*				50			
	HS											
									55	658.4 (55.0)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Brown 1" sand seam at 58.4'	
16	SS	24	24	16	7000*							
17	SS	18	18	29	8000*							
18	SS	18	18	26	7000*					654.1 (59.3)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
	HS								60			
										650.9 (62.5)		

*Calibrated Hand Penetrometer Test

Continued on Page 3 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 5'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 4/06/88
BORING COMPLETED 4/12/88
RIG CME850 FOREMAN REF
APPROVED DMS JOB #40875135

Form 106—6-85

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 2 of 5
	HS							CL		650.9 (62.5)	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown
									65		
19	SS	24	24	54	3500*					647.0 (66.4)	
										646.0 (67.4)	See Note 1
20	SS	18	18	105	8000*					644.4 (69.0)	See Note 2
21	SS	18	18	57	7000*					643.8 (69.6)	See Note 3
	HS								70		(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray
									75		
22	SS	24	24	68	9000+*	11.4					
23	SS	18	18	260	9000+*						
24	SS	18	18	90	9000+*						
	HS								80		
									85		
25	SS	24	24	49	9000+*						
26	SS	18	18	100	9000+*						
27	SS	18	18	95	9000+*				90		
	HS									620.9 (92.5)	

NOTE 1: CLAYEY FINE-MEDIUM SAND Brown
Lost 10 Gallons water

NOTE 2: (TILL) SANDY LEAN CLAY TRACE GRAVEL
Brown Gray, fine-medium sand seams 68.0 to 68.3 and 68.5 to 69.0

NOTE 3: (TILL) SANDY LEAN CLAY, TRACE GRAVEL
Brown Gray

*Calibrated Hand Penetrometer Test

Continued on Page 4 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 5'	W.S. OR W.D.	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.			

Terracon

BORING STARTED	4/06/88
BORING COMPLETED	4/12/88
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #40875135

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 3 of 5
									(92.5)	620.9	
	HS							CL			(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray
									95		
28	SS	24	24	47	5500*	12.4					
29	SS	18	18	44	7000*						
30	SS	18	18	51	7500*						
									100		
	HS										
									(102.5)	610.9	SHALE Gray
									(103.8)	609.6	
	RB										
									105		LIMESTONE Light Gray, jointed, fossiliferous
C1	DB	60	32								
									110		
C2	DB	114	93						(110.9)	602.5	DOLOMITE Light Gray, jointed, shaley, shale laminations, slightly vuggy
									115		
									(116.3)	597.1	SHALE Dark Gray, jointed, conchoidal fractures
									(119.4)	594.0	LIMESTONE Light Gray, fossiliferous in part, pinpoint porosity in part, shaley in part
C3	DB	64.8	64.8						120		
									(122.5)	590.9	
											Continued on Page 5 of 5

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	5'	W.S. OR W.D.	A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED 4/06/88

BORING COMPLETED 4/12/88

RIG CME850 FOREMAN REF

APPROVED DMS JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T24

OWNER
IOWA ARMY AMMUNITION PLANT

ARCHITECT

SITE
LINE 6

PROJECT NAME
GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content, %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
										590.9	(122.5)	
C3	DB	64.8	64.8								LIMESTONE Light Gray, fossiliferous in part, pinpoint porosity in part, shaley in part	
	RB								125			
										585.4	(128.0)	
											BOTTOM OF BORING	
									130			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 5'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED 4/06/88	
BORING COMPLETED 4/12/88	
RIG CME850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. 125

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.59 ft.
G.S. Elevation = 712.8 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL	(2.0)	710.8	LEAN CLAY, Dark Brown
1	SS	24	24	9	3200*	27.3					(LOESS) LEAN CLAY, Gray Brown
	HS								(16.0)	696.8	
2	SS	24	24	9	1500*	19.8					(TILL) SANDY LEAN CLAY, Trace Gravel, Gray
	HS								(21.0)	691.8	
											BOTTOM OF BORING

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/88
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T26

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATE QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description T.O.C. Elevation = 715.63 ft. G.S. Elevation = 713.1 ft.	Monitoring Well Details
	HS							CL	(2.0)	711.1	LEAN CLAY Dark Brown	
									(16.0)	697.1	(LOESS) LEAN CLAY Gray Brown	
									(22.0)	691.1	(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									(32.5)	680.6	(TILL) SANDY LEAN CLAY Trace Gravel Brown	

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/8
BORING COMPLETED	4/27/88
RIG CME850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T26

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
										680.6	(32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
1	SS	24	16	17	9000*	16.5						
	HS								40	673.1	(40.0)	
											SANDY LEAN CLAY Trace Gravel Gray	
									45			
									50			
									55			
									60	653.1	(60.0)	
											(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray-Brown	
										650.6	(62.5)	

*Calibrated Hand Penetrometer

Continued on Page 3 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0′	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/88
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

LOG OF BORING NO. T26

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
										650.6	(62.5)	
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown	
									65			
2	SS	24	24	36	7000*	15.9						
	HS											
									70			
										642.1	(71.0)	
											BOTTOM OF BORING	

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 7.0'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	4/26/8
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T27

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description T.O.C. Elevation = 715.78 ft. G.S. Elevation = 713.5 ft.	Monitoring Well Details
	HS							CL			LEAN CLAY Dark Brown	
									(2.0)	711.5	(LOESS) LEAN CLAY Gray Brown	
									(16.0)	697.5	(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									(22.0)	691.5	(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									(32.5)	681.0		

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/88
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB #40875135

Form 106—6-85

OWNER IOWA ARMY AMMUNITION PLANT	ARCHITECT
SITE LINE 6	PROJECT NAME GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
									(32.5)	681.0		
	HS										(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									35			
									40 (40.0)	673.5		
											SANDY LEAN CLAY Trace Gravel Gray	
									45			
									50			
									55			
									60 (60.0)	653.5	(TILL) SANDY LEAN CLAY TRACE GRAVEL Gray Brown	
									(62.5)	651.0		
											Continued on Page 3 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 7.0'	W.S. OR W.D.	A.B.		BORING STARTED	4/26/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	4/27/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T27

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
									(62.5)	651.0		
	HS							CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Gray-Brown	
									70			
1	SS	24	16	17	9000*+	13.0						
	HS											
									75 (75.0)	638.5	(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									80			
									85			
									90			
2	SS	24	24	36	7000*	17.1						
	HS								(92.5)	621.0		
											Continued on Page 4 of 5	

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/88
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T27

OWNER
IOWA ARMY AMMUNITION PLANT

ARCHITECT

SITE
LINE 6

PROJECT NAME
GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
									92.5	621.0		
	HS							CL	95, 100, 105, 110, 115		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									116.0	597.5	WEATHERED LIMESTONE Brown Gray with Shale seams .15% water loss at 120.1	
	RB								120			
									120.4	593.1	LIMESTONE Light Gray, fossiliferous, vuggy in part, dolomitic in part, ~~shaley in part.~~	
C1	DB	120.0	97.2									
									122.5	591.0		
											Continued on Page 5 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/8
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T27

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 4 of 5	
									(122.5)	591.0		
C1	DB	120.0	97.2						125		LIMESTONE Light Gray, fossiliferous, vuggy in part, dolomitic in part, shaley in part	
									130			
C2	DB	120.0	120.0						(134.3)	579.2	SHALE Dark Gray, fissile, with occasional limestone layers	
									135			
									(138.0)	575.5	LIMESTONE Light Gray fossiliferous	
									140 (139.9)	573.6	DOLOMITE Light Brown Gray, pinpoint porosity, laminated in part	
	RB											
									(143.0)	570.6	BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 7.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	4/26/88
BORING COMPLETED	4/27/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T28

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Description
T.O.C. Elevation = 715.89 ft.
G.S. Elevation = 713.6 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CH			FAT CLAY Dark Brown	
1	SS	24	12	9	4000-7500*	24.8				710.8	(2.8)	
	HS							CL			(LOESS) LEAN CLAY Brown	
										699.6	(14.0)	
											(TILL) SANDY LEAN CLAY Trace Gravel Gray	
										697.6	(16.0)	
											(TILL) SANDY LEAN CLAY Trace Gravel Brown Gray	
2	SS	24	24		3000*	16.7						
	HS									692.6	(21.0)	
											BOTTOM OF BORING	

*Calibrated Hand Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/02/88
BORING COMPLETED	5/03/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T29

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description: T.O.C. Elevation = 715.86 ft. G.S. Elevation = 713.6 ft.	Monitoring Well Details
	HS							CH			FAT CLAY Dark Brown	
									(2.8)	710.8		
								CL			(LOESS) LEAN CLAY Brown	
									(14.0)	699.6	(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									(16.0)	697.6	(TILL) SANDY LEAN CLAY Trace Gravel Brown Gray	
1	SS	24	24	13	5500*	16.4						
	HS											
									(32.5)	681.1		

*Calibrated Hand Penetrometer

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/2/88
BORING COMPLETED	5/03/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T29

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
										681.1	(32.5)	
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown Gray	
									40			
									45			
									50			
									55			
										655.6	(58.0) (TILL) SANDY LEAN CLAY OCCASIONAL SAND SEAMS Brown Gray	
									60			
										651.1	(62.5)	
											Continued on Page 3 of 3	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 6.0'	W.S. OR W.D.	A.B.		BORING STARTED 5/02/88	
W.L.	B.C.R.	A.C.R.		BORING COMPLETED 5/03/88	
				RIG CME 850	FOREMAN REF
W.L.				APPROVED DMS	JOB #40875135

LOG OF BORING NO. T29

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
									(62.5)	651.0		
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Occasional Medium Sand Seams Brown Gray	
2	SS	24	24	47		14.9			65			
	HS								70			
									(72.0)	641.6	BOTTOM OF BORING	
									75			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/02/88
BORING COMPLETED	5/03/88
RIG CME 850	FOREMAN REF
APPROVED DMS	JOB #40875135

Form 106—6-85

LOG OF BORING NO. T30

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description: T.O.C. Elevation = 716.21 ft. G.S. Elevation = 713.8 ft.	Monitoring Well Details
	HS							CH			FAT CLAY Dark Brown	
									(2.8)	711.0		
								CL			(LOESS) LEAN CLAY Brown	
									(14.0)	699.8	(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									(16.0)	697.8	(TILL) SANDY LEAN CLAY Trace Gravel Brown Gray	
									(32.5)	681.3		

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 6.0'	W.S. OR W.D.	A.B.		BORING STARTED	5/3/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	5/3/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB # 40875137

Form 106—6-85

LOG OF BORING NO. T30

OWNER IOWA ARMY AMMUNITION PLANT	ARCHITECT
SITE LINE 6	PROJECT NAME GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
										681.3 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown Gray	
									40			
									45			
									50			
									55			
										655.8 (58.0)		
									60		(TILL) SANDY LEAN CLAY OCCASIONAL SAND SEAMS Brown Gray	
										651.3 (62.5)		
											Continued on Page 3 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6.0'	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	5/3/88
BORING COMPLETED	5/5/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875137

LOG OF BORING NO. T30

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
	HS							CL		651.3 (62.5)	(TILL) SANDY LEAN CLAY Trace Gravel Occasional Medium Sand Seams Brown Gray	
									65			
									70			
									75			
1	SS	24	24	64	9000*+	13.5		SC		637.3 (76.5)		
								CL	80		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									85			
									90			
										621.3 (92.5)		

*Calibrated Hand Penetrometer

Continued on Page 4 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/3/88
BORING COMPLETED	5/5/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875137

Form 106—6-85

LOG OF BORING NO. T30

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 3 of 5	
										621.3	(92.5)	
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									95	618.8	(95.0)	
2	SS	24	24	50		16.3					(TILL) LEAN CLAY WITH SAND, Trace Gravel Gray	
									100			
									105			
									110			
									115			
									120			
										591.3	(122.5)	
											Continued on Page 5 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				Terracon		
W.L. 6.0'	W.S. OR W.D.		A.B.		BORING STARTED	5/3/88
W.L.		B.C.R.	A.C.R.		BORING COMPLETED	5/5/88
W.L.					RIG CME 850	FOREMAN REF
					APPROVED	JOB # 40875137

Form 106—6-85

LOG OF BORING NO. T30

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 4 of 5
									(122.5)	591.3	
	HS							CL			(TILL) LEAN CLAY WITH SAND, Trace Gravel Gray
									125		
									(125.5)	588.3	WEATHERED LIMESTONE Light Brown
	RB										
									(129.3)	584.5	LIMESTONE, Light Brown-Gray, Fossiliferous, Shale Laminated Very Shaley In Part, Pyritic In Part
C1	DB	120	110.4						130		
									(132.4)	581.4	DOLOMITE, Dark Gray-Gray Brown, Calcareous In Part, Shaley, Shale Laminated
									135		
									(135.5)	578.3	LIMESTONE, Light Gray Fossiliferous
									(136.7)	577.1	SHALE, Gray, Fissile, Calcerous with Thin Limestone Layers
									(139.3)	574.5	SHALE AND LIMESTONE, Dark Gray, Interbedded
C2	DB	120	115.2						140		
									(140.9)	572.9	LIMESTONE, Light Gray Fossiliferous
									(142.4)	571.4	SEE NOTE 1
									(144.0)	569.4	LIMESTONE, Light Gray Fossiliferous, Shale Laminated with Shale Layers
									145		
											NOTE 1: DOLOMITE, Light Brown-Gray, Shale Laminated Very Shaley in Part Calcareous in Part
	RB								150		
									(152.7)	561.1	BOTTOM OF BORING

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 6.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/3/88
BORING COMPLETED	5/5/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875137

Form 106—6-85

LOG OF BORING NO. T31

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Description

T.O.C. Elevation = 715.44 ft.
G.S. Elevation = 713.0 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS							CL-CH			LEAN TO FAT CLAY Dark Brown	
										709.5	3	
								CL	5		(LOESS) LEAN CLAY Brown	
									(6.5)	706.5	(TILL) LEAN CLAY WITH SAND, Trace Gravel Dark Gray	
1	SS	18	18	7		26.8						
	HS								10			
									(13.0)	700.0	(TILL) SANDY LEAN CLAY Trace Gravel Olive Gray	
									15			
									(17.0)	696.0	(TILL) SANDY LEAN CLAY Trace Gravel Brown	
2	SS	18	18	11		16.5						
	HS								20			
									(21.0)	692.0	BOTTOM OF BORING	
									25			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/03/88
BORING COMPLETED	5/05/88
RIG CME 55	FOREMAN JRJ
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T32

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											T.O.C. Elevation = 715.37 ft. G.S. Elevation = 712.7 ft.	
	HS							CL-CH	(3.5)	709.2	LEAN TO FAT CLAY Dark Brown	
								CL	(6.5)	706.2	(LOESS) LEAN CLAY Brown	
									(13.0)	699.7	(TILL) LEAN CLAY WITH SAND, Trace Gravel Dark Gray	
									(17.0)	695.7	(TILL) SANDY LEAN CLAY Trace Gravel Olive Gray	
									(32.5)	680.2	(TILL) SANDY LEAN CLAY Trace Gravel Brown	

Depth scale: 5, 10, 15, 20, 25, 30

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/03/88
BORING COMPLETED	5/05/88
RIG CME 55	FOREMAN JRJ
APPROVED DMS	JOB # 40875135

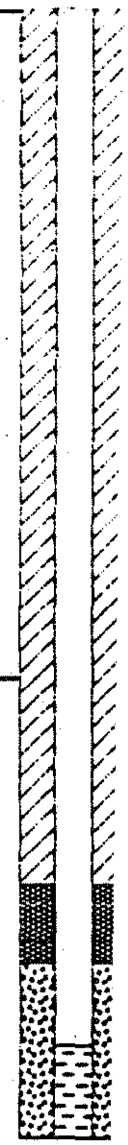
Form 106—6-85

LOG OF BORING NO. T32

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
											Continued from Page 1 of 3
										680.2	(32.5)
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown
1	SS	18	18	30		13.0			40		
									45		
									50	662.7	(50.0)
											(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown
									55		
									60		
										650.2	(62.5)
											Continued on Page 3 of 3

Monitoring Well Details



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	5/03/88		
BORING COMPLETED	5/05/88		
RIG	CME 55	FOREMAN	JRJ
APPROVED	DMS	JOB #	40875135

LOG OF BORING NO. T32

OWNER
IOWA ARMY AMMUNITION PLANT

ARCHITECT

SITE
LINE 6

PROJECT NAME
GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
										650.2	(62.5)	
	HS							CL			(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									65			
2	SS	18	10	46		14.6						
	HS											
									70			
										641.7	(71.0)	
											BOTTOM OF BORING	
									75			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	5/03/88
BORING COMPLETED	5/05/88
RIG CME 55	FOREMAN JRJ
APPROVED DMS	JOB # 40875135

Form 106—6-85

LOG OF BORING NO. T33

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.60 ft.
G.S. Elevation = 713.4 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs./ft.²	Water Content %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CL-CH			LEAN TO FAT CLAY Dark Brown
1A	SS	18	18	7		30.0				709.9	
									(3.5)		
	HS							CL	5		(LOESS) LEAN CLAY
									(6.5)	706.9	(TILL) LEAN CLAY WITH SAND, Trace Gravel Dark Gray
									10		
									(13.0)	700.4	(TILL) SANDY LEAN CLAY Trace Gravel Olive Gray
									15		
									(17.0)	696.4	(TILL) SANDY LEAN CLAY Trace Gravel Brown
									20		
									25		
									30		
									(32.5)	680.9	

Continued on Page 2 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/25/88
BORING COMPLETED	5/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T33

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 5	
										680.9		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									40			
									45			
									50	663.4	(50.0)	
1	SS	24	24	22	6000*	17.0					(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
	HS								55			
									60			
										650.9	(62.5)	

*Calibrated Hand Penetrometer

Continued on Page 3 of 5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/25/88
BORING COMPLETED	5/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

LOG OF BORING NO. T33

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 5	
										650.9		
	HS							CL	65, 70		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
									75	638.4	(75.0)	
								GP			FINE-MEDIUM SAND AND GRAVEL Gray Brown	
										634.4	(79.0)	
								CL	80, 85, 90		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
										620.9	(92.5)	
											Continued on Page 4 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				Terracon		
W.L. 8.0'	W.S. OR W.D.		A.B.		BORING STARTED	5/25/88
W.L.		B.C.R.	A.C.R.		BORING COMPLETED	5/27/88
W.L.					RIG CME 850	FOREMAN REF
					APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T33

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 3 of 5	
										620.9		
	HS							CL	95		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									100			
									105			
									110			
									115			
										594.4	(119.0) LIMESTONE, Light Brown Light Gray, Fossiliferous, Pinpoint Porosity, Jointed	
									120			
C1	DB	120	116.4							591.4	(122.0)	
										590.9	(122.5) SEE NOTE 1	
											Continued on Page 5 of 5	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	5/25/88
BORING COMPLETED	5/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T33

OWNER: IOWA ARMY AMMUNITION PLANT

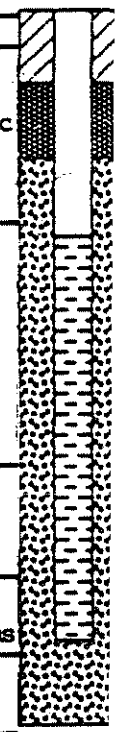
ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 4 of 5

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
										590.9	(123.3) SEE PREVIOUS PAGE
C1	DB	120.0	116.4						125	590.1	LIMESTONE Light Gray, Shale, Laminated, Fossiliferous, Dolomitic and Cherty at Top
									1 0	585.4	(128.0) LIMESTONE, Light Brown Light Gray-Gray, Shaley in Part, Fossiliferous, Dolomitic in Part Pyritic in Part 4-inch Shale Layer at 128.0'
C2	DB	120.0	120.0						135	579.1	(134.3) DOLOMITE, Light Gray Light Brown, Shaley Shale, Laminated, Jointed
										576.0	(137.4) SHALE, Gray-Dark Gray Fissile, Calcite Inclusions
									140	574.1	(139.3) SEE NOTE 2
									145	571.9	(141.5) BOTTOM OF BORING



NOTE 1: CLAY, Brown-Light Gray, 1" Light Brown-Blue Chert Layer at Bottom

NOTE 2: SHALE, LIMESTONE, AND DOLOMITE, Interbedded, Light Gray Limestone, Gray Dolomite, and Gray Shale

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.		A.B.
W.L.		B.C.R.	A.C.R.
W.L.			

Terracon

BORING STARTED	5/25/88
BORING COMPLETED	5/27/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T34

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.21 ft.
G.S. Elevation = 712.5 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY Dark Brown
1	SS	18	4	12		31.3			(3.5)	709.0	
	HS							CL			(LOESS) LEAN CLAY Brown
									(8.0)	704.5	
											(TILL) LEAN CLAY WITH SAND, Trace Gravel Brown
2	SS	18	12	10		17.7					
	HS								(20.0)	692.5	
									(21.0)	691.5	SEE NOTE 1

BOTTOM OF BORING

NOTE 1: (TILL) SANDY LEAN CLAY
Trace Gravel
Gray Brown

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/05/8
BORING COMPLETED	5/05/88
RIG CME 55	FOREMAN JRJ
APPROVED DMS	JOB # 40875135

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OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.23 ft.
G.S. Elevation = 712.5 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY Dark Brown
								CL	(3.5)	709.0	(LOESS) LEAN CLAY Brown
									(8.0)	704.5	(TILL) LEAN CLAY WITH SAND, Trace Gravel Brown
									(20.0)	692.5	
1	SS	18	17	14		17.2					(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown
	HS										
									(30.0)	682.5	(TILL) SANDY LEAN CLAY Trace Gravel Brown
									(32.5)	680.0	

Monitoring Well Details

Continued on Page 2 of 3

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.			

Terracon

BORING STARTED	5/09/88
BORING COMPLETED	5/10/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB #40875135

Form 106—1-87

LOG OF BORING NO. T35

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 3	
										680.0		
	HS							CL	35–59.0		(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown	
								SP (Sw)	(59.0)	653.5	SAND, FINE TO COARSE Brown	
2	SS	18	12	82		11.5			60			
	HS								(62.5)	650.0		
											Continued on Page 3 of 3	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8.0	W.S. OR W.D.		A.B.
W.L.	B.C.R.		A.C.R.
W.L.			

Terracon

BORING STARTED	5/09/8
BORING COMPLETED	5/10/88
RIG CME 55	FOREMAN JRJ
APPROVED	JOB # 40875135

LOG OF BORING NO. T35

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 3	
										650.0		
								SP		649.0	(63.5) SEE PREVIOUS PAGE	
	HS							CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									70			
										641.5	(71.0)	
											BOTTOM OF BORING	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS					
W.L. 8.0	W.S. OR W.D.	A.B.	BORING STARTED	5/09/88	
W.L.	B.C.R.	A.C.R.	BORING COMPLETED	5/10/88	
W.L.			RIG CME 55	FOREMAN	JRJ
			APPROVED	JOB #	40875135

Terracon

Form 106—1-87

LOG OF BORING NO. T36

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

T.O.C. Elevation = 715.14 ft.
G.S. Elevation = 712.3 ft.

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description
	HS							CH			FAT CLAY, Trace Sand Dark Brown
								CL	(3.5)	708.8	(LOESS) LEAN CLAY Brown
									(8.0)	704.3	(TILL) LEAN CLAY WITH SAND, Trace Gravel Brown
									(20.0)	692.3	(TILL) SANDY LEAN CLAY Trace Gravel Gray Brown
1	SS	24	24	21	6500*	14.1			(30.0)	682.3	(TILL) SANDY LEAN CLAY Trace Gravel Brown
									(32.5)	679.8	

*Calibrated Hand Penetrometer

Continued on Page 2 of 6

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/11/88
BORING COMPLETED	5/23/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T36

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 1 of 6	
										679.8 (32.5)		
	HS							CL	35		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
										653.3 (59.0)		
								SP	60		CLAYEY FINE TO COARSE SAND Brown	
									62.5	649.8 (62.5)		
											Continued on Page 3 of 6	

Depth scale: 35, 40, 45, 50, 55, 60, 62.5

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 8.0'	W.S. OR W.D.	A.B.		BORING STARTED	5/11/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	5/23/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB #40875135

Form 106—1-87

LOG OF BORING NO. T36

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 2 of 6	
								SP	62.5	649.8	(62.5)	
	HS									648.8	(63.5) SEE PREVIOUS PAGE	
								CL	65		(TILL) SANDY LEAN CLAY Trace Gravel Brown	
									70			
									75			
									80	632.3	(80.0)	
									85		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									90			
										619.8	(92.5)	
											Continued on Page 4 of 6	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon		
W.L. 8.0'	W.S. OR W.D.	A.B.		BORING STARTED	5/11/8
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	5/23/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB #40875135

Form 106—1-87

LOG OF BORING NO. T36

OWNER: IOWA ARMY AMMUNITION PLANT

ARCHITECT:

SITE: LINE 6

PROJECT NAME: GROUNDWATER QUALITY ASSESSMENT, IAAP

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength lbs/ft.²	Water Content - %	Dry Density lbs/ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Page 3 of 6	
										619.8 (92.5)		
	HS							CL	95		(TILL) SANDY LEAN CLAY Trace Gravel Gray	
									100			
									105	607.3 (105.0)		
2	SS	24	24	106	9000*	14.9					SEE NOTE 1	
										605.3 (107.0)		
									110		(TILL) LEAN CLAY WITH SAND, Trace Gravel Gray	
									115			
									120			
										589.8 (122.5)		

*Calibrated Hand Penetrometer

Continued on Page 5 of 6

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 8.0'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L.		

Terracon

BORING STARTED	5/11/88
BORING COMPLETED	5/23/88
RIG CME 850	FOREMAN REF
APPROVED	JOB # 40875135

Form 106—1-87

LOG OF BORING NO. T36

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	**PROJECT NAME**
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 4 of 6

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description
									(122.5)	589.8	
	HS							CL			(TILL) LEAN CLAY WITH SAND, Trace Gravel Gray
									(132.5)	579.8	
								SP	(133.5)	578.8	SAND SEAM
								CL			(TILL) LEAN CLAY WITH SAND, Trace Gravel Gray
									(136.5)	575.8	LIMESTONE, Weathered, with shale layers
	RB								(139.7)	572.6	
									(140.1)	572.2	LIMESTONE fossiliferous
C1	DB	120.0	120.0								SHALE Gray, fissile, with limestone layers
									(141.7)	570.6	LIMESTONE Light Blue Gray fossiliferous, shaley and shale laminated in part dolomite in part, pin-point porosity
									(145.9)	566.4	SHALE Gray, Soft
									(146.9)	565.4	See Note 2
									(149.4)	562.9	DOLOMITE Light Brown Gray, fossiliferous, shaley, shale laminated fractured
C2	DB	120.0	120.0								
									(152.5)	559.8	

Continued on Page 6 of 6

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS					
W.L. 8.0'	W.S. OR W.D.	A.B.	Terracon	BORING STARTED	5/11/88
W.L.	B.C.R.	A.C.R.		BORING COMPLETED	5/23/88
W.L.				RIG CME 850	FOREMAN REF
				APPROVED	JOB # 40875135

Form 106—1-87

OWNER	ARCHITECT
IOWA ARMY AMMUNITION PLANT	
SITE	PROJECT NAME
LINE 6	GROUNDWATER QUALITY ASSESSMENT, IAAP

Continued from Page 5 of 6

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs./ft.²	Water Content - %	Dry Density - lbs./ft.³	Unified Classification Symbol	Depth	Elevation	Description	Monitoring Well Details
									(152.5)	559.8	DOLOMITE Light Brown Gray fossiliferous, shaley, shale lamin., fractured	
C2	DB	120.0	120.0						(154.7)	557.6	See Note 3.	
									155			
									(156.5)	555.8	See Note 4.	
									(157.7)	554.6	LIMESTONE Light Blue Gray - Light Gray, fossiliferous, slightly shaley, shale laminated	
	RB								160			
									(163.0)	549.3	BOTTOM OF BORING	

NOTE 1: LEAN CLAY WITH SAND Trace Gravel with coal seams and clay seams Gray

NOTE 2: LIMESTONE Light Gray, fossiliferous, very shaley in part, shale laminated, dolomitic in part, pyritic in part

NOTE 3: LIMESTONE Light Blue Brown, fossiliferous, dolomitic in part, shaley in part

NOTE 4: DOLOMITE Light Brown Gray, fossiliferous, shaley in part

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L. 8.0'	W.S. OR W.D.	A.B.	BORING STARTED	5/11/88
W.L.	B.C.R.	A.C.R.	BORING COMPLETED	5/23/88
W.L.			RIG CME 850	FOREMAN REF
			APPROVED	JOB # 40875135

Terracon

12.2.1

GZ Well 1

Final Report

UNDERGROUND POLLUTION INVESTIGATION AT IOWA ARMY AMMUNITION PLANT, BURLINGTON, IOWA

Contract No. DACA87-80-C-0333

Volume I

Submitted to:

U.S. Army Corps of Engineers
Omaha District Office
6014 U.S. Post Office and Courthouse
Omaha, Nebraska 68102

Submitted by:

SCS Engineers
4014 Long Beach Boulevard
Long Beach, California 90807

February 22, 1982

TABLE SUPPLEMENTAL MONITORING WELL LOG DETAILS
IOWA ARMY AMMUNITION PLANT, BURLINGTON, IOWA
JOB NO. [illegible]

4" Wells

Well	x[a] North (ft.)	y[a] South (ft.)	Natural Grade Elevation	Top of Pipe Elevation (ft.)	Installation Date	Nominal Hole Diameter (in.)	Well Depth (ft.)	Casing[b] Depth (ft.)	Screen[c] Length (ft.)	Cement Head (bags)
Z1#1	7192	14117	682.1	685.8	12-3-80	8.5	50	40	10	[illegible]
Z1#2	7181	13955	670.7	673.8	12-22-80	8.5	30	20	10	[illegible]
Z1#2A	7195	13948	671.0	673.9	12-22-80	8.5	10	5	5	[illegible]
Z1#3	7169	13794	677.6	680.6	12-4-80	8.5	46	36	10	[illegible]
Z1#6	9566	13239	683.5	687.3	12-2-80	8.5	49	39	10	[illegible]
Z2#1	8016	8182	722.7	725.4	11-25-80	8.5	54	44	10	[illegible]
Z2#2	5376	10010	698.4	69[illegible].6	12-11-80	8.5	30	20	10	[illegible]
Z2#18	6895	9173	712.4	716.0	12-10-80	8.5	50	40	10	[illegible]
Z2#18A	6924	9173	712.5	716.9	12-10-80	8.5	10	5	5	[illegible]
Z2#19	7192	10148	712.6	715.9	12-10-80 and 12-11-80	8.5	50	40	10	[illegible]
Z3#1	9650	8650	723.6	726.4	12-5-80	8.5	19	9	10	[illegible]
Z3#2	9730	8800	723.9	727.1	12-5-80	8.5	8	3	5	[illegible]
Z3#3	9500	8925	720.9	722.1	12-9-80	8.5	11.5	6.5	5	½
Z3#4	9330	8915	720.9	725.4	12-12-80	8.5	28	18	10	1
Z3#5	9370	8850	722.2	725.8	12-9-80	8.5	18.5	8.5	10	½

(a) Set according to local coordinate system established by C.O.E. for construction on Line 4A, for approximate conversion to State Plane Coordinate System, Iowa South Zone, Est. 1955 use the following formula S.P.C. = L.C. + (294,126 North)
(2,615,430 East)

(b) Nominal 4" inside casing diameter, schedule 40 PVC plastic pipe in accordance with ASTM D 1785-74.

(c) Johnson well screen, V shaped size 20 slot (0.020"), nominal 4" inside diameter PVC.

MONITORING WELL WATER LEVEL RECORD

IOWA ARMY AMMUNITION PLANT

BURLINGTON, IOWA

TCI JOB NO. 680574 / 3-3-81

SITE NO.	WELL NUMBER	READING DATE / ELEVATION TOP OF PIPE (FEET)	WATER DEPTH	WATER LEVEL ELEV.	WATER DEPTH	WATER LEVEL ELEV.	WATER DEPTH	WATER LEVEL ELEV.	WATER DEPTH	WATER LEVEL ELEV.
1	1	[illegible].8								
	2	673.8								
	2A	673.9								
	3	680.0								
	6	[illegible]								
2	1	725.1								
	[illegible]	[illegible]								
	10	716.0								
	10A	716.9								
	[illegible]	[illegible]								
3	1	[illegible]								
	2	727.1								
	3	[illegible].1								
	4	[illegible]								
	5	[illegible]								

APPENDIX C

SITE Z_1 DATA

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
[illegible] ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
[illegible] CREEK ABANDONED PINKWATER LAGOON	SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Well Installed 12-3-80

Surface Elevation = [illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
										[illegible]	(1.0) SILT TRACE SAND, Dark [illegible]	
	HS										CLAYEY SILT Brown	
										678.1	(4.0)	
1	[illegible]	24	[illegible]			[illegible]	11[illegible]	CH	5		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL)	
	HS										Brown Very Stiff to Stiff	
2	ST	24	[illegible]					CL	10			
	HS											
3	ST	24	14					CL	15			
	HS										To Gray Brown at 19'.	
4	ST	24	17			15.9	115	CH	20			
	HS											659.
5	ST	24	18					CH	25			656.
	HS										Thin Sand Seams at 29'.	
6	ST	24	8					CL SM	30	651.6	(30.5)	
										650.[illegible]	(31.5) COARSE SAND, Brown	

Continued on Sheet #2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	43'	W.S. OR W.D.	47'	A.B.
W.L.		B.C.R.		A.C.R.
W.L.	13' 1 hr. A.B./7' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita KS

BORING STARTED	12-3-80		
BORING COMPLETED	12-3-80		
RIG	CME 75	FOREMAN	JM
APPROVED	JFH	JOB #	680573

LOG OF BORING NO. [illegible] (Continued)

OWNER IOWA ARMY AMMUNITION PLANT
[illegible], IOWA

ARCHITECT-ENGINEER
U. S. ARMY CORPS OF ENGINEERS

SITE [illegible] CREEK
ABANDONED [illegible] WATER LAGOON

PROJECT NAME
SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
									30		Continued from Sheet #1	
										650.6	(31.5)	
	H[illegible]										SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown to Gray Very Stiff to Hard	
7	ST	24	1[illegible]					CL	35			
	HS											
8	ST	24	12					CL	40			
	HS											
9	ST	24	0					CL-ML	45			
	HS											
10	ST	24	13					CL	50			632
										631.1	(51.0)	
									55		Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS

W.L. 43' W.S. OR W.D. 47' A.B.
W.L. B.C.R. A.C.R.
W.L. 18' 1 hr. A.B./7' on 1-8-81

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED 12-3-80
BORING COMPLETED 12-3-80
RIG CME 75 **FOREMAN** JM
APPROVED JEH **JOB #** 68057[illegible]

LOG OF BORING NO. [illegible]

OWNER IOWA ARMY AMMUNITION PLANT MIDDLETOWN, IOWA	**ARCHITECT-ENGINEER** U.S. ARMY CORPS OF ENGINEERS
SITE [illegible] CREEK [illegible]	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Well Installed 12-22-80 Surface Elevation = 670.7	
	PA										SANDY SILT Dark Brown	
										669.7	(1.0)	
1	ST	24	[illegible]					CL	5		SILTY CLAY TRACE SAND Gray Very Stiff	
	PA									663.7	(7.0)	
2	ST	24	1[illegible]			20.1	[illegible]	CL-CH	10		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown Very Stiff to Hard	
	PA											
3	ST	24	20					CL	15			653.
	PA											
4	ST	24	18					CL	20			650.
	PA										To Gray at 22'.	
5	ST	24	16					CL	25			
	PA											
6	ST	24	10			13.7	114	CL-SC	30	640.7	Fine to Medium Sand Seam at 29'. (30.0)	640.
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	W.S. OR W.D. 4'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L.	+0.4 on 1-8-81		

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-22-80
BORING COMPLETED	12-22-80
RIG Bomb	FOREMAN REF
APPROVED JFH	JOB # 680574

LOG OF BORING NO. [illegible]

OWNER [illegible] ARMY AMMUNITION PLANT
[illegible], IOWA

ARCHITECT-ENGINEER [illegible] ARMY CORPS OF ENGINEERS

SITE [illegible] CREEK
ABANDONED [illegible]WATER LAGOON

PROJECT NAME [illegible]SURFACE CONTAMINATION INVESTIGAT[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring
											Well Installed 12-22-[illegible] Surface Elevation = [illegible]	
	[illegible]									[illegible]8.0	SANDY SILT Dark Brown Medium (3.0)	
1	[illegible]	[illegible]	[illegible]					CL	5		SILTY CLAY TRACE SAND Gray Brown Very Stiff	
										[illegible]	([illegible])	
[illegible]		[illegible]	[illegible]					[illegible]		[illegible]	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray to Gray Brown [illegible]	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L.	W.S. OR W.D.	None	A.B.
W.L.	B.C.R.		A.C.R.
W.L.	4.8' on 1-8-81		

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	12-22-80
BORING COMPLETED	12-22-80
RIG Bomb	FOREMAN [illegible]
APPROVED JFH	JOB # 6805[illegible]

LOG OF BORING NO. 21 #3

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BRUSH CREEK [illegible] PINKWATER [illegible]	[illegible] CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Well Installed 12-4-80; Surface Elevation = 677.6)
	HS									675.6	CLAYEY SILT (2.0) Dark Brown
1	ST	24						CL	5		CLAYEY SILT Dark Brown Stiff
	HS									668.6	(9.0)
2	ST	24				[illegible]	104	CL	10		SAND, SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown to Greenish Brown Stiff to Very Stiff
	HS										
3	ST	24						CL	15		
	HS										
4	ST	24	12					CL	20		Greenish Gray with Sand Seams at 20'.
	HS										
5	ST	24	13					CL	25		
	HS									648.6	(29.0)
									30		Continued on Sheet #2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUA

WATER LEVEL OBSERVATIONS				
W.L. 12.5'	W.S. OR W.D.	A.B.	BORING STARTED	12-4-80
W.L.	B.C.R.	A.C.R.	BORING COMPLETED	12-4-80
W.L. 2.0' on 1-8-81			RIG CME 75	FOREMAN JM
			APPROVED JFH	JOB # 680574

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

LOG OF BORING NO. [illegible] (Continued)

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT [illegible], IOWA	[illegible] ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BRUSH CREEK ABANDONED PINKWATER LAGOON	[illegible]RFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth	Elevation	Description	Monitoring Well Details
										648.6	(27.0) Continued from Sheet #1	
6	ST	18	18					CL	30		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL)	
	HS										Brown Gray to Gray Hard	
[illegible]	ST	[illegible]	[illegible]					CL	[illegible]		With Coarse Sand and Gravel Seams at 30'.	641.
	HS											
[illegible]	[illegible]							[illegible]	40		Very Sandy at 39.5'.	
	HS											
[illegible]	[illegible]	[illegible]	[illegible]					[illegible]	45		Very Silty at 44.5'.	631.
	HS											
10	ST	[illegible]	[illegible]					CL	50	627.6	(50.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		
W.L. 12.5'	W.S. OR W.D.	A.B.
W.L.	B.C.R.	A.C.R.
W.L. 2.0' on 1-8-81		

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-4-80
BORING COMPLETED	12-4-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB #680574

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
[illegible] ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
[illegible] CREEK ABANDONED [illegible]WATER [illegible]	SUBSURFACE CONTAMINATION INVESTIGATIO[N]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Surface Elevation = [illegible])	Monitoring Well Details
	PA										SANDY SILT TRACE CLAY WITH COAL CHIPS Dark Brown to Black	
										674.1	(2.5)	
1	ST	[illegible]	13			14.0	11[illegible]	CL			SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff	
	[illegible]								5			
[illegible]	ST	24	[illegible]					CL		66[illegible]	([illegible])	
	[illegible]								10		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown Stiff to Very Stiff	
3	ST	24	12			16.5	116	CL				
	PA								15			
4	ST	24	16					CL				
									20	656.6	(20.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS						
W.L.		W.S. OR W.D.	None	A.B.	BORING STARTED	12-23-80
W.L.		B.C.R.		A.C.R.	BORING COMPLETED	12-23-80
W.L.	[illegible] 1-7-81				RIG Bomb/CME 45	FOREMAN REF
					APPROVED JFH	JOB # 680574

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita KS

LOG OF BORING NO. 21 [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BROWN CREEK ABANDONED [illegible] WATER LAGOON	[illegible] TRACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Surface Elevation = 674.2)	Monitoring
1	ST	24	5					ML		627.7	(1.5) SEE NOTE #1 BELOW	
	PA							CL	5		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown to Gray Brown Stiff to Very Stiff	
2	ST	24	[illegible]			23.5	101	CL	10			
	PA									663.2	(11.0) SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Brown Very Stiff to Hard	
3	ST	24	16			14.0	118	CL	15			
	PA											
4	ST	24	18					CL	20	654.2	(20.0)	

Bottom of Boring

NOTE #1:

CLAYEY SILT TRACE SAND WITH COAL CHIPS
Dark Brown to Black

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	W.S. OR W.D.	None	A.B.	
W.L.	B.C.R.		A.C.R.	
W.L.	0.8' on 1-7-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-22-80
BORING COMPLETED	12-22-80
RIG Bomb/CME 45	FOREMAN REF
APPROVED JFH	JOB # 680574

LOG OF BORING NO. ZI #6

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U.S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BRUSH CREEK ABANDONED PINKWATER LAGOON	SURFACE CONTAMINATION INVESTIGATI[ON]

Well Installed 12-2-80

Surface Elevation = 683.5

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring
	HS									682.5	(1.0) CLAYEY SILT, Dark Brown	
											SILTY CLAY SOME SAND Dark Brown Very Stiff	
1	ST	24	3			27.8	90	CL	5			
										677.5	(6.0)	
	HS										SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Very Stiff to Hard	
2	ST	24	14					CL	10			
	HS											
3	ST	24	21			11.5	117	CL	15			
	HS											
4	ST	24	13					CL	20			
	HS											
5	ST	24	19					CL	25		To Gray at 24.8 Feet.	
	HS											
										655.0	(28.5)	
									30		Continued on Sheet #2	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUA[L]

WATER LEVEL OBSERVATIONS			
W.L. 7.5'	W.S. OR W.D.	44.5'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 0.0' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	11-26-80		
BORING COMPLETED	11-26-80		
RIG	CME 75	FOREMAN	JM
APPROVED	JFH	JOB #	680574

LOG OF BORING NO. [illegible] #6 (continued)

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BROWN CREEK ABANDONED FIRE WATER LAGOON	SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft.²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring
										655.0	(28.5) Continued from Sheet #1	
6	ST	24	11					CL	30		SANDY SILTY CLAY TRACE GRAVEL WITH SAND LAYERS Gray Green (31.5) Very Stiff	
	HS									651.5	SANDY SILTY CLAY TRACE GRAVEL Gray Hard	
7	ST	24	14					CL	35			
	HS										(38.5)	
8										645.0		
	HS								40		SANDY SILTY CLAY TRACE GRAVEL WITH COARSE SAND AND GRAVEL SEAMS Gray Hard	
9	ST	14						CL				
	HS								45			
10	ST	12	8					CL				
	HS								50			
										630.0	(53.5)	
									55		Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 7.5'	W.S. OR W.D.	44.5'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 0.0' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	11-26-80
BORING COMPLETED	11-26-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB # 680574

LOG OF BORING NO. ZI #7

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE BRUSH CREEK ABANDONED PINKWATER LAGOON	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 679.2	Monitoring
1	ST	24	4					CL		677.7	(1.5) **SANDY SILTY CLAY** Brown	
	HA								5		**SANDY SILTY CLAY TRACE GRAVEL** Gray Brown Very Stiff to Hard	
2		[illegible]	[illegible]					CL	10	669.2	(10.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	W.S. OR W.D.	None	A.B.	
W.L.	B.C.R.		A.C.R.	
W.L.	1.3' on 1-7-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	12-22-80
BORING COMPLETED	12-22-80
RIG Bomb/CME 45	**FOREMAN** TT
APPROVED JFH	**JOB #** 680574

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
[illegible] CREEK [illegible] WATER LAGOON	[illegible]RFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 676.2	Monitoring Well Details
	PA										**SILTY CLAY TRACE SAND** Dark Brown (3.0)	
1	ST	24	[illegible]					CL		672.2	**SANDY SILTY CLAY TRACE GRAVEL** Gray to Gray Brown Stiff to Very Stiff	
	PA								5			
2	ST	24	[illegible]					CL			(10.0)	
									10	666.2	Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU, THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS				Terracon Consultants, Inc.		
W.L.	W.S. OR W.D.	None	A.B.	Cedar Rapids Davenport Des Moines, IA Kansas City Wichita KS	BORING STARTED	12-23-80
W.L.	B.C.R.		A.C.R.		BORING COMPLETED	12-23-80
W.L.	2.5' on 1-7-81				RIG Bomb/CME 45	FOREMAN TST
					APPROVED LFH	JOB # 680574

LOG OF BORING NO. Z1 #9

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
BRUSH CREEK ABANDONED PINKWATER LAGOON	SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 677.4	Monitoring
	PA										CLAYEY SILT WITH SAND SEAMS Dark Brown Stiff	
1	ST	24	0					CL CL		673.4	(4.0)	
									5		SILTY CLAY LITTLE SAND WITH NUMEROUS SAND SEAMS Brown Gray Stiff to Very Stiff	
	PA											
2	ST	24	0					ML-CL				
									10	667.4	(10.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUA

WATER LEVEL OBSERVATIONS				Terracon Consultants, Inc.	BORING STARTED	12-23-80
W.L.	7'	W.S. OR W.D.	None A.B.	Cedar Rapids Davenport Des Moines IA	BORING COMPLETED	12-23-80
W.L.		B.C.R.	A.C.R.	Kansas City Wichita KS	RIG Bomb/CME 45	FOREMAN REF
W.L.	3.4' on 1-7-81				APPROVED JFH	JOB #680574

LOG OF BORING NO. Z1 #10

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE BRUSH CREEK ABANDONED PINKWATER LAGOON	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content-%	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 678.3	Monitoring
	PA										SANDY SILT WITH COAL CHIPS Dark Brown to Black	
										675.8	(2.5)	
1	ST	24	12					CL			SANDY SILTY CLAY TRACE GRAVEL Brown Very Stiff	
	PA								5			
2	ST	24	16					CL				
									10	668.3	(10.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	W.S. OR W.D.	None	A.B.	
W.L.	B.C.R.		A.C.R.	
W.L.	5.3' on 1-7-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita KS

BORING STARTED	12-23-80		
BORING COMPLETED	12-23-80		
RIG Bomb/CME 45		**FOREMAN** TB	
APPROVED JFH		**JOB #** 68057	

APPENDIX D

SITE Z_2 DATA

LOG OF BORING NO. [illegible] #1

OWNER IOWA ARMY AMMUNITION PLANT, BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE [illegible], DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth	Elevation	Description (Well installed 11-25-80; Surface Elevation = 722.7)	Monitoring Well Details
	PA									720.[illegible]	CLAYEY SILT TRACE SAND (2.0) Dark Brown	
1	ST	24	[illegible]			30.2	[illegible]	CL	5		SILTY CLAY TRACE SAND Gray Brown Medium	719
	PA									714.[illegible]	([illegible])	
2	ST	24	[illegible]					CL	10		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL)	
	PA										Brown Medium to Stiff	
3	ST	24	6			19.3	109	CL				
	PA								15			
4	ST	24	20					CL				
	PA								20		To Gray Brown at 23'.	
5	ST	24	16					CL				
	PA								25	699.7	(26.0)	
6	ST	24	10					CL			SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray (30.0) Very Stiff	
									30	692.7		

Continued on Sheet #2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 8'	W.S. OR W.D.	11.3'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 18.2' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED 11-20-80	
BORING COMPLETED 11-20-80	
RIG CME 55 #4	**FOREMAN** REE
APPROVED JEH	**JOB #** 680[illegible]

LOG OF BORING NO. Z2 #1 (continued)

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE 6 DETONATOR LINE	SUBSURFACE CONTAMINATION INVESTIGATION

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft.	Unconfined Compressive Strength-lbs/ft.^{2}	Water Content-%	Dry Density-lbs./ft.^{3}	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Sheet #1	
	PA								30	692.7	(30.0) SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Very Stiff	
7	ST	24	13					CL CL	35	688.7	(34.0) SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown to Gray Brown Very Stiff to Hard	
	PA											
8	ST	24	12					CL	40			
	PA											
9	ST	24	15					CL	45			678.7
	PA											
10	ST	24	6					CL			Cobbles at 49'.	
									50	672.7	(50.0) Bottom of Boring	668.7

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	8'	W.S. OR W.D.	11.3' A.B.	
W.L.		B.C.R.	A.C.R.	
W.L.	18.2' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	11-20-80		
BORING COMPLETED	11-20-80		
RIG	CME 55 #4	FOREMAN	REF
APPROVED	JFH	JOB #	680574

LOG OF BORING NO. ZZ #2

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATIO

Well Installed 12-11-80

Surface Elevation = 698.4

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol
	PA							
1	ST	24	8			28.6	89	CL
	PA							
2	ST	24						CL
	PA							
3	ST	24	19					CL
	PA							
4	ST	24	19					CL
	PA							
5	ST	24	11			17.9	112	CL
	PA							
6	ST	24	13					CL

Depth	Elevation	Description	Monitoring Well Details
0		SILTY CLAY TRACE SAND Dark Brown Stiff	695..
6.5	691.9	(6.5)	692..
		SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Brown Very Stiff to Hard. With Occasional Sand Seams at 15'.	
			678..
30	668.4	(30.0)	668..
		Continued on Sheet #2	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS					
W.L.	7.5' W.S. OR W.D.	10.3' A.B.	Terracon Consultants, Inc. Cedar Rapids Davenport Des Moines IA Kansas City Wichita KS	BORING STARTED 11-20-80	
W.L.	B.C.R.	A.C.R.		BORING COMPLETED 11-20-80	
W.L.	2.0' on 1-8-81			RIG CME 55 #4	FOREMAN REF
				APPROVED JFH	JOB # 680574

LOG OF BORING NO. [illegible] (Continued)

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE [illegible] [illegible] LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Sheet #1	
									30	668.4	(30.0)	
	PA										SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL)	
[illegible]	ST	24	[illegible]					CL			Brown Very Stiff to Hard	
	PA								35			
[illegible]	ST	24	12					CL				
	PA								40			
[illegible]	ST	[illegible]	13					CL			with Numerous Sand Seams at 43.5'.	
	PA								45			
10	ST	24	12					CL				
									50	648.4	(50.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	7.5'	W.S. OR W.D.	10.3'	A.B.
W.L.		B.C.R.		A.C.R.
W.L.	2.0' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	11-20-80		
BORING COMPLETED	11-20-80		
RIG CME 55 #4		**FOREMAN**	REI
APPROVED	JFH	**JOB #**	680574

LOG OF BORING NO. 22 #[illegible]

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 716.9	Monitoring Well Details
	PA									714.9	CLAYEY SILT Dark Brown (2.0)	
1	ST	24	7					CH	5		SILTY CLAY TRACE SAND Brown Medium	
	PA										Gray at 4'.	
2	ST	24	20					CL-CH	10		Brown at 9'.	
	PA									703.9	(13.0)	
3	ST	24	7			16.4	113	CL	15		SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Brown Stiff to Very Stiff	
	PA											
4	ST	24	15					CL	20		With Numerous Sand Seams at 19'.	
	PA											
5	ST	24	11			15.7	108	CL	25		Gray at 24'.	
	PA											
6	ST	24	10					CL	30	686.9	(30.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 9.0'	W.S. OR W.D. 8.1'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 4.7' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED 11-21-80	
BORING COMPLETED 11-2[illegible]-80	
RIG CME 55 #4	**FOREMAN** REF
APPROVED JFH	**JOB #** 680574

LOG OF BORING NO. Z2 #4

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGAT

Surface Elevation = 713.8

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth	Elevation	Description	Monitoring
										712.3	(1.5) CLAYEY SILT, Dark Brown	
	PA										SILTY CLAY Brown to Gray Brown Medium to Stiff	
1	ST	24	5					CL-CL	5			
	PA											
2	ST	24	14					CL		[illegible]	([illegible])	
	PA								10		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown Stiff to Very Stiff Brown at 13'.	
3	ST	24	15					CL	15			
	PA											
4	ST	24	17					CL	20			
	PA											
5	ST	24	16					CL	25			
	PA											
6	ST	24	18					CL	30	683.8	With Occasional Sand Seams (30.0) at 29'.	
											Continued on Sheet #2	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 3.5'	W.S. OR W.D.	3.75'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 3.3' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	11-21-80
BORING COMPLETED	11-22-80
RIG CME 55 #4	FOREMAN REF
APPROVED JFH	JOB # 680574

LOG OF BORING NO. DD #4 (Continued)

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATION

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Sheet #1	
									30	683.8	(30.0)	
	PA										SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff to Very Stiff	
7	ST	24	15			12.1	122	CL				
	PA								35			
8	ST	24	15					CL				
	PA								40			
										671.3	(42.5)	
9	ST	24	17			25.3	101	CH			SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Very Stiff	
	PA								45		Brown at 48.5'.	
10	ST	24	18					CH				
									50	663.8	(50.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU; THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L. 3.5'	W.S. OR W.D.	3.75'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 3.3' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	11-21-80
BORING COMPLETED	11-22-80
RIG CME 55 #4	**FOREMAN** REF
APPROVED JFH	**JOB #** 680574

LOG OF BORING NO. Z2 [illegible]

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE [illegible] DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Surface Elevation = 710.[illegible]	
	PA									708.[illegible]	SILTY CLAY TRACE SAND Dark Brown (2.0)	
1	ST	24	[illegible]					CL-CH	5		SILTY CLAY TRACE SAND Gray Brown Stiff	
	PA									[illegible]	([illegible])	
2	ST	24	18			22.[illegible]	[illegible]	CL	10		SILTY CLAY LITTLE SAND Gray Medium	
	PA									699.[illegible]	(11.[illegible])	
3	ST	24	15					CL	15		SANDY CLAYEY SILT TRACE GRAVEL (GLACIAL TILL) Brown Stiff	
	PA										Gray Brown at 18'.	
4	ST	24	19					CL	20			
	PA									688.6	(22.0)	
5	ST	24	15					CL-CH	25		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Very Stiff to Hard	
	PA										With Sand Seams at 24'.	
6	ST	24	18					CL	30	680.6	(30.0)	
											Continued on Sheet #2	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
W.L.	7.0' W.S. OR W.D.	WCI	11.5' A.B.	
W.L.	B.C.R.		A.C.R.	
W.L.	3.7' on 11-26-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita, KS

BORING STARTED	11-21-80		
BORING COMPLETED	11-21-80		
RIG	CME 55 #4	FOREMAN	REF
APPROVED	JFH	JOB #	680574

LOG OF BORING NO [illegible] (continued)

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE [illegible] DETONATOR LINE	SUBSURFACE CONTAMINATION INVESTIGATIC

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
											Continued from Sheet #1	
									30	680.6	(30.0)	
	PA										SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Brown Very Stiff to Hard	
7	ST	24	17					CL	35			
	PA											
8	ST	24	15			15.4	115	CL	40			
	PA											
9	ST	24	16					CL	45			
	PA									663.1	(47.5)	
10	ST	24	16					CL			SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Greenish Gray, Very Stiff	
									50	660.6	(50.0) Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon Consultants, Inc.	BORING STARTED	11-21-80
W.L. 7.0'	W.S. OR W.D.	WCI 11.5' A.B.	Cedar Rapids Davenport Des Moines IA	BORING COMPLETED	11-21-80
W.L.	B.C.R.	A.C.R.	Kansas City Wichita KS	RIG CME 55 #4	FOREMAN REF
W.L. 3.7' on 11-26-80				APPROVED JFH	JOB # 680574

LOG OF BORING NO. 22 #6

OWNER	IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	ARCHITECT-ENGINEER	U. S. ARMY CORPS OF ENGINEERS
SITE	LINE 6 DETONATOR LINE	PROJECT NAME	[illegible]URFACE CONTAMINATION INVESTIGATI

Sample No.	Type Sampler	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Surface Elevation = 712.8)	Monitoring Well Details
	PA									710.8	CLAYEY SILT Dark Brown (2.0)	
1	ST	24	6			28.6	91	CH	5		SILTY CLAY TRACE SAND Gray Stiff to Medium	
	PA											
[illegible]	ST	24	20			29.[illegible]	[illegible]	CH-CL	10	701.8	(11.0)	
	PA										SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Stiff	
3	ST	24	14					CH-CL	15			
	PA											
4	ST	24	15					CL	20		Brown at 19.0'.	
	PA									689.8	(23.0)	
5	ST	24	14					CH-CL	25		SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Gray Brown to Gray Very Stiff to Hard	
	PA											
6	ST	24	16					CL	30	682.8	(30.0)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 6.0'	W.S OR W.D. 4.75'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 4.5' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED	11-22-80
BORING COMPLETED	11-22-80
RIG CME 55 #4	FOREMAN REF
APPROVED JFH	JOB # 680574

LOG OF BORING NO. Z2 #7

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATIC

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft ^{2}	Water Content %	Dry Density lbs/ft ^{3}	Unified Class Symbol
	PA							
1	ST	24	[illegible]			28.6	89	CH-CL
	PA							
2	ST	24	13					CH-CL
	PA							
3	ST	24	14					CH
	PA							
4	ST	24	24					CL
	PA							
5	ST	24	18			17.9	112	CL
	PA							
6	ST	24	15					CL

Depth	Elevation	Description	Monitoring Well Details
		Surface Elevation = 715.8	
(2.0)	713.8	CLAYEY SILT Dark Brown	
(12.0)	703.8	SILTY CLAY TRACE SAND Dark Brown Very Stiff to Stiff To Gray Brown at 5.0'.	
(30.0)	685.8	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Gray to Brown Stiff to Very Stiff	
		Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L. 8.7'	W.S. OR W.D. 20'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 5.5' on 11-26-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	11-24-80
BORING COMPLETED	11-24-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB # 680574

LOG OF BORING NO. 22 #8

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** : U. S. ARMY CORPS OF ENGINEERS
SITE LINE 5 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength tsf/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol
	PA							
1	ST	24	14					CH
	PA							
2	ST	24	[illegible]			[illegible]	[illegible]	[illegible] CL
	PA							
3	ST	24	10			21.8	104	CL
	PA							
4	ST	24	15					CL
	PA							
5	ST	24	15					CL
	PA							
6	ST	24	17					CL

Depth	Elevation	Description
		Surface Elevation = 712.7
0 – 2.0	710.7	CLAYEY SILT Dark Brown
2.0 – 8.7	704.0	SILTY CLAY TRACE SAND Gray Brown Medium
8.7 – 18.0	694.7	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown Stiff
18.0 – 30.0	682.7	SANDY SILTY CLAY TRACE GRAVEL WITH SAND SEAMS (GLACIAL TILL) Brown Very Stiff
30.0		Bottom of Boring

Depth scale: 5, 10, 15, 20, 25, 30

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 7.0'	W.S. OR W.D. 17.2'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 5.3' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	11-22-80
BORING COMPLETED	11-22-80
RIG CME 55	FOREMAN REE
APPROVED JFH	JOB # 680574

LOG OF BORING NO. Z2 #9

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 6 DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Surface Elevation = 714.3)	Monitoring Well Details
	PA										CLAYEY SILT Dark Brown	
1	ST	24	4					CH		712.3	(2.0) SILTY CLAY TRACE SAND Gray Brown Hard	
	PA								5			
2	ST	24	19					CH-CL CL-CH		706.3	(8.0) SANDY SILTY CLAY Brown Gray Stiff	
	PA								10	703.3	(11.0) SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff	
3	ST	24	16			21.1	107	CL				
	PA								15			
4	ST	24	22					CL				
	PA								20			
5	ST	24	18					CL				
	PA								25			
6	ST	24	15			19.7	108	CL		686.3	(28.0) SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray, Very Stiff	
									30	684.3	(30.0) Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				Terracon Consultants, Inc.		
W.L. 6.5'	W.S. OR W.D. 10.7'	A.B.		Cedar Rapids Davenport Des Moines, IA Kansas City Wichita, KS	BORING STARTED 11-24-80	
W.L.	B.C.R.	A.C.R.			BORING COMPLETED 11-24-80	
W.L. 5.7' at 24 hr./4.9' on 1-6-81					RIG CME 75	FOREMAN JM
					APPROVED JEH	JOB # 680574

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT MIDDLETOWN, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE [illegible] [illegible]ATOR LINE	SUBSURFACE CONTAMINATION INVESTIGATION

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol
	PA							
1	ST	24	[illegible]			[illegible]	[illegible]	CH
	PA							
2	[illegible]	24	14					CL
	PA							
3	ST	24	12					CL
	PA							
4	ST	24	16			17.5	116	CL
	PA							
5	ST	24	15					CH CL
	PA							
6	ST	24	16					CL-CH

Depth	Elevation	Description	Monitoring Well Details
		Surface Elevation = 713.5	
(1.5)	712.0	CLAYEY SILT Dark Brown	
(8.0)	705.5	SILTY CLAY TRACE SAND Gray Brown Medium	
(11.0)	702.5	SILTY CLAY LITTLE SAND WITH SAND SEAMS Dark Gray Stiff	
(24.0)	689.5	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Medium to Stiff	
(28.0)	685.5	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff	
(30.0)	683.5	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Light Gray, Very Stiff	
		Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 4.5'	W.S. OR W.D. 6.0'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 3.9' on 11-25-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	11-22-80		
BORING COMPLETED	11-22-80		
RIG	CME 55	FOREMAN	REF
APPROVED	JEH	JOB #	680574

LOG OF BORING NO. [illegible] #17

OWNER IOWA ARMY AMMUNITION PLANT [illegible], IOWA	**ARCHITECT-ENGINEER** [illegible] ARMY CORPS OF ENGINEERS
SITE LINE [illegible] [illegible] LINE	**PROJECT NAME** [illegible] CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description Surface Elevation = 719.[illegible]	Monitoring Well Details
	PA										CLAYEY SILT Dark Brown	
									(2.0)	717.[illegible]		
1	ST	[illegible]	[illegible]					CL			SILTY CLAY SOME SAND Gray Brown to Brown Very Stiff	
	PA								5			
2	ST	24	1[illegible]					CL				
								CL	[illegible]	711.		
	PA								10		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff to Very Stiff	
3	ST	24	1[illegible]			22.2	104	CL				
	PA								15			
4	ST	24	13					CL				
	PA								20			
5	ST	24	13					CL				
	PA								25			
6	ST	24	10			13.1	123	CL				
									30 (30.0)	689.0	Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L. 2.7'	W.S. OR W.D. 10.0'	A.B.	
W.L.	B.C.R.		A.C.R.
W.L. 4.9' on 11-26-80			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita KS

BORING STARTED	11-24-80
BORING COMPLETED	11-24-80
RIG CME 75	FOREMAN JM
APPROVED [illegible]	JOB #[illegible]

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT [illegible]INGTON, IOWA	[illegible] ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
[illegible]	[illegible]FACE CONTAMINATION INVESTIGATI[illegible]

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth
	HS								
1	[illegible]	[illegible]	[illegible]			23.2	[illegible]	CL	
	HS								
2	ST	24	[illegible]					CL	10
	HS								
3	ST	24	13					CL	15
	HS								
4	ST	24	16					CL	20
	HS								
5	ST	24	10					CL	25
	HS								
6	ST	24	9					CL	30

Elevation	Description
	Well Installed 12-10-80
	Surface Elevation = 712.[illegible]
	CLAYEY SILT Dark Brown
710.[illegible]	[illegible]LTY CLAY TRACE SAND Brown Gray Stiff Gray at 8.0'.
695.9	(16.5)
	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray to Brown Gray Stiff to Very Stiff
684.4	(28.0)
	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown to Brown Very Stiff to Hard
681.4	(31.0)

Monitoring Well Details: 695, 692

Continued on Sheet #2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 4.0'	W.S. OR W.D. 32.0'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. [illegible] 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids · Davenport · Des Moines, IA
Kansas City · Wichita, KS

BORING STARTED	12-10-80
BORING COMPLETED	12-10-80
RIG CME 75	FOREMAN JM
APPROVED [illegible]	JOB # [illegible]

LOG OF BORING NO. [illegible] #15 (Continued)

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE [illegible] DETONATOR LINE	SUBSURFACE CONTAMINATION INVESTIGAT

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft 2	Water Content %	Dry Density lbs/ft 3	Unified Class Symbol	Depth	Elevation	Description	Monitoring
									30		Continued from Sheet #1	
										681.4	(31.0)	
	HS										SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown to Brown Very Stiff to Hard	
[illegible]	ST	24	[illegible]			1[illegible].4	12[illegible]	CL	35			
	HS											
[illegible]	ST	24	16					CL	40			
	HS											
9	ST	24	1[illegible]					CL	45			
	HS											
10	ST	24	14					CL	50	662.4	(50.0)	662
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 4.0'	W.S. OR W.D. 32.0'	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 4.3' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids, Davenport, Des Moines, IA
Kansas City, Wichita, KS

BORING STARTED	12-9-80
BORING COMPLETED	12-10-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB # 680574

LOG OF BORING NO. [illegible] #1AA

OWNER IOWA ARMY AMMUNITION PLANT [illegible], IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE [illegible] DETONATOR LINE	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth	Elevation	Description	Monitoring Well Details
											Well Installed 12-10-80 Surface Elevation = [illegible]	
										710.[illegible]	CLAYEY SILT Dark Brown	709
											SILTY CLAY T[illegible] Brown Gray at 8.0'. (10.0)	
										702.[illegible]	Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			Terracon Consultants, Inc.	BORING STARTED 12-10-80	
W.L. 3.0'	W.S. OR W.D. --	A.B.	Cedar Rapids, Davenport, Des Moines, IA	BORING COMPLETED 12-10-80	
W.L.	B.C.R.	A.C.R.	Kansas City, Wichita, KS	RIG CME 75	FOREMAN JM
W.L. 3.2' on 1-8-81				APPROVED JFH	JOB # 680574

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
[illegible] AMMUNITION PLANT [illegible], IOWA	[illegible] ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
[illegible] [illegible] LINE	[illegible]RFACE CONTAMINATION INVESTIGAT[illegible]

Well Installed 12-10-[illegible]
12-11-80

Surface elevation = 712.[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description
	[illegible]									711.1	([illegible]) Dark Brown
											SILTY CLAY TRACE SAND Gray Brown Stiff
1	ST	24	[illegible]					CH	5		
	[illegible]										
2	ST	[illegible]						CH	10		
	HS									699.[illegible]	(13.[illegible])
											SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff to Very Stiff Sand seams at 20.5'.
3	ST	[illegible]	[illegible]					CL	15		
	HS										
4	ST	24	21					CL	20		
	HS										
5	ST	24	11					CL	25		
	HS										
6	ST	24	10					CL	30		
										679.6	(33.0)

Monitoring Well Details: 709

Continued on Sheet #2

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 18.0'	W.S. OR W.D.	42.0'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 3.3' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids · Davenport · Des Moines, IA
Kansas City · Wichita, KS

BORING STARTED	12-10-80
BORING COMPLETED	12-10-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB # 680574

LOG OF BORING NO. 22 [illegible] (Continued)

OWNER: [illegible] ARMY AMMUNITION PLANT, [illegible], IOWA

ARCHITECT-ENGINEER: [illegible] ARMY CORPS OF ENGINEERS

SITE: LINE [illegible], [illegible] LINE

PROJECT NAME: [illegible]RFACE CONTAMINATION INVESTIGATIO[illegible]

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength, lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
									30			
										[illegible]	([illegible]) SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown	
[illegible]	[illegible]	[illegible]	[illegible]					CL	35			
	[illegible]									[illegible]	([illegible]) Hard	
											SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Gray Brown Stiff to Very Stiff	
[illegible]	[illegible]	[illegible]	[illegible]					CL	40			
	HS											
9	ST	24	12					CL	45			
	HS											
10	ST	24	16			23.2	99	CL				
									50	662.0	(50.0)	662.[illegible]

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L. 18.0'	W.S. OR W.D.	42.0'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 3.3' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-10-80
BORING COMPLETED	12-10-80
RIG CME 75	FOREMAN JM
APPROVED JFH	JOB # 680574

APPENDIX E

SITE Z_3 DATA

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE 4A NEW WATEWATER LAGOON	SUBSURFACE CONTAMINATION INVESTIGATI

Well Installed 12-5-80

Surface Elevation - 723.6

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength-lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS									721.6	CLAYEY SILT Dark Brown (2.0)	
											SILTY CLAY TRACE SAND Gray Brown Stiff	719
1	ST	24	1			23.7	100	CL-CH	5			
	HS											716
2	ST	24	11					CL	10			
	HS											
3	ST	24	12					CL	15			
	HS											704
4	ST	24	14			13.6	120	CL-ML	20	704.1	(19.5) SANDY CLAYEY SILT TRACE GRAVEL (GLACIAL TILL) Brown, Hard	
										702.6	(21.0) Bottom of Boring	
									25			

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL

WATER LEVEL OBSERVATIONS			
W.L. 9.5'	W.S. OR W.D.	17.2'	A.B.
W.L.	B.C.R.		A.C.R.
W.L. 10' 1 hr A.B./5.2' on 1-8-8			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-5-80
BORING COMPLETED	12-5-80
RIG CME 75	FOREMAN [illegible]
APPROVED JEH	JOB # [illegible]

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
IOWA ARMY AMMUNITION PLANT [illegible]INGTON, IOWA	U. S. ARMY CORPS OF ENGINEERS
SITE	**PROJECT NAME**
LINE 4A NEW WASTEWATER LAGOON	SUBSURFACE CONTAMINATION INVESTIGATI[illegible]

Well Installed 12-5-80

Surface Elevation = 72[illegible]

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring [illegible]
	HS										CLAYEY SILT Dark Brown	72[illegible]
										720.4	(3.5)	720
1	ST	24	[illegible]			26.3	91	CH	5		SILTY CLAY TRACE SAND Gray Brown Very Stiff	
	HS											71[illegible]
2	ST	24	[illegible]			24.6	102	CH				
									10	713.9	(10.5)	
											Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L.	W.S. OR W.D.	None	A.B.
W.L.	B.C.R.		A.C.R.
W.L.	None		

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita, KS

BORING STARTED	12-5-80		
BORING COMPLETED	12-5-80		
RIG	CME 75	FOREMAN	JM
APPROVED	JFH	JOB #	68057

LOG OF BORING NO. Z3 #3

OWNER IOWA ARMY AMMUNITION PLANT
BURLINGTON, IOWA

ARCHITECT-ENGINEER
U. S. ARMY CORPS OF ENGINEERS

SITE LINE 4A
NEW WASTEWATER LAGOON

PROJECT NAME
SUBSURFACE CONTAMINATION INVESTIGATIO

Well Installed 12-9-80

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description (Surface Elevation = 720.9)
	HS									718.9	CLAYEY SILT Dark Brown (2.0)
1	ST	24	8			25.1	92	CL-CH	5		SILTY CLAY TRACE SAND Gray Brown Stiff
	HS								10		Gray at 11'.
2	ST	24	8			26.4	97	CL		707.9	(13.0)
									15		Bottom of Boring

Monitoring Well Details

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN-SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 11.5'	W.S. OR W.D.	11.5'	A.B.
W.L.	B.C.R.		A.C.R.

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA

BORING STARTED	12-9-80
BORING COMPLETED	12-9-80
RIG BOMB	FOREMAN JM

LOG OF BORING NO. [illegible] #4

OWNER IOWA ARMY AMMUNITION PLANT, BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 4A, NEW WASTEWATER LAGOON	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATION

Well Installed 12-12-80

Surface Elevation = 720.9

Sample No.	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class. Symbol	Depth
	HS								0–4
1	ST	24	5					CL-CH	4–6
	HS								6–9
2	ST	24	11					CL	9–11
	HS								11–14
3	ST	24	13					ML-CL	14–16
	HS								16–19
4	ST	24	19			14.4	121	ML-CL	19–21
	HS								21–26
5	ST	24	6			22.4	103	CL	26–28

Depth	Elevation	Description
0.0–2.0	720.9–718.9	CLAYEY SILT, Dark Brown
2.0–14.0	718.9–706.9	SILTY CLAY TRACE SAND, Gray Brown, Very Stiff to Stiff
14.0–25.0	706.9–695.9	SANDY CLAYEY SILT TRACE GRAVEL (GLACIAL TILL), Gray Brown, Stiff
25.0–28.0	695.9–692.9	SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL), Gray Brown, Very Stiff
28.0	692.9	Bottom of Boring

Monitoring Well Details: 715., 712., 7??., 692.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
W.L. 13.0'	W.S. OR W.D. None	A.B.	
W.L.	B.C.R.	A.C.R.	
W.L. 7.8' on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines IA
Kansas City Wichita KS

BORING STARTED 12-12-80	
BORING COMPLETED 12-12-80	
RIG Bomb	**FOREMAN** JM
APPROVED JFH	**JOB #** 680574

LOG OF BORING NO. 23 #5

OWNER IOWA ARMY AMMUNITION PLANT BURLINGTON, IOWA	**ARCHITECT-ENGINEER** U. S. ARMY CORPS OF ENGINEERS
SITE LINE 4A NEW WASTEWATER LAGOON	**PROJECT NAME** SUBSURFACE CONTAMINATION INVESTIGATIO

Well Installed 12-9-80

Surface Elevation = 722.2

Sample No	Type Sample	Sampling Distance	Recovery	Blows/ft	Unconfined Compressive Strength lbs/ft²	Water Content %	Dry Density lbs/ft³	Unified Class Symbol	Depth	Elevation	Description	Monitoring Well Details
	HS										SILTY CLAY TRACE SAND Gray Brown Very Stiff to Stiff	719
1	ST	24	4					CH	5			716
	HS											713
2	ST	24	16			33.9	97	CL	10			
	HS									708.7	(13.5)	
3	ST	24	8			19.2	100	CL	15		SANDY SILTY CLAY TRACE GRAVEL (GLACIAL TILL) Brown Stiff	
	HS											703
4	ST	24	13					CL	20	701.7	(20.5)	
									25		Bottom of Boring	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES IN SITU. THE TRANSITION MAY BE GRADUAL.

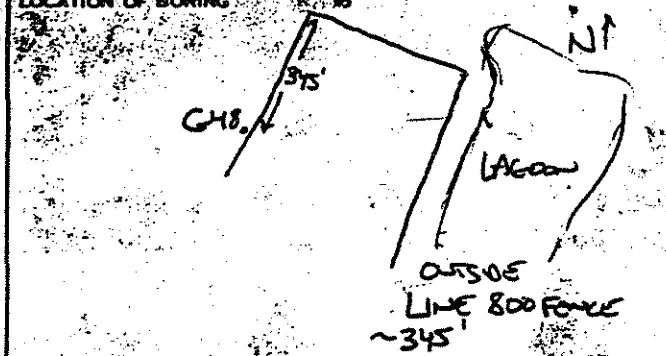
WATER LEVEL OBSERVATIONS			
W.L. None	W.S. OR W.D. None		A.B.
W.L.	B.C.R.		A.C.R.
W.L. 9.21 on 1-8-81			

Terracon Consultants, Inc.
Cedar Rapids Davenport Des Moines, IA
Kansas City Wichita KS

BORING STARTED	12-9-80
BORING COMPLETED	12-9-80
RIG CME 75	**FOREMAN** JM
APPROVED	**JOB #**

Dames & Moore

LOCATION OF BORING



JOB NO.	CLIENT	LOCATION
0670202	IOWA ARMY AMMO PLANT	MIDDLETOWN IA

DRILLING METHOD: 6 1/4" ID HSA CME 55 RIG

BORING NO. G-48

SHEET 1 OF 2

SAMPLING METHOD: 24' SPT 140# HAMMER

WATER LEVEL	17.5' TO SURFACE	8.48	TOC
TIME	11:42	14:50	
DATE	9/25/87	10/2/87	
CASING DEPTH			

DRILLING	START	FINISH
TIME	8:33	9:58
DATE	9/25/87	9/25/87

DATUM ELEVATION

DRILLING CONTR. HANNIBAL TESTING JOHN YOHN

No. 67488

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT, 10YR 3/1 ROOTMAT, MOIST, LOW PLASTICITY ROOTMAT, TOPSOIL NO APPARENT BEDDING	
						1			
						2	ML	CLAYEY SILT 10YR 4/3 NO APPARENT BEDDING, MOIST SLIGHT PLASTICITY TILL ORANGE MOTTLING SOFT	
						3			CLEANING OUT CUTTINGS AT
						4			
	18 / 6'			4		5			8:44 SAMPLING AT 5-6.5 8:46 ADVANCING AUGER
SS				3 3		6	CL	CLAYEY SILT 10YR 5/2 20% ORANGE BLACK MOTTLING 30% ORANGE MOTTLING SLIGHT TO LOW PLASTICITY, MOIST TILL SOFT	
						7			
						8		SILTY CLAY, 2.5Y 6/2 NO BEDDING LOW PLASTICITY, 20% ORANGE MOTTLING, SOFT, MOIST	
						9			
				3 2		10	ML	SAME AS ENCOUNTERED AT 5-6 DEPTH	8:58 SAMPLING 10-11.5' 9:00 ADVANCING AUGER
SS	18 / 6			3		1	ML	CLAYEY SILT 10YR 6/1 SLIGHT PLASTICITY WITH 1% COARSE SAND NO APPARENT BEDDING MOIST GLACIAL TILL	
						2			
						3			
						4			
SS	18 / 16			2 5 8		15	ML	SANDY SILT 10YR 5/1 SLIGHT PLASTICITY WET, NO APPARENT BEDDING, GLACIAL TILL 10% FINE SAND	9:10 SAMPLED AT 15-16.5' 9:12 ADVANCING AUGER
						6	CL	SANDY CLAY, 10YR 5/1 5-40% FINE SAND 5% FINE GRAVEL, LOW PLASTICITY FLUVIAL MEDIUM STIFF	
						7			
						8			
						9			
						0			

LOGGED BY [signature] DATE 9/25/87 CHK'D BY

Dames & Moore

LOCATION OF BORING	
JOB NO.	06702012
CLIENT	IAAP
LOCATION	MIDDLETOWN [cut off]
DRILLING METHOD:	6 1/4" ID HSA CME 55 RIG
SAMPLING METHOD:	24" SPT 140# HAMMER
BORING NO.	G-48
SHEET	2 OF [cut off]

WATER LEVEL	8.48		2.60	STKP
TIME	14:50			
DATE	10/2/87			
CASING DEPTH	33.02	TOC		

DRILLING	START	FINISH
TIME	8:33	9:5[cut off]
DATE	9/25/87	9/2[cut off]

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
SS	18/18			3 7 10		20	CL	SANDY CLAY, SAME AS ABOVE 10YR/5/3	
						1			
						2			
						3			
						4			
SS	18/15			5 13 8		25	CL	SANDY CLAY, 10YR 5/6 WITH STRINGERS OF FINE WET SAND, WET, NO APPARENT BEDDING SLIGHT PLASTICITY 40% FINE SAND 5-10% COARSE SAND 1% FINE GRAVEL, FLUVIAL, STIFF	9:43 SAMPLING 25-2[cut off]
						6			
						7			
						8	TRANSITION CONTACT		
						9			DRILLED TO 30'
SS	18/13			9 12 13		30	ML	SANDY SILT, 10YR 5/6 15% SILT 5Y4/2 MOIST NO APPARENT BEDDING SLIGHT PLASTICITY 15% FINE SAND FLUVIAL STIFF	10:00 SAMPLING 30-31
						1	SP	FINE CLEAN SAND 10Y 6/4 WET, NO APPARENT BEDDING FLUVIAL, MEDIUM DENSE	BOTTOM OF HOLE 31.[cut off]
						2			
						3			
						4			
						35			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. HAMMER TESTING LABS
JOHN YOHN

No. 67489

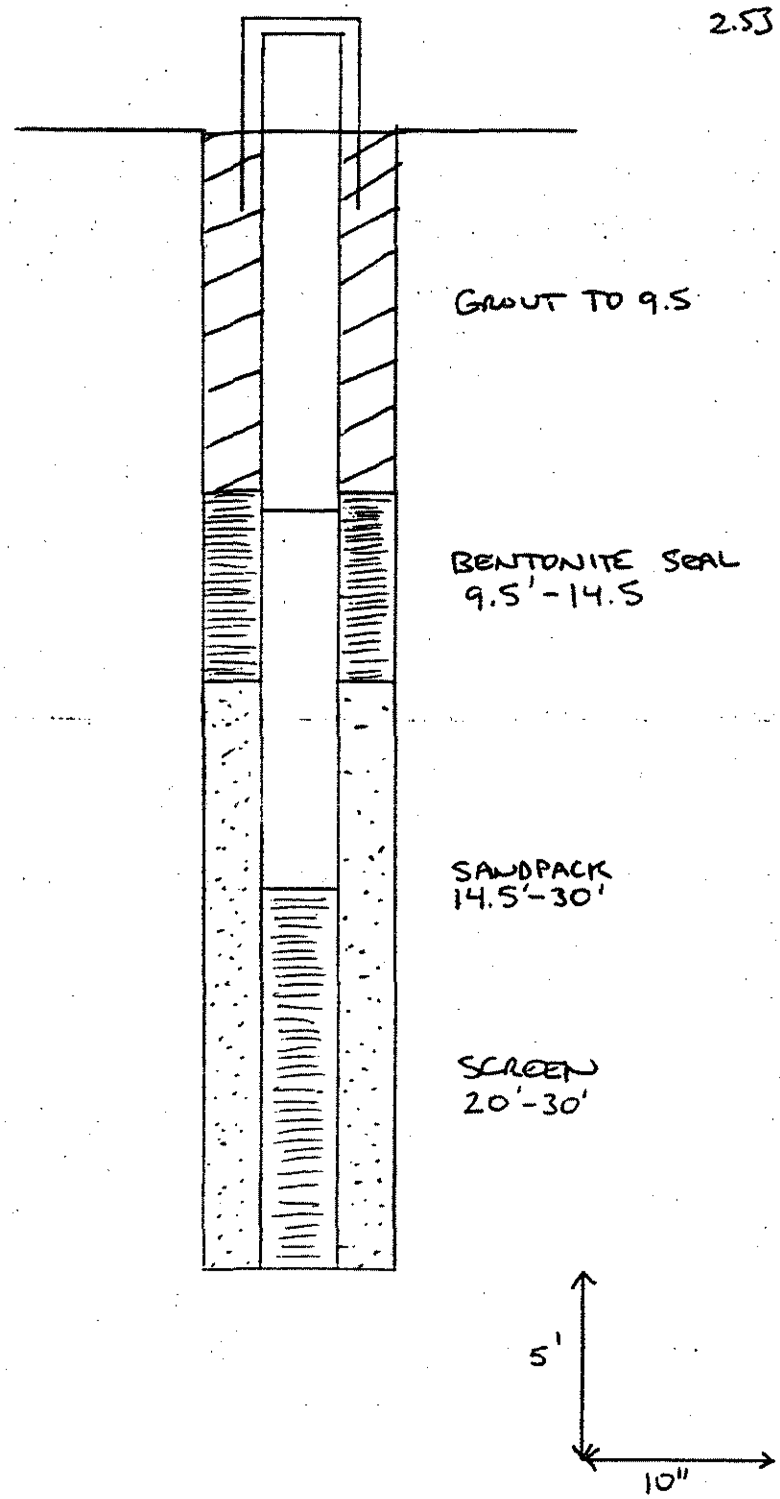
BY Rick [illegible] DATE 9/25/87 CHK'D BY

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET ___(

REVISIONS
BY ___ DATE ___ TO EO ___
BY ___ DATE ___ TO EO ___

WELL G-48

2.60 STICKUP PVC
2.53 HEIGHT TO BOTTOM PROTECTIVE CASING



4" TRILOC PVC FLUSH JOINT CASING
3 BAGS GROUT USED, 2 1/2 BUCKETS OF 1/4" VOLCLAY BENTONITE TABLETS
16 BUCKETS SAND, ROME SANDPIT CESSFORD CONSTRUCTION
10' 10 SLOT SCREEN

BY DAW DATE 9/25/87
CHECKED BY ___
COPY TO EO ___

Dames & Moore

946.1 PRINTED IN U.S.A.

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETOWN I[illegible]

DRILLING METHOD: 6 1/4 ID HSA
CME 55 RIG

BORING NO.: G-49
SHEET 1 OF —

SAMPLING METHOD: 24" SPT 140# HAMMER

WATER LEVEL	9.90 TOC			
TIME	7:50			
DATE	9/11/87			
CASING DEPTH				

DRILLING	START	FINISH
TIME	10:45	14:1[illegible]
DATE	9/4/87	9/4[illegible]

DATUM   ELEVATION

SURFACE CONDITIONS:

DRILLING CONTR. Hannigan Testing Labs
John York

No. 69078

BY Debbie [illegible]   DATE 9/4/87   CHK'D BY

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT, 10YR 3/2 MIXED WITH BRICKS AND RUBBLE AND ROOT MAT TO 1.5' MOIST, NO APPARENT BEDDING	
						1			
						2			
						3			
						4	CL	SILTY CLAY 10YR 5/3 WITH BLACK SPOTTING	
SS	18/15		1/5	1 1 1		5		SILTY CLAY 2.5Y 7/2 WITH ~7% BLACK SPOTTING AND ORANGE ZONES 7.5Y 5/8 MOIST WITH NO APPARENT BEDDING	
						6	ORANGE		
						7			
						8			
						9			PULLING AUGER AUGER FULL OF CLA[illegible] WATER AT 10' 11:08
SS	18/18		2/10	3 3 4		10	CL	SILTY CLAY 10YR 5/1 WITH FAINT ORANGE MOTTLING, MOIST NO APPARENT BEDDING ~1% FINE SAND <1% GRAVEL	
						1			
						2			
						3			
						4			PULLING AUGER
SS	18"/18		3/15	3 4 5		15	SC	SANDY CLAY 10YR 5/3 WITH GRAY MOTTLES + DARK SPOTS GRADING TO SILTY CLAY 10YR 5/3 GRADING TO GOOD LIGHT GRAY SILTY CLAY 10YR 6/1 GRADES WITH DEPTH	
						6			
						7			
						8			DRILLER FELT GRAVEL AT 18' [illegible]
SS	18/15			[illegible]		9			
				[illegible]		20			

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

SAMPLING METHOD: 24" SPT 140# HAMMER

BORING NO. G49

SHEET 2 OF 2

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING	START	FINISH
TIME	10:45	14:
DATE	9/4/87	9/4/

DATUM   ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION
SS	18/15		4/20	3		20	CL	CLAYEY SILT, ALTERNATING 1/2" LAYERS OF ORANGE 10YR 5/3 AND GRAY 10YR 6/1 MOIST FLAT BEDDING
				4		1	SM	SHARP CONTACT SANDY SILT, 10YR 5/3 WITH BLACK SPOTTING AND
				5		2		7% FINE GRAVEL NO
						3		APPARENT BEDDING STRINGERS OF WET
						4		FINE SAND
SS	18/17		5/25	4		25		SANDY SILT 10YR 5/2
				5		6		WITH ORANGE 10YR 5/6 MOTTLING <1% BLACK SPOTTING ~2%
				7		7		COARSE GRAVEL NO APPARENT BEDDING WET
						8		
						9		
SS	18"/18		6/30	6		30		SANDY SILT 10YR 5/3 ~1% FINE GRAVEL NO
				7		1		APPARENT BEDDING SHARP CONTACT SANDY SILT 7.5YR 6/0
				11		2		WITH ~10% CRUSHED LIMESTONE NO BEDDING, GLACIAL TILL
						3		MASS
						4		
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. HAMMOCK TESTING LAB
JOHN YOHN

No.69080

BY Alex A. [illegible]   CHK'D BY

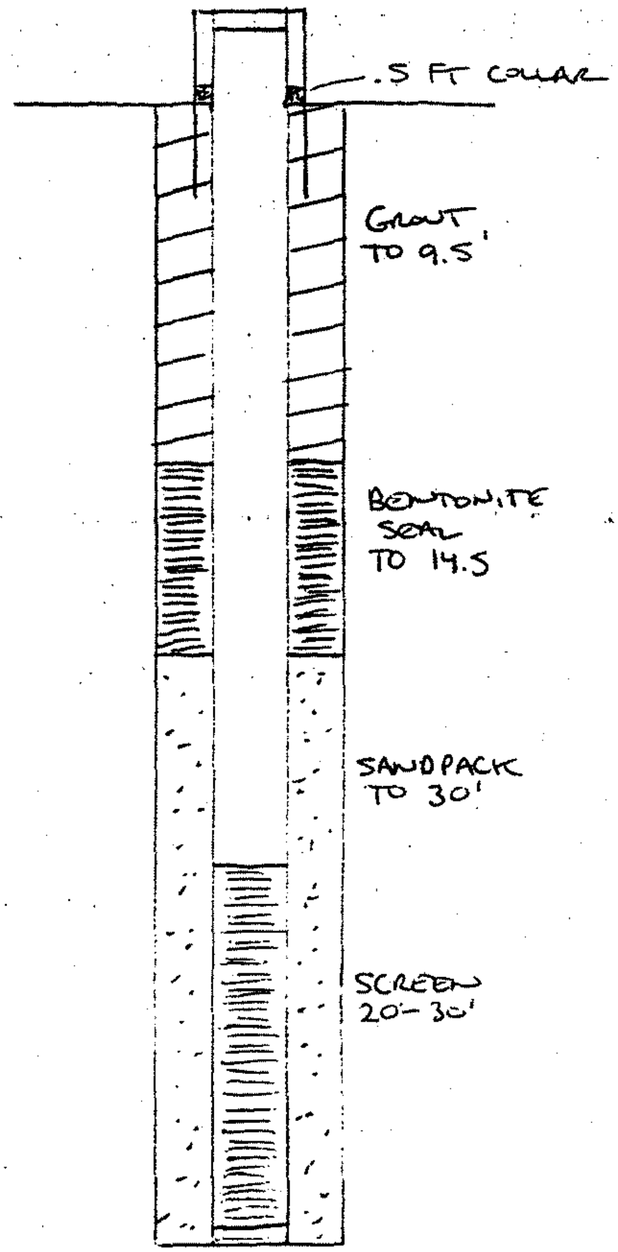
DATE 9/4/87

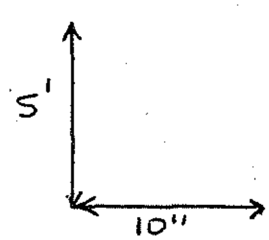
FILE 06702-012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

WELL G-49

2.3' STICKUP PVC
2.21' HEIGHT TO BOTTOM OF PROTECTIVE CASING





BY DAW DATE 9/8/87
CHECKED BY ____
COPY TO EO ____

4" TRILOC PVC FLUSH JOINT CASING
3 BAGS GROUT, 3-5GAL BUCKETS OF 1/4" VOLCLAY BENTONITE
10' - 10 SLOT SCREEN
15-5GAL BUCKETS SAND FROM RONE SAND PIT.

Dames & Moore

Dames & Moore

LOCATION OF BORING: PLANT H ROAD

JOB NO.	CLIENT	LOCATION
06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN I[illegible]

DRILLING METHOD: 6 1/4" ID HSA CME 55 RIG

BORING NO. G 50

SHEET 1 OF 5

SAMPLING METHOD: 18" SPT 140# HAMMER 30" FALL

DRILLING

	START	FINISH
TIME	11:34	1710
DATE	10/6/87	10/7/[illegible]

WATER LEVEL	TOC		2.7'	STKP
TIME	12:03			
DATE	10/18/87			
CASING DEPTH	83.94	TOC		

DATUM

ELEVATION

DRILLING CONTR. HAWKEYE DRILLING LABS

TOM CLAY

No. 67459

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT 10YR 3/2 MOIST, NO APPARENT BEDDING ROOTMAT LOW PLASTICITY TOPSOIL SOFT	
						1			
						2			
						3			PULLED AUGER TO CLEAN AT 3' DEPTH
						4			
SS	18 / 18		1 / 5	1 2 1		5	OL	ORGANIC SILT 10YR 3/2 WITH 15% BROWN ORGANIC MOTTLING	FAINT HORIZONTAL CONTACT
						6	SM	SILTY FINE SAND 10YR 3/2 VERY LOOSE WET ~60% FINE SAND 40% SILT NO APPARENT BEDDING, ORGANIC BROWN MOTTLING FLUVIAL	WATER AT 6
						7			
						8			
						9	OL	ORGANIC SILT, 10YR 3/1 LOW PLASTICITY, SOFT MOIST FLUVIAL NO APPARENT BEDDING	
SS	18 / 6		2 / 10	1 3 6		10			
						1	SW	WELL GRADED SAND 10YR 3/1 20% F SAND, 60% M SAND, 18% C SAND, 2% SILT SATURATED FLUVIAL NO APPARENT BEDDING LOOSE	SHARP HORIZONTAL CONTACT
						2			
						3			
						4			
SS	18 / 4		3 / 15	2 4 8 10		15	ML	SILT 10YR 5/1 LOW PLASTICITY 5% FINE GRAVEL, 15% INCLUSIONS OF FINE WET SAND, 1% ORGANIC SPOTTING MOIST MED STIFF STIFF GLACIAL TILL	
						6			
						7			
						8			
						9			
						0			

BY: [illegible] DATE 10/6/87 CHK'D BY

528.1 (3-72) (REV. 11-80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

BORING NO. G-50

SHEET 2 OF

SAMPLING METHOD: 18" SPT 140# HAMMER 30" FALL

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING

START	FINISH
TIME 11:34	TIME 17
DATE 10/6/87	DATE 10/7

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
SS	18/12		4/20	2 6 8		20	ML	SILT 10YR 5/1 ~~10YR 5/1~~ LOW SLIGHT PLASTICITY 5% C.GRAVEL 3% WOODY MATERIAL MED. STIFF MOIST GLACIAL TILL - NO APPARENT BEDDING	SAMPLED AT 20-21.5' ADVANCED AUGER
						1			
						2			
						3			
						4			
SS	18/16		5/25	3 6 9		25	ML	SILT 10YR 5/1 SLIGHT PLASTICITY MOIST CONTAINS LOTS OF ROCK FLOUR 2% WOODY MATERIAL GLACIAL TILL MED STIFF	SAMPLED AT 25-2 ADVANCED AUGER SLIGHT HORIZONTAL BREAK AT 16'
						6			
						7	ML	SILT 10YR 4/1 SLIGHT PLASTICITY 20% FINE ANGULAR GRAVEL 5% WOODY MATERIAL MOIST MED STIFF-STIFF NO APPARENT BEDDING GLACIAL TILL	
						8			
						9			
SS	18/14		6/30	5 7 5		30	ML	SILT, 10YR 5/1 SLIGHT PLASTICITY 10% FINE ANGULAR LIMESTONE GRAVEL ~3% WOODY MATERIAL MOIST, MED STIFF, NO APPARENT BEDDING GLACIAL TILL	SAMPLED AT 30-31.5' ADVANCED AUGER
						1			
						2			
						3			
						4			
SS	18/18		7/35	2 3 6		35		SILT 10YR 5/1 SLIGHT PLASTICITY, 5% FINE ANGULAR GRAVEL <1% WOODY MATERIAL, SOFT TO M STIFF NO APPARENT BEDDING GLACIAL TILL	SAMPLED 35-36.5 ADVANCED AUGER GRAVEL AT 37-38'
						6			
						7			
						8			
						9			
						40			

DRILLING CONTR. HANNIBAL TESTING LAB TOM CLAY

No. 67460

BY [signature] DATE 10/6/87 CHK'D BY

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

SAMPLING METHOD: 18" SPT 140# HAMMER
30" FALL

BORING NO. G-50
SHEET 3 OF 5

					DRILLING START	FINISH
WATER LEVEL					TIME	TIME
TIME					11:34	17:
DATE					DATE	DATE
CASING DEPTH					10/6/87	10/

DATUM | ELEVATION

DRILLING CONTR. HAMMOND DRILLING
TOM CLAY

No. 69093

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:	
SS	18/18		8/40	5		40	ML	SILT, 10YR 5/1	
				6				SLIGHT PLASTICITY <1%	
				7		1		FINE GRAVEL, MOIST MED	
								STIFF, 1" BAND OF PT AT	
						2		41' GLACIAL TILL	
								NO APPARENT BEDDING	
						3			
						4			
SS	18/6"		9/45	8		45	ML	SILT 10YR 5/1 SLIGHT PLASTICITY	
				9		6		1/8" VERTICAL STRINGER OF MED	
				10				FLUVIAL SAND STIFF MOIST	
						7	ML	NO APPARENT BEDDING	
								WEATHERED LIMESTONE AT 46.'	
						8			
						9	CL	SILTY CLAY, 10YR 5/1	
SS	18/18		10/50	2		50		MOIST, FAINT HORIZONTAL	
				2				BEDDING MEDIUM PLASTICITY	
				4		1		SOFT	
							PT	HIGHLY ORGANIC SILT 10YR 3/1	SHARP BREAK
						2		H2S ODOR MOIST SOFT	
								SLIGHT PLASTICITY TILL	
						3		NO APPARENT BEDDING	
						4			INCREASE IN FEED PR
SS	18/18		11/55	3		55			STOPPED AT 55' 17:25
				5			SW	WELL GRADED SAND, 10YR 6/3	RESUMED 8:15 10/
				11		6		DRY LOOSE, 2" POCKET FLUVIAL	
							ML	SILT, 10YR 5/1 STIFF, LOW	
						7		PLASTICITY MOIST NO APPARENT	
								BEDDING	
						8			
						9			
						0			

BY [signature] CHK'D BY
DATE 10/6/87

528.1 (R) (REV. 3/1/80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

BORING NO. G-50

SHEET 4 OF [illegible]

SAMPLING METHOD: 18" SPT 140# HAMMER
3" NX WIRELINE
10' CORE BARREL

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING	START	FIN[ISH]
TIME	11:34	17:[illegible]
DATE	10/6/87	10/7

DRILLING CONTR. ~~HAYWARD TESTING~~ TOM CLAY

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH
	18		12 / SU	3		60	ML
				5			
				16		1	SP
RUN	REC / CORE	% REC	24 / CORE	% RQD	MIN / FT	2	
				1		3	
				6			
				6		4	
				6		5	
				6		6	
				12			
				8		7	
				6		8	
				6		9	
				6		70	
				6		1	
				7		2	
RUN	REC / CORE	% REC	≥4" / CORE	% RQD	MIN / FT	3	
2				6		4	
				7		5	
				7		6	
				6		7	
				8		8	
				7		79	
				6		80	

SAME AS ABOVE

FINE AND MEDIUM SAND 10YR 5/1
SATURATED. 60% M SAND
40% FINE SAND. MEDIUM DENSE
NO COARSE FRACTION, NO SILT, FLUVIAL — AUGER REFUSAL AT 63
FLUVIAL. NO APPARENT BEDDING — 10:24 START ROCK CORING
FINE SANDSTONE 63-63.1 HARD 5Y 4/1 — 10:26 STOP 10:27 RESUME
LOST CORE DUE TO WASHOUT OF WEATHERED LIMESTONE
STOP 10:40 RESUME 11:06
LIMESTONE 5Y 6/1
MASSIVE, MODERATELY HARD — LOSS OF FLUID CIRCULATION
WELL CEMENTED FINE GRAINED — AT 66' DRILLER THINKS DUE TO N[illegible]
HORIZONTAL BEDDING — CIRCULATION FLUID RETURN
SLIGHTLY TO MODERATELY — AT 67'
WEATHERED VUGGY FROM — STOP AT 11:27 TO CLEAN OUT
63.1 TO 63.6 — CUTTINGS + ADD ROD 67.5'
LOW PRIMARY K, WELL CEMENTED — 11:36 RESUME CORING
HIGH SECONDARY ALONG FRACTURES — 11:41 CLEANING HOLE AT 68'
AND EXTENSIVELY WEATHERED ZONES — 11:42 RESUME CORING

LIMESTONE, 40% CHERT LENSES HORIZONTAL BEDDING
THIN BEDDED 2.5Y 6/2 MODERATELY
HARD, MODERATELY CEMENTED, FINE — 72.2 PULLED CORE REPLACE
GRAINED, HIGHLY FRACTURED — WORN BIT
MODERATE TO HIGH WEATHERING MODERATE PRIMARY K (CEMENTATION) HIGH SECONDARY
LOST CORE FROM 73.0 TO 76.2 — HAVING DIFFICULTY WITH
WASH OUT OF POORLY CEMENTED — AUGER BOUNCING AGAINST
LIMESTONE — CORE BARREL

LIMESTONE, MASSIVE, 10YR 7/1
MODERATELY HARD, MODERATE — HORIZONTAL BEDDING
CEMENTATION, FINE GRAINED VERTICAL
FRACTURE 77.0-77.25', MODERATELY
WEATHERED, MODERATE PRIMARY K (CEMENTATION) HIGH SECONDARY K [illegible] — HARDER ROCK AT 77.5
LIMESTONE, MASSIVE, SILICEOUS, 2.5Y 7/1
V. HARD, WELL CEMENTED
FINE CRYSTALLINE, VERTICAL FRACTURES 77.6 TO 78', UNWEATHERED, SOLID
LOW PRIMARY K (CEMENTATION) HIGH [illegible] SECONDARY K [illegible]
LIMESTONE, MASSIVE, 2.5Y 7/1
SHALEY FROM 79 TO 79.5 (THIN BEDDED) 2.5Y 3/2
MODERATELY HARD, MODERATELY
CEMENTED, FINE GRAINED
MODERATELY WEATHERED HORIZONTAL
BEDDING SEVERAL OPEN WEATHERED FRACTURES

BY Neil A. [illegible] DATE 10/7/87 CHK'D BY

No. 69094

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD:	CME 55 RIG				BORING NO. G50
SAMPLING METHOD:	3" NX WIRELINE 10' CORE BARREL				SHEET 5 OF 5
					DRILLING START / FIN
WATER LEVEL					TIME: 11:34 / 17:
TIME					
DATE					DATE: 10/6/87 / 10/
CASING DEPTH					

DATUM ELEVATION

DRILLING CONTR. Hawkins-Test Wells / Tom Clay

10.67453

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
					7	80		SOLUTION ALONG SEAMS WEATHERING OPEN FRACTURES
						1		MODERATE PRIMARY K DUE TO MODERATE CONCENTRATION
					6	82		HIGH SECONDARY K FROM FRACTURES
								BOTTOM OF HOLE AT 82' 17:00 10/7/87
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		
						1		
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

BY Dale A. [illegible] DATE 10/7/87 CHK'D BY

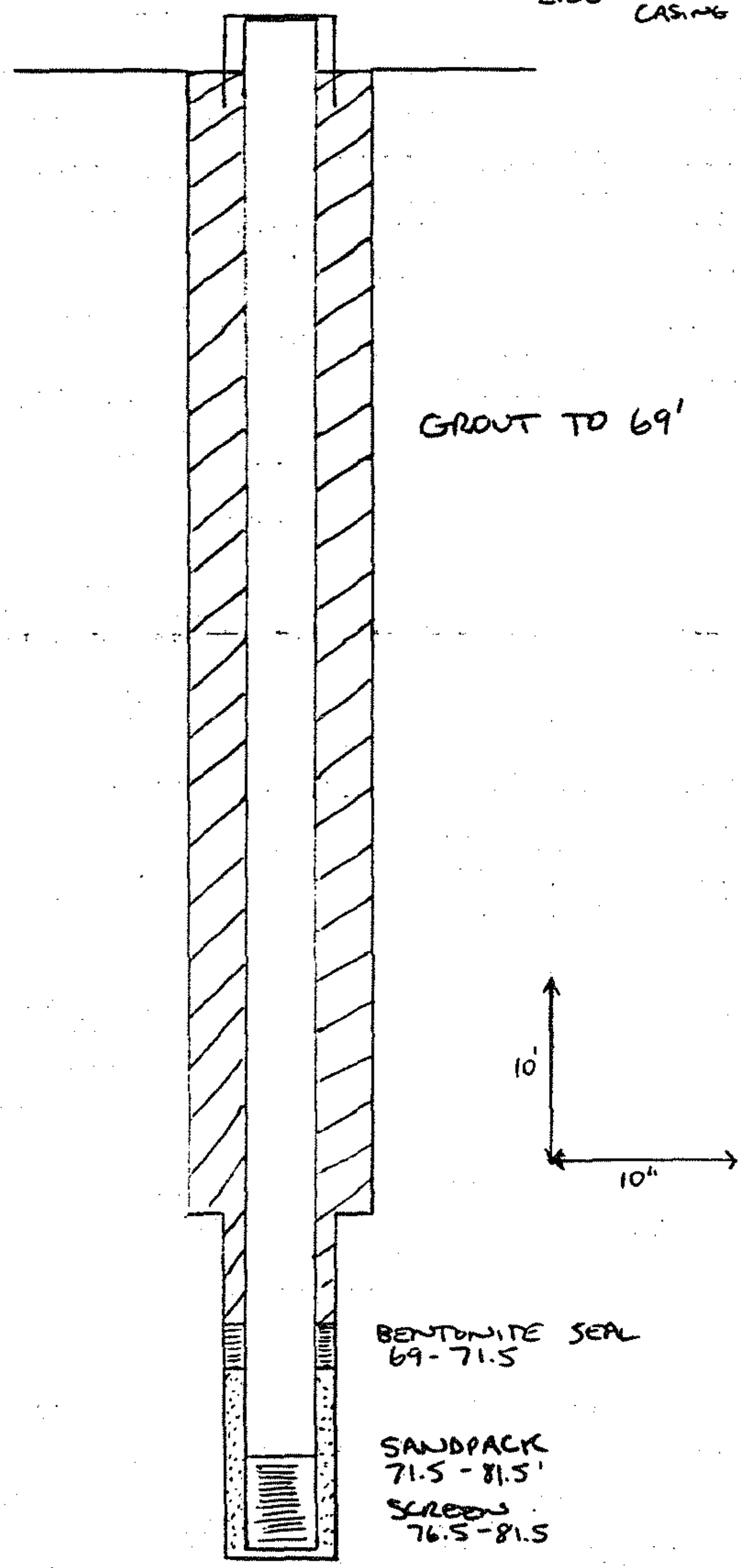
628.1 (3) (REV. 11-80)

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

WELL G-50

2.70' STICKUP PVC
2.63' HEIGHT TO BOTTOM OF PROT CASING LID



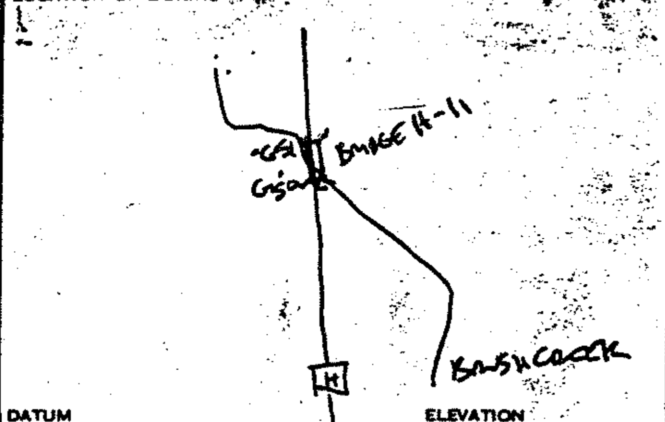
4" TRILOC FLUSH JOINT PVC CASING 5' 10 SLOT SCREEN
2.5 BUCKETS SAND, 1/2 BUCKET BENTONITE BALLS
13 SACKS GROUT

BY DAW DATE 10/9/87
CHECKED BY ____
COPY TO EO ____

Dames & Moore

946.1 PRINTED IN U.S.A.

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

BORING NO. G-51

SHEET 1 OF

SAMPLING METHOD: 24" SPT 140# HAMMER

DRILLING

	START	FINISH
TIME	14:03	9:
DATE	9/14/87	9/1

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM

ELEVATION

DRILLING CONTR. HANNIBAL TESTING LABS
JOHN YOHN

No.69088

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	SM	SILTY SAND 10YR 5/3 MOIST, NO APPARENT BEDDING ROOT MAT, TOPSOIL, SOFT	
						1	SM	SANDY SILT 10YR 5/6. MOIST NO APPARENT BEDDING	
						2		~1% MEDIUM SAND MEDIUM STIFF, FLUVIAL	FELT GRAVEL AT 2'
						3			
						4			
SS	18" / 2"		1 / 5	5 7 5		5		SHARP BREAK TO ORGANIC SILT 10YR 2/1 TR CALCAREOUS	AUGER PLUGGED UP CLEANING IT OUT.
						6			
						7		GRAVEL MOIST NO APPARENT BEDDING	
						8			
						9			GRAVEL AT 9'
SS	18 / 10		2 / 10	2 4 6		10	CL	INORGANIC SILTY CLAY 2.5Y 4/2 5% FINE BLUE GRAVEL	
						1		MOIST ~1% ORGANIC SPOTTING, MEDIUM PLASTICITY	
						2		MEDIUM STIFF	
						3			FELT GRAVEL LEDGE AT 13.5'
						4			
SS	18" / 6"		3 / 15	4 4 6		15		SANDY SILT 10YR 5/6 BROWN ORGANIC SPOTTING	
						6		2% COARSE SAND MOIST, NO APPARENT BEDDING	
						7			
						8			
						9			
						20			

BY [signature] DATE 9/14/87 CHK'D BY

628.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETOWN I

DRILLING METHOD: 6¼" ID HSA 140# HAMMER

SAMPLING METHOD: 24" SPT

BORING NO. G-51

SHEET 2 OF 3

DRILLING

START TIME	FINISH TIME
14:03	9:1
DATE 9/14/87	DATE 9/15

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM — ELEVATION — SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	
SS	18/14		4/20	3 4 5		20	OL	ORGANIC SILT 5Y 4/1 NO APPARENT BEDDING 1% ANGULAR GRAVEL + SAND MOIST	
						1			
						2			
						3			
						4			
SS	18/10.5		5/25	3 5 7		25	SM / SP-SM / ML	SANDY SILT 10YR 5/1; SILTY SAND 10YR 5/1; SILT 10YR 5/1; SLIGHTLY HORIZONTALLY BEDDED MOIST, EACH CONTAINS ~1-2% WOODY BROWN MATERIAL	
						6			
						7			
						8			
						9			
SS	18/18		6/30	2 4 5		30		CLAYEY SILT 10YR 5/1 WITH 1/2" LAYERS OF ORGANIC MATERIAL 10YR 3/1	
						1		2" LAYER OF SILTY FINE SAND 10YR 5/1 WET	STOP 16:45 9/14/87 RESUME 8:28 9/15/87
						2		ROCKFLOUR AND ORGANIC SILT MOIST	GRAVEL AT 32' ~~(?)~~
						3			
						4			
SS	18/16		7/35	3 3 4		35	CL	GRAVELLY CLAY WITH WOODY MATERIAL 10YR 4/1 SLIGHT HORIZONTAL BEDDING MOIST ~10% GRAVEL	
						6			
						7			
						8			
						9			
						40			

DRILLING CONTR. HANNIBAL TESTING LABS JOHN YOHO

No.690089

BY [signature] DATE 9/14/87 CHK'D BY ____

628.1 (R)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA
140# HAMMER

SAMPLING METHOD: 24" SPT

BORING NO. GS1

SHEET 3 OF 3

DRILLING	START	FINISH
TIME	14:03	9:4[illegible]
DATE	9/14/87	9/15

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	
SS	18/18		8/40	2 2 5		40	CL	SILTY CLAY 5Y 3/1 MOIST NO APPARENT BEDDING	
						1			
						2			
						3			
						4			
SS	18/14		9/45	2 10 10		45		SILTY CLAY 5Y 4/1 MOIST SLIGHT HORIZONTAL BEDDING	
						6	SP	CLEAN FINE SAND 10YR 5/1 WET HORIZONTAL CONTACT	SHARP BREAK
						7			DRILLED TO 45' BOTTOM OF HOLE 46.5'
						8			
						9			
						0			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. HANNIBAL TESTING LAB JOHN YOHN

No. 69090

BY Wallace C. Voigt CHK'D BY DATE

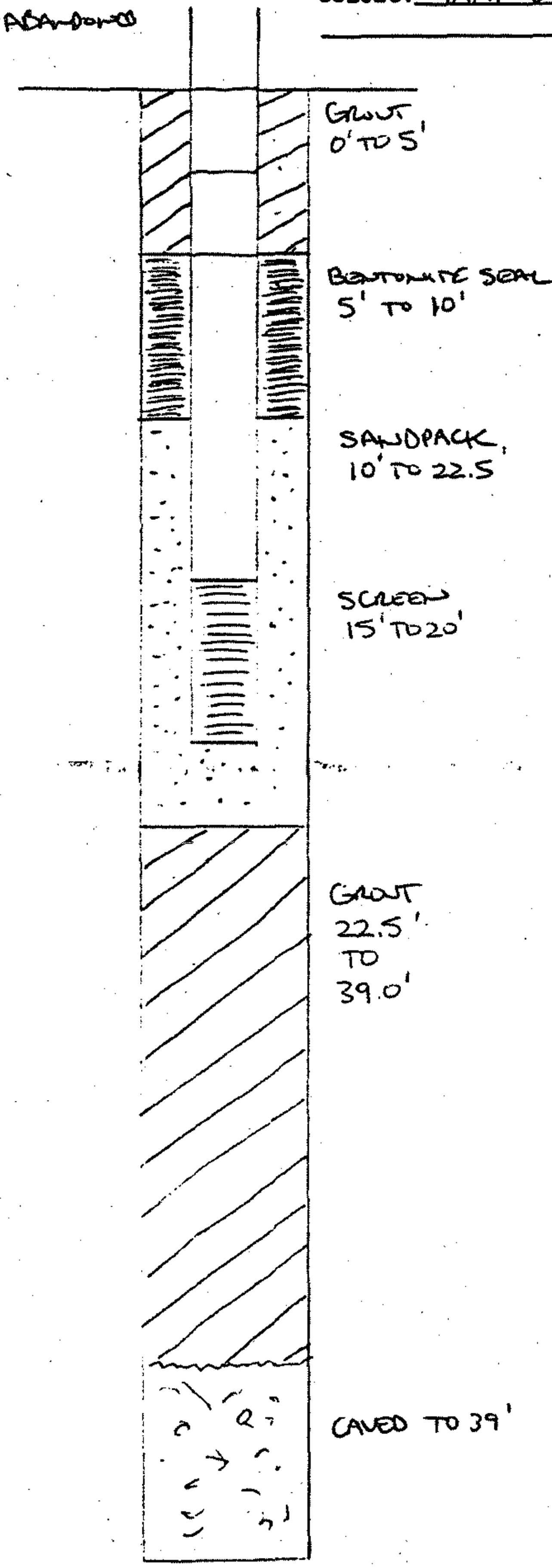
128.1 (3) (REV. 11-80)

WELL G-51

WELL GROUTED & ABANDONED
10/20/87

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____



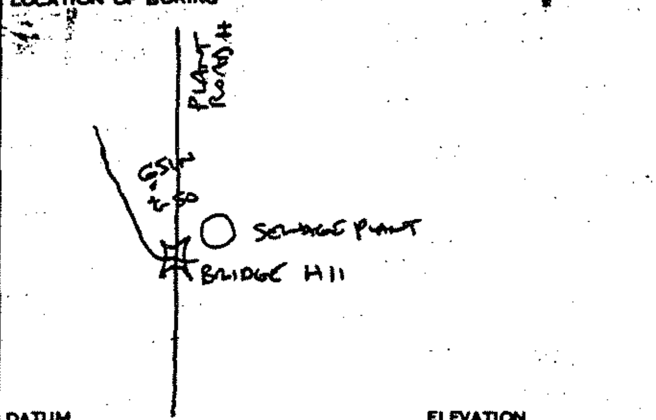
BY DAW DATE 9/17/87
CHECKED BY
COPY TO EO

Dames & Moore

946.1 PRINTED IN U.S.A.

Dames & Moore

LOCATION OF BORING



JOB NO.	CLIENT	LOCATION
06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA CME 55 RIG

BORING NO. GS1N

SHEET 1 OF 1

SAMPLING METHOD: 18" SPT 140# HAMMER 30" FALL

WATER LEVEL	7.67		2.36' STICKUP	
TIME	18:10			
DATE	10/11/87			
CASING DEPTH	17.55 TOC			

DRILLING	START	FINISH
TIME	11:24	14:
DATE	10/5/87	10/

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT 10YR 3/2 MOIST, NO APPARENT BEDDING ROOTMAT, ~~SLIGHT~~ LOW PLASTICITY TOPSOIL SOFT	GS1N REPLACES ABA[N] WELL GS1
						1			
						2			
						3			PULLED AUGER AT 3.5' TO CLEAN OUT PLUG
						4			SAMPLED 5'-6.5' ADVANCE AUGER
SS	18/3		1/5	1, 2, 1		5			
						6	SM	SILTY FINE SAND 10YR 3/2 VERY LOOSE, DAMP ~60% FINE SAND NO APPARENT BEDDING, ORGANIC	
						7	▽		
						8			WET AT 8' DEPTH
						9	OL	~~SANDY~~ ~~ORGANIC~~ SILT 10YR 3/1 LOW PLASTICITY, SOFT, MOIST FLUVIAL, NO APPARENT BEDDING	
SS	18/6		2/10	1, 4, 3		10			SAMPLED 10-11.5'
						1	SW	WELL GRADED SAND 10YR 5/1 20% F. SAND, 60% MED SAND, 18% C SAND 2% SILT. SATURATED, FLUVIAL NO APPARENT BEDDING V LOOSE FLUVIAL	SHARP HORIZONTAL CO[NTACT] STOP 12:00 RESUME 13:48
						2			
						3			
						4			BOTTOM OF DRILLED HOLE
SS	18/14		3/15	2, 5, 8		15	ML	SILT 10YR 5/1 LOW PLASTICITY w/ 35% MED ANGULAR GRAVEL FROM 15-15.5' 45% FINE SAND FROM 15.5-16.0, 4% ORGANIC SPOTTING FROM 16-16.5' MOIST V. FAINT BEDDING MEDIUM STIFF GLACIAL TILL	SAMPLED TO BOTTOM AT 16[.5] .5' OF SOIL IN BOTTOM OF HOLE, CLEANING OUT WITH ROLLER BIT FINISHED SAMPLING AT 14:
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. HANNIBAL TESTING LABS TOM CLAY

No. 67458

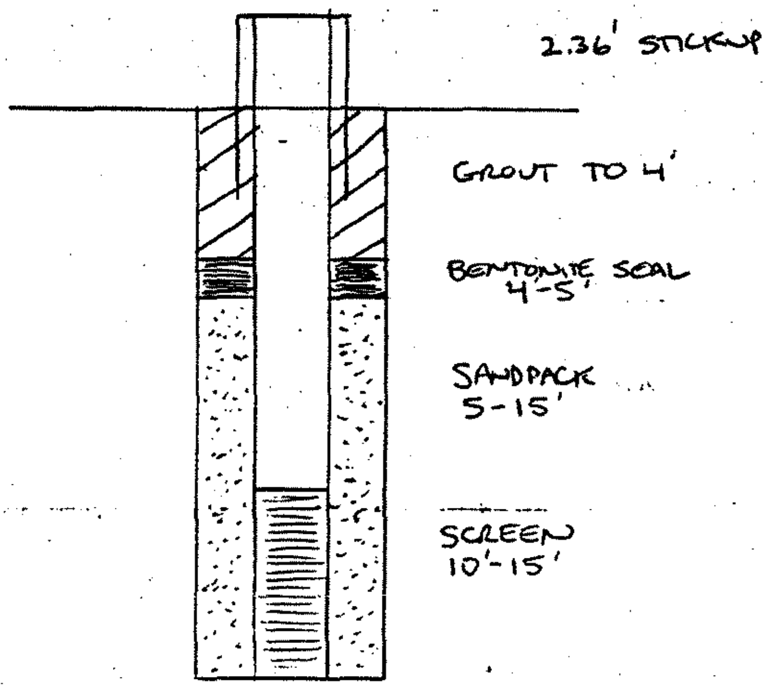
BY [illegible] DATE 10/5/87 CHK'D BY

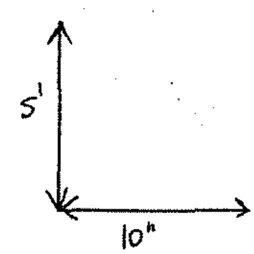
028.1 (3/) (REV. 11-80)

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

WELL G51 (NEW)



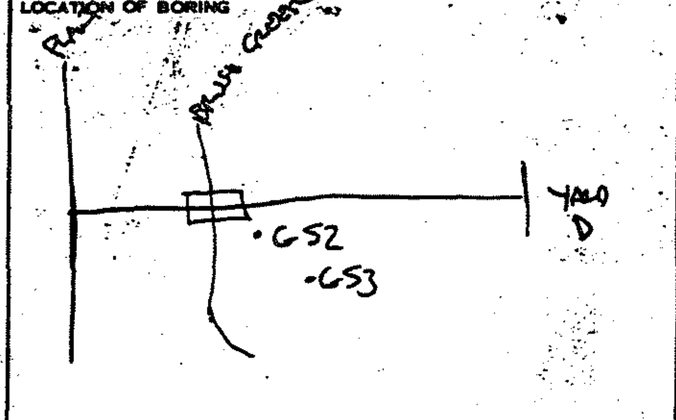


4" TRILOC PVC FLUSH JOINT CASING
BAGS GROUT, BUCKETS BENTONITE BALLS (1/4")
BUCKETS SAND
5' 10 SLOT SCREEN

BY DAW DATE 10/5/87
CHECKED BY ____
COPY TO EO ____

Dames & Moore

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	Iowa Army Ammo Plant	Middletown

DRILLING METHOD:	6 1/4" ID HSA	BORING NO.	G52
	CME 55 RIG	SHEET	1 of 2
SAMPLING METHOD:	24" SPT 30" FALL		
	140# HAMMER	DRILLING	
WATER LEVEL	TOP OF CASING (ARTESIAN FLOW)	START TIME	FINISH TIME
TIME	[redacted] 9:19 3.86' ABOVE SURF	9:28	16:[illegible]
DATE	[redacted] 10/4/87 2.47' STKP	DATE	DATE
CASING DEPTH	36.58 [redacted] FROM SURFACE	9/22/87	9/22

DATUM | ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0		ORGANIC SILT 10YR 3/1 ROOTMAT, MOIST	
						1	OL	LOW PLASTICITY ROOTMAT TOPSOIL NO APPARENT BEDDING	
						2			
						3		FINE SILTY SAND 10YR 3/2 ~50% FINE SAND MOIST	PULLED AUGER TO CLEAN OUT CLOGGED PLUG
						4	SM	NO APPARENT BEDDING FLUVIAL	9:40 DROVE SPOON FROM [illegible]
SS	18/12		1/5	5 5		5			SHARP CONTACT
				4		6	SP	FINE SAND 10YR 5/3 SLIGHTLY WET NO APPARENT BEDDING FLUVIAL	SHARP
						7	SM	FINE SILTY SAND 10YR 4/1 ~20% BROWN ORGANIC SPOTTING	
						8		MOIST NO APPARENT BEDDING	
						9			9:54 SAMPLING 10-11.
SS	18/12		2/10	3 12		10	SP	FINE SAND, CLEAN 10YR 5/3 MOIST 20% FAINT ORANGE MOTTLING NO APPARENT BEDDING FLUVIAL	10:00 ADVANCE AUGER
				8		1	OL	~~[illegible]~~ SILT 10YR 4/1	
						2		MOIST, TILL, NO APPARENT BEDDING STIFF	
						3			HITTING GRAVELLY SILT AT 1[illegible]
						4			10:11 CLEANING AUGER OUT WITH SHELBY TUBE
SS	18/18		3/15	5 11		5	OL	CLAYEY ORGANIC 10YR 4/1 SILT, MOIST, STIFF, TILL NO APPARENT BEDDING	GRAVELLY SILT FOLLOW ~~10:17 USING GRAVEL SP[illegible]~~ TO CLEAN OUT HOLE
				13		6		<1% COARSE SAND AND ROCK FLOUR	MOVED AUGER TRYING TO PU[illegible] SPOON UP 10:22 DROVE SS
						7			
						8	ML	COARSE SANDY SILT 2.5Y 4/2 20% COARSE SAND MOIST FLUVIAL	
						9		NO APPARENT BEDDING	
						20			

DRILLING CONTR. Hawkeye Testing Lab
John York

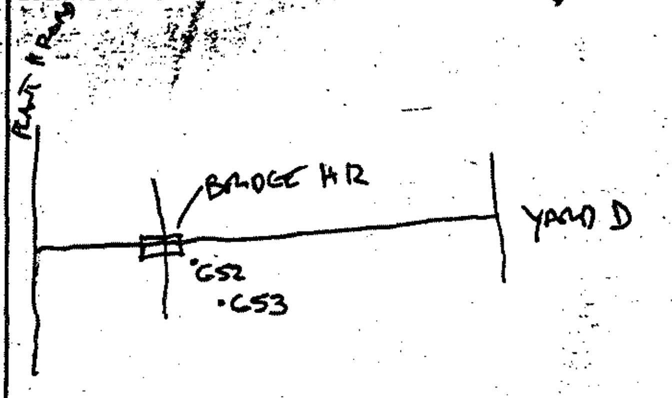
No. 67486

BY [signature] DATE 9/23/87 CHK'D BY

828 (11/81) REV. (11/80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN



DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

SAMPLING METHOD: 24" SPT 140# HAMMER
3" NXQ WIRELINE
10 FT BARREL

BORING NO. G52

SHEET 2 OF

	DRILLING START	FIN
TIME	9:28	16:
DATE	9/22/87	9/2

WATER LEVEL					
TIME					
DATE					
CASING DEPTH					

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
SS	18/12		4/20	12		20	ML	SILT, 10YR 4/1, MOIST LOW PLASTICITY NO APPARENT BEDDING	SPLIT SPOON TO 21' AUGER REFUSAL AT 20'
RUN	REC/CORE	% REC	24"/CORE	% RQD	MIN/FT	1		SOFT GLACIAL TILL	REAMED WITH ROLLER BIT
1					~~5~~			LIMESTONE; CALCAREOUS, MASSIVE BEDDING 2.5Y 6/2 MODERATELY HARD WELL CEMENTED FINE GRAINED SOLID SLIGHTLY WEATHERED LOW PRIMARY PERMEABILITY, HIGH SECONDARY ALONG FRACTURES	GOOD ROCK AT 21.0' 13:34 START CORING FROM
					3	22		EXTREMELY WEATHERED CALCAREOUS SHALE LOST CORE 23-24' WASHOUT	WATER TURNED DARK GRAY AT 22.5' AND BACK TO CREAMY BROWN AT 22.6
	72/82	88	24/82	29	3	3			13:38 RAN
					3				
					5	24		THINBEDDED 5Y 6/2 SOFT, POORLY CEMENTED, FINE GRAINED, HORIZONTAL BEDDING LOW PRIMARY K, HIGH ALONG BEDDING	WATER STOP. RESUME 100% CIRCULATION RE
					4	5		LIMESTONE, CALCAREOUS, MASSIVE 5Y 5/4 MODERATELY HARD WELL CEMENTED FINE GRAINED SLIGHTLY WEATHERED LOW PRIMARY K HIGH SECONDARY FRACTURES	
					3	26		SHALE CALCAREOUS THIN BEDDED MODERATELY HARD MODERATELY CEMENTED FINE GRAINED, CLAY LINED HORIZONTAL FRACTURES. MODERATELY WEATHERED CLAY INFILLING, HIGH SECONDARY K LOW PRIMARY K 5Y 6/3	CORED TO 27.8' 14: STOPPED TO PULL CORE WITH WIRELINE
					3	7			
2	120/120	100	65/120	54	3	28		LIMESTONE, CLAYEY, MASSIVE 10YR 7/4 MODERATELY HARD MODERATELY CEMENTED FINE GRAINED HORIZONTAL BEDDED MODERATELY WEATHERED	
						9		VUGGY WITH PARTIAL INFILLING OF CALCITE, MODERATE PRIMARY K DUE TO MODERATE CEMENTATION	
					3	30			
					3			HIGH SECONDARY ALONG FRACTURES AND VUGS	STOPPED AT 30.8 TO GE
					3	1			RESUMED AT 15:42
						32		SHALE, CALCAREOUS, LAMINATED 5Y 4/1	
					3			MODERATELY HARD, MODERATE CEMENTATION	15:48 STOPPED TO ADD RO
						3		FINE GRAINED, HORIZONTAL BEDDING FISSILE MODERATELY WEATHERED	32.8' 15:51 RESUME C
					3			SOLID. LOW PRIMARY K	
					2	34		HIGH SECONDARY K ALONG BEDDING JOINTS	
						5		LIMESTONE, CLAYEY, MASSIVE 10YR 8/3	
					3			FAIR CEMENTATION FINE GRAINED	
					3	36		HORIZONTAL BEDDED MODERATE TO HIGHLY WEATHERED, VUGGY WITH CALCITE	
					3	7		MODERATE PRIMARY K DUE TO FAIR CEMENTATION, HIGH DUE TO SECONDARY K DUE TO FRACTURES	STOPPED AT 16:05 TO PULL CORE
3	115/115	100	135/115	93.1	3	38			16:19 CORED TO 39.0 9/22/87
						39		BOTTOM OF HOLE 39.0'	
						40			

DRILLING CONTR. HANNIBAL TESTING LABS JOHN YOHN

No. 67487

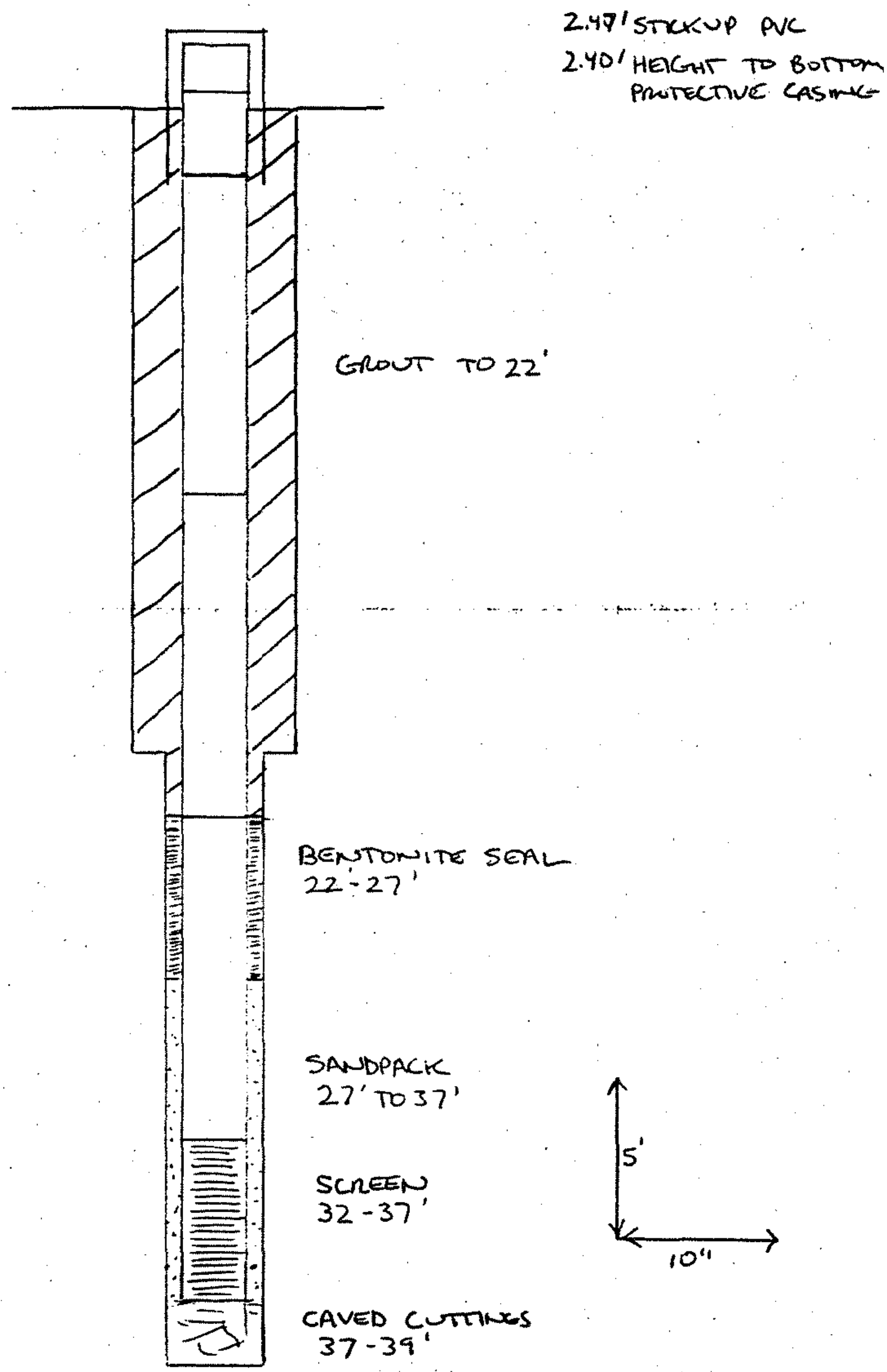
BY [signature] DATE 9/22/87 CHK'D BY

FILE 06702012
SUBJECT IAAP WELL INSTALLATION CONSTR
SHEET (

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

BY DAW DATE 9/24/87
CHECKED BY ____
COPY TO EO ____

WELL G52



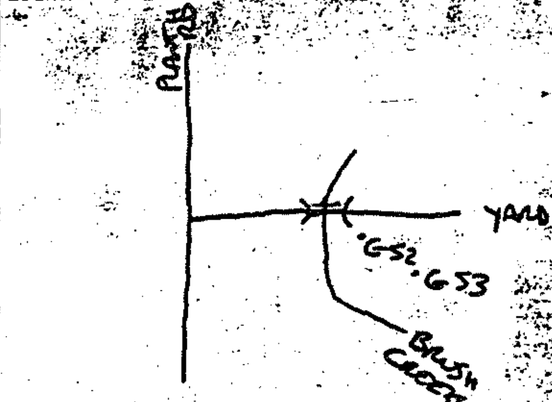
4" TRILOC PVC FLUSH JOINT CASING
8 BAGS GROUT USED, 1 1/2 BUCKETS OF 1/4" VOLCLAY BENTONITE TABL
2 1/2 BUCKETS SAND, ROME SANDPIT CESSFORD CO.
5' 10 SLOT SCREEN

Dames & Moore

946.1 PRINTED IN U.S.A.

Dames & Moore

LOCATION OF BORING



DATUM ELEVATION

JOB NO.	CLIENT	LOCATION
06702012	IOWA ARMY AMMO PLANT	MIDDLETOW

DRILLING METHOD:	6 1/4" ID HSA	BORING NO. G5
	CME 55 RIG	SHEET 1 OF
SAMPLING METHOD:	18" SPT 140# HAMMER 30" FALL	DRILLING

WATER LEVEL	9.8' TOC		2.39' STICK		START TIME	15:06
TIME	13:00				DATE	9/16/87
DATE	10/3/87					
CASING DEPTH	10.61					

DRILLING CONTR. HANNIBAL TESTING LABS JOHN YOHN

10.67456

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT 10YR 3/1 ROOTMAT MOIST NO APPARENT BEDDING TOPSOIL LOW PLASTICITY	
						2		FINE SILTY SAND 10YR 3/2 ~50% FINE SAND MOIST NO APPARENT BEDDING FLUVIAL, LOOSE	
SS	18/13		1/5	3 4 5		5	SP	FINE SAND 10YR 4/1, ~25% BROWN ORGANIC MOTTLING SLIGHTLY WET, NO APPARENT BEDDING, LOOSE FLUVIAL	SAMPLED AT 5' WATER AT 6.5'
						7	SW	WELL GRADED SAND 10YR 4/3 NO APPARENT BEDDING SATURATED, FLUVIAL, LOOSE	
SS	18/13		2/10	3 4 6		10	SM	FINE SILTY SAND 10YR 3/1 HIGHLY ORGANIC MOIST NO APPARENT BEDDING FLUVIAL, LOOSE	SAMPLED AT 10' PUTTING CASING IN AT SHARP HORIZONTAL CO
						11	OL	SILT MOIST 5Y 4/1 ~1% BROWN ORGANIC SPOTTING LOW PLASTICITY MEDIUM STIFF FLUVIAL	DRILLED TO 10' SAMPLED TO 11.5' BO OF HOLE
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

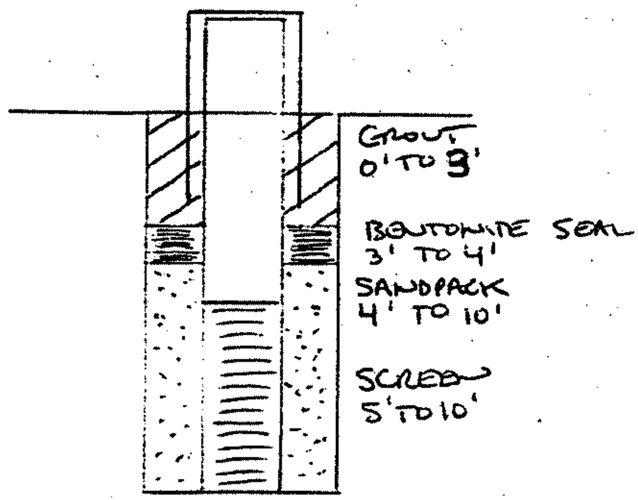
BY [signature] DATE 9/16/87 CHK'D BY

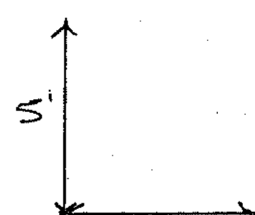
FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

2.39' STICKUP PVC
2.30' HEIGHT TO BO[illegible] OF PROTECTIVE CASING LID

WELL G-53





4" TRILOC PVC FLUSH JOINT CASING

6 BUCKETS SAND

1/2 BUCKET BENTONITE BALLS

1 BAG GROUT

BY DAL DATE 9/17/87
CHECKED BY ____
COPY TO EO ____

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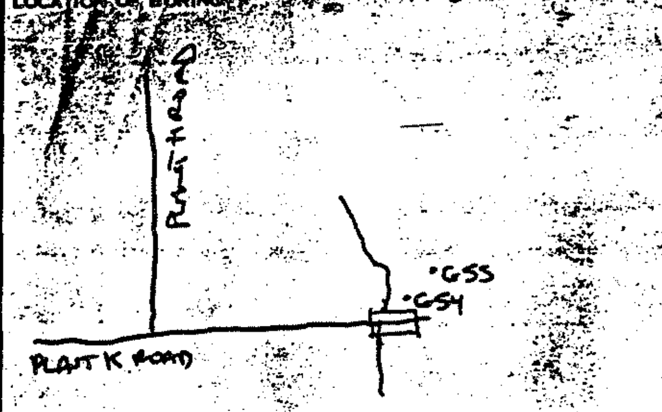
Dames & Moore

LOCATION OF BORING



DATUM ELEVATION

JOB NO.	CLIENT	LOCATION
06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN IA

DRILLING METHOD: 6¼" ID HSA
CME 55 RIG

SAMPLING METHOD: 24" SPT 140# HAMMER
30" FALL

BORING NO. G54
SHEET 1 OF 4

WATER LEVEL	9.44	TOC	2.79'	STKP
TIME	14:00			
DATE	10/3/87			
CASING DEPTH	64.21	SURFACE		

DRILLING	START	FINISH
TIME	11:20	11:4
DATE	9/28/87	9/30

SURFACE CONDITIONS:

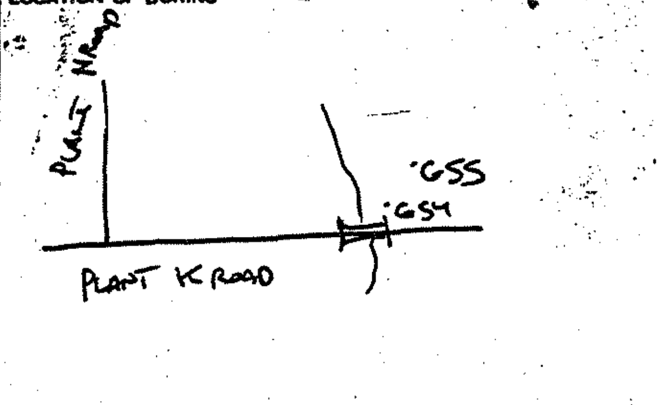
SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	ML	SILT 10YR 4/3 ROOTMAT MOIST NO APPARENT BEDDING SLIGHT PLASTICITY, TOPSOIL	
						3			DOWN AT 3' DEPTH ... CLEANING OF AUGER 11:27 RESUME
SS	18 / 5		1 / 5	2 3 5		5	ML	SILT, MOIST 10YR 5/1 WITH BLACK ORGANIC SPOTTING AND ORANGE MOTTLING TILL NO APPARENT BEDDING MED STIFF	HIT GRAVEL AT 7.5'
						8	OL	DAMP SANDY SILT 2.5Y 4/2 ~~...~~ ORGANIC WITH ROUNDED COARSE SAND FLUVIAL LOW PLASTICITY NO APPARENT BEDDING	
SS	18 / 2		2 / 10	2 2 4		10	ML	SILT, ~~...~~ 10YR 4/3 CONTAINS ROUNDED GRAVEL AND ROOTS FLUVIAL NO APPARENT BEDDING	SPOON MAY HAVE BEEN BLOCKED BY ROCK SPOON WET ON OUTSIDE WATER ~10'
SS	18 / 18		3 / 15	5 5 7		15	CL	GRAVELLY SANDY CLAY 2.5Y 4/4 MEDIUM PLASTICITY 1% FINE GRAVEL 10% FINE SAND FLUVIAL NO APPARENT BEDDING	12:00 ~~...~~ LUNCH 13:24 RESUME HIT GRAVEL AT 17'
						20			

No. 67490

DRILLING CONTR. HANNIBAL TESTING LABS
JOHN YOHN

LOGGED BY [signature] DATE 9/28/87 CHK'D BY

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4" ID HSA

BORING NO. G54

SAMPLING METHOD: 18" SPT 140# HAMMER

SHEET 2 OF 4

DRILLING	START	FINISH
TIME	11:20	11:
DATE	9/28/87	9/

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
SS	18/4		4/20	3		20	CL	GRAVELLY SILTY CLAY 2.5Y 4/4
				10				MOIST NO APPARENT
				5		1		BEDDING 10% SAND+GRAVEL
								MEDIUM PLASTICITY, FLUVIAL
						2		
						3		
						4		
SS	18/13		5/25	2		25		SHARP HORIZONTAL C
				3				ORGANIC SILT, 5Y 4/1
				4		6	OL	LOW PLASTICITY 2% BLACK ORGANIC
						7		MOTTLING 1% COARSE SAND
								~~FLUVIAL~~, MOIST
						8		1% FINE GRAVEL
						9		
								ORGANIC SILT 5Y 5/2
SS	18/13		6/30	3		30	OL	~5% COARSE SAND MOIST
				4		1		NO APPARENT BEDDING
				6				FLUVIAL LOW PLASTICITY
								~1% FINE GRAVEL
						2		
						3		
						4		
SS	18/15		7/35	3		35	OL	ORGANIC SILT, 5Y 4/1
								LOW PLASTICITY 5%
				4		6		BLACK ORGANIC SPOTTING
				7				2% COARSE SAND AND FINE
						7		GRAVEL MOIST NO
								APPARENT BEDDING FLUVIAL
						8		
						9		FELT GRAVEL AT 39'
						40		SHARP CONTACT (HORIZONTAL

DRILLING CONTR. HANNIBAL TESTING LABS JOHN YOHN

No. 67492

BY [signature] DATE 9/28/87 CHK'D BY

628.1 (3/?) (REV. 11-80)

Dames & Moore

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN IA

DRILLING METHOD: 6¼" ID HSA
CME 55 RIG

SAMPLING METHOD: 18" SPT 140# HAMMER
3" NXQ WIRELINE
10' BARREL

BORING NO. G54

SHEET 3 OF 4

DRILLING	
START	FINISH
TIME 11:20	TIME 11:4
DATE 9/28/87	DATE 9/30

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING CONTRACTOR: HAWKEYE TESTING LABS
JOHN YOHN

No. 67493

BY: Rick A. Nye DATE: 9/28/87 CHK'D BY:

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
	18 / 18		8 / 40	4		40	PT	HIGHLY ORGANIC SOIL (SILT)	14:50 AT 40' RAN OUT
				5				CONTAINING PIECES OF WOODY	AUGER HELPERS GETTING
				7		1		MATERIAL 10YR 3/1 MOIST NO APPARENT BEDDING FIRM MEDIUM STIFF	15:16 RESUME AUGERING
						2	SP	FINE SAND, 5Y 5/1	
								SILTY, SATURATED, NO	
								APPARENT BEDDING LOOSE	
						3		~60% FINE SAND 40% SILT	ENCOUNTERING MORE
RUN	REC CORE	TIME	24" CORE	RQD	MIN/FT	4		FIRM	AUGER RESISTANCE
									AUGERED TO 45' 5' OF MAT
1	44 / 89.4	45	25.5 / 89	~~29~~	4	45		DIRTY LIMESTONE 10YR 6/1	MOVED UP IN HOLE
				~~25~~		6		HORIZONTALLY BEDDED WITH	ATTEMPT TO CLEAN O
					3			LOST CORE FROM 46 TO 50.8'	AUGER REFUSAL AT 4
						7		DUE TO VOIDS AND LAYERS	10:07 9/29/87 START C
					3			OF SOFT MATERIAL	BUCKING FROM 45-46'
						8		~~FRE~~	STOPPED AT 48.5' 10:25
					3				TO ADD ROD 10:22 RESUM
						9			100% CIRCULATION RON
					2				
						50			10:35 GETTING MORE
					3				11:14 RESUMED CORING
						1		LOSSES OF CHERT (~15-20%)	
					3			VUGGY FROM 52.9 TO 55'	
						2		MICACEOUS FROM 53.3 TO 54.3	
					2				END OF RUN 1 CORED TO
						3			53.2' 11:21, RESUMED
					3				AT 11:33
2	103 / RD	85.8	65.5 / 120	54.6	2	4			
						5		LIMESTONE, CONCHOIDAL MASSIVE 10YR 7/2	
					3			HARD, WELL CEMENTED FINE GRAINED	AT 4" CLAY SEAM AT 56'
2						6		LOST CORE 55.5-56.9'	
					3			VOIDS AND SOFT MATERIAL WASH	STOPPED, RAN OUT OF WATER BACKED FOR WATER
						7		OUT (DRILLER SAID IT FELT CLAYEY)	13:10 PUMP OPERATOR FILL
					3			CONTINUED CONCHOIDAL BED (CHERT 57.0-57.1) MODERATELY WEATHERED	TRUCK WITH WATER 13:23
								2% VUGS LOW PRIMARY K WELL CEMENTED HIGH SECONDARY IN WASHOUT FRAGMENTS	ADD ROD 13:33
					4	8		SUTURED AT 58.0 10YR 7/1	13:36 RESUME CORING AT
								LIMESTONE, CONCHOIDAL, MASSIVE	
						9		WELL CEMENTED, HARD, MEDIUM	
					4			GRAINED TO FINE GRAINED HORIZONTAL	
								BEDDING, SUTURED AT 58.0, 59.2	
						60		61.4, 61.9, 62.8'	

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO. PLANT	MIDDLETOWN I

DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

SAMPLING METHOD: 3" NXQ WIRELINE
10' BARREL

BORING NO. G54
SHEET 4 OF 4

DRILLING	START	FINISH
TIME	11:20	11:4
DATE	9/28/87	9/30/

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
RUN	REC / CORE	% REC	74" / CORE	% RQD	MIN/FT	60		UNWEATHERED SOLUTION	
					3			CONDITIONS ALONG SUTURES	
2						1		HIGH SECONDARY PERMEABILITY	
					4			ALONG SUTURES. LOW PRIMARY	
						2		K DUE TO GOOD CEMENTATION	
					4			NOTICEABLY COARSER GRAINED	
								FROM 64 TO 65.5'	13:55 STOPPED AT 63.2' TO
					2	3			CLEAN HOLE AND PULL CORE
3	28" / 28"	100	28 / 28	100		4			GET WATER 14:44 RESUME
					3				
					1	65			CORED TO 65.5 11:45 9/
						6			
						7			
						8			
						9			
						70			
						1			
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. HANNIBAL TESTING LAB
JOHN YOHN

No. 67494

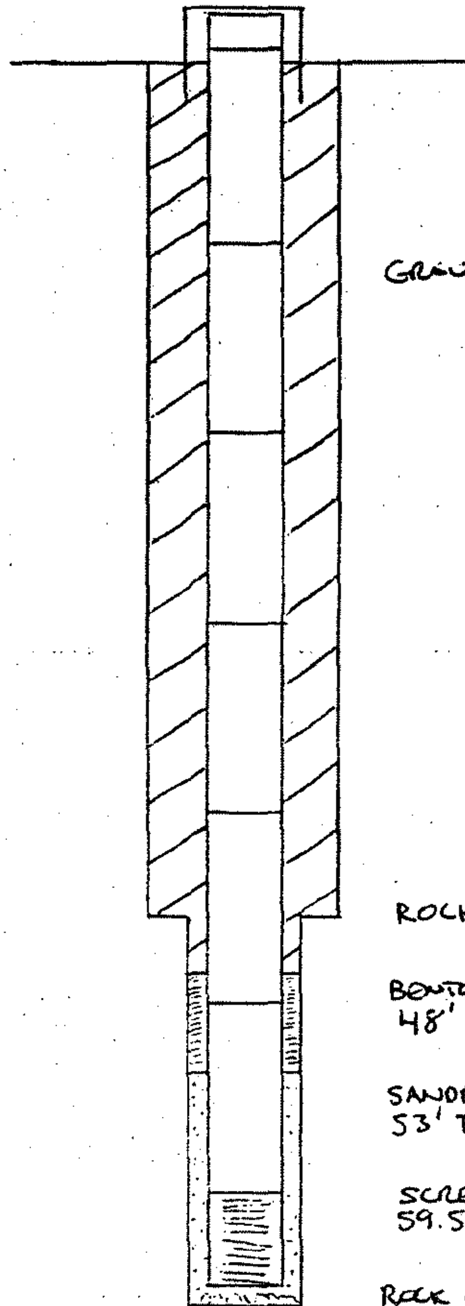
BY Eric A. O'Neage DATE 9/29/87 CHK'D BY

626.1 (3) (REV. 11-80)

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

WELL G54

2.79' STICKUP PVC
2.70' HEIGHT TO BOTTOM PROTECTIVE CASING



GROUT TO 48'

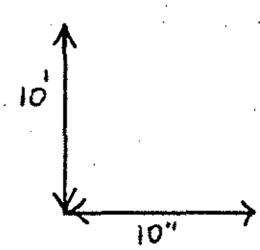
ROCK AT 45'

BENTONITE SEAL
48' TO 53'

SANDPACK
53' TO 64.5'

SCREEN
59.5 TO 64.5

ROCK CUTTINGS
64.5 TO 65.5



4" TRILOC PVC FLUSH JOINT CASING
12 BAGS GROUT USED, 3/4 BUCKETS OF VOLCLAY 1/4" B...
1 1/2 BUCKETS SAND, ROME SAND PIT CESSFORD CONSTRUCTION T
5' 10 SLOT SCREEN

REVISIONS
BY ___ DATE ___ TO EO ___
BY ___ DATE ___ TO EO ___

BY DAL DATE 10/1/87
CHECKED BY ___
COPY TO EO ___

Dames & Moore

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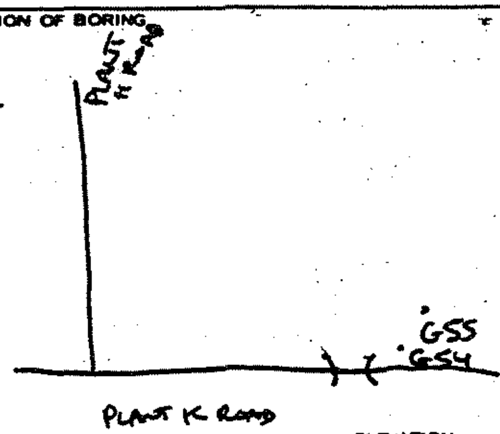
LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN I



DATUM | ELEVATION

DRILLING METHOD: 6 1/4" ID HSA CME 55 RIG

BORING NO. G55

SHEET 1 OF 1

SAMPLING METHOD: 18" SPT 140# HAMMER 30" FALL

WATER LEVEL	10.32'	TOC	2.64'	STKP
TIME	1410S			
DATE	10/3/87			
CASING DEPTH	17.95'	TOC		

DRILLING	START	FINISH
TIME	9:38	10:[illegible]
DATE	9/18/87	9/18

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	ML	SANDY SILT 10YR 4/3 ROOTMAT MOIST, NO APPARENT BEDDING ~5% FINE SAND, TOPSOIL	
SS	18 / 11		1 / 5	4, 2, 3		5			
						6		SILTY SAND 10YR 3/3 80% FINE TO COARSE SAND ~20% SILT. MOIST FLUVIAL V LOOSE	SHARP HORIZONTAL BED; WET SAND AT 7.0'
						▽7			
						9	ML	GRAVELLY SANDY SILT 10YR 4/4 ~5% FINE GRAVEL ~10% FINE SAND, 5% GRAY MOTTLING 10YR 6/1 <1% ORGANIC MATERIAL, SLIGHT HORIZONTAL BEDDING FLUVIAL	
SS	18 / 9		2 / 10	3, 4, 5		10			
SS	18 / 18		3 / 15	3, 5, 9		15	ML	SANDY SILT 2.5Y 5/2 ~3% MEDIUM SAND, 30% FINE SAND, FAINT HORIZONTAL BEDDING FLUVIAL	DRILLED TO 15' SAMPLED TO 16.5' BO
						20			

DRILLING CONTR. HAWKEYE TESTING LAB JOHN YOHR

No. 67457

BY Mark U. [illegible] DATE 9/18/87 CHK'D BY

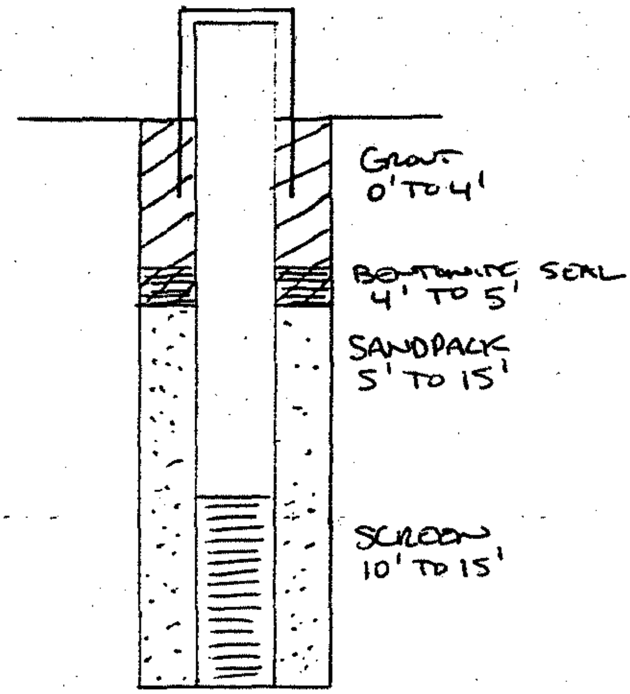
628.1 (3/) (REV 11-80)

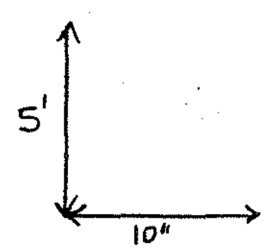
FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

WELL G55

2.64' STICKUP PVC
2.55' HEIGHT OF BOTTOM
PROTECTIVE CASING L





BY DAL DATE 9/21/87
CHECKED BY
COPY TO EO

4" TRILOC PVC FLUSH JOINT CASING
1½ BAGS GROUT, ½ BUCKETS OF ¼" VOLCLAY BENTONITE TAB
10 BUCKETS SAND, ROME SANDPIT CESSFORD CONSTRUCTION
5' 10 SLOT SCREEN

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LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETON IC

DRILLING METHOD: CME 55
3 1/4" ID HSA

BORING NO. G56

SAMPLING METHOD: 24" SPT 140# HAMMER

SHEET 2 OF 2

DRILLING

					START	FIN
WATER LEVEL	8.4				TIME	TI
TIME	15:12				9:42	11:
DATE	9/3/87				DATE	DA
CASING DEPTH					9/3/87	9/3

DATUM — ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	
24" SS	18 / 18		4 / 20	3		20	SM	SILTY SAND, MOIST 10YR 5/1 ~2%	
				8					
				12		1		MEDIUM SAND, MOSTLY VFINE SAND AND SILT MOIST	
						2		SLIGHTLY MOTTLED ORANGE NO APPARENT BEDDING	
						3			
						4			
SS	18 / 17		5 / 25	4		5	SM	FINE SAND, SILTY MOIST ORANGE MOTTLING ACCOUNTS FOR 60% OF THE SAMPLE	APPEARS TO BE TRANSITION FROM
				5		6		10YR 5/4 GRAY 10YR 5/1	GRAY, MOTTLED SM
				7		7		~2% M-COARSE SAND	ORANGE, MOTTLED SM
						8			
						9			
SS	18" / 18"		6 / 30	3		30	SM	SILTY FINE SAND, 10YR 5/6 FAINT HORIZONTAL AND	DRILLED TO 30' SAMPLED TO 31.5'
				7					
				10		1		CROSS BEDDING OF GRAY 10YR 6/2 SILTY SAND	
						2		~3% COARSE AND FINE SAND MOIST	
						3			WELL CASED W/ 4" TRILOC PVC FLUSH JOINT CASING
						4			
						5			10 SLOT SCREEN
						6			2 BAGS GROUT
						7			
						8			
						9			
						40			

DRILLING CONTR. HANNIBAL TESTING LABS
JOHN YOHN

No. 69077

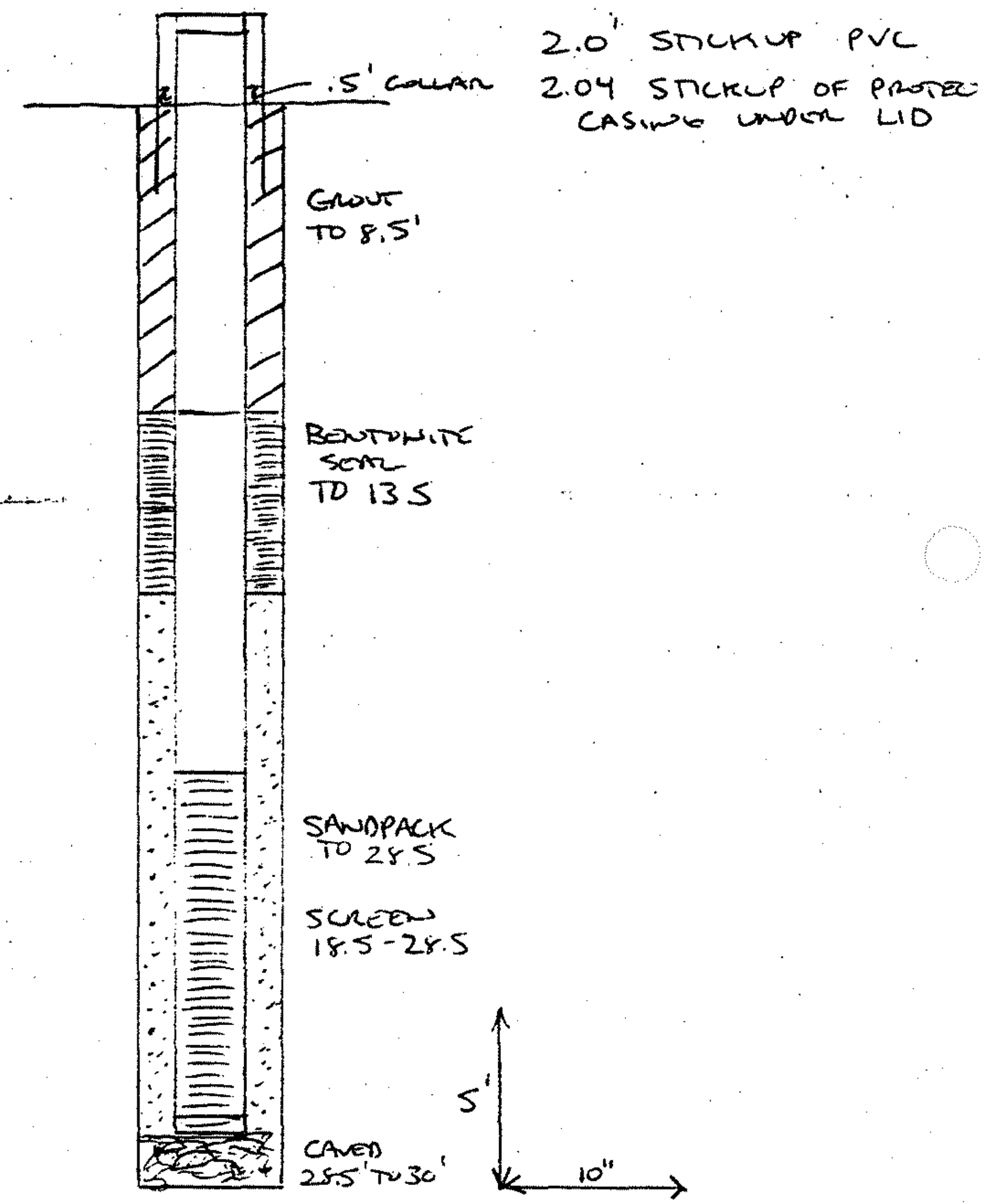
BY DALE A WAGNER
DATE 9/3/87 CHK'D BY

628.1 (REV. 11-80)

FILE 06702 012
SUBJECT IAAP . WELL CONSTRUCT
SHEET 1

REVISIONS
BY ___ DATE ___ TO EO ___
BY ___ DATE ___ TO EO ___

WELL G-56



4" TRILOC PVC CASING (FLUSH JOINT)
2 BAGS GROUT
10' -10 SLOT SCREEN
3 - 5 GAL BUCKETS VOLCLAY BENTONITE TABLETS

BY DAL DATE 9/3/87
CHECKED BY ___
COPY TO EO ___

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LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMM. PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4 ID HSA
CME 55

BORING NO. G 57

SHEET 1 OF 2

SAMPLING METHOD: SPT 140# HAMMER
U SAMPLER 300# HAMMER

WATER LEVEL	5.96 TOC			
TIME	8:14			
DATE	9/11/87			
CASING DEPTH				

DRILLING

	START	FIN[ISH]
TIME	9:58	13:[illegible]
DATE	9/9/87	9/9[illegible]

DRILLING CONTR. HAWKEYE TESTING LABS
JOHN YOHN

No. 69081

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
						0	OL	ORGANIC SILT 5YR 2.5/1 BLACK MOIST ROOTMAT NO APPARENT BEDDING	
						1			
						2			
						3	CL	INORGANIC CLAY 2.5Y 6/4 MOIST NO APPARENT BEDDING	10:05 AUGER BLOC[KED] UP WITH CLAY. DR[ILLER] REMOVING IT FROM A[UGER]
						4			
SS	18/18		1/5	2, 2, 4		5	CL	INORGANIC CLAY, 2.5Y 6/2 SILTY, SPOTTED AND MOTTLED WITH ORGANIC BLACKSPOTS AND 15% LT. OLIVE BROWN 2.5Y 5/6, MOIST NO APPARENT BEDDING	
						6			
						7			
						8			
						9			OUTSIDE OF SPLIT[SPOON]
SS	18/17		2/10	1, 2, 2		10	SP/SM	SANDY SILT, MOIST 10YR 5/1 5% MOTTLED WITH OLIVE BROWN 2.5Y 5/6 NO APPARENT BEDDING	IS WET AT 10-11.5' MUD COMING UP FROM AUGER AT 12
						11	▽		
						12			
						13			
						14			
SS	18/17		3/15	3, 6, 6		15	SM	SANDY SILT, MOIST 10YR 5/1 ~2% FINE RIVER GRAVEL FAINT BEDDING ~~MOT~~ GRADES TO SANDY SILT 10YR 5/4 WITH STRINGERS OF SILTY SAND WET	
						16			
						17			
						18			
						19			
						20			

BY [signature] DATE 9/9/87 CHK'D BY

628.1 (3) (REV. 11-80)

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LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IOWA ARMY AMMO PLANT	MIDDLETOWN

DRILLING METHOD: 6 1/4 ID HSA
CME 55

BORING NO. G57

SHEET 2 OF 2

SAMPLING METHOD: SPT 140# HAMMER
U SAMPLER 300# HAMMER

DRILLING

START	FINI
TIME	TIM
9:58	13:4
DATE	DA
9/9/87	9/9

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
SS	18 / 17		4 / 20	4		20		SILTY SAND, MOIST 10YR 5/3 — SHARP BREAK AT 2
				8		1	SM	37% MEDIUM QUARTZ SAND PRIMARILY
				12				FINE SAND & SILT SLIGHT
						2		GRAY (5%) MOTTLING, NO
								APPARENT BEDDING
						3		
						4		
SS	18 / 15		5 / 25	3		25	SM	SANDY SILT, MOIST 10YR 5/6
				5				ACCOUNTS FOR 60% OF SAMPLE
				8		6		GRAY 10YR 5/1 ACCOUNTS FOR
						7		40% OF SAMPLE FAINT
								HORIZONTAL & CROSS BEDDING
						8		
						9		
U	18" / 16		6 / 30	4	10	30		SANDY SILT, MOIST 10YR 5/1
				8		1	SM	GRADING TO SILTY FINE SAND
				12				10YR 5/6. STRINGERS OF
								CLEAN FINE SAND, WET
						2		~~<20% OF MEDIUM & COARSE SAND~~
								NO APPARENT BEDDING
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. HAWKEYE TESTING LABS
JOHN YOHN

No. 69082

BY Kent W. Lyons CHK'D BY
DATE 9/9/87

628.1 (3) (REV. 11-80)

FILE 06702012

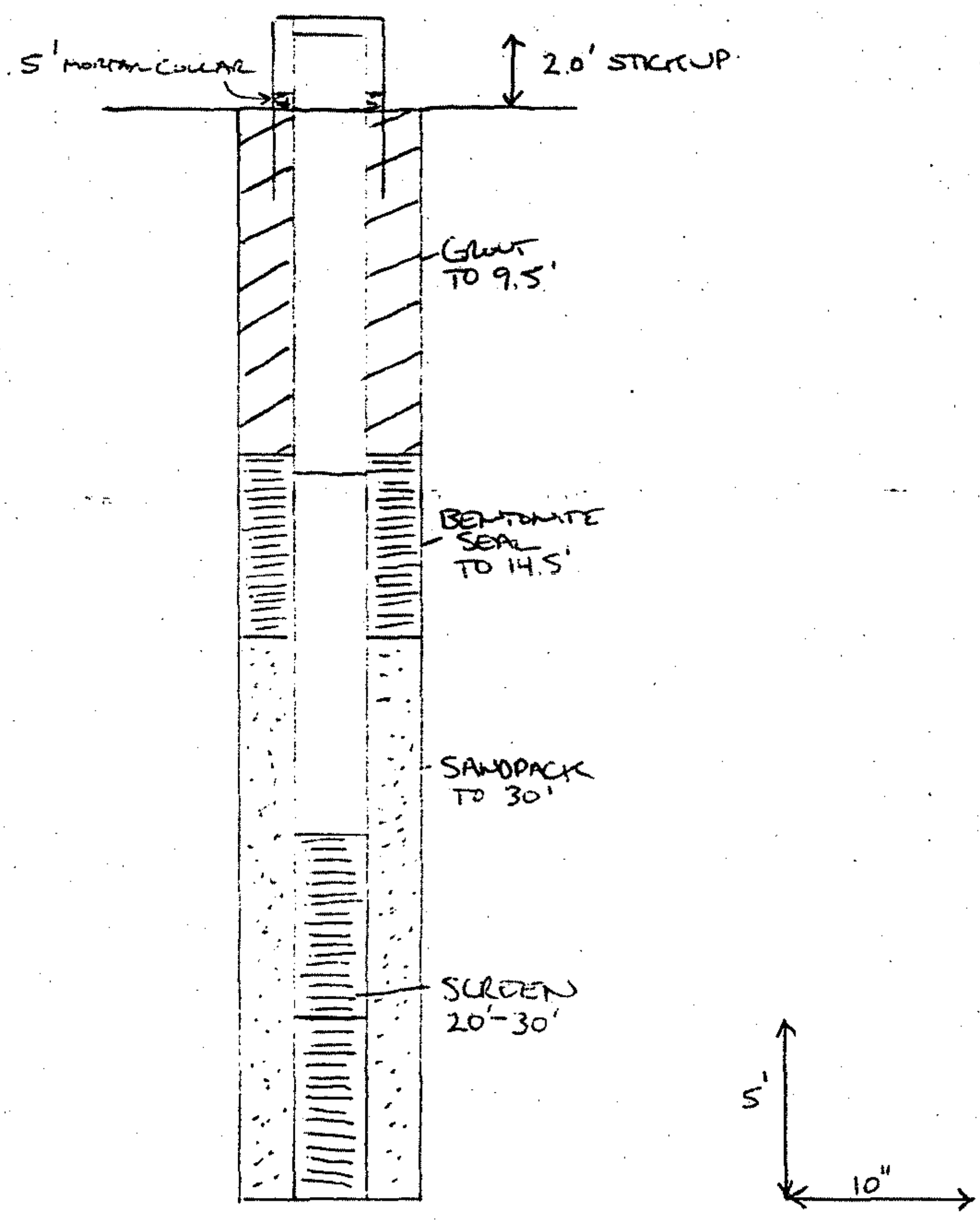
SUBJECT IAAP WELL CONSTR

SHEET

REVISIONS BY ___ DATE ___ TO EO ___

BY ___ DATE ___ TO EO ___

WELL G 57



BY DAW DATE 9/9/87

CHECKED BY

COPY TO EO

WELL CASED WITH 4" TRILOC PVC FLUSH JOINT CASING

3 BAGS GROUT, 5' OF VOLCLAY ¼" BENTONITE TABLETS

10 SLOT SCREEN

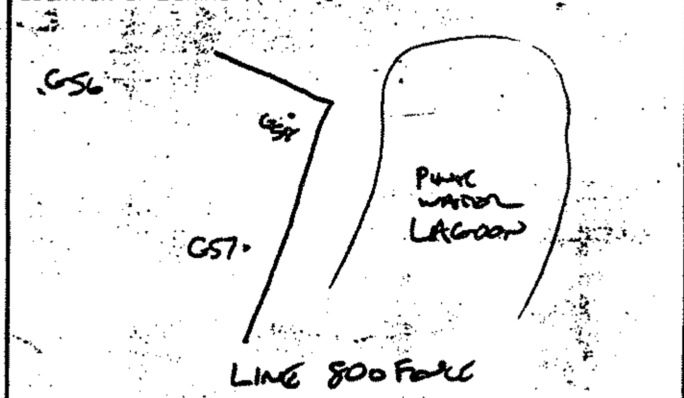
SAND FROM ROME SAND PIT CESSFORD CONSTRUCTION

15 5 GAL BUCKETS

Dames & Moore

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
(sketch below)	06702012	IAAP	MIDDLETOWN



DRILLING METHOD: 6 1/4" ID HSA
CME 55 RIG

SAMPLING METHOD: 24" SPT 140# HAMMER
18" U SAMPLER 300# HAMMER

BORING NO. G-58
SHEET 1 OF 2

WATER LEVEL	7.91 TOC	2.85' STICKUP	
TIME	9:48		
DATE	9/14/87		
CASING DEPTH	30.1		

DRILLING	START	FINISH
TIME	13:13	15:
DATE	9/10/87	9/1

DATUM

ELEVATION

DRILLING CONTR. HANNIBAL TESTING LAB
HANNIBAL MO JOHN YEN

No. 690083

BY [signature] DATE 9/10/87 CHK'D BY

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:	
						0	OL	ORGANIC SILT 5YR 2.5/1 BLACK MOIST ROOT MAT NO APPARENT BEDDING TOPSOIL	
						1			
						2			
						3	CL	INORGANIC CLAY 2.5Y 6/4 MOIST, SILTY, NO APPARENT BEDDING, LOW PLASTICITY GLACIAL TILL SOFT	AUGER CLOGGED
						4			
SS	18/18		1 / 5	1 1		5	CL	INORGANIC CLAY 2.5Y 6/2 SILTY, 1% ORGANIC SPOTTING 40% ~~DARK~~ YELLOW BROWN 2.5YR 5/6 MOTTLING MOIST NO APPARENT BEDDING MOIST, TILL V. SOFT LOW PLASTICITY	
				2		6			
						7			
						8			
						9			
SS	18/17		2 / 10	1 2		10	▽ ~~SM~~ ML	SANDY SILT, 10YR 5/1 50% MOTTLED WITH OLIVE BROWN 2.5Y 5/6 1% BLACK ORGANIC SPOTTING ~10% V FINE TO MEDIUM SAND ~~[illegible]~~ GLACIAL TILL V. SOFT SLIGHT PLASTICITY	WATER ON SPOON AT 10'
				2		11			
						12			
						13			
						14			
SS	18/17		3 / 15	2		15		SANDY SILT MOIST 10YR 5/1 FAINT BEDDING GRADES TO	
				4		16	ML	SANDY SILT 5Y 6/3 WITH STRINGERS OF WET SILTY SAND 5% OLIVE BROWN 2.5Y 5/6 MOTTLING ~2% FINE GRAVEL FLUVIAL SLIGHT PLASTICITY	
				6		17			
						18			
						19			
						20			

R2B.1 (3) (REV. 11/80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	06702012	IAAP	MIDDLETOWN

DRILLING METHOD:	6 1/4" ID HSA CME 55 RIG	BORING NO. G-58
SAMPLING METHOD:	24" SPT 140# HAMMER 18" US SAMPLER 300# HAMMER	SHEET 2 OF 2

WATER LEVEL	29.1'	TOC	28.5'	SDG
TIME	9:48			
DATE	9/14/87			
CASING DEPTH	30'			

DRILLING	START	FINISH
TIME	13:13	15:[illegible]
DATE	9/10/87	9/10/[illegible]

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	DESCRIPTION	REMARKS
SS	18/18		4/20	2, 5, 10		20	ML	SILT 10YR 5/1 AND 50% 2.5Y 5/4 SILT NO APPARENT BEDDING, MOIST TILL	
						1	SW	1" BAND OF CLEAN CRUSHED QTZ FLUVIAL COARSE SAND AND FINE GRAVEL	
						2	ML	SANDY SILT 50% 2.5Y 6/0, 50% 2.5Y 5/4 ~10% FINE TO MEDIUM SAND, <1% FINE GRAVEL	
						3	ML	CONTAINS WHITE POWDERED ROCK MOIST, NO APPARENT BEDDING	
						4		GLACIAL TILL SLIGHT PLASTICITY	
SS	18/18		5/25	5, 5, 6		25	ML	[redacted] - SANDY SILT 60% 10YR 5/6, 40% 10YR 5/1 ~1% FINE GRAVEL MOIST	SHARP BREAK (HORIZON)
						6			
						7		NO APPARENT BEDDING FLUVIAL SLIGHT PLASTICITY	
						8			
						9			DRILLER SAID HE HIT GRAVEL AT 28.5', RIG HOPPING
U	18/10		6/30	2, 9, 6		30	SM	SILTY FINE SAND 10YR 5/6 WITH STRINGERS OF CLEAN FINE SAND AND 10% LIGHT GRAY SILTY SAND 10YR 7/1 ~2% FINE GRAVEL WET	
						1			
						2		NO APPARENT BEDDING FLUVIAL	HOLE DRILLED TO 30 SAMPLED TO 31.5 BOTTOM
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						0			

DRILLING CONTR. HAWKEYE TESTING LABS JOHN YOARS

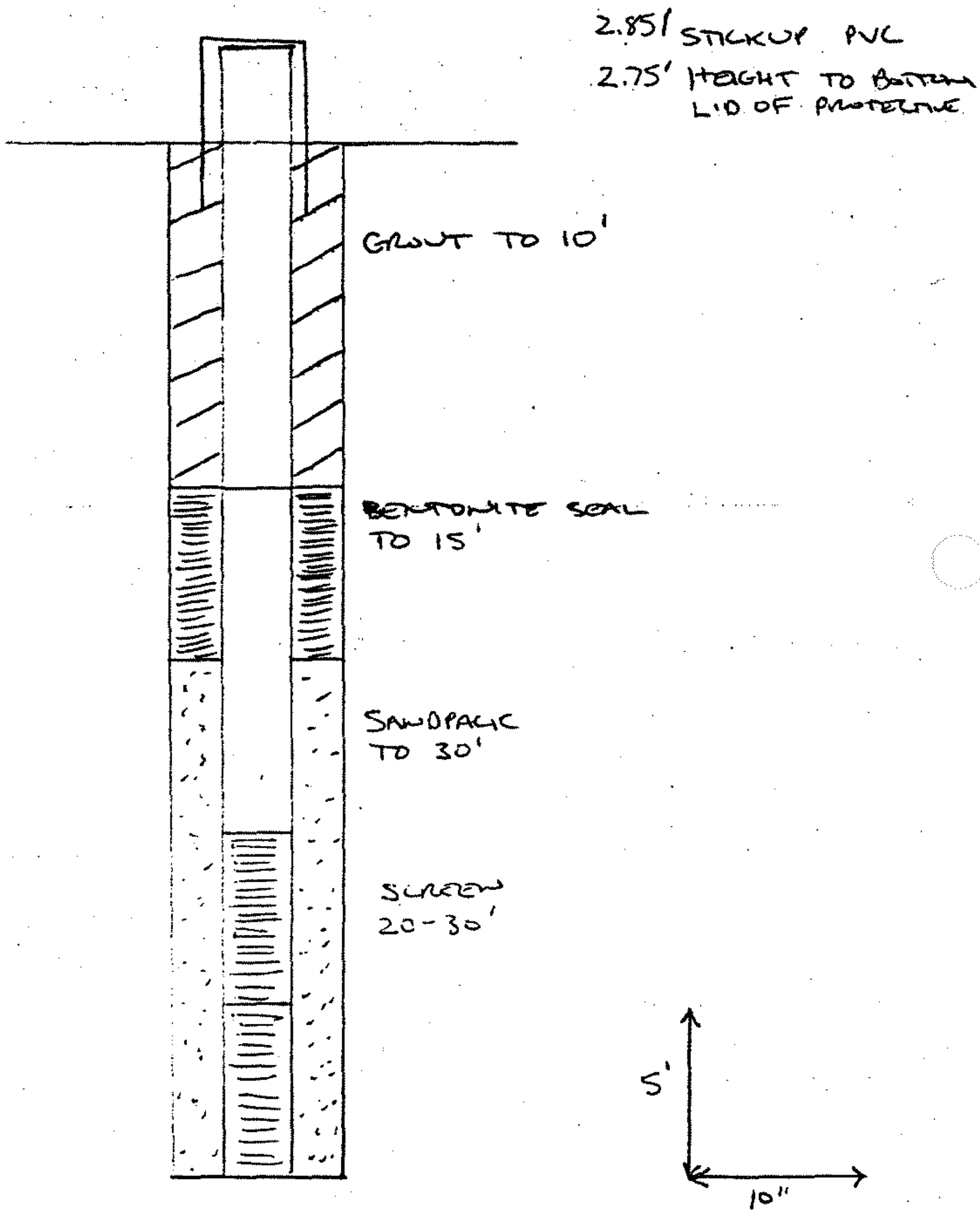
No. 69085

BY [signature] DATE 9/10/87 CHK'D BY

625.1 (3) (REV. 11-80)

FILE 06702012
SUBJECT IAAP WELL CONSTRUCTION
SHEET 0

WELL G-55



4" TRILOC PVC FLUSH JOINT CASING
3 BAGS GROUT, 3-5 GAL BUCKETS OF 1/4" VOLCLAY BENTONITE TABLETS
15-5 GAL BUCKETS SAND, ROME SAND PIT COSSFORD CONSTRUCTION
10' - 10 SLOT SCREEN

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

BY DAW DATE 9/11/87
CHECKED BY ____
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Dames & Moore

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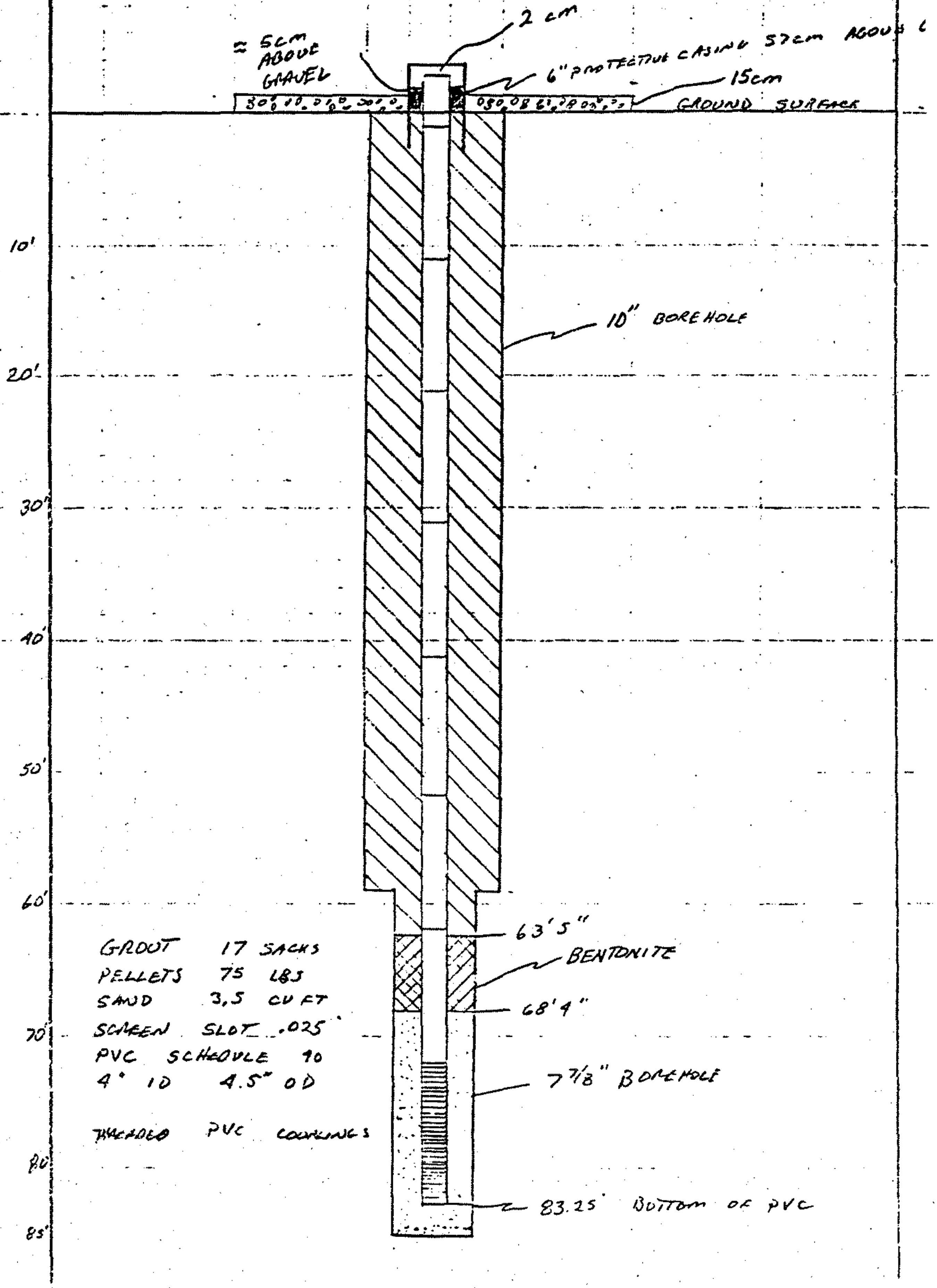
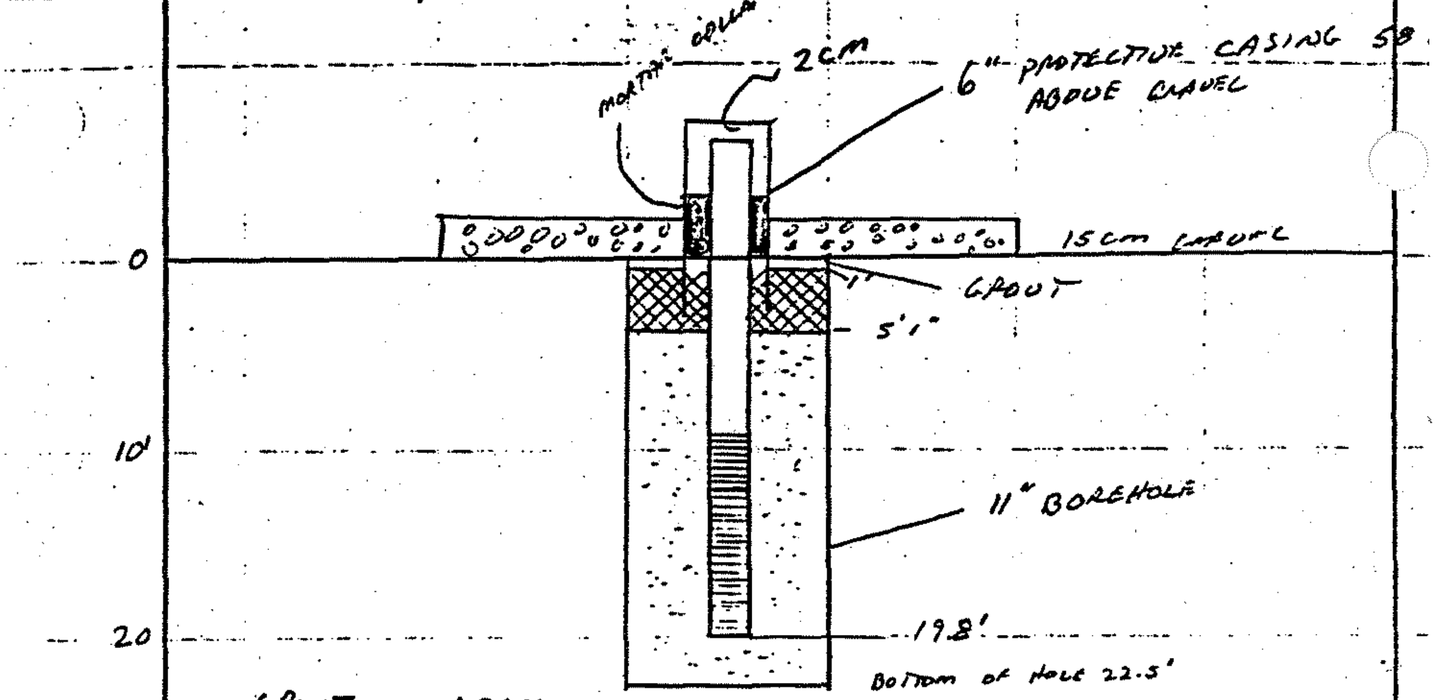
IOWA ARMY AMMUNITION PLANT
WELL G-40

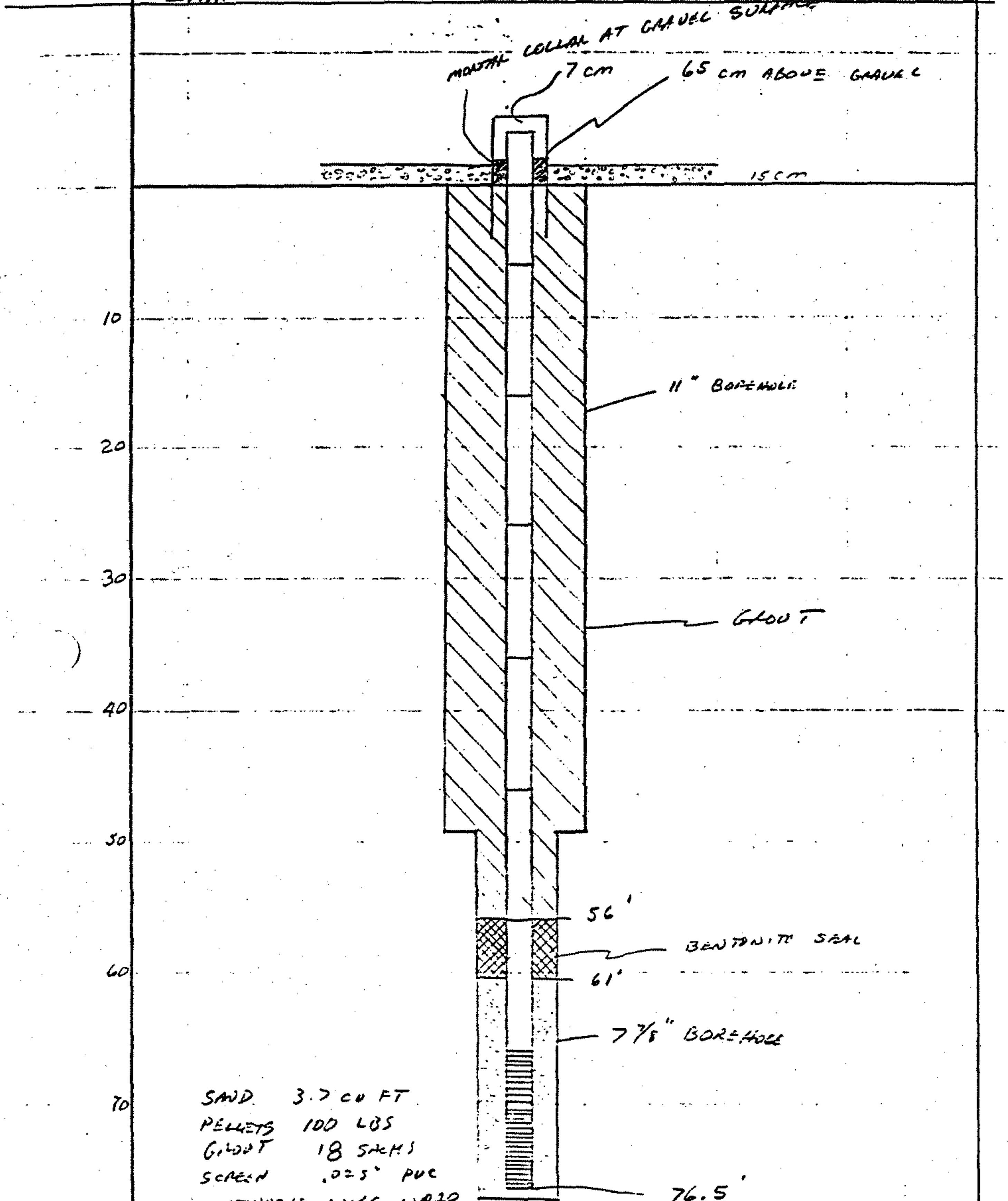




GROUT 1 SACK
PELLETS 225 LBS
SAND 8.0 CU FT
SCREEN SLOT .025"
PVC SCHEDULE 40
4" ID 4.5" OD

THREADED PVC

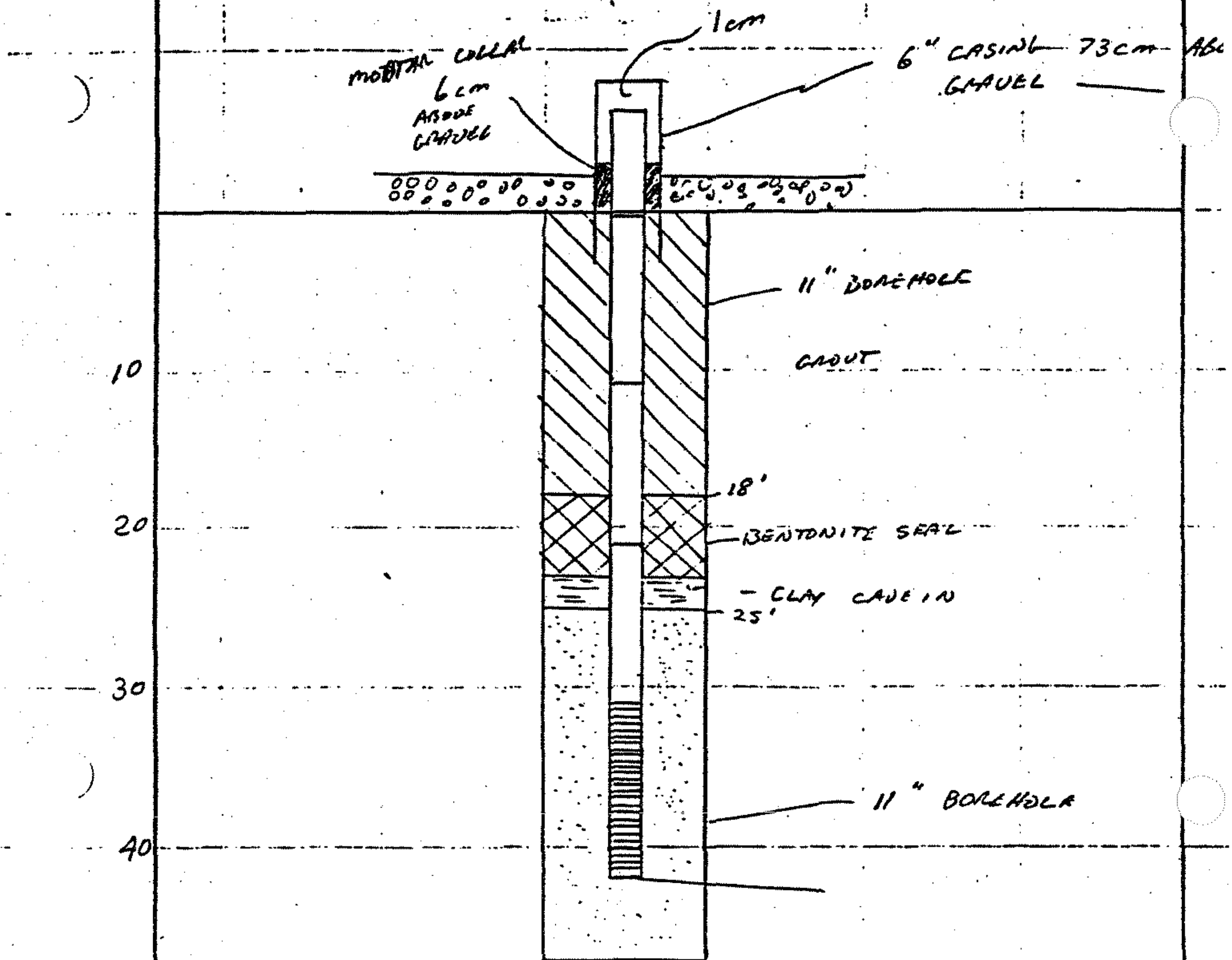
IAAP



SAND 3.7 CU FT
PELLETS 100 LBS
GROUT 18 SACKS
SCREEN .025" PVC
CONTINUOUS WIRE WRAP
PVC SCHEDULE 40
4.0" ID 4.5" OD

THREADED PVC JOINTS

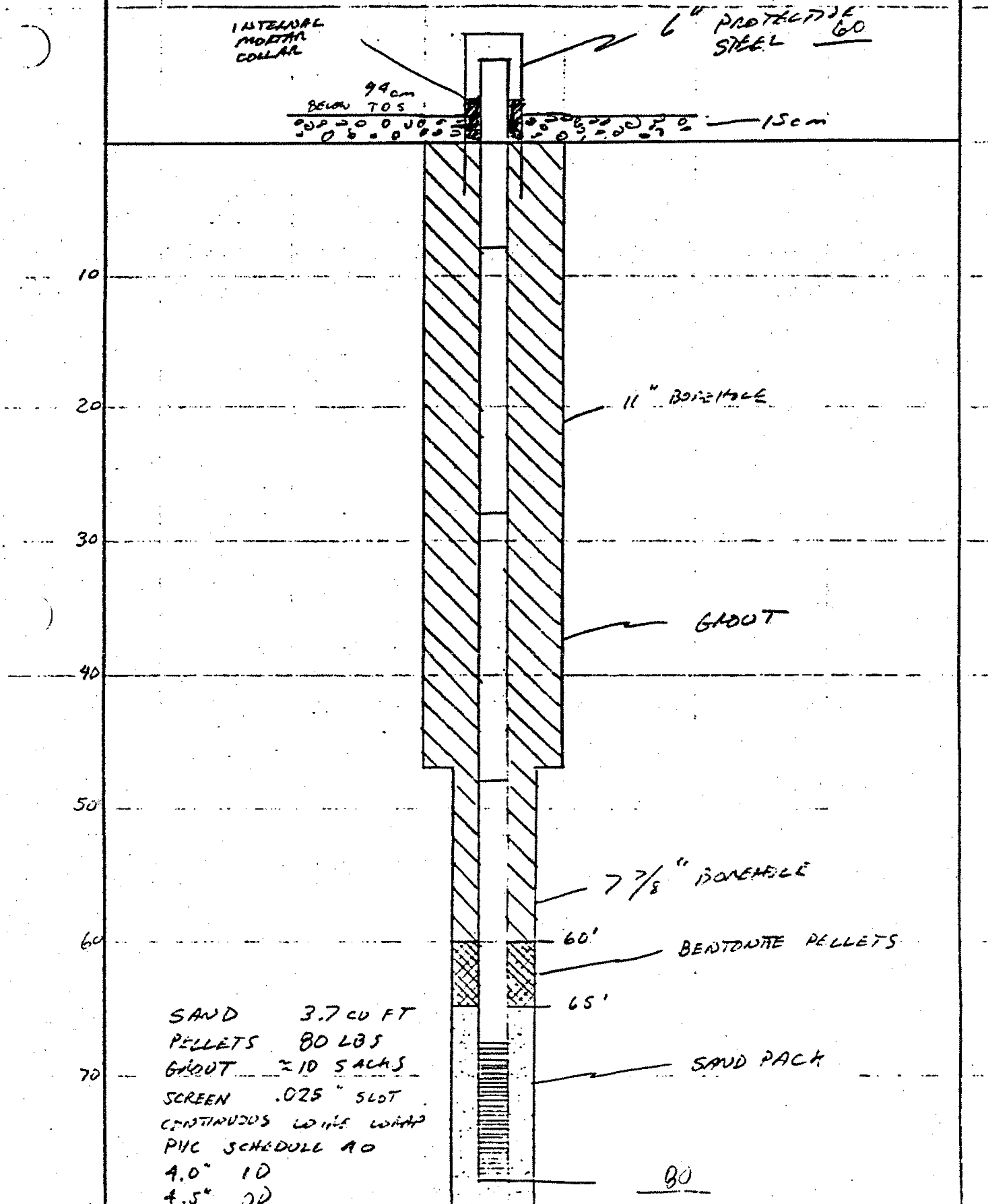
IAAP



50

SAND 7.5 CU FT
GROUT 8 SACKS
PELLETS 100 LBS
SCREEN .025" CONTINUOUS WIRE
WRAP PVC
SCHEDULE 40 4" ID 4.5" OD

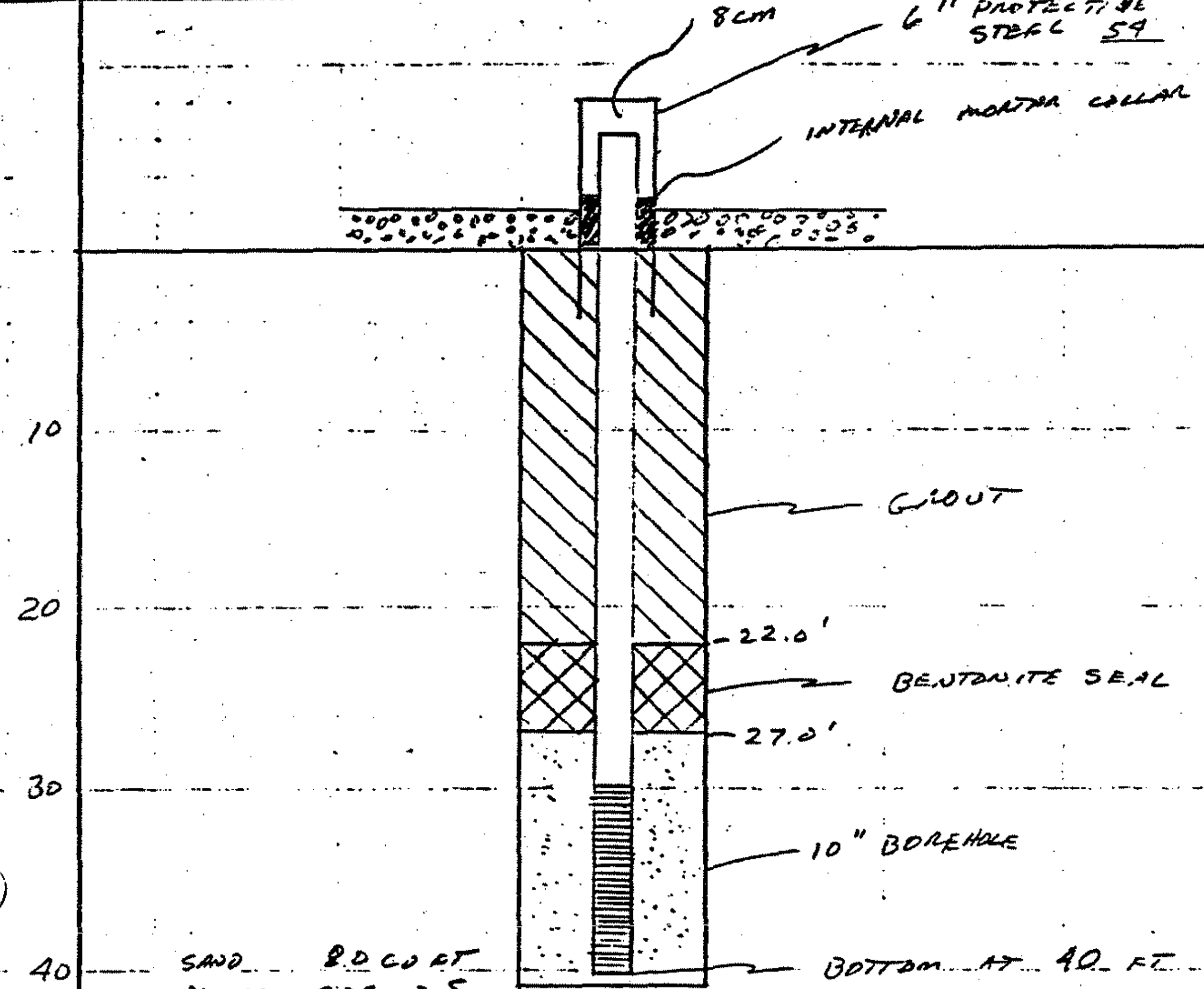
THREADED JOINTS EXCEPT TOP JOINT GLUED PVC
SLIP COUPLING



SAND 3.7 CU FT
PELLETS 80 LBS
GROUT ≈10 SACKS
SCREEN .025" SLOT
CONTINUOUS WIRE WRAP
PVC SCHEDULE 40
4.0" ID
4.5" OD

20' SCHEDULE 40 PVC WITH GLUED JOINTS

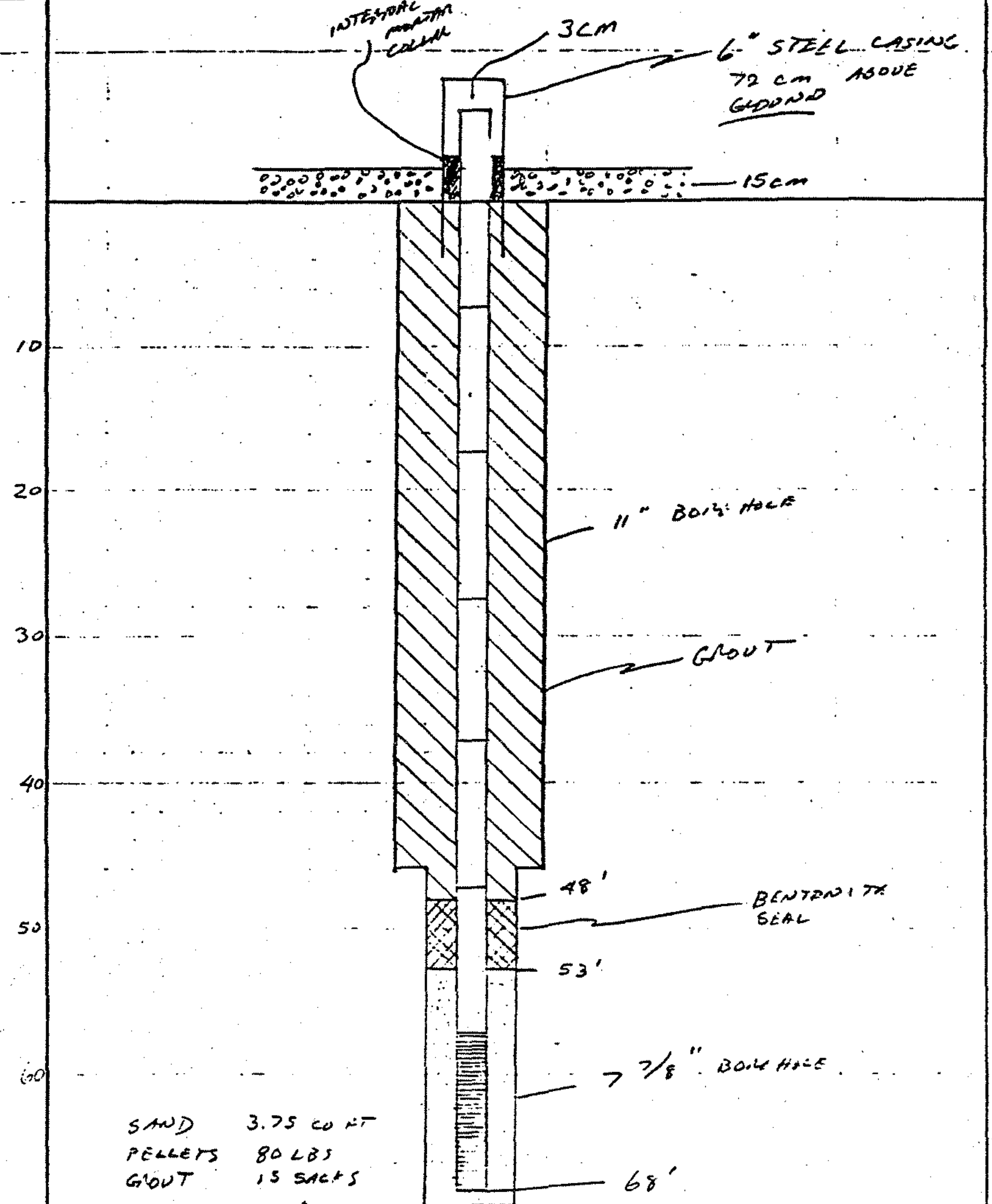
I AAP



SAND 8.0 CU FT
PELLETS 225 LBS
GROUT 8 SACKS
SCREEN .025" CONTINOUS WIRE
WRAP
PVC SCHEDULE 40
4.0" ID
4.5" OD

NOTE: ID OF SCREEN IS 3.75" DUE TO
SCHEDULE 80 COUPLINGS ON SCREEN
JOINTS

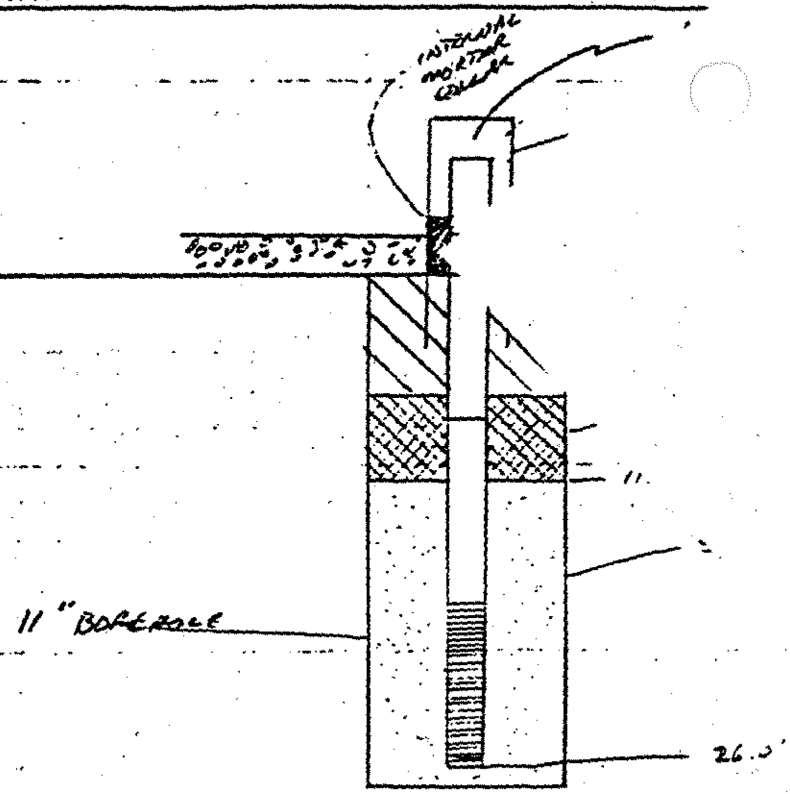
IAAP



SAND 3.75 cu FT
PELLETS 80 LBS
GROUT 15 SACKS
SCREEN .025" CONTINUOUS
WIRE WRAP PVC
PVC SCHEDULE 40 4.0" ID
4.5" OD

SCREW JOINTS

IAAP



SAND 6.5 CU FT
PELLETS 350 LBS
GROUT 30 GALLONS
SCREEN .025" CONTINUOUS WIRE WRAP
PVC SCHEDULE 40 4" ID
4.5" OD

SCREW COUPLINGS

SOIL TESTING SERVICES, INC. 1805 CHANU.. RD., PEORIA, IL 61614
Phone: 309/692-6591

Sheet 1 of 1

TECHNICIAN DM Jedlicka
DRILLER Mike Dant
HELPER Mike Mcconnel
RIG NO. 53
Mobile Truck

SURFACE ELEV.
BORING STARTED 2-16-81
BORING COMPLETED 2-17-81
STATION
OFF SET

Push Tube to 10' Set HSA to 10'
Sample at 2' intervals ahead of ASA.
W.L 2-17-81 7.0'

CASING USED NONE SIZE 3 1/4" Hollow Stem Augers

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: 7.0 BCR 7.0 ACR
WL: ______ AB ______ Hr. AB
WL: 8.0 24 Hr. AB

JOB NO. 22017 BORING NO. G-1 CLIENT ERG WEATHER 60° Fair

FROZEN 0.0'~2.5'
Trace indicates 10% or less
*advance hole to 20', stop for day, next day water @ 7.0', set well.
24° E Strike 40° Dip

Sample No.	Depth or Elevation From	To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	1.8	2.3					0-2	1.3			Clay, Silty trace organics (Roots)
							2-4	1.6		2.5	ICE XLS, Black Mottled Lt. Brown 2.5Y 2 CL Topsoil
2	2.5	3.0					4-6	1.6			Clay, Silty tr. Sand tr. gravel Moist
							6-8	1.7			light Br. (2.5Y 4.2) CL-CH Med-High Pl weathered Till
3	3.5	3.8					8-10	2.0		8.5	Clay, Silty, trace Sand tr. gravel Moist
							10-12	1.8			Med. Plastic, Gray Mottled. 10YR 5/1 Till CL
							12-14	1.5		10.5	Clay, Silty, 15% Sand trace gravel Med. Moist v. Moist
4	10.5	10.8					14-16	1.5			Plastic CL, Brown, Till 10YR 6.6
							16-18	1.6		13.0	trace Black Coal Frags
							18-20	1.8			Clay, Silty, trace Sand tr. gravel Moist
5	13.0	13.3									Med Plastic CL, Till, Greenish Gray
										14.0	5Y-5/2, CL
											Clay Silty trace Sand tr. gravel (Moist
6	14.0	14.3									Med.-Hi Plastic CL-CH, Dark Gray
											Till 2.5YR 1/4 Moist
										*	tr. Organics (wood chips 18.0-20.0)
			* No water encountered till next day								
			water level 7.0'-2-17-81								END OF BORING at 20'

FEB 17 1981

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness 2'
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss

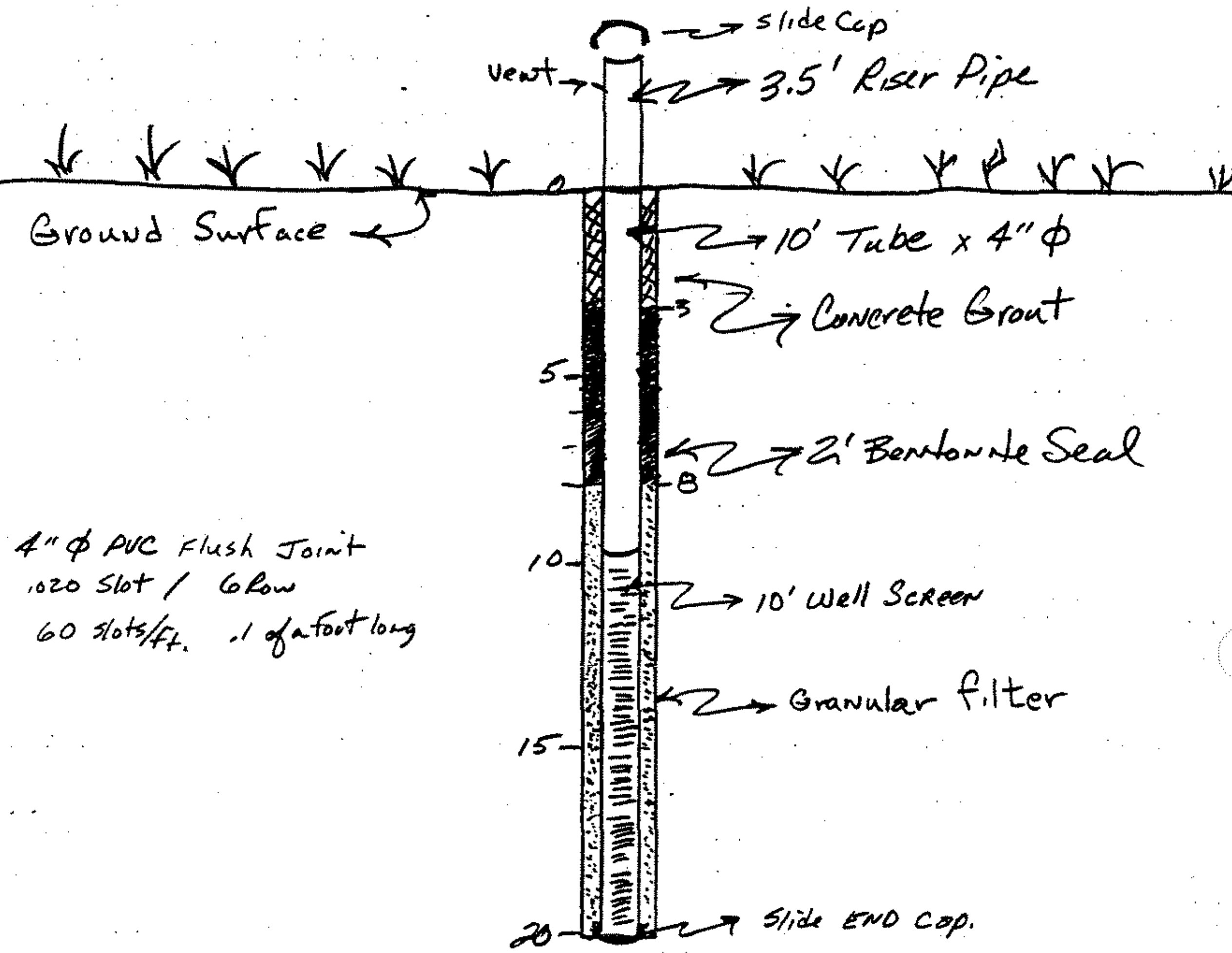
BOULDERS OR OBSTRUCTION
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC.	DATE Feb. 17, 81	PAGE 1 OF
PROJECT Iowa Army Ammunition, STS JOB NO 22017	BY DMJ	CHK DMJ

IAAP) WELL INSTALLATION DIAGRAM

WELL → G-1



WELL SET Feb 17, 81

Water Level 7.0' After 24 hrs.

FEB 17 198

[redacted]

DAVID M. JEDLICKA

GEOLOGIST, DATE

LOCATION

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-6520

Sheet 1 of 2

TECHNICIAN MAT
DRILLER A. Davis
HELPER M. McCann
RIG NO. DC-4 Mobile B-53

SURFACE ELEV.
BORING STARTED 3/26/81
BORING COMPLETED 3/27/81
STATION
OFF SET

Push tube to 10' then set HSA and sample 2' ahead of HSA

CASING USED 3¼" HSA SIZE

WATER LEVEL OBSERVATIONS
WL: -5.8' WS OR WD
WL: BCR ACR
WL: -.5' AB Hr. AB
WL: 24 Hr. AB

JOB NO. 22170 BORING NO. G-2 CLIENT E.R.G. WEATHER

Sample No.	Depth or Elevation From	To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	2.0	3" ST			0	2	1.2	—		DARK Brown - Black Clay Silty w/ tr. sand
											- Note - Roots & Organics throughout
											moist - wet, stiff, med. plasticity -
											Sampled .4-.6, 10YR 2/1 (OL)
2	2.0	9.2				2	4	1.0	—		Brown - Gray (mottled) clay, Silty w/ tr
	encountered water @ 5.8'					4	6	1.2	-		sand & decayed root zones, moist, stiff
	rose to -1.5' in 10 min -					6	8	1.6	—		to v. stiff, med - high plasticity,
	14 hours later @ -.6'										becomes wet @ 5.8', saturated @ 6.2
											Sampled 4.0-4.2' 10YR 5/6 [illegible]
											7.5YR 6/8 to 10YR 6/1
3	9.2	11.1				8	10	1.5	—		Gray Clay Silty w/ tr. - little sand wet to
						10	12	1.7	—		saturated, med - high plasticity, firm to
											stiff Note: Manganese & iron staining
											and concretions, also mottled @ 10.3 ft.
											Sampled 9.6 - 9.8' 10YR 5/1 (CL-CH)
4	11.1	15.0				12	14	2.0	-		Brown - Gray (mottled) clay, silty w/ tr. - little
						14	16	1.9	-		f-c. sand (fissured in upper 1.0') moist - wet,
											[illegible]

ABBREVIATIONS
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R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness 2.0
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At To
Percent Loss
At To
Percent Loss

BOULDERS OR OBSTRUCTIONS
At To
At To

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

[redacted] TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN M. Travers
DRILLER M. Bant
HELPER M. McConnell
RIG NO. Dr-4 Mobile B-53

SURFACE ELEV.
BORING STARTED 2/26/81
BORING COMPLETED 2/27/81
STATION
OFF SET

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS

WL: 5.8' WS OR WD
WL: 7.0' BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22170 **BORING NO.** B-2 **CLIENT** C.R.S. **WEATHER**

Sample No.	Depth or Elevation: From	Depth or Elevation: To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (← 2 Feet →)	R: Length Recovered in Feet	Qp: Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
5	15.0	18.0	3" ST			15.0	18.0	2.0	—		Brown w/ gray streaks, Clay, Silty, w/ tr.- little sand, occasionally occurring in lenses, mst- high plasticity, wet-saturated, firm-stiff, Note: Maganese & iron concretions & staining, sand stringer @ base of sample.
											Sample 16.3-16.6 10YR 6/8
											CL-CH
											E.O.B. 18'

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
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S.S.-Split Spoon
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P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

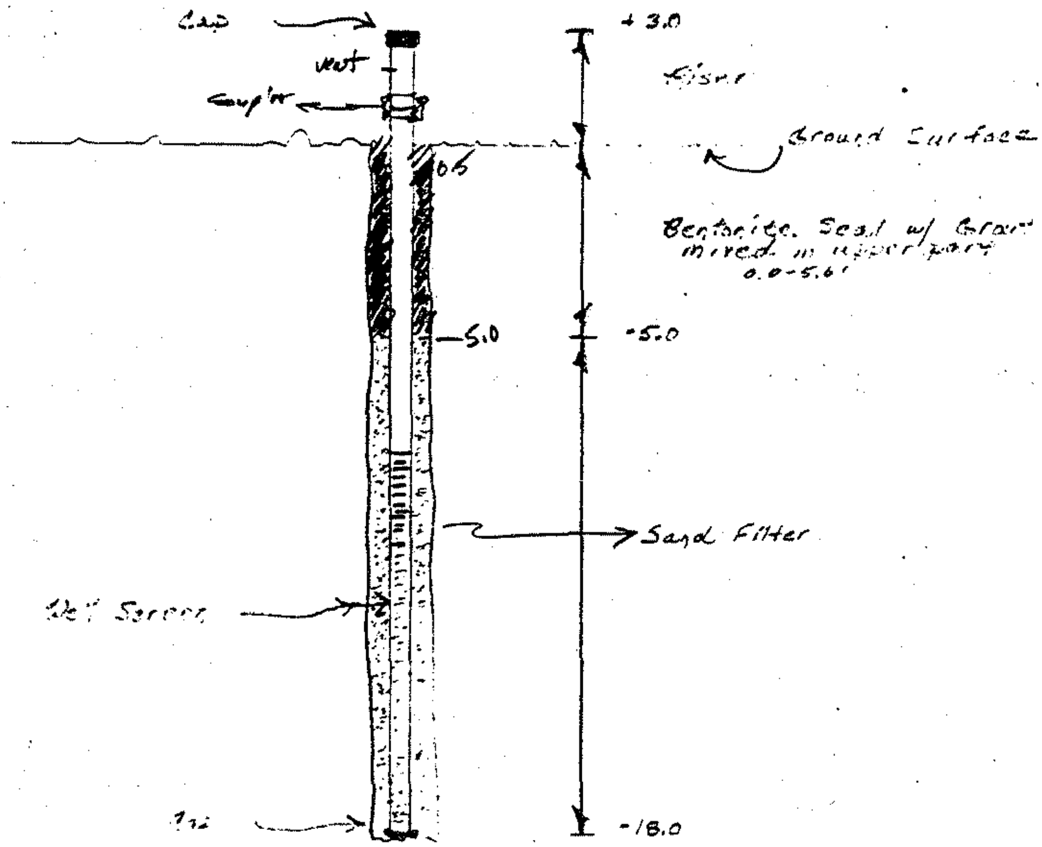
BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC.	DATE March 2 81	PAGE 1 OF 1
PROJECT Iowa Army Ammunition Plant STS JOB NO 22017	BY DMJ	CHK DMJ

Well installation Diagram
Well G-2

Well Point G-2



SOIL TESTING SERVICES, INC. 1805 CHANUTE RD., PEORIA, IL 61614 Phone: 309/692-6591

Sheet 1 of 1

TECHNICIAN DM. Jedlicka
DRILLER Mike Dart
HELPER [illegible] McConnell
RIG NO. 53
Mobile Truck Mount

SURFACE ELEV.
BORING STARTED 2-17-81
BORING COMPLETED 2-18-81
STATION
OFF SET

Push tube to 10', Set HSA, Sample @ 2' interval ahead of HSA Stop at 20' For 2-17-81

3 1/4" Hollow Stem Augers

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS

WL: ______ WS OR WD
WL: 15.5 BCR 19.0' ACR
WL: ______ AB ______ Hr. AB
WL: 19.0 24 Hr. AB

JOB NO. 22017 BORING NO. G-3 CLIENT (ERG.) WEATHER Cloudy Cold

2-18-81 WL @ 15.5 in HSA Bott Casing 20.0'
*

NO Black Topsoil

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R – Length Recovered in Feet	Qp – Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	0.3	3" ST				0-2	1.1			Clay, Silty little 15% Sand trace gravel Med. Plastic
							2-4	1.3		3.5	CL Moist Brown (Till weathered) 10YR 5/4. Soft
2	3.5	31.8	3" ST				4-6	1.5			Clay, Silty little 20% Fine Sand Moist Med Plastic CL
							6-8	1.8		11.0	Brown Till 10YR 5/8 stiff
							8-10	1.7			Clay, Silty trace Sand trace gravel Till
3	11.0	11.3	3" ST				10-12	1.8			Med. Plastic CL. Brown Moist stiff 10YR 6/6
							12-14	2.0		13.0	
4	13.0	13.3	3" ST				14-16	1.8			Sand, Fine Silty SP Moist Br. 10YR 6/6
							16-18	1.8		13.3	
5	13.3	13.6	3" ST				18-20	1.6			Clay, Silty trace Sand trace gravel Till Med.
							20-22	1.5		17.0	Plastic (CL) Moist stiff Brown Mottled Gray 10YR 4/6
				* See above for WL			22-24	1.6		[illegible]	Clay, Silty trace Sand trace gravel Till Med.
6	17.0	17.3	3" ST	* Small 1 1/2" thick, Fine Sand Stringer @ 20.0 20.15' Moist (NO Sample)							Plastic (CL) Moist 5Y 6/4 Olive Brown Mottled. Stiff
										20.5	
7	20.5	20.8	3" ST				24-26	1.7			Sand, Silty trace clay 'Saturated' Brown
							26-28	2.0		21.3	5Y 6/3 SM
8	21.3	21.6	3" ST				28-30	1.8			Clay, Silty little Sand trace gravel Moist, till.
							30-32	1.6		[illegible]	Olive Br. Med. Plastic CL 5Y 5/3. Stiff
											Clay Silty little Sand trace Gravel Till. Med. Plastic
9	22.0	[illegible]	3" ST								CL [illegible] Gray Dark 2.5YR N4/. Stiff

DAVID M. JEDLICKA

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness 0
Fill Thickness 0

CAVE IN LEVEL:
While Drilling and Sampling ______
After Boring Completion ______

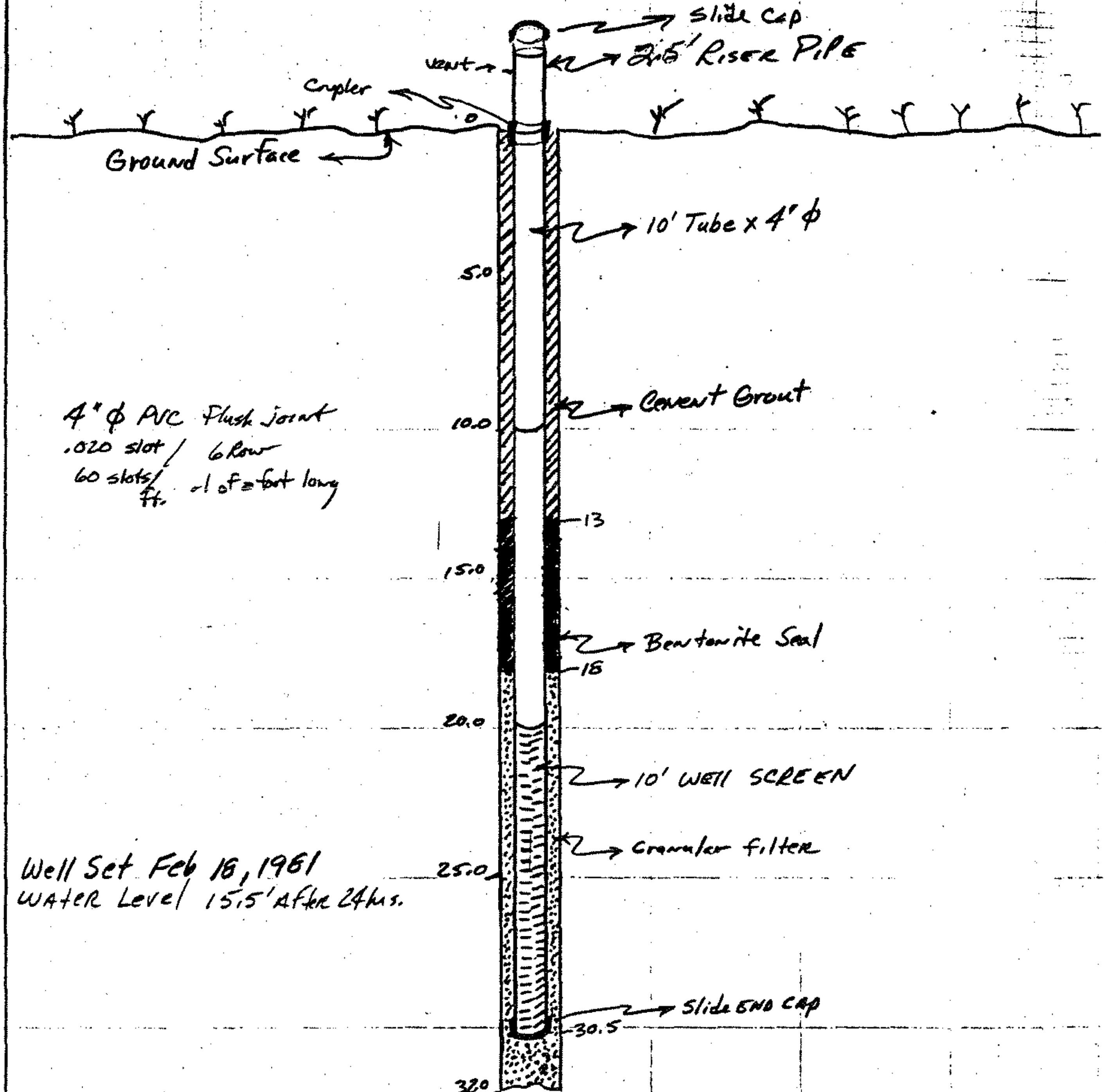
WATER LOSS:
At ______ To ______
Percent Loss ______
At ______ To ______
Percent Loss ______

BOULDERS OR OBSTRUCTIONS:
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth ______
Height of Soil Rise In Casing ______

SOIL TESTING SERVICES, INC.		DATE Feb. 18, 81	PAGE 1 OF 1
PROJECT Iowa Army Ammunition	STS JOB NO 82017	BY DMJ	CHK DMJ

IAAP WELL INSTALLATION DIAGRAM
WELL G-3



4" φ PVC Flush joint
.020 slot / 6 Row
60 slots/ft. .1 of a foot long

Well Set Feb 16, 1981
WATER Level 15.5' After 24hrs.

FEB 18 1981

DAVID M. JEDLICKA
GEOLOGIST, DATE ______
LOCATION

[redacted] TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062 Chicago Phone 273-5440 Northbrook Phone 272-6520

Sheet 1 of 2

TECHNICIAN M. Travers
DRILLER M. Dent
HELPER M. McConnell
RIG NO. DR-4 Mobile B-53

SURFACE ELEV. ____
BORING STARTED 2-24-81
BORING COMPLETED 2-24-81
STATION ____
OFF SET ____

Push tube 10', Set HSA and Sample at 2' intervals ahead of HSA.

3¼" HSA
CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS

WL: ____ WS OR WD
WL: 12.0 BCR 15.0 ACR
WL: ____ AB ____ Hr. AB
WL: —— 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-4 **CLIENT** E.R.C. **WEATHER** Cloudy Cool

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	1.9	3" ST			0	2	1.4	—	0.0	Dark Brown (mottled) Clay, Silty w/ tr-little
											sand & gravel, occasional traces of paper, plastic
											and organic debris, Note: tr. of ice @ 1.8',
											Sampled .4-.6 ft. - moist, stiff to v.stiff, low
										1.9	-med. plasticity, 10YR 4/4 (Fill-CL)
2	1.9	3.2	3" ST			2	4	1.1	—	—	Dark Brown to Black Clay, silty w/ little organic
											debris and occasional traces of sand & f.gravel,
											moist, stiff-v.stiff, low-med. plasticity,
											Note: concentration of organic debris from 1.5-1.8',
											Sampled 2.2-2.4 ft, 10YR 3/2
										3.2	(CL-OL)
3	3.2	11.6	3" ST			4	6	1.4	—	—	Brown & Gray (mottled) Clay, Silty, w/ tr. of
						6	8	1.4	-	-	F-C. Sand occasionally occuring in lenses,
						8	10	1.3	-	-	moist, v.stiff-hard, low-med plasticity, Note:
						10	12	1.8	-	-	decayed root zones in upper 7.0 ft. - more gray @ depth
											(Sampled 4.6-4.8 ft) - 10YR 5/6
										11.6	(CL)
4	11.6	13.4	3" ST			12	14	2.0	—	-	Gray Clay, Silty, tr. F-C. Sand & F.gravel,
											moi[illegible]-wet, v.stiff, med. plasticity, Note: greater
											am[illegible] of sand @ depth, Sampled [illegible]

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness ____
Fill Thickness ____

CAVE IN LEVEL:
While Drilling and Sampling ____
After Boring Completion ____

WATER LOSS:
At ____ To ____
Percent Loss ____
At ____ To ____
Percent Loss ____

BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE:
Depth ____
Height of Soil Rise In C[illegible] ____

[redacted] SERVICES, 111 PFINGS ROAD NORTHBROOK, ILL. 60062

Sheet 2 2

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN M. Travers
DRILLER M. Dant
HELPER M. McConnell
RIG NO. DR-4 Mobile B-53

SURFACE ELEV.
BORING STARTED 2/24/81
BORING COMPLETED 2/24/81
STATION
OFF SET

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS

WL: ____ WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. C-4 CLIENT C.P.G. WEATHER ____

Sample No.	Depth or Elevation: From	Depth or Elevation: To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R: Length Recovered in Feet	Qp: Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
5	13.4	14.0	3" ST							13.4	Brown Clay, Sandy, w/ tr. f-m. gravel, wet,
											dense, Note: sand & gravel lenses located
											locally throughout, - Sampled 13.6-13.8,
											10 YR 5/6 —
										14.0	(CL)
6	14.0	22.0	3" Br			14	16	2.0	–	–	Brown Clay, Silty w/ tr.-little sand, occuring occasionally
	Water encountered while sampling @ 15.5' - rose to										in lenses, moist-wet, stiff-v.stiff, med. plasticity,
	12.0' after 15 min. —										Note: Sand stringers @ 14.5-14.7 and @ 18.0', –
						16	18	2.0	–	–	10 YR 5/6
						18	20	2.0	–	–	(CL)
						20	22	2.0	–	–	
7	22.0	25.1	3" ST							22.0	
						22	24	2.0	–	–	Brown Clay, Sandy w/ tr. gravel, wet-saturated,
											dense, Sampled 21.0-21.2, 10YR 5/8.
										25.1	(CL)
8	25.1	26.0	3" ST			24	26	1.9	–	–	Brown w/ tr. gray f.-m sand, clayey, wet, dense,
											Sampled 25.5-25.7, 10YR 5/8,
											(SC-SP)

During placement of wellpoint.
T_0 17.4', T_{15} - 17.2', T_{30} - 12.2', T_{60} 11.7' T_{90} 11.3' after 24 hrs - 6.5'

ABBREVIATIONS
F.T.-Fish Tail
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D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

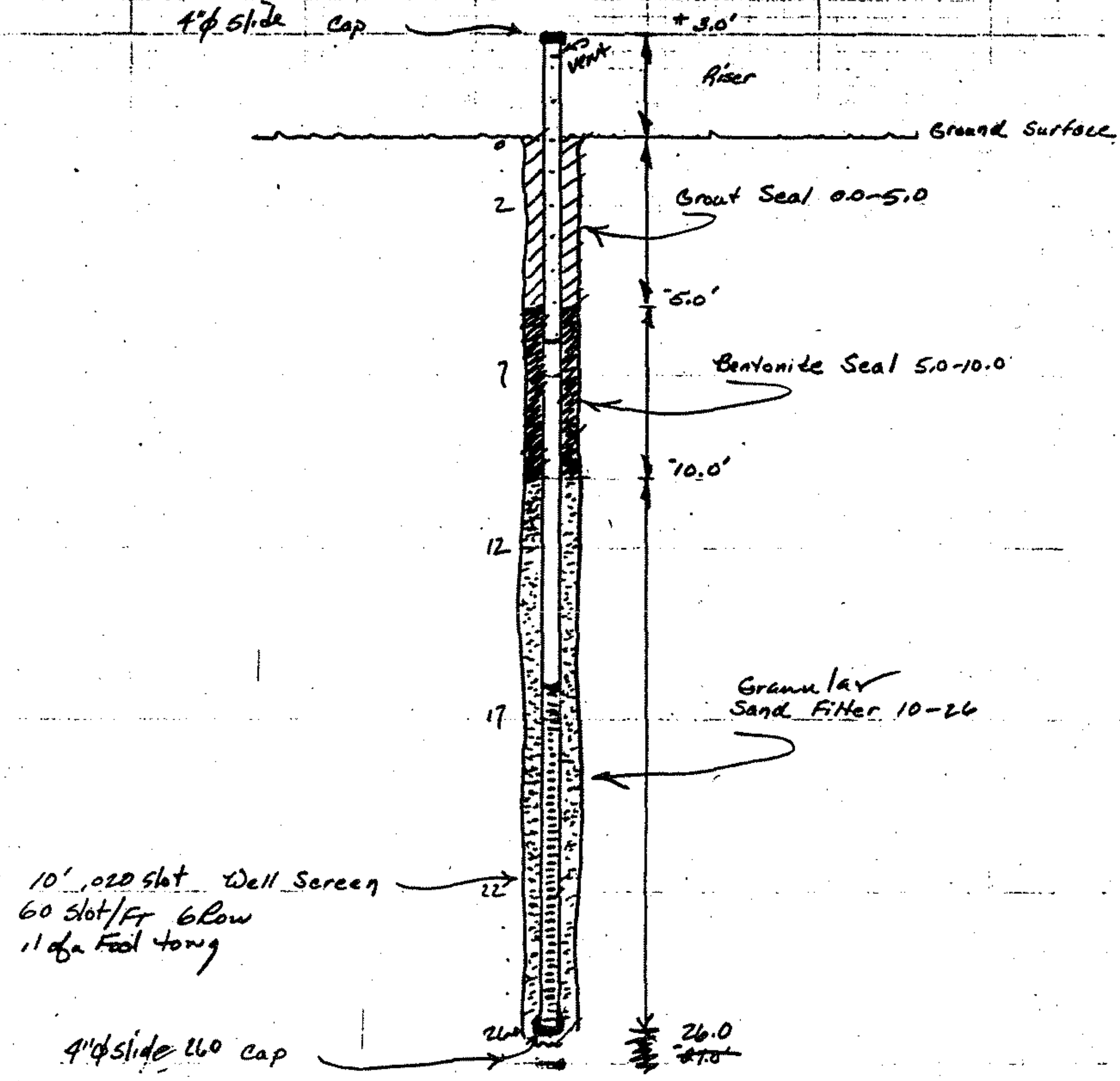
BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC. | DATE 2-24-81 | PAGE 1 OF 1
PROJECT IOWA ARMY AMMUNITION Plant | STS JOB NO 22017 | BY MAT | CHK DMJ

Well Installation Diagram

G-4 Well G-4



water encountered @ 15.5' while sampling.

[illegible] TESTING SERVICES, 111 PFINGS[illegible] ROAD NORTHBROOK, ILL. 60062

Sheet 1 [illegible] 2

TECHNICIAN J. Crawley
DRILLER G. Davis
HELPER G. [illegible]
RIG NO. CME 750

SURFACE ELEV. ______
BORING STARTED 3-11-81
BORING COMPLETED 3-11-81
STATION ______
OFF SET ______

Chicago Phone 273-5410
Northbrook Phone 272-8520

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: 41.5 WS OR WD
WL: ______ BCR ______ ACR
WL: ______ AB ______ Hr. AB
WL: ______ 24 Hr. AB

JOB NO. 22017 BORING NO. G-5 CLIENT ______ WEATHER ______

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.3	0.6	ST				0-2	1.2			Clay, silty, Little Roots, TR. Decay leaves, Top .5 Mod. Moist + (CL) Low Pl.
											soft, Bottom .7 Mod. stiff, Med. moist, 10YR 6/6 brN. Yellow ~~Topsoil~~
2	2.5	2.8	ST				2-4	2.0			Clay, silty, TR. Roots, Very stiff, low moist, TR. V. Dark
			HS				4-6 6-8	1.1 .4			brN. oxidat. spots, 10YR 6/4, lt. yell. Brown (CL) low Pl. Till
3	8.0	8.3	ST				8-10	.8			Clay V. silty, TR Grav. + Sand in Seam Extrem. Stiff V. Low Moist,
			HS				10-12 12-14	1.2 1.5			little oxid. staining Dk. brown 10YR 4/6 DK. yell. Brown (CL) Low PL Till
							14-16	2.0			slightly Moister from 14-16
4	17.1	17.4	ST				16-18 18-20	2.0 2.0			Clay, silty, little sand, TR. Gravel, MOD. stiff, Low-Med Moist.
			HS				20-22 22-24	2.0 2.0			10YR. 6/8 yellowbrown (CL) Low-Med Pl. Till; one lg. Weathered L.S. Grav @ 23.5
5	25.5	25.8	ST				24-26	2.0		25.0	VF-Co. Sand, alternating Layers; Gradational Co-V.F. Top-Roots - TR. silt
			HS								slightly moist, soft, 10YR 6/4-7/4 light yellow Brown Till (SW)
6	27.5	27.8	ST				26-28 28-30	2.0 2.0		27.0	Clay, silty, Some f-Co. Sand, TR. Gravel, wood & Grass Mod. Firm; Low Moist
			HS				30-32 32-34	2.0 2.0			5Y 4/1 dark Gray Till (CL) Med Plast.
											6 silt to V.f. sand seams < ¼" in 30-32 Moist @ Tip Till
											3 " " " " 34-36. Till
7	35.1	35.4	ST				34-36 36-38	2.0 2.0			Clay, V. silty, Mod. Soft - Mod moist, TR Gravel, Co. Sand, Org (Grass)
											2.5Y N 3/ V. Dark Gray CL - Low Plas. Till
8	39.1	39.4					38-40	2.0			Clay, silty Sandy f-Co., Little Gravel, Stiff, slightly Moist,
											5Y 4/4 Olive, Till CL - Low-Med Plas.
9	41.4	41.7					40-42	1.25		40.0	Sand, f., silty, TR. Clay, Gravel in Seam, [illegible]

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss
BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

...ING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-8520

TECHNICIAN
DRILLER
HELPER
RIG NO.

SURFACE ELEV.
BORING STARTED
BORING COMPLETED
STATION
OFF SET

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: 41.5 WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. G-5 CLIENT ____ WEATHER ____

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Q_p Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
10	43.0	43.3	ST				42-44	2.0			f-Co. Sand, Some silt & clay, Saturated, Mod. Stiff,
			HS								5Y 3/2 dark olive gray, Till (in)
11	44.5	44.8	ST				44-46	2.0		44	Clay, silty, Sandy Tr. Co. Sand, stiff, Low Moist,
			HS				46-48	.75			5Y-4/2 olive Gray - Grayish Part of (CL) Low Plas. Till
											1 in V.f. sand, Notches in 46-48
12	49.5	49.8	ST				48-50	1.5			Silt, moist, V.f. Sand seams 1-2" - moist, soft,
				E.B. 50.0'							5Y 4/2 olive Gray
											H_2O @ 40.0 ft.* 1 hr. A.B.
											*in well.
											screen 40.0 to 50.0
											4" Ø PVC To Ground Surface
											4" Ø PVC Riser - +3.0 ft.
											Granular filter - 50.5 to 21.0
											Bentonite Seal 21.0 to 15.0
											Cement Grout 15.0 to 0.0

ABBREVIATIONS
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W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

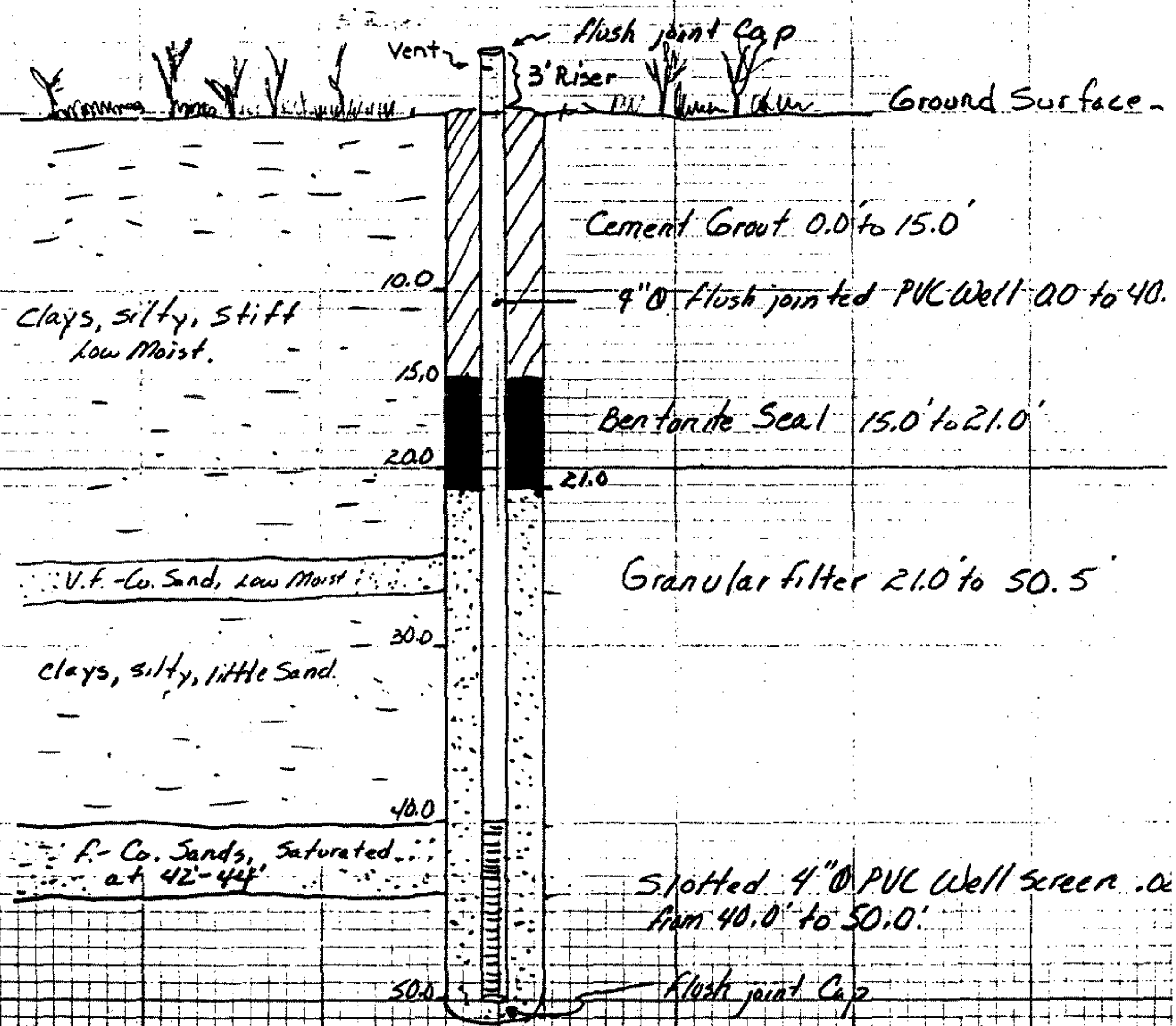
BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE:
Depth
Height of Soil Rise in Casing

SOIL TESTING SERVICES, INC.	DATE 3-11-81	PAGE ___ OF
PROJECT Iowa Army Ammunition Plant STS JOB NO 22017	BY JEC	CHK JEC

Well No. G-5 Installation Diagram

installed 3-11-81



H_2O @ 40.0' 1 hr
after well secured.

by John E. Crowley
Geologist 3-11-81

[redacted] SERVICES, INC. 1805 CHANUTE RD., PEORIA, IL 61614 Phone: 309/692-6591

Push tube to 10'; Set HSA to 10 then Sample ahead of HSA; 2' intervals 25-28' SS Samples Due to hardness of Rock frags.

Sheet 1 of 1

TECHNICIAN DM Jedlicka SURFACE ELEV. ______
DRILLER MIKE DANT BORING STARTED 2-18-81
HELPER MIKE McCONNEL BORING COMPLETED 2-19-81
RIG NO. Mobile 53 TRUCK STATION ______ OFF SET ______

3¼" HSA
CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: 7.0' BCR 7.0' ACR
WL: ______ AB ______ Hr. AB
WL: 7.0' 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-6 **CLIENT** ERG **WEATHER** Cloudy Cold.

0.0-1.5 Frozen

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.8	1.2	3"ST				0-2	1.5			Clay, Silty Dry-Moist Med. Plastic CL trace Organics
							2-4	1.6		1.5	Roots), Topsoil Gray Brown & Black 10YR 3/2. stiff
2	1.5	1.8	3"ST				4-6	1.8			Clay Silty Moist Med.-High Plastic CL-CH
							6-10	2.0			trace <10% Fine Sand Weathered Till, Brown Mottled,
							10-12	1.4		4.0	10YR 5/4. soft
3	4.0	4.9	3"ST				12-14	1.4			Clay, Silty trace Very Fine Sand Med.-High Plastic
							14-16	1.8			CL-CH Moist-V. Moist Gray & Brown Mottled.
							16-18	1.5		7.0	Till 10YR 5/2. stiff
4	7.0	12.30	3"ST				18-20	1.7			Clay Silty trace <10% Sand Med. Plastic Moist CL
							20-22	1.9		12.0	10YR 5/3 darkish Brown. V. Stiff
5	12.0	12.9	3"ST	*water at 17.0' while sampling							Clay Silty trace <10% Sand trace <10% Gravel Till, Med.
				*Small Sand Stringer at 17.0' Not Enough to Sample						17.0	Plastic CL Moist Gray Mottled Brown V. Stiff 2.5Y N5/
6	17.0	17.35	3"ST	(WL. 16.0' IN CASING After 10 MIN.)							Clay, Silty Little 15% Sand trace gravel Till Very Moist
							22-24	1.7			Med. Plastic CL, Yellow Brown V. Stiff 10YR 6/6
							24 26	1.5		24.5	(Occasional thin <1CM Sand Seams Saturated) Between 17.0 - 20.0'
7	24.5	24.8	SS	~~(25.0-26.5)~~ ~~21~~	~~28~~	35	26-28	1.5			Sand, Silty trace <10% Clay V. Moist Fine grained SM
				(26.5-28) 29	35	49				25.5	Brown 10YR 6/6
8	25.5	26.0	SS								Clay Silty Little 20% Sand trace <10% Gravel Moist Med.
											Plastic CL Brown 10YR 5/4. V. stiff

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
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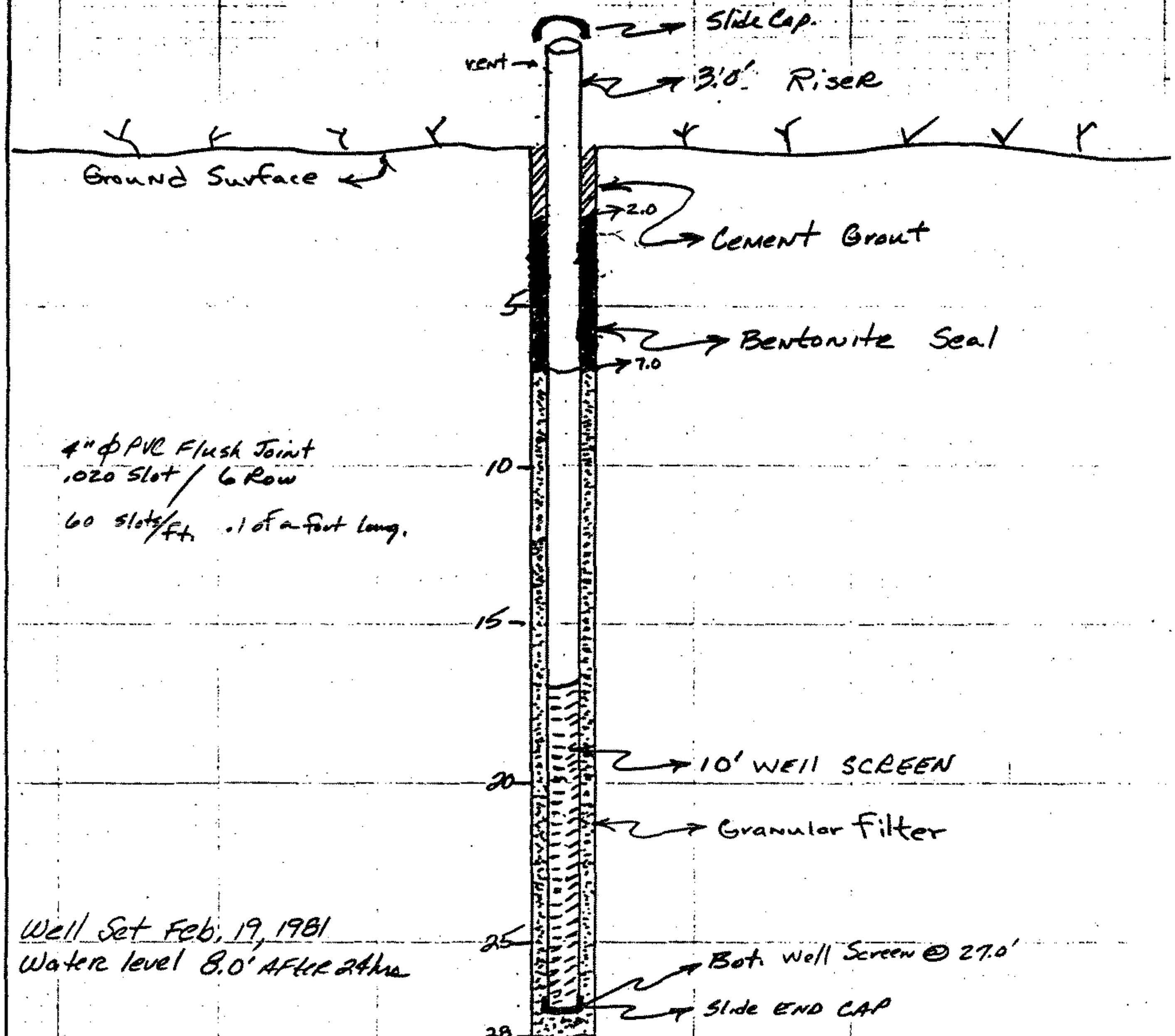
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness ______
Fill Thickness ______
CAVE IN LEVEL:
While Drilling and Sampling ______
After Boring Completion ______
WATER LOSS:
At ______ To ______
Percent Loss ______
At ______ To ______
Percent Loss ______
BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______
ARTESIAN PRESSURE:
Depth ______
Height of Soil Rise In Casing ______

14' [illegible] 2-18-81

SOIL TESTING SERVICES, INC.	DATE Feb. 19, 81	PAGE 1 OF
PROJECT Iowa Army Ammunition STS JOB NO 22019	BY DMJ	CHK DMJ

IAAP Well Installation Diagram
Well G-6



FEB 19 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION IAAP

TESTING SERVICES, INC. 1805 CHANUTE RD., PEORIA, IL 61614 Phone: 309/692-6591

Sheet 1 of 1

TECHNICIAN D.M. Jedlicka SURFACE ELEV. ______

DRILLER M. DANT BORING STARTED Feb 23 81

HELPER M. McConnell BORING COMPLETED Feb 23 81

RIG NO. 53 Mobile Truck STATION ______

OFF SET ______

Push tube to 10', set HSA, Sample at 2' intervals ahead of HSA

3¼" HSA

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS

WL: ______ WS OR WD

WL: 25' BCR 28' ACR

WL: ______ AB ______ Hr. AB

WL: 22.5' 48 Hr. AB

JOB NO. 22017 BORING NO. G-7 CLIENT ERG WEATHER Cold Cloudy

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
											Frozen 0.0 - 1.0
1	0.0	0.3	3"ST				0-2 2-4	1.0 1.3			Clay Silty, trace organics Moist Med. Plastic
							4-6 6-8	1.2 1.8		1.0	CL, Brown & Black, 10YR 5/3, Topsoil Silt
2	1.0	1.30	3"ST				8-10 10-12	2.0 1.9			Clay, Silty Moist Med. Plastic CL Yellow
							12-14 14-16	1.8 1.5		2.0	Brown, 10YR 5/6. weathered Till stiff
3	2.0	2.3	3"ST				16-18 18-20	1.5 1.6			Clay, Silty trace of fine Sand Moist Med-High Plastic
							20-22 22-24	1.5 1.5		7.0	CL-CH Brown Mottled 10YR 6/4 Till stiff
4	7.0	7.30	3"ST	* Mg Concretions 7.0 - 8.5			24-26	1.5			Clay Silty trace Sand trace Gravel Till Med.
							26-28 28-30	1.7 1.8			Plastic CL trace Mg Concretions Moist stiff
							30-32 32-34	1.8 1.5		12.0	Gray Mottled, 10YR 4/2.
5	12.0	12.30	3"ST				34-36 36-38	1.5 1.4			Clay, Silty little Sand trace Gravel Med. Plastic
							38-40 40-42	1.5 1.5		19.0	CL. Moist Till Yellow Brown 10YR 5/6 Till hard
6	19.0	19.30	3"ST								Clay, Silty little Sand little Gravel Moist Med. Plastic
											CL. Brown 10YR 6/3. Till stiff
				22.0 / 31.0 * Drove on rock	19	8	7			31.0	
7	31.0	31.30	3"ST								Clay Silty little Sand little Gravel Med. Plastic CL
				* water while Sampling at 32.0'						34.0	Brown Mottled Gray & dark Brown. Moist 10YR 4/6 Trace stiff
8	34.0	34.8	3"ST	15 min Delay water at 31.0'							Sand, Silty trace Gravel Saturated SM Yellow
										34.8	Brown, 10YR 6/8.
9	34.8	35.0	3"ST	35.0 - 36.0 (Small Sand Seams > 1cm thick) (V. Moist)							Clay Silty little Sand little Gravel Med. Plastic CL
										39.8	Yel... Brown Moist 10YR 5/4. Till stiff

ABBREVIATIONS
F.T.-Fish Tail
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P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness ______

Fill Thickness ______

CAVE IN LEVEL:

While Drilling and Sampling ______

After Boring Completion ______

WATER LOSS:

At ______ To ______

Percent Loss ______

At ______ To ______

Percent Loss ______

BOULDERS OR OBSTRUCTION

At ______ To ______

At ______ To ______

ARTESIAN PRESSURE:

Depth ______

Height of Soil Rise In Casing ______

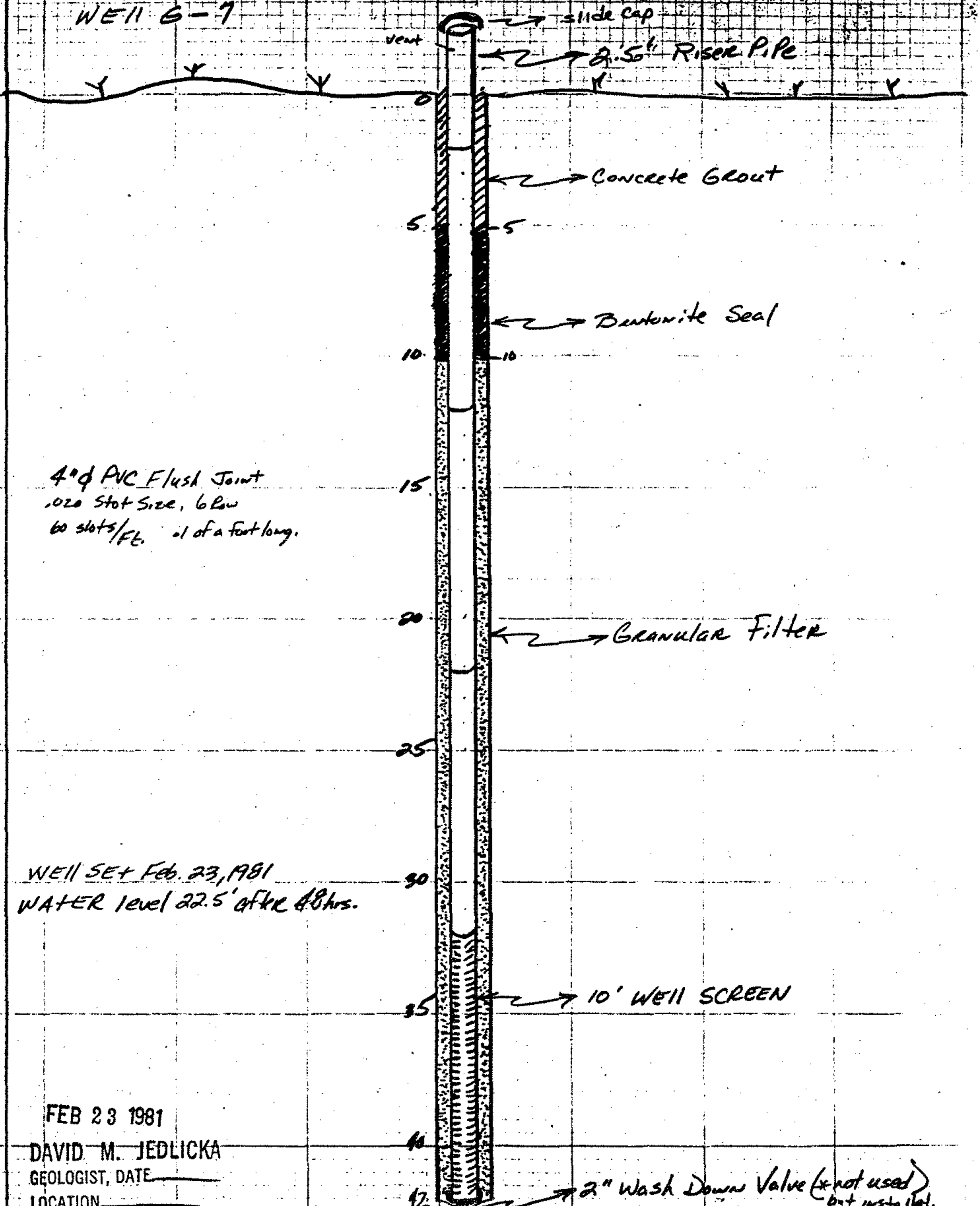
DAVI... JEDLICKA

GEOLO... DATE

SOIL TESTING SERVICES, INC. | DATE Feb. 23 81 | PAGE 1 OF 2

PROJECT Iowa Army Ammunition | STS JOB NO 22017 | BY DMJ | CHK DMJ

IAAP Well Installation Diagram
Well G-7



FEB 23 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

[illegible]TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 1

TECHNICIAN J. Crowley
DRILLER G. Davis
HELPER G. Jones
RIG NO. CME 750

SURFACE ELEV.
BORING STARTED 3-12-81
BORING COMPLETED 3-12-81
STATION
OFF SET

Chicago Phone 273-5440
Northbrook Phone 272-6520

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: 3.5 WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-8 **CLIENT** ____ **WEATHER** ____

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.6	0.8	ST				0-2	2.0			clay, silty, some Roots, mod moist, soft, 10yR 3/4
											dark yellow brown, Topsoil (CL) Med Pl. 0 to 1.5
1A	1.6	1.9	ST				0-2			1.5	Sand, fine, little silt, TR clay, Roots, V. moist
											soft, 10yR 2/2 V. Dark brown - alluvium (SP)
2	3.0	3.3	ST	H_2O at 3.5'			2-4	2.0		2.0	clay, v. sandy, silty, TR Roots soft, v. moist, Low Plast.
				15 min a. samp. #3							(Tip Saturated), 10yR 4/4 dark yellow brown (Alluvium)(CL)
3	3.5	5.0	ST				4-6	2.0		5.0	Sand, f-Med, TR. Co Sand, Roots, Soft, saturated, sub-Rounded
			HS				6-8	1.6			grains, gradational from Sample #2 at 5.0', 10yR 5/4 yel. Brn. Alluvium (SP)
											6-8 identical Sand as 4-6 with Color change to dark yell brown & dark Red Brown 2.5yR 2.5/
4	8.3	8.6	ST				8-10	1.1		8.2	clay, silty, mod-V. stiff, Low Moist, little
			HS								Fe oxidation, 2.5y 6/2 light brn. Gray, Till (CL) Low Plast.
5	11.2	11.5	ST				10-12	1.5			clay, silty, V. stiff, V. Low moist, TR. Pyrite in Horiz. Planes
			HS				12-14 14-16	.5 .4			2.5Y N4/ Dark Gray (CL) Low Med Plast. (Possibly weathered shale)
			E.B	16.0'							Weathered shale B.R.? from 11.0 to E.B @ 16.0'

screen 15-5' filter 16-4.5
Bent. 4.5 to Top

ABBREVIATIONS
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P.A.-Power Auger
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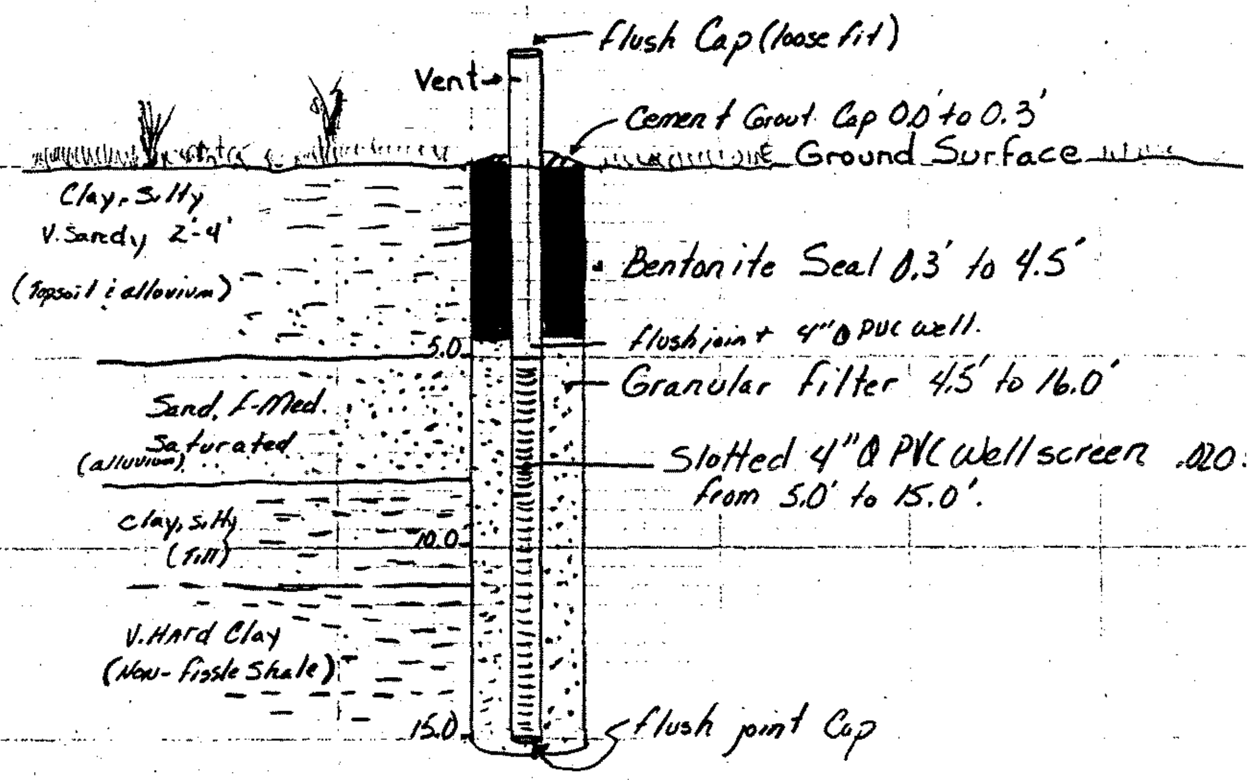
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At To
Percent Loss
At To
Percent Loss
BOULDERS OR OBSTRUCTION
At To
At To
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC.	DATE 3-13-81	PAGE ___ OF
PROJECT Iowa Army Ammunition Plant STS JOB NO 22017	BY JEC	CHK JEC

Well G-8 Installation Diagram

installed 3-12-81



by John E. Crowley
Geologist
3-13-8

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 1

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN: M. Travers
DRILLER: M. Dart
HELPER: M. McConnell
RIG NO. DR-4 MOBILE B-63

SURFACE ELEV. ______
BORING STARTED 2/25/81
BORING COMPLETED 2/26/81
STATION ______
OFF SET ______

Push tube to 10', Set HSA then Sample at 10' to 2' intervals Ahead of HSA.

Wait for r developmt

3 1/4" HSA
CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS

WL: ______ WS OR WD
WL: X BCR X ACR
WL: ______ AB — Hr. AB
WL: X 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-9 **CLIENT** E. R. G. **WEATHER** Cloudy Cool

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	2.0	3" ST			0	2	1.3	—	—	Dark Brown Clay, Silty w/ tr. sand & gravel,
											moist-wet, stiff, low-med plasticity.
											Note: Topsoil w/ roots in upper .5 ft. —
											Sampled from 1.0'-1.2' — 10YR 4/1
											(CL-OL)
2	2.0	4.0	3" ST			2	4	1.8	—	—	Dark Brown Clay, Silty w/ little to some f.-med.
	Water encountered @ 4.0' while sampling —										sand, w/ occasional limestone clasts, wet
	rose to 3.4' after 16 min. —										firm to stiff, med. plasticity,
	Water source dried up after continued drilling										Sampled 2.7'-2.9' 10YR 4/2
											(CL)
3	4.0	24.2	3" ST			4	6	1.2	—	—	Brown & Gray (mottled) Clay, Silty w/
						6	8	1.4	—	—	tr.-little f.-c. sand (occasionally occuring
Water encountered while						8	10	1.6	—	—	in stringers) tr. f.-m. gravel, moist, low-med plasticity
sampling at 21.0' - rose to						10	12	1.8	—	—	v. stiff-hard, Note: locally manganese & iron
18.2' after 15 min —						12	14	1.7	—	—	staining, sometimes in concentrations, and
@ 17.8' after 24 hrs. —						14	16	1.5	—	—	vertical jointing, & limestone clasts from
						16	18	1.4	—	—	19.0'-21.0', - Saturated f.-c. sand stringers
						18	20	1.3	—	—	@ 21.2', 22.0', 22.5', - surrounding clays
						20	22	1.7	—	—	only moist - 10 YR 5/6 to 10YR 6/1
						22	24	1.5	—	-	Sampled 12.0-12.2 (CL)

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W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss

BOULDERS OR OBSTRUCTION
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth
Height of Soil Rise in Casing

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN M. Travers
DRILLER M. Dent
HELPER M. McConnell
RIG NO. Dl-4 Mobile B-63

SURFACE ELEV.
BORING STARTED 2/25/81
BORING COMPLETED 2/26/81
STATION
OFF SET

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: ____ WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. B-9 CLIENT E.R.B. WEATHER

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
4	27.2	28.0	3" ST			26	28	1.6'	—		Brown & Lt. Gray fine Sand, Silty w/ traces of occasional clay layers, moist, extremely dense, Sampled from 27.2-27.4 10YR 7/1 (SM)
											Auger encountered wea. bedrock @ 28.0'
											Water @ -9.0' after wellpoint secured —

ABBREVIATIONS
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W.S.-While Sampling
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A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss
BOULDERS OR OBSTRUCTIONS
At ____ To ____
At ____ To ____
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

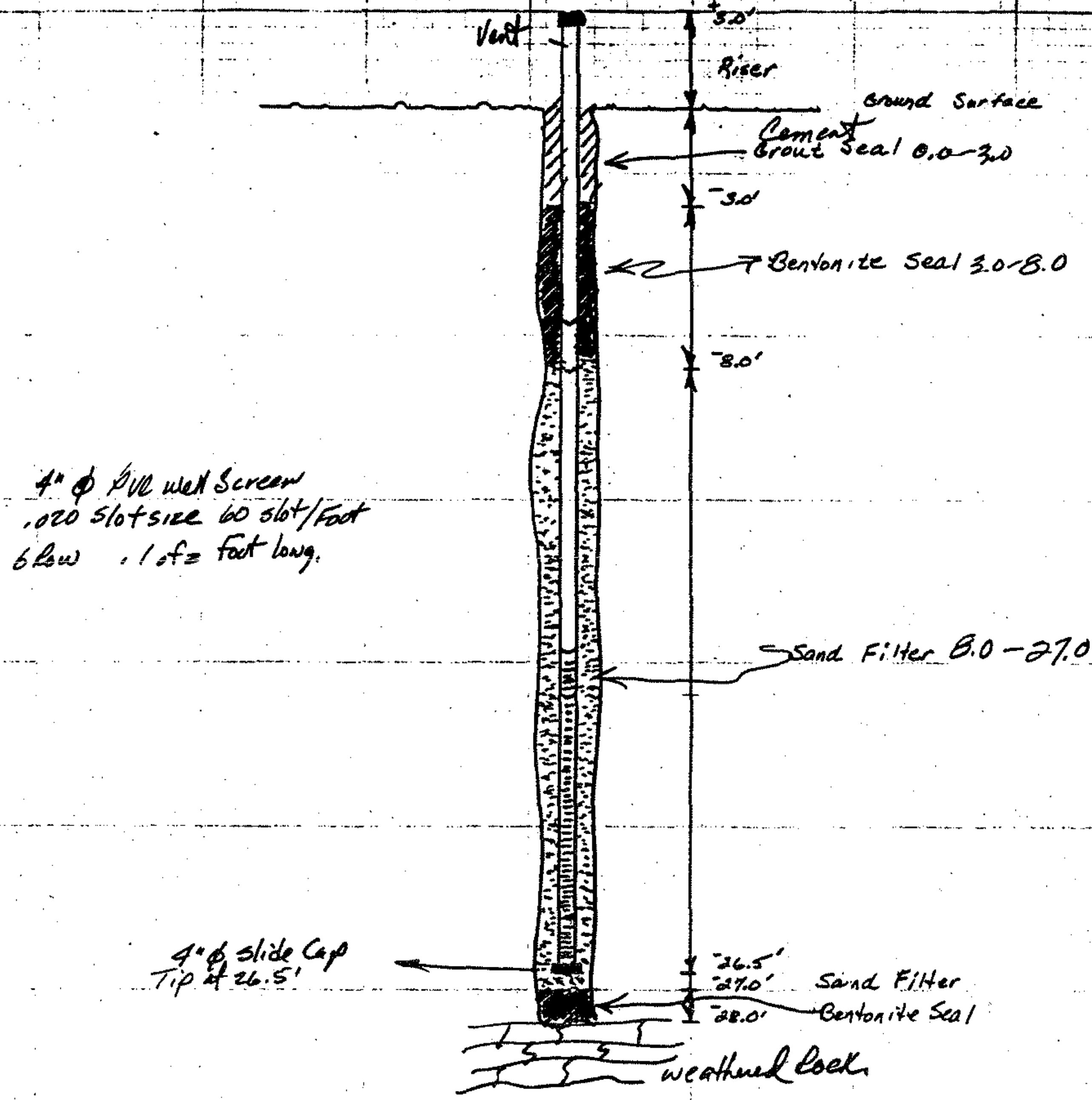
SOIL TESTING SERVICES, INC.

DATE Feb. 26-81 PAGE 1 OF 1

PROJECT Iowa Army Ammunition Plant STS JOB NO. 22077 BY MAT CHK'D MS

WEll INStAllAtION DIAGRAM

G-9 WEll G-9



SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 1

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN J. Crowley
DRILLER G. Davis
HELPER G. Jones
RIG NO. CME-750

SURFACE ELEV.
BORING STARTED 3-12-81
BORING COMPLETED 3-13-81
STATION
OFF SET

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: N/A WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. G-11 CLIENT ____ WEATHER ____

No Water Encountered.

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	.6	.9	ST				0-2	1.8			clay, silty, TR. Roots & Organics (Grass), soft, Mod moist
			HS								upper .9 10yR 4/6 Brown, lower .9 10yr 6/6 Br. yellow ~~(CL) Low Plast.~~ Topsoil & Till
2	5.5	5.8	ST				2-4 4-6	1.0			Clay, silty, TR Roots, MOD soft, Mod-moist, 10yR 6/4
			HS				6-8	1.5			Lt. yell. Brown w/ yell. Red mottling, 5YR 5/8, Till (CL) Med Plas.
							8-10	1.75			Dark brown Mg Concret. In 4-6; MOD to Very stiff @ 8-10,
3	11.5	11.8	ST				10-12	1.75			Clay, Very Sandy f- (Clayey Sand in Seams), slightly moist,
			HS								stiff, TR. Co Sand, DK. Brown Mg Precip. 10yR 6/2 Lt. Br. Gray Till CL low Plast
4	17.5	17.8	ST				12-14 14-16	2.0 1.5			clay, silty, little Med-Co Sand, TR. Gravel, low
							16-18 18-20	2.0 2.0			moist, MOD to V. stiff; increase of f. sand from 18-20,
							20-22 22-24	2.0 2.0			Some Gray Mottling @ 22-24. - Softer & Moister
							24-25	1.0			From 24-26: 7.5yR 6/8 Reddish yellow, Till (CL) Low Plast.
											Large Weathered L.S. Gravel at Tip of 24-25.
5	27.5	35.2		Dia. Core from 27.5 to 37.5; 7.8 Recovery							25-27.5 - weathered B.R. Dolomite Gravel,
	27.5	31.5	DIA.		Lost 2.2 in shale from 35.2 to 37.5						Dolomite, V. Dense, X-bedded laminations, Glauconitic Seam @ ?.
					two attempts						10yR 6/8 to 10yR 7/8 brown yellow
	31.6	34.5	DIA.								limestone, Micro-Xln, fractured, vug filled, Sand in Fract.
					E.B. @ 37.5						Glauc. Shale @ 31.6 to 31.65 - 10yR 8/1 white,
	34.6	35.3	Dia.								Shale, w/ 2 seams Glauc. Sand, Rounded Grains, 2"
											bed. L.S., as above, 2.5Y 7/4, pale yellow

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

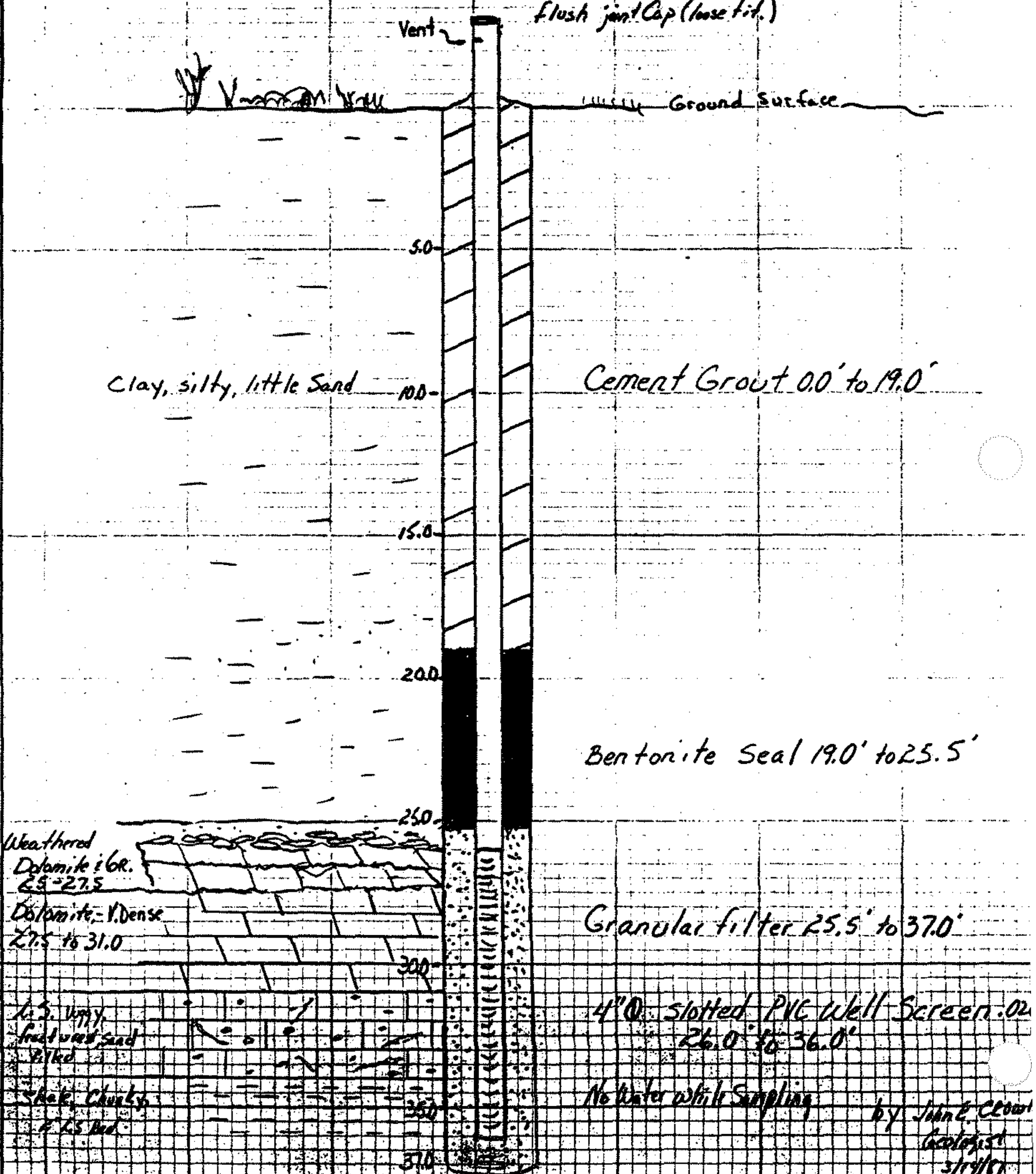
BOULDERS OR OBSTRUCTIONS
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC.	DATE 3-14-81	PAGE __ OF __
PROJECT Iowa Army Ammunition Plant STS JOB NO 122017	BY JEC	CHK JEC

Well G-11 Installation Diagram

installed 3-13-81

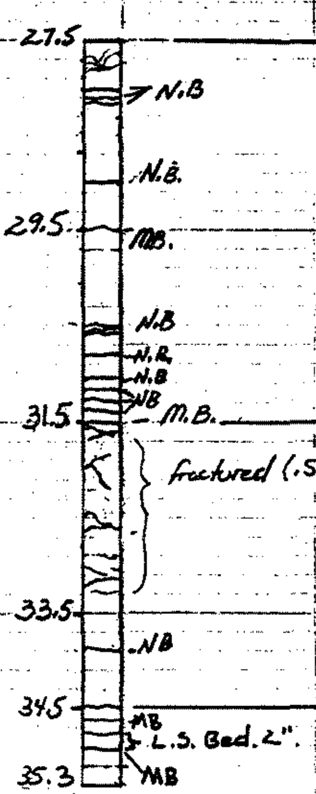


by John E. Clow
Geologist
3/14/81

SOIL TESTING SERVICES, INC.	DATE 3-14-81	PAGE ___ OF
PROJECT Iowa Army Ammunition Plant STS JOB NO 22017	BY JEC	CHK JEC

Well G-11 Core Diagram

1st Run 27.5 to 29.5; 78% Recovery
2nd Run 27.5 to 37.5



27.5-31.5 Dolomite - V. Dense, One Glauconitic Sea[m] at 28.2, cross bedded laminations brownish yellow 10YR 6/8 to 10YR 7/8

31.5-34.5 Limestone - Micro-Crystalline, fractured, Vug fil[led] Sand in fractures, Glauconitic Shale at 31.6 to 31.65, white 10YR 8/1

Shale - Chunky, with two 1/8" seams Glauconi[tic] Sand; 2" bed Limestone, as above. Pale yellow 2.5Y 7/4

M.B. - Mechanical Break
N.B Natural Break

by John Crowley
Geologist
3-14-8

[redacted] TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-8520

Sheet 1 of 1

TECHNICIAN D. Jedlicka
DRILLER M. Dart
HELPER B. Bustle
RIG NO. B-53
Mobile Truck Mount

SURFACE ELEV. ______
BORING STARTED March 2 81
BORING COMPLETED March 2 81
STATION ______
OFF SET ______

Push tube to 10.0' then HSA to 10' then sample 20' intervals ahead of HSA

CASING USED 3 1/4" HSA SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: 12.0 BCR 14.0' ACR
WL: ______ AB ______ Hr. AB
WL: ______ 24 Hr. AB

JOB NO. 22017 BORING NO. G-12 CLIENT ERG WEATHER Clear Cold

Sample No.	Depth or Elevation: From	Depth or Elevation: To	Sampling Method	Penetration Record – Split Spoon Blows: 6"	6"	6"	6" (2 Feet)	R: Length Recovered in Feet	Qp: Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	1.0	1.3	3"ST				0-2	1.3			Clay Silty trace organics (Roots) Med Plastic CL Moist
							2-4	2.0		2.0	light gray 10YR 4/2 soft Topsoil
2	2.5	2.8	3"ST				4-6	2.0			Clay Silty trace sand trace gravel (weathered Till) (trace Mg concretions)
							6-8	2.0		8.0	Moist Med. Plastic CL Soft, Light Gray Mottled 10YR 6/2
3	8.0	8.3	3"ST	water at 8.0' while Sampling			8-10	2.0			Clay Silty trace Sand trace gravel Till V. Moist
				(5 Min Delay WL 6.5')			10-12	2.0			Med. Plastic CL Yellow Brown Soft. 10YR 6/4. Till
4	12.0	12.3	3"ST				12-14	1.2		12.0	trace-little mg concretions at 10-12' sample.
							14-16	1.4			Clay Silty trace sand little gravel Till Moist V. Stiff
							16-18	1.2			Med. Plastic CL Yellow Brown. 10YR 5/8.
							18-20	1.5			
											END OF BORING 20'.

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At To
Percent Loss
At To
Percent Loss
BOULDERS OR OBSTRUCTION
At To
At To
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

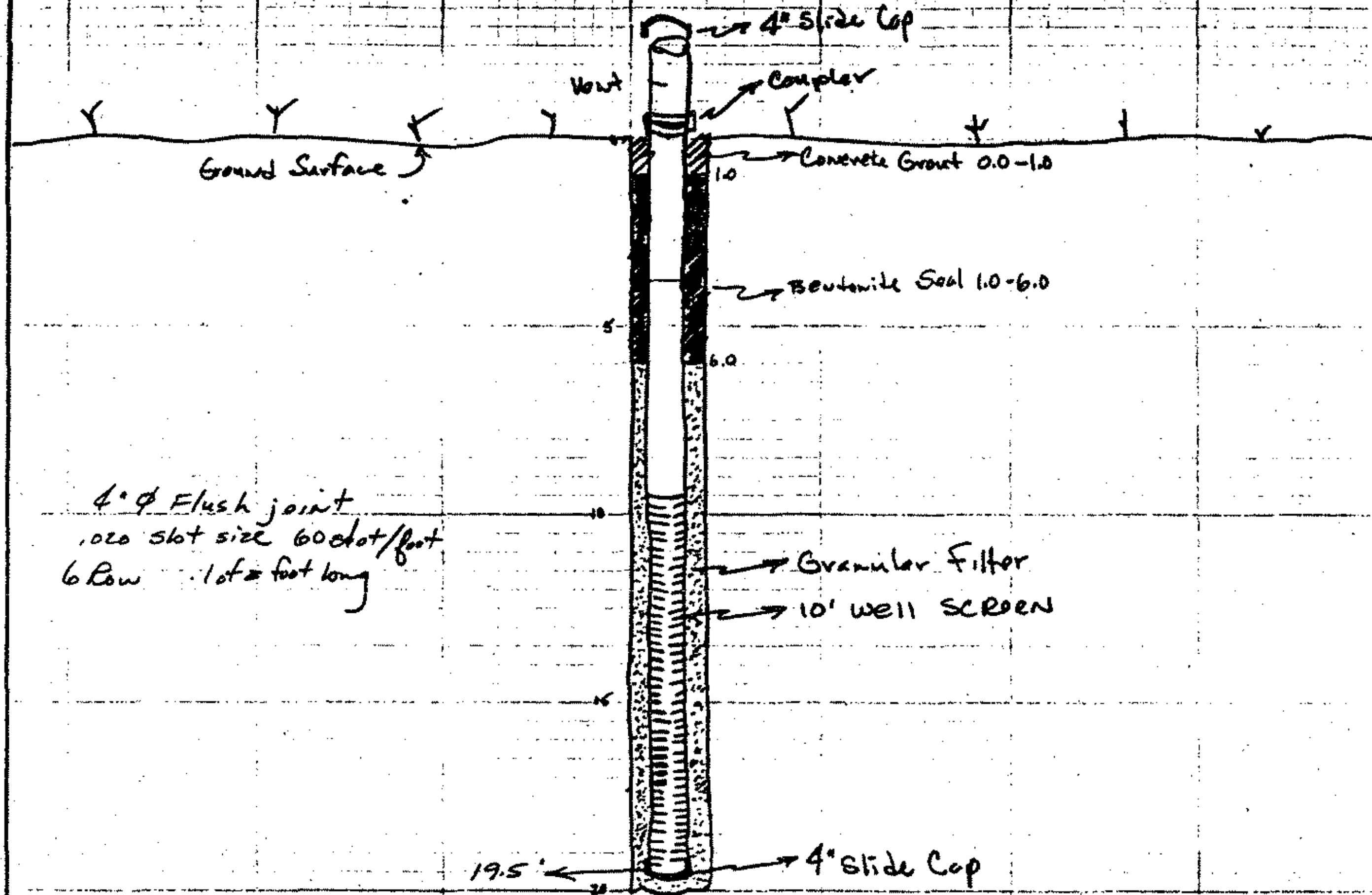
MAR 02 1981

DAVID M. JEDLICKA

SOIL TESTING SERVICES, INC. | DATE March 2 81 | PAGE 1 OF 1

PROJECT Iowa Army Ammunition Plant | STS JOB NO 22017 | BY DMJ | CHK DMJ

Well Installation Diagram
Well G-12.



Water at 6.0' while sampling.

MAR 02 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062 Sheet 1 of 2

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN J. Crowley
DRILLER M. Dent
HELPER B. Bostle
RIG NO. DR4

SURFACE ELEV. Push tube to 10' then set HSA See Sheet #2
BORING STARTED 3/3/81
BORING COMPLETED 3/4/81
STATION * See page 2 *
OFF SET
CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: ____ WS OR WD
WL: ____ X BCR X ACR
WL: X AB ____ Hr. AB
WL: X 24 Hr. AB

JOB NO. 22017 BORING NO. G-13 CLIENT ____ WEATHER ____

MAR 04 1981

Sample No.	Depth or Elevation: From	Depth or Elevation: To	Sampling Method	Penetration Record – Split Spoon Blows: 6"	6"	6"	6" (← 2 Feet →)	R – Length Recovered in Feet	Q_p – Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.9	1.3	ST				0-2	1.5'	1.5		Clay, silty, Trace Roots, Mod. moist, soft, Topsoil
											dark yellow brown, 10YR 4/4 (CL) Med. Plastic
2	0.8	1.1	ST				2-4	1.2'	2.75		clay, silty, Trace Roots, Mod. moist, mod. soft (Till)
											dark brown ", some gray mott., 10YR 4/3 (CL) med.
3	1.0	1.3	ST				4-6	1.4	1.0-1.5		clay, silty, Trace Roots, moist, soft, yellowish (Till)
											Brown, 10YR 5/6, with Pale brown mott., 10YR 6/3 (CL)
4	0.1	0.4	ST				6-8	1.5	0.5		clay, silty, TR. organics-Black, mod. moist, very
											soft, yellowish brown 10 yR 5/6 (Till) (CL)
5	0.9	1.2	ST				8-10	2.0	.5-1.0		clay, silty, TR. Organics; Black, wood Pieces, V. f. sand <1%
											V. soft Mod. moist, yellowish brown 10yR 5/6 (Till) (CL)
6	0.8	1.1	ST				10-12	2.0	<0.5		Clay, silty, Tr. Roots + f. sand <1%, V. soft, V. moist, Till (CL)
											yellowish brown, 10yR 5/6, 1cm Seam of organics, Leaves etc.
6A	1.3	1.6	ST				10-12	2.0	4.0	11.0	clay, silty, little sand <5%, TR. Gravel, V. Stiff CL-CH
											low Moist, yellowish Red 5yR 4/6 Till
			ST				12-14	0.0			Sample lost
7	1.0	1.3	ST				14-16	1.5	2.5		clay, silty, some f-Co. Sand, TR. Gravel, low-Med Moist (CL)
											stiff, Strong brown 7.5yR 5/8 Till areas of Black sec. Staining Mg Concr
8	0.3	0.7	ST				16-18	1.0	2.5		clay, silty, Some Sand <10%, TR Gravel, moist, mod. Stiff (CL) Till
											yello[illegible] brown 10YR 4/6, bottom 6", weathered L.S. Boulder
9	0.5	[illegible]3	ST				18-18.5	0.8		20	Gr[illegible] clayey, some silt [illegible]

ABBREVIATIONS
F.T.-Fish Tail
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R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____

ARTESIAN PRESSURE
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, 111 PFINGS ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-6520

Sheet 2 of 2

TECHNICIAN J. Crowley
DRILLER M. Dant
HELPER B. Bustle
RIG NO. DR4

SURFACE ELEV. ______
BORING STARTED 3-3-81
BORING COMPLETED 3-4-81
STATION ______
OFF SET ______

Push tube to 10', Set HSA then sample @ 2' intervals to 18.5' / Roller Bit w. Rock 18.5-20.0, DIA Core 20-30 95%
3 1/4" HSA, Set 6" Casing NX
CASING USED / ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: X BCR X ACR
WL: ______ AB ______ Hr. AB
WL: X 24 Hr. AB

JOB NO. 22017 BORING NO. 6-13 CLIENT ______ WEATHER ______

MAR 04 1981

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
10	0.4	0.7	SS	86	125	100/2"	185-20	1.0			Gravel, L.S., weather, little f. sand, some HTR. clay, V. Moist to Saturated
											Lt. Gray 2.5Y N7 (GC).
11	20.0	23.2		Dia. Core	from	20.0ft.	to 30.0ft				Limestone, Macro Microcrystaline, Lt. Gray, [illegible] Calcite chert layer
											from 21.8 to 21.95, Horizontal Bedding.
	23.2	25.0									Limestone, Macrocrystaline, yellowish brown, argillaceous
											in part, cherty in part, soft (one silty shale seam, 1/4")
	25.0	28.5									Limestone, Microcrystaline, V. Lt. Gray, 1/8" seam, one-three brown shale
											soft, lower 8" of alternating L.S. / Dark Gray shale,
											shale 1/8-1/4".
	28.5	29.1		End of Core (Dia) at 30.0'							Shale, dark Gray, MOD. soft
											X
	29.1	30.0		No Recovery							
											3-4-81, Set 30ft. of Wellpoint
											with 10ft screen,
											-30 to -18.5- Granular filter, Sand.
											18.5 to 13.5 Bentonite Seal
											13.5 to 0.0 Cement Grout.
											Screen from 18.5 to 28.5, solid 4" ø PVC to Top
											Placed Protective Cover over Well.

ABBREVIATIONS
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R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss

BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth
Height of Soil Rise in Casing

SOIL TESTING SERVICES, INC. DATE 3-3-81 PAGE 1 OF 1

PROJECT Iowa Ammunition Plant STS JOB NO 22017 BY JEG CHK [illegible]

G-13 Core Run

1ST Run 20.0-30.0 ft. 90% Recovery

20.0 Natural Breaks

21.0 - TRACE iron staining. Natural Break

Natural Break

22.0 Chert Layer

23.0 Natural Break — Little iron staining

Natural Break

24.0 Natural Breaks

*Thin Seam 1/8" indurated clay, dK. Brown

25.0 Mechanical Break

26.0 Natural Break, Trace iron staining

V. Thin indurated Clay Seam, DK. Brown, Nat. Break

Extremly thin Brown Laminations

27.0 Natural Break

1-2MM laminations

28.0 Natural Break

29.0 Mechanical Break

30.0 29.1-30 Sample Not Recovered

End of Dia. Core (NX) at 30.0 ft.

20.0 to 23.4
Limestone, macro Crystaline, Lt. Gray, Secondary Calcite, Horizontal Bedding

23.5 to 25.0
Limestone, MacroCrystaline, yellowish Brown, argillaceous in Part, chert in Part, (one silty shale seam, S...

25.0 to 28.5
Limestone, Microcrystaline, V.Lt. Gray, 3-1/8" Seams indurated clay. Dark brown to dark Gray, 27.3 to 28.5 dark Gray ~~laminations~~ bands of indurated clay & limestone

28.5 to 29.1
shale, dark Gray, Massive, MOD. soft

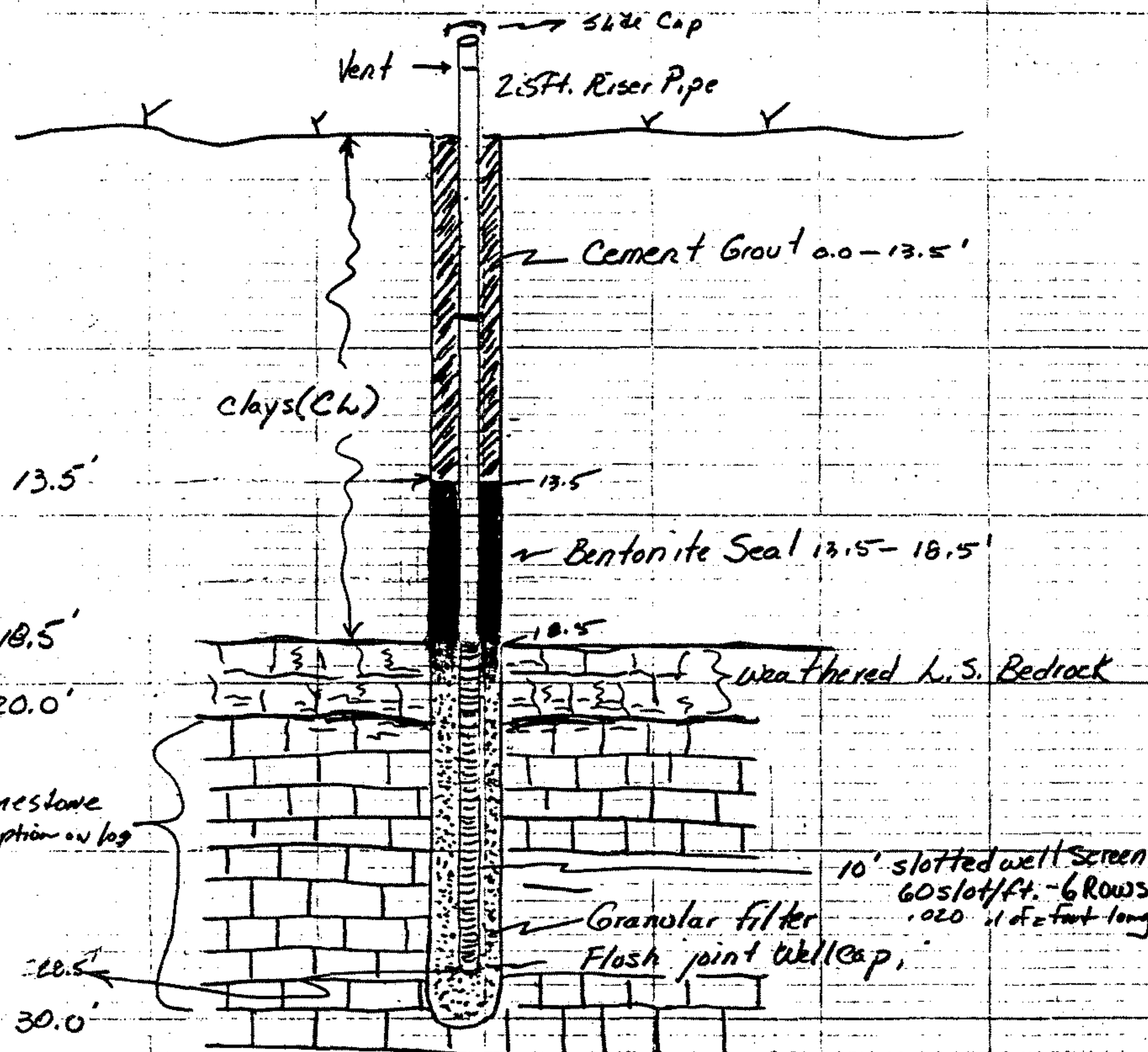
MAR 04 1981

SOIL TESTING SERVICES, INC. | DATE 2/3/81 | PAGE 1 OF 1

PROJECT Iowa Army Ammunition Plant | STS JOB NO 22017 | BY JEC | CHK GS

installed ~~Jan.~~ 3, 1981

Well installation Diagram
Well G-13
4 in. Ø PVC flush joint.



* water level data should not be used until well is developed.
* this well is expected to be dry?
* Fresh Drill water used to Core hole. Recirculated.

MAR 04 1981

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

TECHNICIAN DM Jedlicka
DRILLER D. White
HELPER T. Welch
RIG NO. Go-Track Mobile B-53

SURFACE ELEV.
BORING STARTED 2-24-81
BORING COMPLETED 2-24-81
STATION
OFF SET

Push tube 0.0-10.0 then Auger HSA Sample at 2' intervals ahead of Auger
Chicago Phone 273-5440
Northbrook Phone 272-6520
3 1/4" HSA
CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: ____ WS OR WD
WL: 25.0 BCR 27.0 ACR
WL: ____ AB ____ Hr. AB
WL: 11.0' 24 Hr. AB

JOB NO. 22017 BORING NO. G14 CLIENT ERG WEATHER ____

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
											No Frost.
1	0.5	0.8	3"ST				0.0-2.0	1.5		0.0	Clay Silty, trace Fine Sand (trace organics Roots), Moist
	~~2.3~~	~~2.8~~	~~3"ST~~				2.0-4.0	1.3		2.0	V. Moist, Med Plastic CL Black & Lt. Gray, Topsoil, 10YR 3/2. Stiff
2	2.3	2.8	3"ST	(*Sand Zone 1/2" thick at 3.3' Moist)			4.0-6.0	1.5			Clay Silty, trace Fine Sand Moist Med. Plastic CL
				(*Sand Zone 1/2" thick at 4.5 Moist)			6.0-8.0	1.7		8.0	Yellow Brown & Lt. Gray (tr. Mg. Concretions at 6.0' & 8.0') 10YR 5/2. weathered Till. Stiff
3	8.0	8.4	3"ST				8.0-10.0	0.9			Clay Silty trace Sand trace Gravel Moist Med. Plastic CL
							10.0-12.0	1.3		14.0	Yellow Brown 10YR 5/4. Till Stiff
4	14.8	15.0	3"ST				12.0-14.0	2.0			Clay Silty trace Sand trace gravel Moist Med. Plastic CL
							14.0-16.0	1.2		27.0	Dark Brown & Gray, 10YR 5/3, Till stiff
5	27.2	27.5	3"ST				16.0-18.0	1.3			Clay Silty Some; Sand occ. Fine Sand lenses Saturated trace
							18.0-20.0	1.5			Gravel Med. Plastic CL Light Gray & Brown 10YR 6/2 Till. Stiff
6	33.0	33.3	3"ST				20.0-22.0	1.4		32.0	Clay Silty little Sand occ. Fine wet sand lenses trace
							22.0-24.0	1.3		[illegible]	Gravel Med. Plastic CL Dark Gray 10YR 3/1. Till V. Hard.
				(*water at 28.0' water level after 15 min 27.0')			24.0-26.0	1.8			
							26.0-28.0	1.5			END OF Boring at 38.0.'
							28.0-30.0	1.3			
							30.0-32.0	1.0			
							32-34.0	1.3			
							34-36	1.2			
							36-38	1.1			

ABBREVIATIONS
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W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss
BOULDERS OR OBSTRUCTIONS
At ____ To ____
At ____ To ____
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

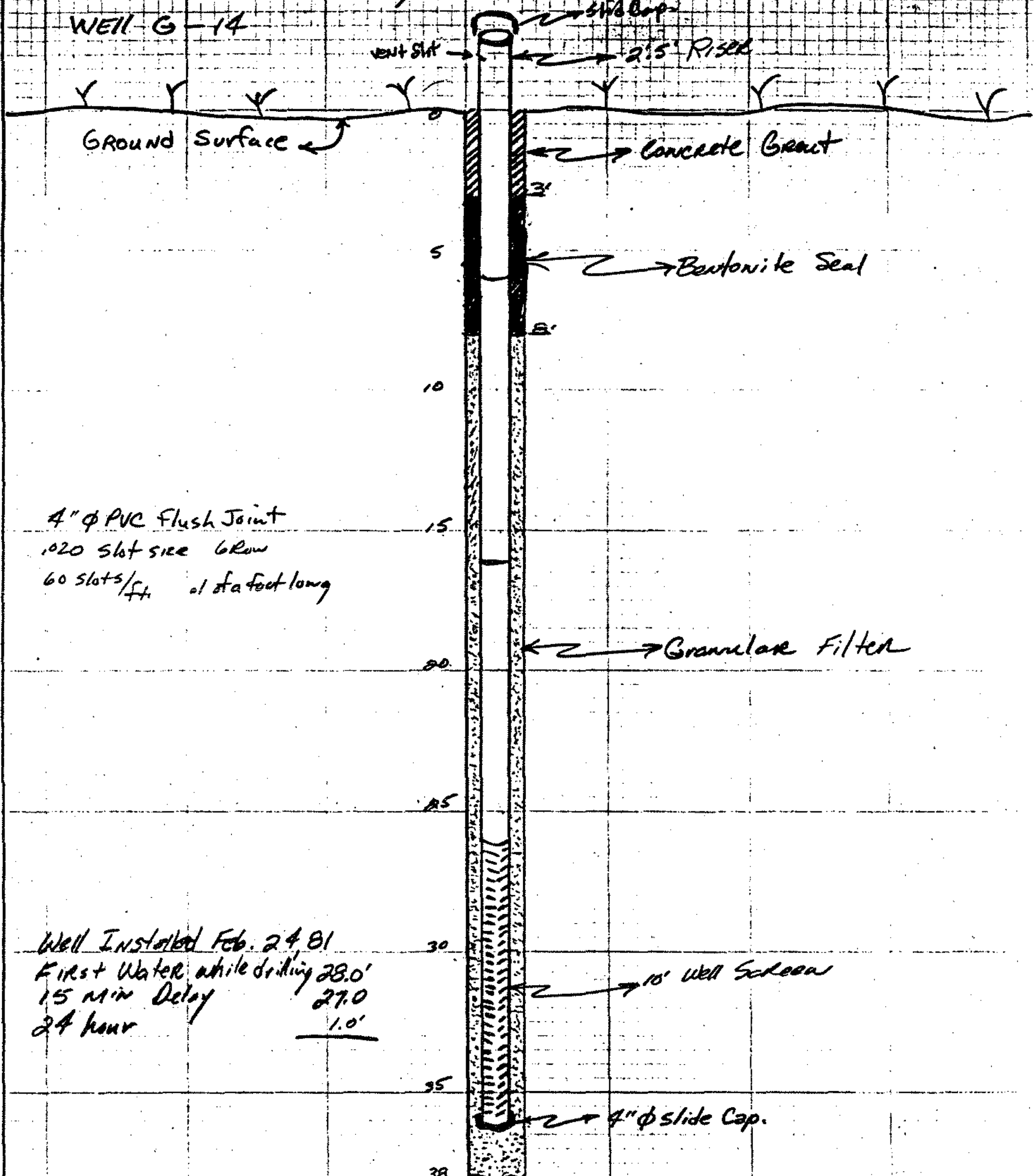
FEB 24 1981

SOIL TESTING SERVICES, INC.

		DATE Feb. 24, 81	PAGE 1 OF 1
PROJECT Iowa Army Ammunition Plant	STS JOB NO 22017 22017	BY DMJ	CHK DMJ

Well Point Installation Diagram

WELL G-14



FEB 24 1981

DAVID M. JEDLICKA

GEOLOGIST, DATE

LOCATION

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062 Sheet 1 of 1

TECHNICIAN J Crawley
DRILLER Glen Davis
HELPER Gaskins
RIG NO. 750

SURFACE ELEV.
BORING STARTED 3-10-81
BORING COMPLETED 3-10-81
STATION
OFF SET

Chicago Phone 273-5440
Northbrook Phone 272-6520

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: 5.5 WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 **BORING NO.** 6-15 **CLIENT** ____ **WEATHER** ____

3.5" Hollow Stem used.

3.5 | 16.5 | 6.5 screen — Granular fill 5.0 to 16.5; Bentonite .25 to 5.0; Cement Grout .25 to Top

Sample No.	Depth or Elevation From (sample taken)	To	Sampling Method	Penetration Record — Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	1.1	1.3	ST				0-2'	1.4			Clay, silty, V. soft, Moist, some fine Sand in seams 1/16"
											10YR 2/1, Black Topsoil (OH) Med Plac.
2	2.4	2.7	ST				2-4	1.3		2.0	fine Sand, silty, some clay, Med-Co. Sand in Seams 1/4" soft,
											moist, 10YR 2/2 - Very dark brown, 2" layer of Clay (CL)
3	5.5	5.8	ST				4-6	1.0			f-Co. Sand, TR. silt and clay, moist, Saturated at 5.5'
			H.S.	Hollow Stem	dozer						loose, Sub-Rounded grains, 7.5YR 4/4 dark Brown areas of Iron Staining. - alluvium
4	6.5-	6.8	ST				6-8	1.0			f-Co. Sand, Some Gravel, TR-silt, loose, Saturated,
			H.S.								7.5YR 5/2 Brown - alluvium (SW)
5	9.4	9.7	ST				8-10	1.5		8.0	clay, Ext. Sandy, V. soft, saturated, TR. Co. Sand & Gravel 10YR 6/6 yel. Brown (CL)
			HS							9.0	, Grades into f.-Med Sand, V. Clayey, V. soft Saturated, TR Gravel & Co. Sand
											10YR 6/6 yellowish brown. (SC) alluvium
6	10.0	10.3	ST				10-12	.6			Med Sand, Some Co Sand & Gravel, loose, saturated, TR clay
			HS								10YR 5/8 yellowish brown (SW)
7	13.6	13.9	ST				12-14 14-16	2.0		12.2	Clay, Silty, Some Co. Sand, TR. Gravel, Med-V. Stiff,
			HS								Low Moisture, 10YR 6/8 yellowish brown - Till (CL) Low to Med
8	17.0	17.3	ST				16-18	2.0			clay, silty, Some Co. Sand, TR Gravel, Med-V. Stiff
											Low Moist. 5Y 5/4 olive, Till (CL) Till
				E.B.	18.0 ft.						
											screen from 6.5 to 16.5

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness @ 3.2-3.4 alluvium
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss
BOULDERS OR OBSTRUCTION
At ____ To ____
At ____ To ____
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

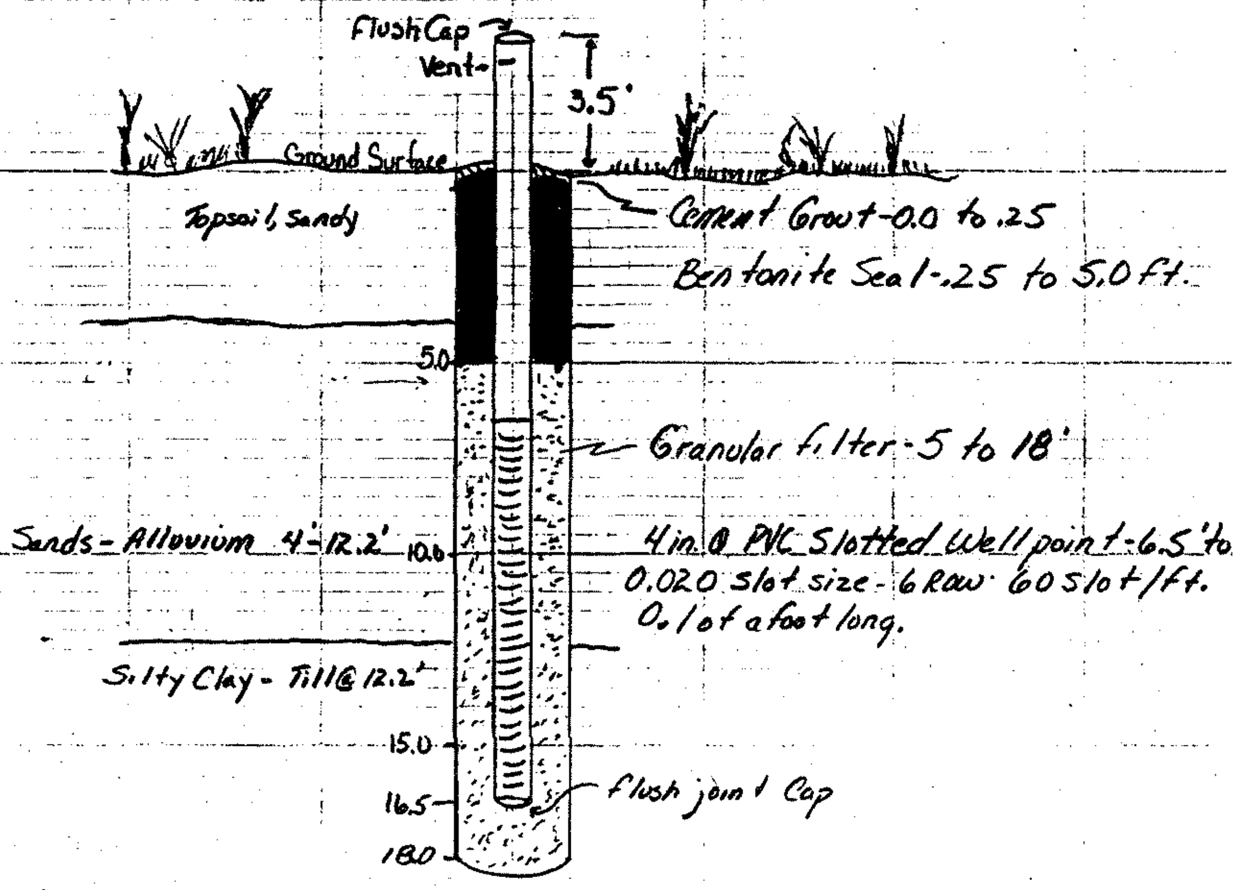
SOIL TESTING SERVICES, INC.

DATE 3-10-81 PAGE 1 OF

PROJECT Iowa Army Ammunition Plant STS JOB NO 22017 BY JEC CHK JEC

Well Installation Diagram

Well G-15



by John E Crowley
Geologist - 3-10-

[illegible]TESTING SERVICES, INC. 1805 CHANUTE RD., PEORIA, IL 61614
Phone: 309/692-6591

Sheet 1 of 1

Push Tube to 10', Set HSA to 10' Sample at 2' intervals ahead of auger to 20

[illegible]ICIAN	D.M. Jedlicka
DRILLER	M. Dant
HELPER	M. McConnel
RIG NO.	53 Mobile Truck Mount
SURFACE ELEV.	
BORING STARTED	2-20-81
BORING COMPLETED	2-20-81
STATION	
OFF SET	
CASING USED	3 1/4" HSA
SIZE	

WATER LEVEL OBSERVATIONS

WL: ______ WS OR WD
WL: 10.0 BCR 5.0' ACR
WL: ______ AB ______ Hr. AB
WL: 4.0' 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-16 **CLIENT** ERG **WEATHER** Clear 55°

NO FROST

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Q_p Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	4.4	3"ST				0-2	1.8			Clay, Silty Moist Med. Plastic CL, Fill trace Brick
							2-4	1.6		4.0	Frags, Nails, etc. Black 5YR 2.5/1.
2	4.4	8.0	3"ST				4-6	1.5			Clay, Silty Moist-V. Moist Med. Plastic CL, weathered Till.
							6-8	1.7		7.0	light Gray Mottled 10YR 7/1. stiff
3.	8.0	10.0	3"ST				8-10	1.0			Clay Silty trace ≤10% Fine Sand Med. Plastic CL
							10-12	1.9		13.0	Moist Dark Gray & Black 10YR 4/1. stiff
4	13.0	13.0	3"ST				12-14	1.8			Clay Silty trace 10% sand trace ≤10% Gravel Till moist
5	15.0			(water at 10' while sampling)						15.0	Med. Plastic CL, dark Yellow brown stiff 10YR 5/4
[illegible]	[illegible]	16.0	3"ST	(15 min. delay Water 7.0')							Silt, Clayey, little 20% Fine Sand V. Moist-Moist
							14-16	2.0		16.0	ML low-plastic Yellow Brown 10YR 5/8
							16-18	2.0			clay, Silty Trace ≤10% Sand Trace ≤10% gravel Till
6	16.0	16.4	3"ST				18-20	1.8			V. Moist Med. Plastic CL. Brown. hard 10YR 5/3

END OF Boring at 20.0'

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness ______
Fill Thickness ______

CAVE IN LEVEL:
While Drilling and Sampling ______
After Boring Completion ______

WATER LOSS:
At ______ To ______
Percent Loss ______
At ______ To ______
Percent Loss ______

BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth ______
Height of Soil Rise In Casing ______

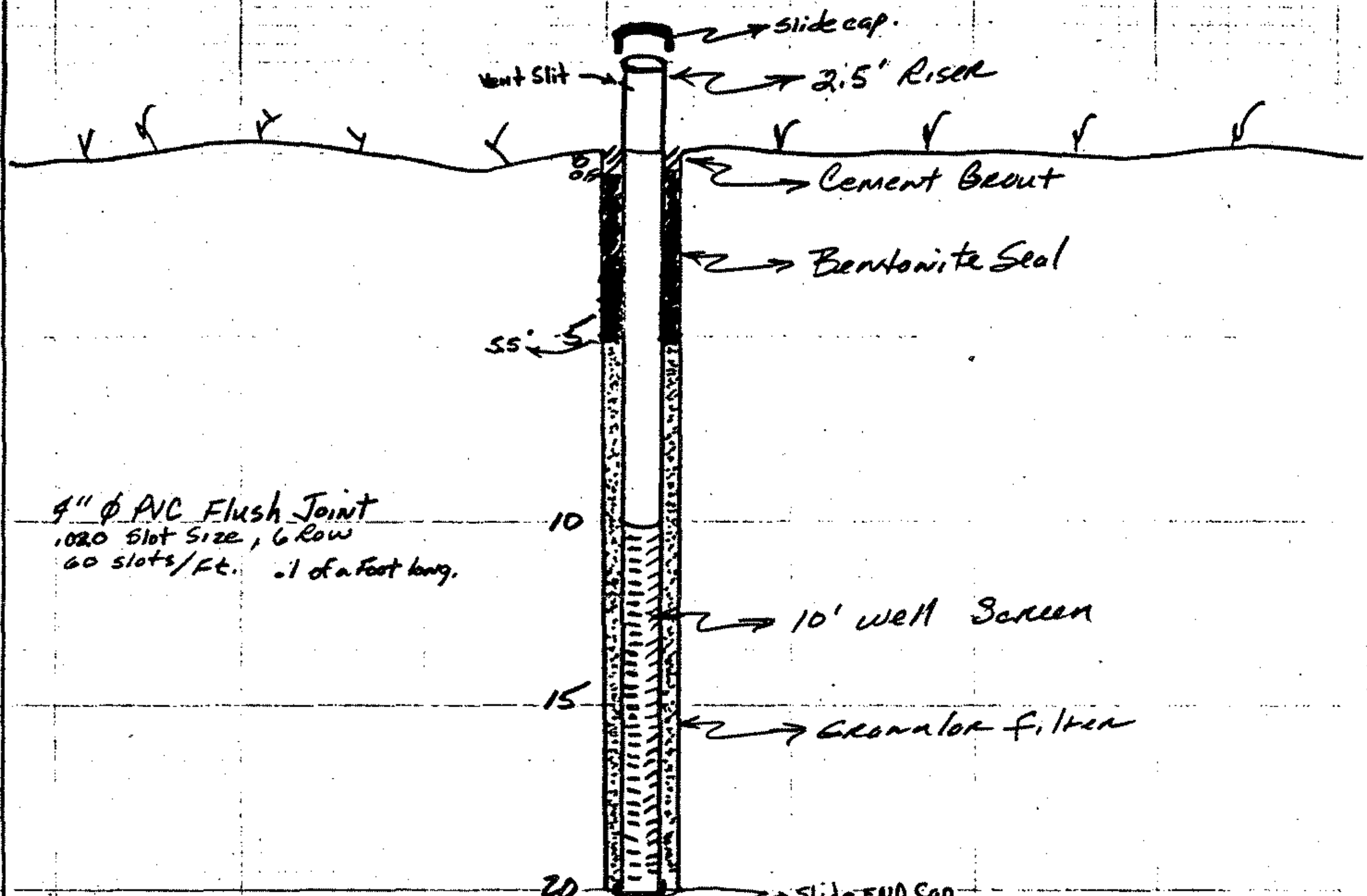
DAVID M. JEDLICKA

SOIL TESTING SERVICES, INC. | DATE Feb. 20, 81 | PAGE 1 OF 1

PROJECT Iowa Army Ammunition STS JOB NO 22077 | BY DMJ | CHK DMJ

WEll INSTALLATION DIAGRAM

WEll G-16



Well Set Feb. 20, 1981
Water level 5.0' after 1 hr.

FEB 19 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

[redacted]ESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 1

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN D Jellicka
DRILLER Dave White
HELPER Terry Welch
RIG NO. 60 Track 53

SURFACE ELEV. ______ Push tube to 10', then HSA and samples at 2' intervals ahead of HSA.
BORING STARTED March 3 - 81
BORING COMPLETED March 3 81
STATION ______
OFF SET ______

3 1/4" HSA
CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: 10.0 BCR 12.0 ACR
WL: ______ AB ______ Hr. AB
WL: X 24 Hr. AB

JOB NO. 22017 BORING NO. G-17 CLIENT [illegible] WEATHER ______

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
										0.0	
1	0.0	0.3	3"ST				0-2	1.2			Clay Silty little organics (Roots) Topsoil soft Med Pl. CL
							2-4	1.0		1.0	Moist Black 10YR 2/1.
2	2.5	2.8	3"ST				4-6	1.2			Clay Silty trace Fine Sand Moist Weathered Till soft
							6-8	1.6		4.0	Med Pl. CL 10YR 5/2 Gray Brown.
3.	5.0	5.6	3"ST				8-10	1.7			Clay Silty trace Sand trace gravel tr. Myconcretions Moist
							10-12	1.8		8.0	V.Moist Soft Med Pl. CL 10YR 4/4 Gray Brown. Till
4	8.6	8.9	3"ST				12-14	1.8			Clay Silty trace Sand trace gravel V.Moist soft Med Pl.
				*water at 8.0' while Sampling (15 Min Delay L.t 6.5')			14-16	2.0			-High Pl. CL-CH Till 10YR 5/1 Gray
5	15.0	15.3	3"ST				16-18	2.0		14.0	*few occasional Sand Seams very thin V.Moist <1cm thick 8-12)
							18-20	2.0			Clay Silty little sand trace gravel Till Moist Med PL
6	16.5	16.8	3"ST							18.0	CL. Stiff 10YR 6/4 Yellow Brown. Mottled.
											Clay Silty trace Sand trace gravel Till Moist Med PL
											CL Stiff Gray. 10YR 5/1.
											E.O.B. 20

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

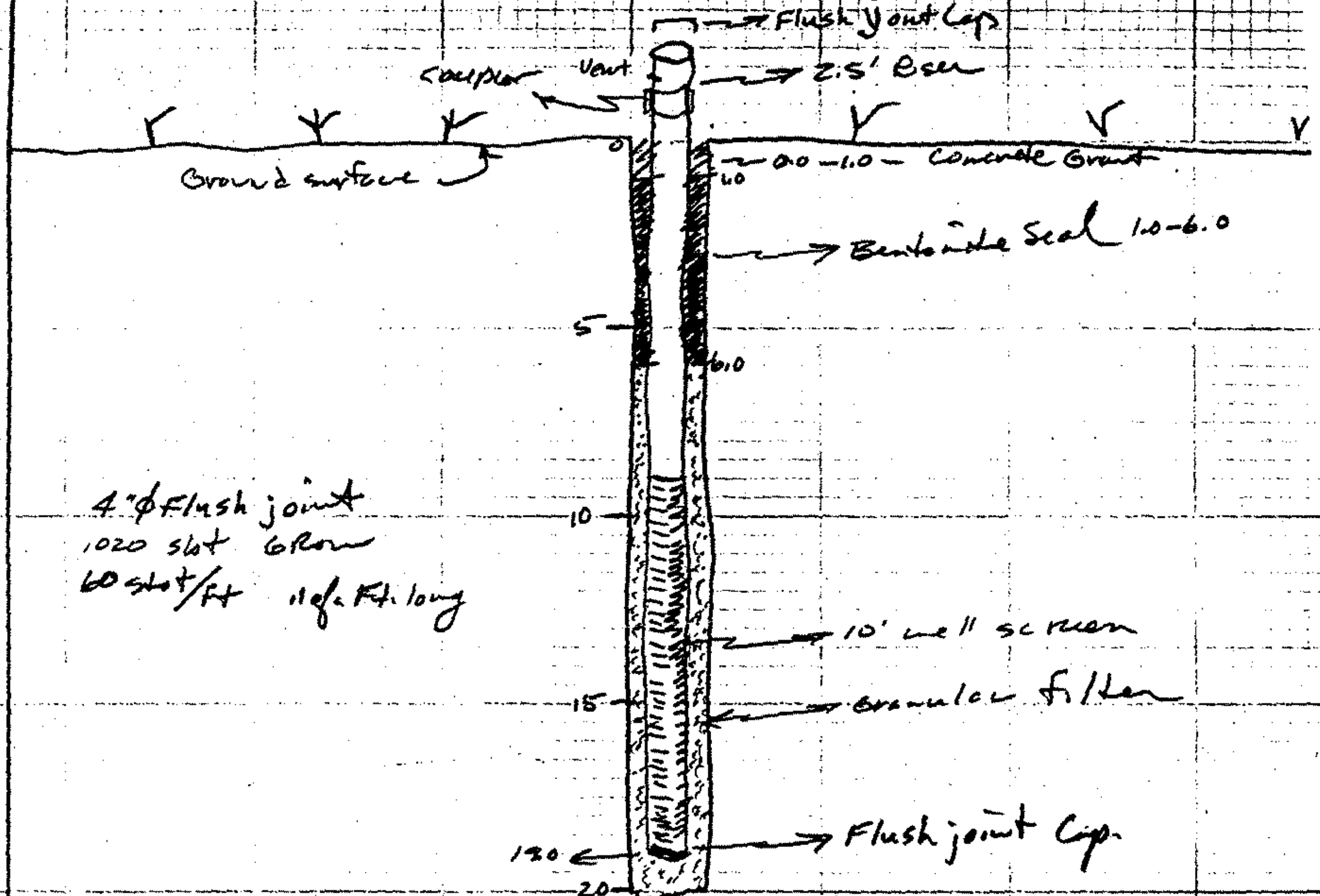
DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss
BOULDERS OR OBSTRUCTION
At ______ To ______
At ______ To ______
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In C[illegible]

MAR 03 1981

SOIL TESTING SERVICES, INC. | DATE March 3 81 | PAGE

PROJECT Iowa Army Ammunition Plant | STS JOB NO 720-17 | BY DMJ | CHK D.

Well installation Diagram
Well G-17



Water at 120' while sampling

MAR 03 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

[redacted]IL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5140
Northbrook Phone 272-6520

Sheet 1 of 1

TECHNICIAN D. Jedlicka
DRILLER Dave Whitt
HELPER Terry Gleich
RIG NO. Go Trac 53

SURFACE ELEV. ______
BORING STARTED March 3 81
BORING COMPLETED March 3 81
STATION ______
OFF SET ______

Push tube to 10' then set HSA, sample 2' intervals ahead of HSA.

CASING USED HSA 3¼" SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: 10.0 BCR 12.0 ACR
WL: ______ AB ______ Hr. AB
WL: X 24 Hr. AB

JOB NO. 22017 BORING NO. G-18 CLIENT ERG WEATHER Cold Clear

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
										0.0	
1	1.0	1.3	3"ST				0-2	1.5			Clay Silty trace-little organic (Roots) Moist Med Plastic
							2-4	1.0		2.5	CL Topsoil Soft. 10YR 2/1.
2	4.0	4.3	3"ST				4-6	1.1			Clay Silty trace Sand trace gravel V.Moist Weathered Till
							6-8	0.8		9.0	(tr. Mg concretions) ~~Med~~ Soft Plastic CL Brown & Gray 10YR 5/2
3	9.5	9.8	3"ST				8-10	1.1			Clay Silty trace Sand trace gravel Till V.Moist
				water at 8.0' while sampling (5 min delay at 6.0')			10-12	2.0			(Small Sandy layers Few <1cm thick) V.Moist-Wet Med
4	10.5	10.8	3"ST				12.0-14.0	2.0		10.0	Plastic ~~St~~ CL Gray Soft 10YR 7/1.
							14.0-16.0	2.0			Clay Silty trace Sand trace gravel V.Moist Soft
5	14.0	14.3	3"ST				16-18	1.0			High Plastic CH Soft. Gray 10YR 7/1.
							18-20	2.0		14.0	(A Few Sandy seams at 13.0-14.0 <1cm thick wet)
6	18.0	18.3	3"ST								Clay Sandy and silt little organics (twigs) Moist
										16.0	-V.Moist ML-OL (Med Plastic-low) 10YR 3/2 Peat?
											Clay Silty trace Sand trace gravel Moist Till
										18.0	V.Stiff Med Plastic CL 7.5YR N4/
											Clay Silty trace Sand trace gravel Moist Till
											V.Stiff hard Med Plastic CL 2.5YR N5/
											E.O.B. @ 20.0

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIS
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss
BOULDERS OR OBSTRUCTIO
At ______ To ______
At ______ To ______
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

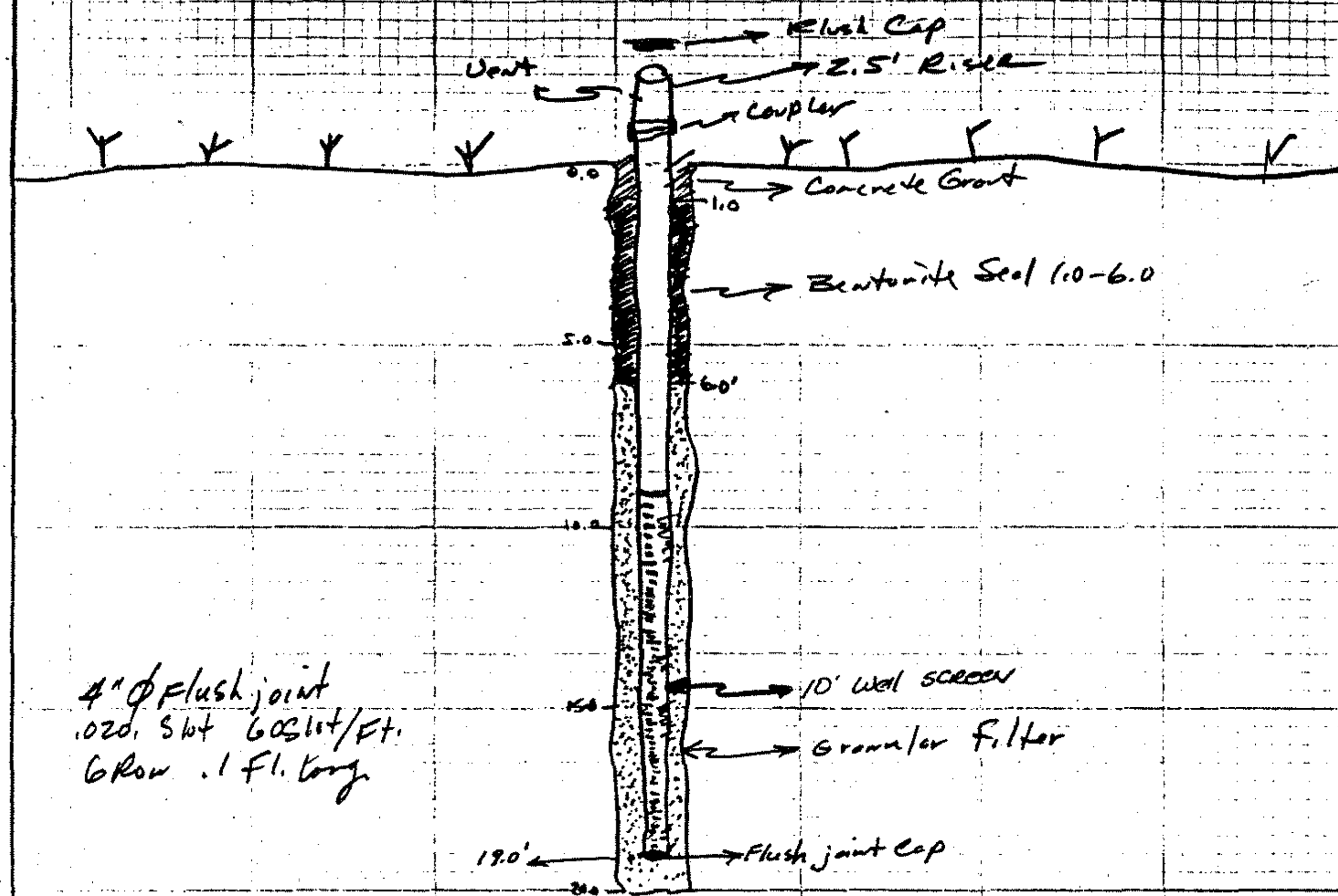
MAR 03 1981

DAVID M. JEDLICKA

SOIL TESTING SERVICES, INC. | DATE March 3 81 | PAGE 1 OF

PROJECT Iowa Army Ammunition Plant STS JOB NO 22017 | BY DMJ | CHK DMJ

Well Installation Diagram
Well G-18



4" ⌀ Flush joint
.020 Slot 60 slot/Ft.
6 Row .1 Ft. long

water at 8.0' while Sampling

MAR 03 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

-STING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062 Sheet 1 of 1

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN D.M. Sedlacek SURFACE ELEV. ______ Push Tube to 10', set HSA then samples at 2' intervals ahead of HSA

DRILLER Dave Witt BORING STARTED March 2 81

HELPER Terry Welch BORING COMPLETED March 2 81

RIG NO. B-53 Go Track STATION ______ 3 1/4" HSA

OFF SET ______ CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: ____ WS OR WD
WL: 8.0' BCR 7.0' ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. G-19 CLIENT ERG WEATHER Cool, Clear

Sample No.	Depth or Elevation From	To	Sampling Method	Penetration Record Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	0.3	3" ST				0-2	1.0		0.0	Clay Silty little organics (Roots) Moist Med. Plastic CL
							2-4	2.0		1.5	Topsoil Soft. 10YR 2/1.
2	1.5	1.8	3" ST				4-6	2.0			Clay Silty trace sand trace gravel Weathered Till trace Mg Concretions
							6-8	1.7		5.0	Moist-V. Moist soft. Med Plastic CL. Lt. Brown & Gray 10YR 7/6.
3	5.0	5.3	3" ST				8-10	2.0			Clay Silty trace Sand trace gravel V. Moist Soft
							10-12	1.5		8.0	Med Plastic CL Light Gray Mottled Till 10YR 7/1.
4	8.5	8.8	3" ST				12-14	1.5			Clay Silty trace Fine Sand trace gravel High Plasticity
							14-16	1.8		15.0	CH V. Moist Stiff Gray 10YR 4/1.
5	15.0	15.3	3" ST	(*Water at 6.0 While Sampling. 15 Min Delay WL 4.0')			16-18	1.6			Clay Silty trace Sand trace gravel Moist Till Med Plastic
							18-20	1.5			CL V. Stiff ~~Gray~~ Brown 10YR 5/3
											(* Sandy Layer at 17.5' 1cm thick V. Moist)
											* Push through Rock @ 19.6'
											E.O.B at 20.0'

MAR 02 1981

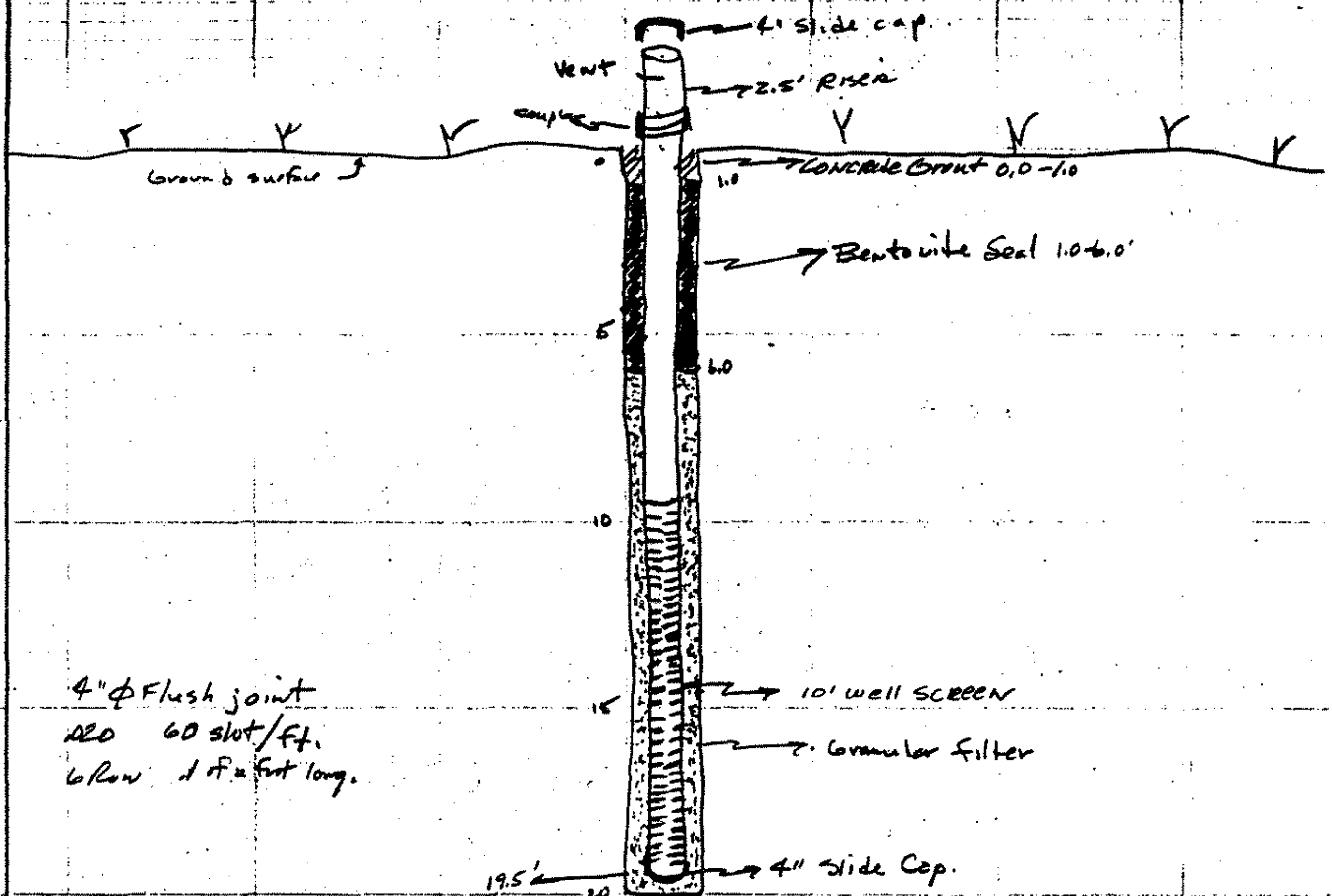
ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness
CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion
WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss
BOULDERS OR OBSTRUCTIONS:
At ____ To ____
At ____ To ____
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Cas[ing]

SOIL TESTING SERVICES, INC.		DATE March 2 81	PAGE 1 OF
PROJECT [illegible] Army Ammunition Plant	STS JOB NO 2L017	BY DMJ	CHK DMJ

Well Installation Diagram

Well # G-19



4" ϕ Flush joint
.020 60 slot/ft.
6 Row 1 ft = foot long.

MAR 02 1981
DAVID M. JEDLICKA
GEOLOGIST, DATE
LOCATION

TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440
Northbrook Phone 272-6520

Sheet 1 of 1

TECHNICIAN D. Jodlicka
DRILLER Dave
HELPER Terry
RIG NO. 353 Go Truck

SURFACE ELEV.
BORING STARTED March 2-81
BORING COMPLETED March 2-81
STATION
OFF SET

Push Tube to 10', then HSA, Sample at 2' intervals Ahead of HSA

CASING USED 3 1/4" HSA SIZE

WATER LEVEL OBSERVATIONS
WL: WS OR WD
WL: 8.0 BCR 10.0 ACR
WL: AB Hr. AB
WL: N/O 24 Hr. AB

JOB NO. 220.7 BORING NO. G-20 CLIENT ERG WEATHER Clear Cold

Sample No.	Depth or Elevation From	To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
										0.0	
1	1.0	1.3	3" ST				0-2	1.8			Clay Silty trace organics (Roots) Moist Med. Plastic
							2-4	1.1		2.0	CL Topsoil 10YR 2/1 Soft.
2	2.2	2.5	3" ST				4-6	0.7			Clay Silty, trace Fine Sand Moist Med Plastic CL
							6-8	1.4		6.0	Lt. Gray Mottled Stiff 10YR 6/4.
3	6.2	6.5	3" ST	*Water at 9.8' while Sampling (15 min Delay 9.3')			8-10	1.7			Clay Silty trace Fine Sand V. Moist Med Plastic
							10-12	1.7		8.0	CL Lt Gray Mottled Stiff 10YR 6/4. Till
4	9.0	9.3	3" ST				12-14	1.8			(Few V. Moist Sand Seams at 9.5-10.0' 1cm thick)
							14-16	1.1			Clay Silty trace Sand trace gravel V. Moist Med
5	12.0	12.3	3" ST				16-18	1.9		10.0	Plastic CL Till Soft. 10YR 4/1 Dark Gray.
							18-20	1.2			Clay Silty trace Sand trace gravel Moist Med
											Plastic CL Stiff Yellow Brown Mottled 10YR 5/8
											E.O.B at 20.0'

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At To
Percent Loss
At To
Percent Loss

BOULDERS OR OBSTRUCTION
At To
At To

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

MAR 02 1981

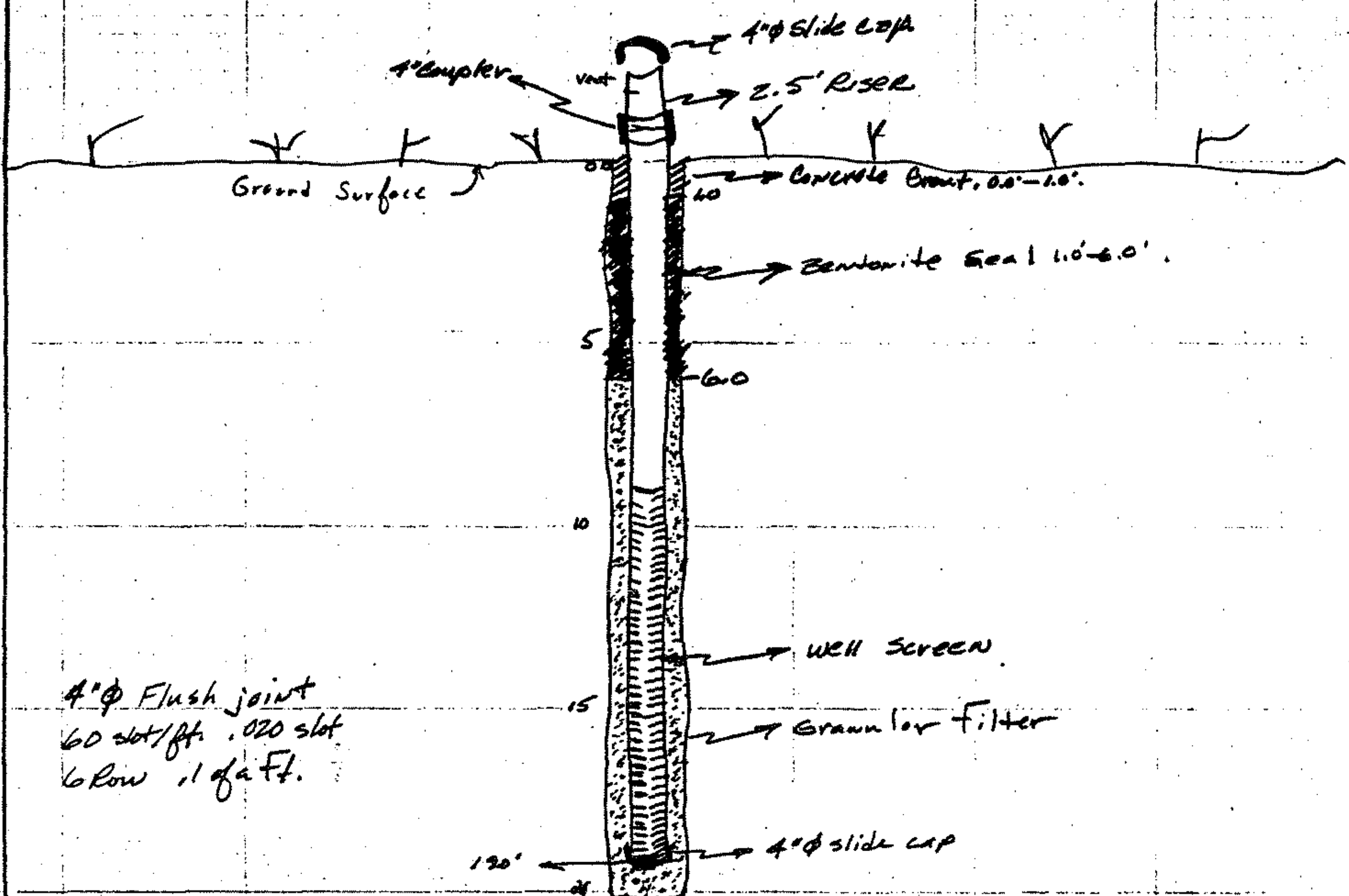
DAVID M. [illegible]

SOIL TESTING SERVICES, INC. DATE March 2 81 PAGE 1 OF 1

PROJECT Iowa Army Ammunition Plant STS JOB NO 22017 BY DMJ CHK DMJ

Well Installation Diagram

Well # G-20.



MAR 02 1981

DAVID M. JEDLICKA

GEOLOGIST, DATE_______

LOCATION_______

[illegible]STING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Chicago Phone 273-5440

Northbrook Phone 272-6520

Sheet 1 of 1

TECHNICIAN J.Canty, D.Jachmuth SURFACE ELEV. ______

DRILLER D.Wirth BORING STARTED 3/4/81

HELPER T. Welch BORING COMPLETED 3/5/81

RIG NO. Go Track 53 STATION ______

OFF SET ______

install 4"Ø PVC wellpoint.

Bottom Set at 19.0 ft.

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS

WL: WS WS OR WD

WL: ______ BCR ______ ACR

WL: 4.5 AB ______ Hr. AB

WL: ______ 24 Hr. AB

JOB NO. 22017 BORING NO. 6-23 CLIENT ______ WEATHER ______

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
1	0.0	0.4	3"ST				0-2	1.3			Clay Silty little organics (roots) Moist Med PL CL
							2-4	1.6		3.5	Soft topsoil dark gray.
2	2.5	2.8	3"ST	*water while sampling at 6.0'			4-6	1.0			Clay Silty little sand trace gravel Weathered Till
				(15 min delay w.l. 4.0')			6-8	1.3		4.0	Moist-V. Moist Med. PL CL dark Gray Yellowish Br.
3	4.3	4.6	3"ST				8-10	1.0			Clay Silty trace Sand trace Gravel Till Moist
							10-12	1.5			Med Pl CL Stiff Gray & Br.
							12-14	1.5			
							14-16	1.5			
4	17.1	17.4	3"ST				16-18	1.5		16.0	Clay, Very Sandy-VF-Co, little gravel, reddish yellow (CL)
5							18-20	1.5			7.5yR 6/8, 4 seams 1/16-1/8" heavy Oxidation, Fe staining
			20.0' End of Boring								slightly moist.
6											
				H2O @ -4.5'							19'-5 - granular filter
											5-.5 - Bentonite Seal
											.5-0.0 - Cement Grout
											1.5' Riser,
											screen 19'-9'

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST

Topsoil Thickness ______

Fill Thickness ______

CAVE IN LEVEL:

While Drilling and Sampling ______

After Boring Completion ______

WATER LOSS:

At ______ To ______

Percent Loss ______

At ______ To ______

Percent Loss ______

BOULDERS OR OBSTRUCTIONS:

At ______ To ______

At ______ To ______

ARTESIAN PRESSURE:

Depth ______

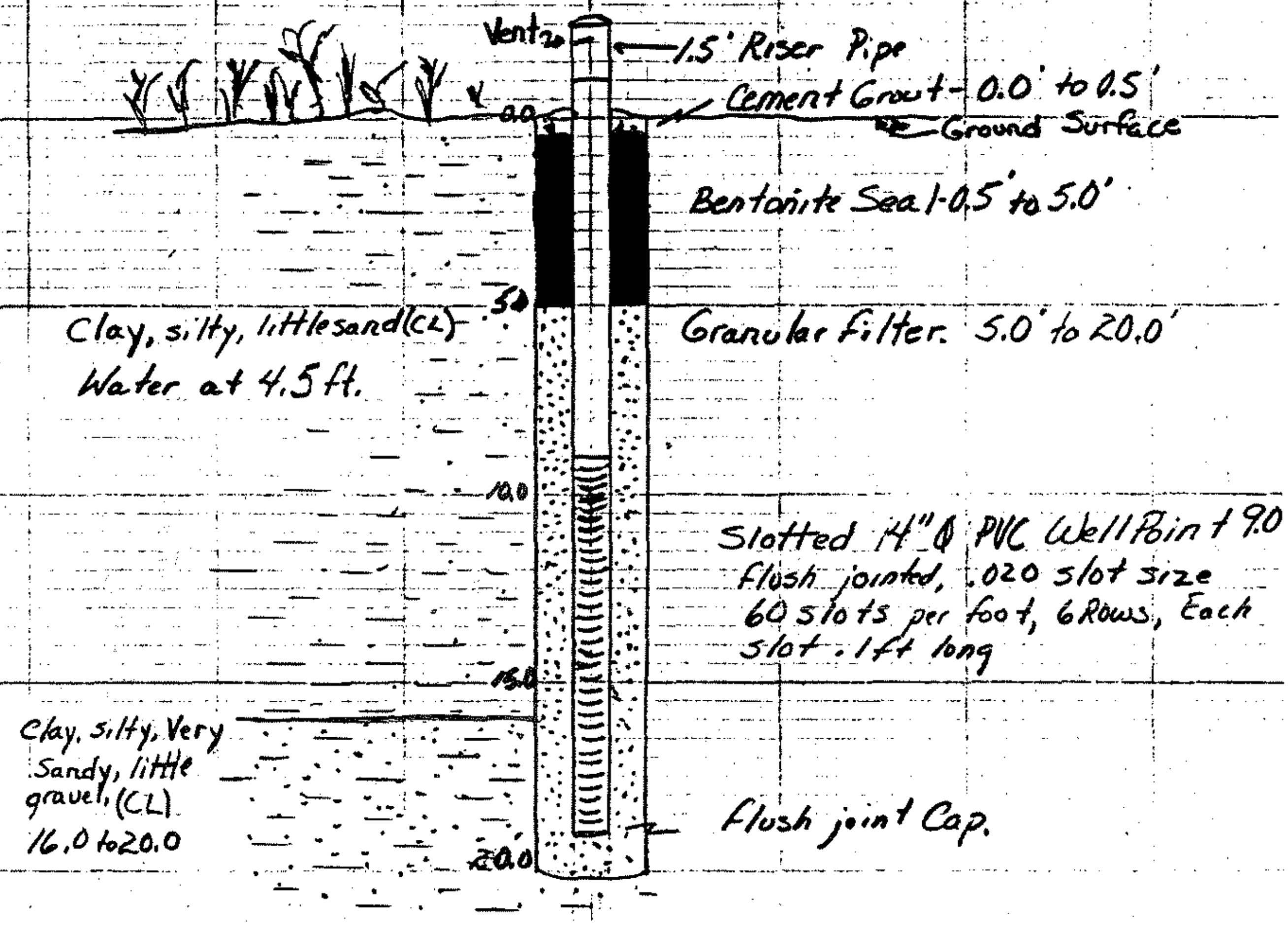
Height of Soil Rise in Casing ______

SOIL TESTING SERVICES, INC.

DATE 3-7-81 | PAGE ___ OF

PROJECT Iowa Army Ammunition Plant STS JOB NO 22017 | BY: JEC | CHK JEC

Well diagram 6-23, Installed March 5, 1981



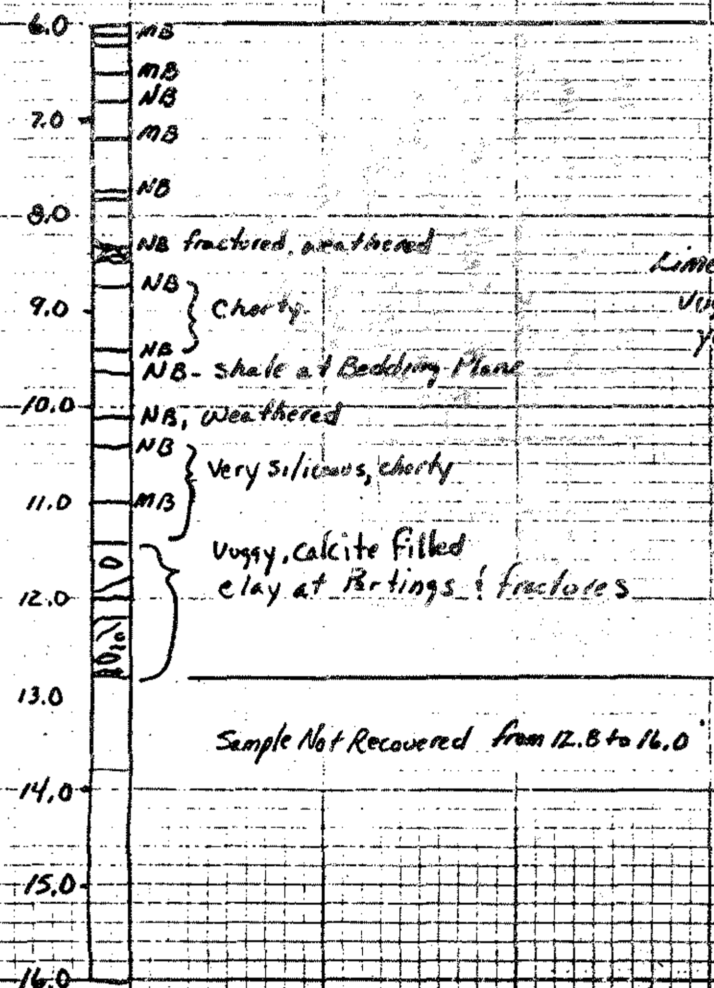
SOIL TESTING SERVICES, INC. | DATE 3-18-81 | PAGE ___ OF

PROJECT Iowa Army Ammunition Plant | STS JOB NO. 22017 | BY JEC | CHK JEC

Well G-24 Core Diagram.

1st Run 6-13.0' 3/5/81
2nd Run 13-17.0 3/17/81

68% Recovery*



Limestone, finely - Med. Crystalline, chert
vugs, calcite filled, white to
yellowish brown 2.5Y 8/2 to 10YR

N.B. Natural Break
M.B. Mechanical Break

* Poor Water Circulation from 16.0 [illegible]

by John E Crowl
Geologist

[illegible] TESTING SERVICES, 111 PFINGS[illegible] ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 2

TECHNICIAN J. Crowley
DRILLER G. Davis
HELPER G. Jones
RIG NO. CME750

SURFACE ELEV.
BORING STARTED 3-17-81
BORING COMPLETED 3-19-81
STATION
OFF SET

Chicago Phone 273-5440
Northbrook Phone 272-6520

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: ____ WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: 62.0' 24 Hr. AB

JOB NO. 22017 BORING NO. G-25 CLIENT ERG WEATHER FAIR

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Split Spoon Blows 6"	6"	6"	6"	R Length Recovered in Feet	Qp Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
											H2O @ 71.0' 1 hr. after well secured
1	3.1	3.4	ST				0-2 2-4	1.2 1.1			- Clay - silty, sandy, little Co Sand, TR. Gravel, stiff, slightly
			HS				4-6 6-8	1.3 1.0			moist, brownish yellow 10YR 6/6 to 10YR 5/6, Topsl. i Till CL (Low Plast)
							8-10 10-12	1.7 2.0			Same dark Brown Oxid. i Decay wood from 2-10 - 1 large Gravel at 11.6
							12-14	1.3			Very Sandy 12-14, 2-1/16-1/8 Seams f. Sand, Gray.
2	15.5	15.9	ST				14-16 16-18	1.0 2.0		15.5 15.9	Sand Seam, Med grain, loose, 10YR 5/6 yell Brown (SP)
			HS				18-20 20-22	2.0 1.4			V. Moist Sl. Saturated (Till) 1" Sand Seam, Same as
							End of weathered Till				above At 16-18. Slight increase in Moist from 14-18.
3	23.2	23.5	ST				22-24 24-26	1.6 2.0			22' Clay, silty, Sandy TR. Co. Sand i Gravel (Dig. Wood)
			HS				26-28	2.0			Slightly Moist, stiff dark Gray 5Y 4/1 Till (CL) Low Plast
							28-30 30-32	2.0 2.0			increase in Sand @ 26-28.
							32-34 34-36	2.0 2.0			one 1/8" f. Sand Seam @ 29.1. (DRY) - V. Stiff at 35.9
							36-38	2.0			(CL) Med+ Plast @ 36-38, V. Stiff 42-44
							38-40 40-42	1.0 4.5			
4	42.4	42.7	ST				42-44 44-46	1.8 1.8			clay, sandy, silty, TR. Co. Sand, Gravel, V. Low Moist, V. Stiff
			HS				46-48 48-50	2.0 2.0			Pale Olive 5Y 6/3 Till (CL) Low-Med.
							50-52 52-54	2.0 1.9			- Change to olive Gray 5Y 4/2 to 5Y 3/2 @ 48.8
							54-56 56-58	2.0 2.0			- TR. wood in 54-56. slightly Moist from 54.3-54.6
											. TR. Sand from 54-58
										(58)	Clay, V. silty slightly moist, Med-V. Stiff
5	59.0	59.3	ST				58-60	2.0			[illegible] Gray 10YR [illegible] Till (CL)

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIS[T]
Topsoil Thickness .5'
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At To
Percent Loss
At To
Percent Loss

BOULDERS OR OBSTRUCTIO[NS]
At To
At To

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

[illegible]ING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

TECHNICIAN J. CROWLEY
DRILLER G. Davis
HELPER G. Jones
RIG NO. CME 750

SURFACE ELEV. ______
BORING STARTED 3-17-81 (pm)
BORING COMPLETED 3-19-81
STATION ______
OFF SET ______

Chicago Phone 273-5440
Northbrook Phone 272-6520

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: ______ WS OR WD
WL: ______ BCR ______ ACR
WL: ______ AB ______ Hr. AB
WL: 62' 24 Hr. AB

JOB NO. 22017 BORING NO. G-25 CLIENT ______ WEATHER ______

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record Split Spoon Blows 6"	6"	6"	6" (2 Feet)	R Length Recovered in Feet	Q_p Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
6	61.3	61.6	ST					60-62	2.0	(61)	Clay, silty, Tr. Sand, Mod. Soft, Mod. Moist +
			1/15								Dark Gray to Dark Olive Gray 5Y 3/2 Till (CL) low
								62-64	2.0		Saturated Sand in Seams 2" at 62.3
								64-66	2.0		Sandy and Ext. stiff at 65.0 to 66.0
								66-68	2.0		
7	67.5	67.8	ST					68-70	2.0		Clay, silty, Some Sand, Tr. Co. Sand & Gravel, V. stiff
								70-72	1.3		low moist, Olive Gray 5Y 4/2 Till (CL) Low
								72-74	2.0		
								74-76	2.0		slight increase in moist @ 72-78
								76-78	1.1		
								78-80	2.0		
								80-82	1.3		
								82-84	1.5		
								84-86	1.3		
				E. Sample 88.0				86-88	1.0		screen from 81.0 to 71.0
											Granular filter 88.0 to 10.0 PVC 3.6' above grn
											Bentonite 10.0 to 5.0
											Cement 5.0 to 0.0 4' Riser
											Water level at 71.0 1 hr. after Well Secured
											No Water used while sampling.

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
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S.S.-Split Spoon
D.B.-Diamond Bit
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R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness .5'
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss

BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______

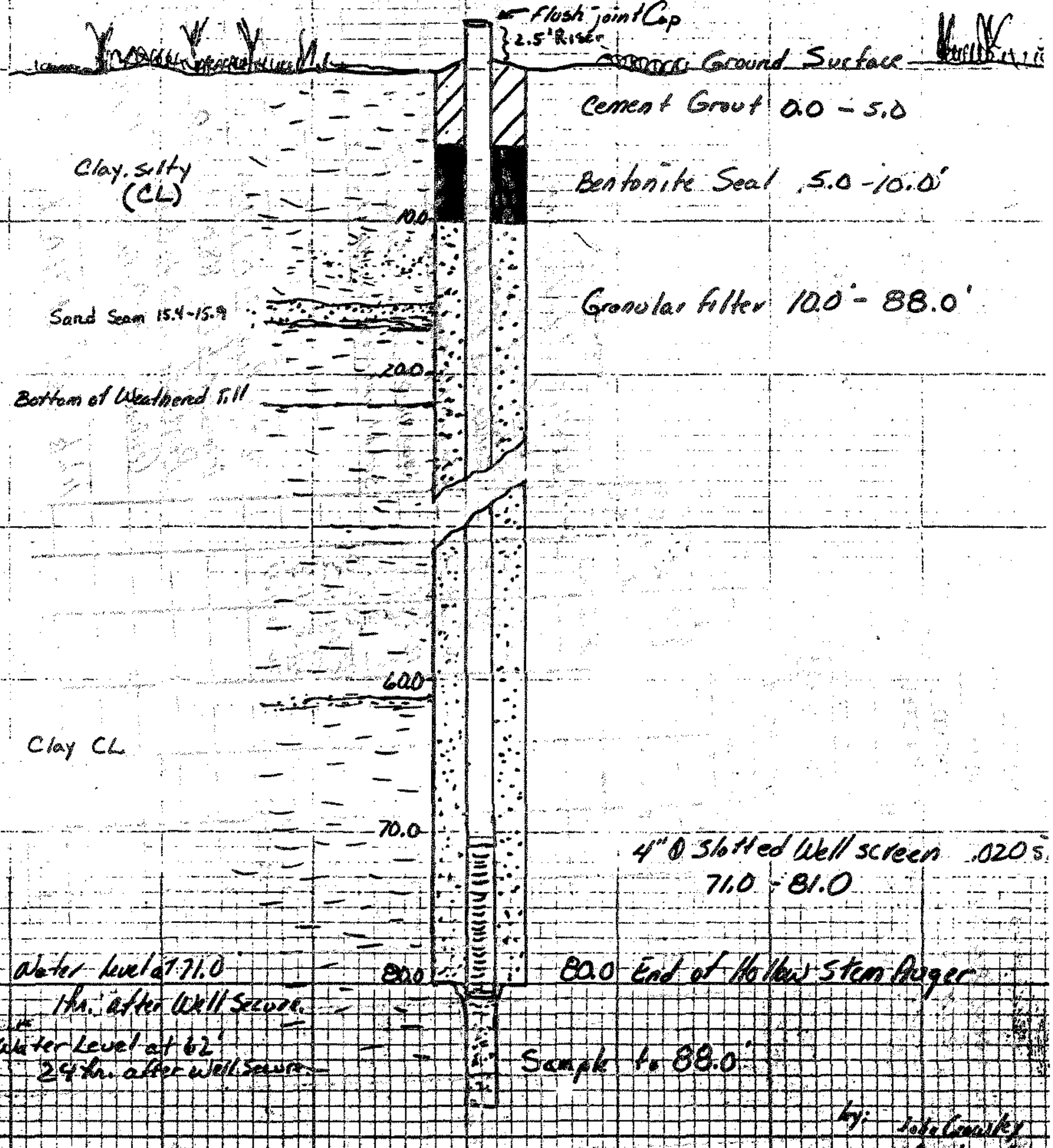
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC. | DATE 3-19-81 | PAGE ___ OF ___

PROJECT Iowa Army Ammunition Plant | STS JOB NO 22017 | BY JEC | CHK JEC

Well G-25 Installation Diagram

Installed 3-19-81



by: John Crowley
Geologist
3/19/81

SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 2 of 2

Chicago Phone 273-5440
Northbrook Phone 272-6520

TECHNICIAN J. Crosby
DRILLER G. Davis
HELPER G. Jones
RIG NO. CME 750

SURFACE ELEV. ______
BORING STARTED 3/20/81
BORING COMPLETED 3/21/81
STATION ______
OFF SET ______

CASING USED ______ SIZE ______

WATER LEVEL OBSERVATIONS
WL: None WS OR WD
WL: ______ BCR ______ ACR
WL: ______ AB ______ Hr. AB
WL: ______ 24 Hr. AB

JOB NO. 22017 **BORING NO.** G-26 **CLIENT** ______ **WEATHER** ______

Sample No.	Depth or Elevation From	Depth or Elevation To	Sampling Method	Penetration Record – Split Spoon Blows 6"	6"	6"	6" (← 2 Feet →)	R Length Recovered in Feet	Q_p Penetrometer Test in TSF	Depth of Strata Change (ft)	Sample Description
							82-84 84-86	1.0 1.0			Change to Dark Grayish Brn 10YR 4/2 - 10YR 3/2
			HS				86-88 88-90	1.5 1.?			very silty - Increase in Wood & Plant Roots 82-100
6	86.5	86.8	ST				90-92 92-94 94-96	1.? 1.8 1.8			clay, silty little wood & Plant Roots, mod. Soft,
							96-98 98-100	1.0 1.5			Mod-Low Moist, Till (CL) low Plast dark Gray 10YR
					100' E.B.						
				No Water Encountered							100-90 - screen
											100-42 - Granular Filter
											42-37 - Bentonite
											37-0.0 Cement Grout

ABBREVIATIONS
F.T.-Fish Tail
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W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ______ To ______
Percent Loss
At ______ To ______
Percent Loss

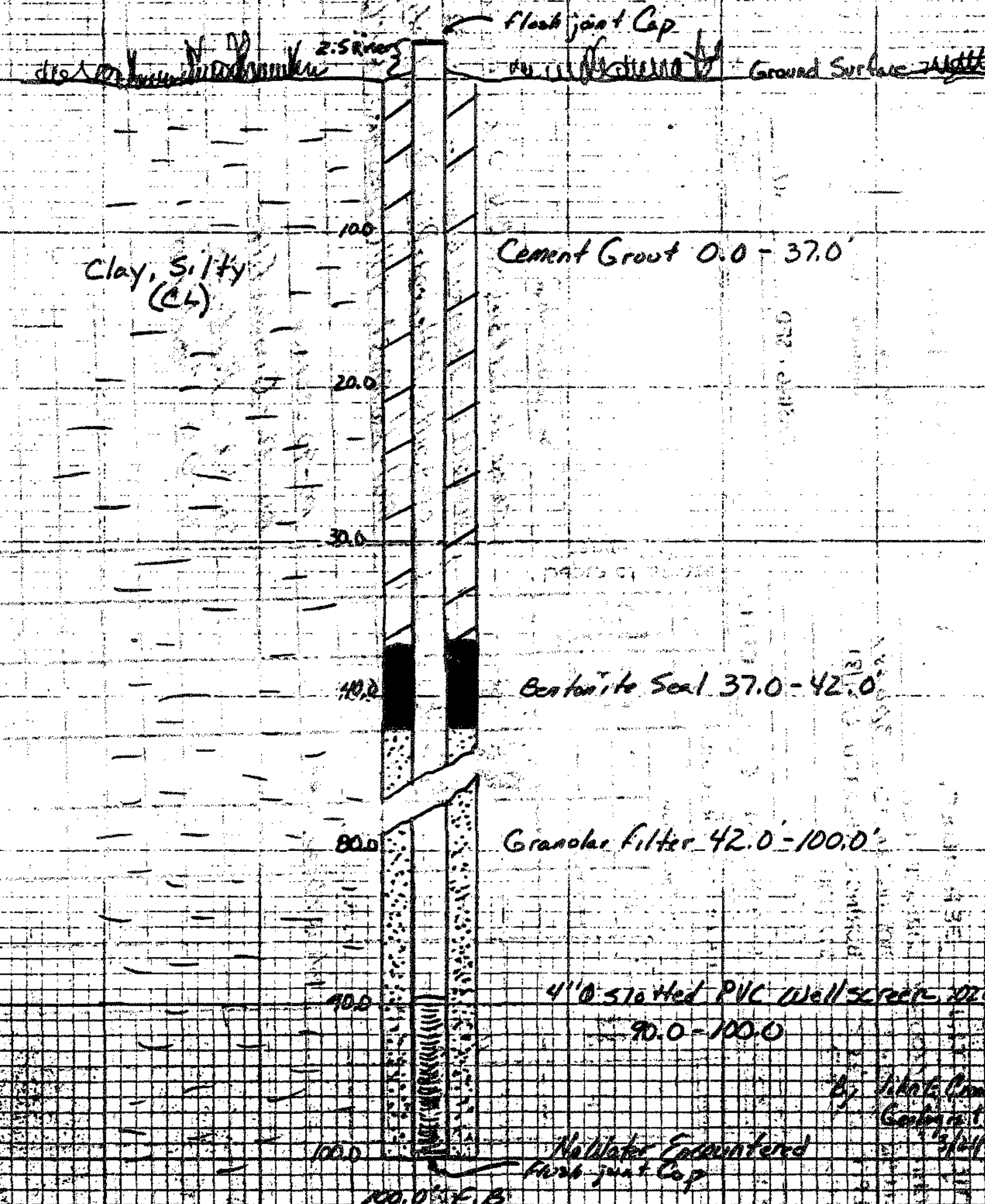
BOULDERS OR OBSTRUCTIONS
At ______ To ______
At ______ To ______

ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC.	DATE 3-21-81	PAGE ___ OF
PROJECT Iowa Army Ammunition Plant STS JOB NO 22017	BY JEC	CHK JE

Well G-26 Installation Diagram

installed 3-21-81



SOIL TESTING SERVICES, 111 PFINGSTEN ROAD NORTHBROOK, ILL. 60062

Sheet 1 of 1

TECHNICIAN J. Crowley
DRILLER G. Dunn
HELPER S. Jones
RIG NO. CME 750

SURFACE ELEV.
BORING STARTED 3-19-81
BORING COMPLETED 3-19-81
STATION
OFF SET

Chicago Phone 273-5440
Northbrook Phone 272-6520

CASING USED ____ SIZE ____

WATER LEVEL OBSERVATIONS
WL: 10' WS OR WD
WL: ____ BCR ____ ACR
WL: ____ AB ____ Hr. AB
WL: ____ 24 Hr. AB

JOB NO. 22017 BORING NO. G-27 CLIENT ____ WEATHER Fair

Sample No.	From	To	Sampling Method	6"	6"	6"	6"	Length Recovered in Feet (R)	Penetrometer Test in TSF (Qp)	Depth of Strata Change (ft)	Sample Description
1	2.4	2.6	ST				0-2	1.1			Clay, v. silty, TR. Roots, Dk Brn, Iron Staining in
			HS				2-4	1.4			spots, moist, soft, light Gray 5Y 7/1 Topsoil & Fill (CL) low plast.
							4-6	1.4			8-10 V. soft & moist
							6-8	1.2			1 Saturated Seam 10-12
							8-10	1.5			
							10-12	1.3			
							12-14	2.0			
2	15.5	15.8	ST				14-16	2.0			Clay, silty, Sandy (v.f. Grain) TR. Gravel, V. Soft, saturated
			HS								at 3 seams < ¼", otherwise v. moist, brown, yellow 10YR 6/8 (CL Low)
3	17.6	17.9	ST				16-18	2.0		16.5	Sand, F.G. Clayey, little Co. Sand, slightly moist, stiff, strong
			HS								Brown, 7.5YR 5/8, Till (Sc)
4	18.5	18.7	ST				18-20	2.0			Sand, f-Med Grain, TR. Clay Saturated 2" Seam, → SM. Remainder
							20-22	1.8			of Sample, Sand Vf. Grain Clayey, saturated, soft,
							22-24	1.0			yell. Brown 10YR 5/8
											Gray silt Seam from 21.5 to 21.9.
											24-14 screen
											24-10 Gran filter
											10-5 Bentonite
											5-0 Grout
											E.O.B. @ 24.0'

ABBREVIATIONS
F.T.-Fish Tail
W.O.-Wash Out
S.T.-Shelby Tube
S.S.-Split Spoon
D.B.-Diamond Bit
P.A.-Power Auger
R.B.-Rock Bit
W.S.-While Sampling
W.D.-While Drilling
B.C.R.-Before Casing Removal
A.C.R.-After Casing Removal
A.B.-After Boring

DRILL CREW CHECK LIST
Topsoil Thickness
Fill Thickness

CAVE IN LEVEL:
While Drilling and Sampling
After Boring Completion

WATER LOSS:
At ____ To ____
Percent Loss
At ____ To ____
Percent Loss

BOULDERS OR OBSTRUCTIONS
At ____ To ____
At ____ To ____

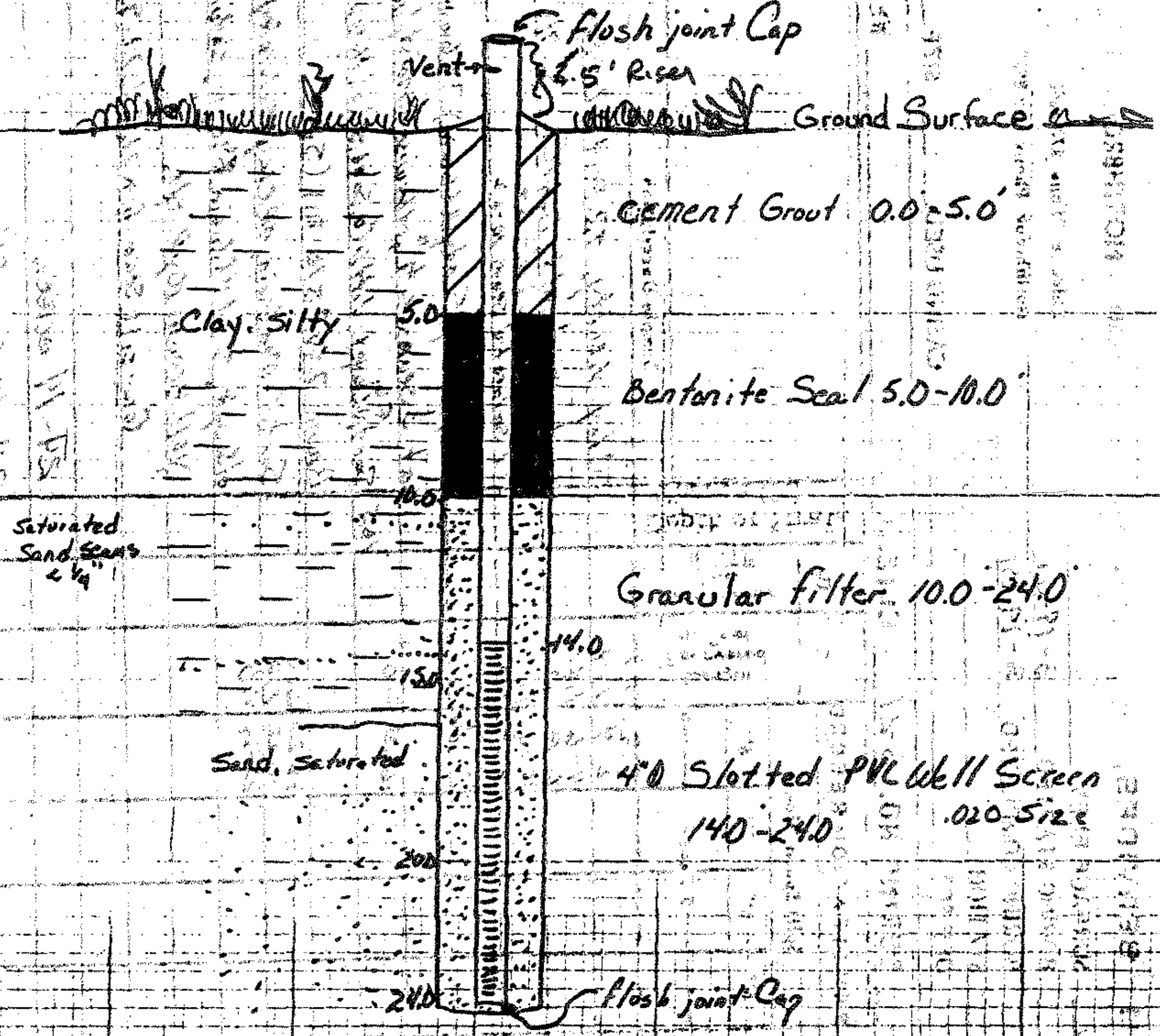
ARTESIAN PRESSURE:
Depth
Height of Soil Rise In Casing

SOIL TESTING SERVICES, INC. DATE 3-20-81 PAGE

PROJECT Twin Army Ammunition Plant STS JOB NO. 22017 BY JEC CHK JEC

Well G-27 Installation Diagram

Installed 3-19-81



Water Level at 10' E.B. at 24.0 ft.

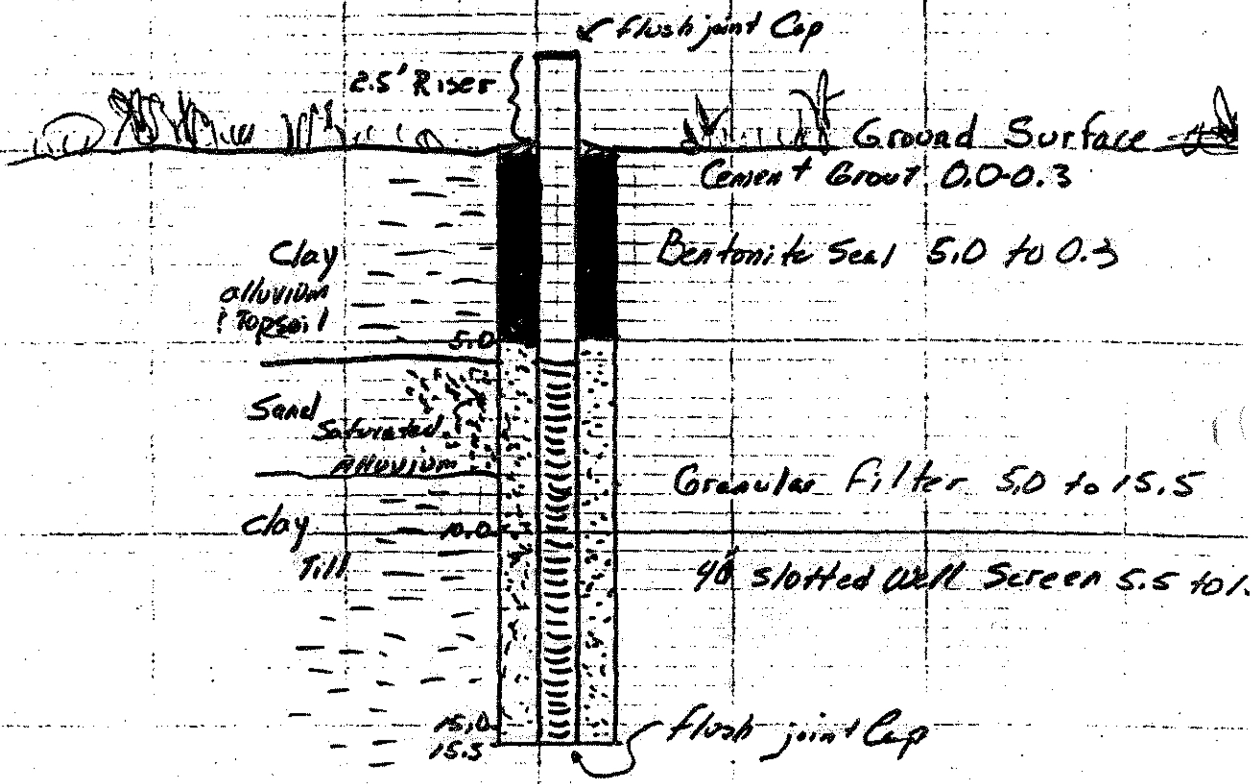
by John E. Chew
Geologist
3/20/8

SOIL TESTING SERVICES, INC. | DATE 5-22-8 | PAGE

PROJECT Iowa Army Ammunition Plant | STS JOB NO 22017 | BY JCC | CHK

Well G-31 Installation Diagram

Installed 5/21/81



15.5 E.B.

By John Cox
Geologist
5/22/8

Report No. 00012659.91

FINAL WORK PLAN

IOWA ARMY AMMUNITION PLANT

PHASE I REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Volume 3 of 3

Health and Safety Plan
and
Quality Assurance Project Plan

Contract No.: DAAA15-90-D-0006
Task No. 0002

Prepared for:

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENGY
Aberdeen Proving Ground, Maryland

Prepared by:

JAYCOR
1901 N. Beauregard Street, Suite 503
Alexandria, VA 22311-1703

CDM FEDERAL PROGRAMS CORPORATION
13135 Lee Jackson Memorial Highway, Suite 200
Fairfax, VA 22033

June 1992

Printed on Recycled Paper

TABLE OF CONTENTS

CONTENTS (Continued)

APPENDICES

LIST OF EXHIBITS

SECTION 1.0

WORK PLAN

SECTION 1.0 WORK PLAN

1.1 INTRODUCTION

This Work Plan consists of the Quality Assurance Project Plan (QAPjP) and the Field Sampling Plan (FSP) for the Remedial Investigation/Feasibility Study (RI/FS) work planned at the Iowa Army Ammunition Plant (IAAP) for USATHAMA. The FSP was presented as Volume 2 of this report. The QAPjP follows as the first part of Volume 3 and outlines the purpose, policies, organization, and operations of the Quality Assurance (QA) and Quality Control (QC) Programs established to support the field sampling and chemical analysis program conducted for USATHAMA at IAAP. Implementation of the QAPjP will help to ensure the validity of data and provide reliable sampling information that will be used to determine the extent of contamination at IAAP. The QAPjP for the IAAP RI/FS work was prepared in accordance with the guidelines presented in the USATHAMA document (January 1990) entitled "Quality Assurance Program." (Where appropriate, Environmental Protection Agency (EPA) protocols are used; however, USATHAMA guidelines always take precedence.)

The Work Plan is published in three volumes. Volume 3, Quality Assurance Project Plan and Health & Safety Plan, addresses the standard practices required for the field collection of samples, field work health and safety practices, and the procedures utilized by the contractor laboratory to analyze samples and provide useable data. The appendices to the QAPjP list the Standard Operating Procedures (SOPs) for the field sampling activities as well as for laboratories involved.

1.2 SCOPE

In June 1990, the U.S. Department of the Army issued Task Order 0002 to JAYCOR. The purpose of Task Order 0002 was to conduct an RI/FS of eight designated Solid Waste Management Units (SWMUs) at IAAP. These original eight areas of concern were derived from the IAAP Resource Conservation and Recovery Act (RCRA) Permit, effective 15 December 1989. Performance of the RI/FS was a requirement of the RCRA Permit.

In September 1990, the U.S. EPA and the U.S. Department of the Army signed a Federal Facility Agreement (FFA) (Docket Number: VII-F-90-0029) under CERCLA Section 120 relative to IAAP. This agreement required that an RI/FS be performed to determine the nature and extent of the threat to public health and the environment caused by the release of hazardous substances at IAAP and to identify, evaluate, and select alternatives for remedial action to mitigate these threats. Pursuant to this agreement, Task 0002 was modified to include, but not be limited to, an additional 35 areas of concern, for a total of 43 presently identified sites to be investigated.

Preliminary assessments (PAs) were conducted on all 43 SWMUs. As a result, one site was recommended for an RI and 42 sites were recommended for site investigation (SI) to determine whether or not an RI will be required. SIs were conducted on all the 43 SWMUs in August 1991; the results are summarized in the FSP.

1.3 OBJECTIVES

The RI/FS of the IAAP is designed to meet the following requirements:

- Identify specific chemical contaminants and their concentrations in the soils, sediments, surface water and groundwater;
- Define sources of contamination;
- Delineate contaminated areas and depths of contamination so that quantities of contaminated media to be processed can be calculated more accurately;
- Determine characteristics of the media that would affect the feasibility of the remedial alternative, such as soil permeability for soil-vapor extraction; and,
- Define pertinent site characteristics not discovered earlier in the initial site characterization effort.

1.4 SCHEDULE

The RI/FS is scheduled to be conducted during a 12 month period beginning in April 1992. After receiving comments from USATHAMA (and any other reviewers) and incorporating these comments into the Work Plan, a final plan will be resubmitted to USATHAMA. Exhibit 1-1 is the Project Schedule. This exhibit reflects the original IAG schedule and does not reflect schedule delays and extensions. The critical path table (Exhibit 10-2) located in Section 10, Project Management, more accurately reflects project deadlines.

1.5 BACKGROUND

The IAAP is a government-owned contractor-operated installation under the command of the U.S. Army Armament, Munitions, and Chemical Command (AMCCOM). The operating contractor is Mason and Hanger/Silas Mason Company.

IAAP is located in Middletown, Iowa and is approximately 19,000 acres in size. This installation has been operating since 1941 at varying rates of production. IAAP is a load, assemble, and pack operation producing a variety of conventional ammunition and fusing systems.

Munition production and renovation operations at IAAP have resulted in the discharge of wastewaters containing explosive and explosive by-products to surface water systems. Other potential contamination sources have resulted from a variety of activities including: explosives test firing, coal storage, Atomic Energy Commission (AEC) operations, metal plating activities, as well as disposal operations that have included explosives burning and detonation, and plating waste landfilling. Any of these operations may have potentially contaminated groundwater, surface water, soil, and sediment.

Eight areas were identified for inclusion in the RI/FS under the RCRA Part B Permit that became effective in 1989. In addition to these eight sites, various studies conducted for EPA and USATHAMA have identified 35 SWMUs or areas of concern. A total of 43 sites were the focus of the SI. These locations or sites are listed in Exhibit 1-2 and a SWMU map is provided as Exhibit 1-3. Specific details concerning the individual sites, contaminants found at each site, and the environmental setting are presented in Volume 2, the FSP.

EXHIBIT 1-1 PROJECT SCHEDULE

Subtask 1: SITE INVESTIGATION (SI) AND RI/FS WORK PLAN

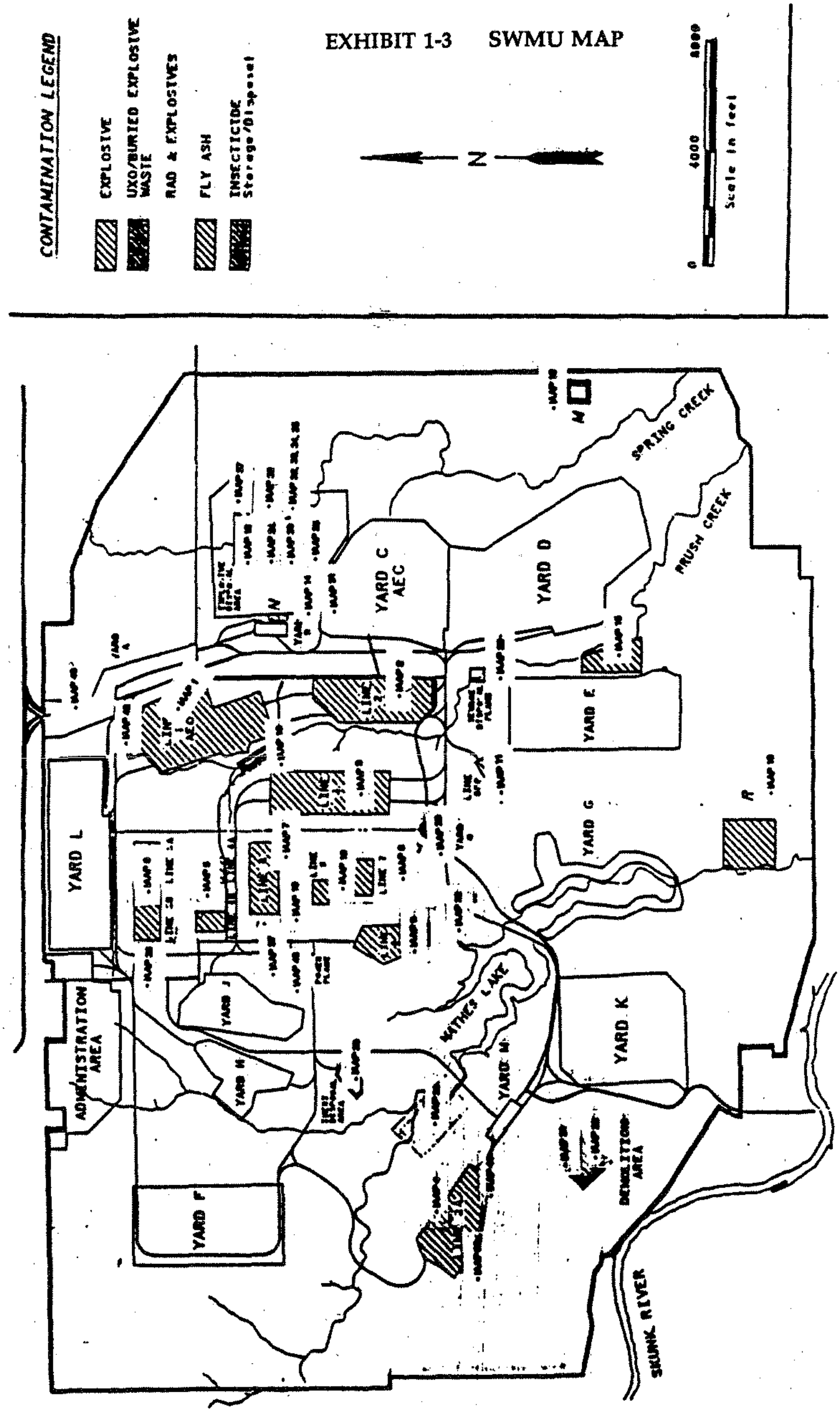
Description	No.	Primary Recipient	Duration (days)	Deadline
Pre Draft Concept Prog Plan	6	Army	30	08 May 91
Draft Concept Prog Plan	18	Army/EPA	42	19 Jun 91
Draft Final Concept Prog Plan	12	Army/EPA	90	17 Sep 91
Final Concept Prog Plan	24	Army/EPA		(To be determined)
Pre Draft SI Work Plan and Report	6	Army		(To be determined)
Draft SI Work Plan and Report	18	Army/EPA		(To be determined)
Draft Final SI Work Plan and Report	12	Army/EPA		(To be determined)
Final SI Work Plan and Report	24	Army/EPA		(To be determined)
Pre Draft RI/FS Work Plan	6	Army	90	04 Nov 91
Draft RI/FS Work Plan	18	Army/EPA	42	16 Dec 91
Draft Final FI/FS Work Plan	12	Army/EPA	90	15 May 91
Final RI/FS Work Plan	24	Army/EPA		(To be determined)

Description	Schedule	IAG Date
BASELINE RISK ASSESSMENT		
Predraft	22 Apr 93	19 Apr 93
Army Review	12 May 93	10 May 93
Draft	02 Jun 93	31 May 93
Review	16 Jul 93	15 Jul 93
Final	30 Aug 93	29 Aug 93
FEASIBILITY STUDY		
Predraft	21 Jan 94	15 Oct 93
Army Review	10 Feb 94	05 Nov 93
Draft	01 Mar 94	26 Nov 93
Review	08 Apr 94	10 Jan 94
Final	20 May 94	24 Feb 94
PROPOSED PLAN		
Predraft	19 May 94	27 Feb 94
Review	10 Jun 94	20 Mar 94
Draft	01 Jul 94	10 Apr 94
Review	17 Aug 94	25 May 94
Final	29 Sep 94	09 Jul 94
Notice of Availability	14 Oct 94	09 Jul 94
Public Comment	15 Nov 94	23 Aug 94
Public Meeting	28 Oct 94	08 Aug 94
Pre-Record of Decision	01 Dec 94	10 Sep 94
Review	22 Dec 94	01 Oct 94
Draft Record of Decision	13 Jan 95	22 Oct 94
Review	13 Feb 95	06 Dec 94
Final Record of Decision	14 Mar 95	20 Jan 95

EXHIBIT 1-2 LIST OF SWMUs CONSIDERED UNDER SITE INVESTIGATION

1. Line 1
2. Line 2
3. Line 3
4. Line 3A
5. Line 4A and 4B
6. Line 5A and 5B
7. Line 6
8. Line 7
9. Line 8
10. Line 9
11. Line 800 Pink Water Lagoon
12. Explosive Disposal Area
13. Incendiary Disposal Area
14. Boxcar Unloading Area
15. Old Fly Ash Waste Pile
16. Former Line 1 Impoundment
17. Pesticide Pit
18. Possible Demolition Site
19. Contaminated Clothing Laundry
20. Inert Disposal Area
21. Demolition Area
22. Petroleum Leak/Spill Site
23. Deactivation Furnace
24. Contaminated Waste Processor
25. Explosive Waste Incinerator
26. Sewage Plant/Sludge Beds
27. Fly Ash Landfill
28. Construction Debris Landfill
29. Line 3A Sewage Plant/Sludge Beds
30. Firing Site Area
31. Yard B Ammunition Box Chipper Disposal Pit
32. Burn Cages
33. Burn Cages Ash Landfill
34. West Burn Pads
35. West Burn Pads Landfill
36. North Burn Pads
37. North Burn Pads Landfill
38. Building 600-86 Septic System
39. Fire Training Pit
40. Roundhouse Transformer Storage
41. Line 3A Pond
42. Abandoned Coal Storage
43. Fly Ash Disposal Area

EXHIBIT 1-3 SWMU MAP



00012659.91

Report No. 00012659.91

FINAL WORK PLAN

IOWA ARMY AMMUNITION PLANT

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Quality Assurance Project Plan

Contract No: DAAA15-90-D-0006
Task No. 0002

Prepared for:

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground, Maryland

Prepared by:

JAYCOR
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SECTION 2.0 QUALITY ASSURANCE PROJECT PLAN

2.1 PROJECT DESCRIPTION

2.1.1 Purpose

The purpose of this Quality Assurance Project Plan (QAPjP) is to:

- Establish function-specific responsibilities and authorities for data quality;
- Establish procedures to ensure that all data are collected under conditions of analytical system control;
- Establish procedures for recognizing and correcting out-of-control situations;
- Establish procedures to ensure that nonlaboratory activities do not compromise analytical data quality; and,
- Establish recordkeeping procedures commensurate with project data uses.

2.1.2 Scope

This QAPjP outlines the purpose, policies, organization, and operations of the quality assurance (QA) and quality control (QC) program established to support the sampling and chemical analysis program conducted for USATHAMA at IAAP. Implementation of this QAPjP will help to ensure the validity of data and provide reliable sampling information that will be used to determine the extent of contamination during the Remedial Investigation/Feasibility Study (RI/FS).

In implementing the QA/QC procedures in this QAPjP, it is important to recognize the difference between QA and QC. QA refers to the system whereby the JAYCOR Team will provide assurance that monitoring of quality related activities has occurred. Frequently, QA is interpreted as a recordkeeping system to ensure documentation of all activities, including traceability, completeness, and security of documents.

QC refers to those specific actions taken to ensure that system performance is consistent with established limits. These actions ensure accuracy, precision, and comparability of results. QC activities are conducted within a QA system to ensure that proof of QC exists. Implementation of the QA Program in the field and laboratory is designed to assure that data are collected under in-control conditions, rather than simply to assure documentation of poorly conducted analyses.

2.1.3 Application

The emphasis of the QAPjP centers on activities that generate analytical data. In this context, analytical data includes those aspects of field sampling that may affect the chemical integrity of samples as well as activities at the analytical laboratory.

Specific requirements are provided for the acquisition and chemical analysis of environmental samples. The general principles described herein are applicable to the field and laboratory activities anticipated for the RI/FS QAPjP at IAAP (USATHAMA 1990).

2.2 PROJECT ORGANIZATION AND RESPONSIBILITY

Overall project direction for the RI/FS at the IAAP will come from the Installation Restoration Division of USATHAMA at Edgewood Arsenal, Aberdeen Proving Ground, MD. Site-specific coordination will be obtained through the Environmental Office at the IAAP. Any modifications to the plan or to field or laboratory procedures will only be undertaken with the approval and under the direction of USATHAMA. This section describes the project organization for the RI/FS and responsibilities for each member of the JAYCOR Team.

2.2.1 Project Organization

The project organization for management of the IAAP RI/FS is designed to provide clear program authority supported by a management control structure (Exhibit 2-1). This control structure provides:

- Clearly identified lines of communication and coordination;
- Monitoring of program budget, schedules, and financial performance;
- Management of key technical resources;
- Monthly financial management and progress reports; and,
- A means to implement and monitor health and safety, quality assurance, and quality control functions.

Exhibit 2-2 is a listing of personnel assigned to this project and their specific responsibilities. Should any personnel changes occur during the course of the project, the JAYCOR Team will notify USATHAMA of the change and submit the necessary information regarding the official function, responsibility, authority, and experience of the newly assigned staff as may be required.

JAYCOR is the prime contractor for the IAAP project, and as such will be ultimately responsible for overall project management, coordination with USATHAMA, and QA/QC of the work performed as part of this project. Subcontractors to JAYCOR and their project responsibilities are:

- CDM Federal Programs Corporation - Field sampling and testing;
- Burns and Roe Environment Services, Inc. - Field sampling and testing; and,
- Environmental Services and Engineer - Chemical analysis of aqueous and soil samples.

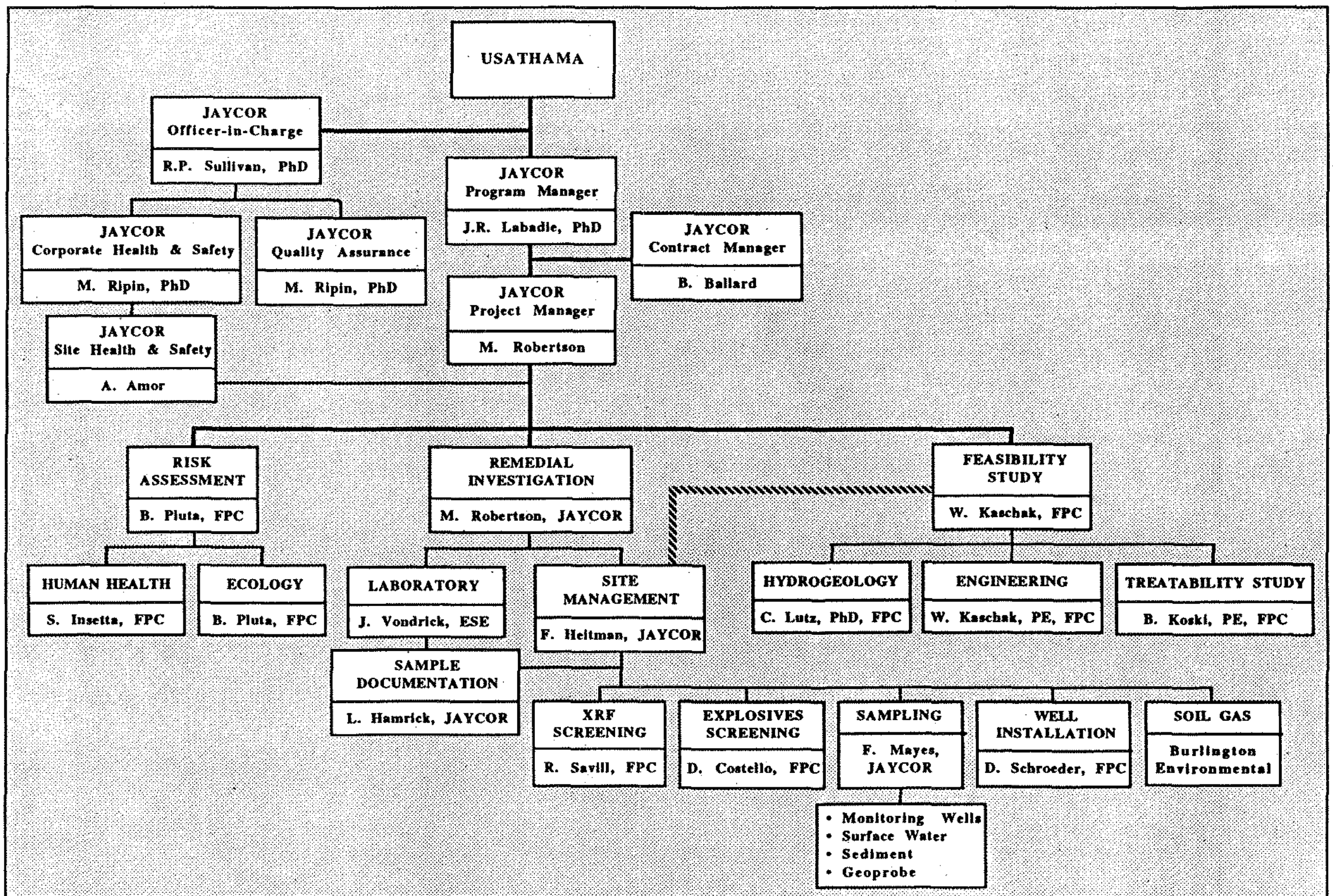

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Figure 2-1. Organizational Chart

EXHIBIT 2-2 MANAGEMENT PERSONNEL

Name	Role	Affiliation	Telephone
Robert P. Sullivan, PhD	Officer-in-Charge	JAYCOR	703-671-7900
Barbara Ballard	Contract Manager	JAYCOR	703-847-4145
John Labadie, PhD	Program Manager	JAYCOR	703-671-7900
Mary Robertson	Project Manager	JAYCOR	703-671-7900
Marilyn J. Ripin, PhD	Quality Assurance Manager	JAYCOR	703-671-7900
Steven M. Gertz, PhD	Subcontract/Project Manager	Burns & Roe	215-354-0500
William Kaschak	Subcontract/Program Manager	CDM FPC	703-968-0900
Joseph Vondrick	Laboratory Project Manager	ESE	904-332-1703
Joe Owusu-Yau	Laboratory QA Coordinator	ESE	904-332-1703

2.2.2 Project Responsibilities

The Program Manager, Dr. John Labadie, PhD, is responsible for the execution of all field sampling and testing and analytical activities performed as part of the RI/FS sampling at IAAP. His responsibilities include assuring that all field and laboratory activities are carried out in strict conformance with the procedures of the QAPjP. Dr. Labadie will coordinate all interactions with USATHAMA.

The Project Manager, Ms. Mary Robertson, reports to Dr. Labadie and is responsible for managing all field requirements of the IAAP Project. Dr. Gertz's and Mr. Kaschak's responsibilities include ensuring that all field activities are carried out in strict conformance with the overall SAP.

The Field Team Manager is David Rosa, P.E. His responsibilities will include directing all efforts in the field. These responsibilities include ensuring that all samples are collected, preserved, packaged, documented, and properly shipped to ESE for analysis. Further, the Field Team Manager is responsible for ensuring that field procedures of the FSP are rigorously followed during the sampling task.

Marilyn Ripin, PhD, the Quality Assurance Manager, is responsible for overseeing all aspects of QA/QC and reports to the Program Manager. Dr. Ripin will be responsible for conducting procedural audits during this project.

The Health and Safety Supervisor is Alan Amor. The Health and Safety Supervisor is responsible for the health and safety aspects of all field work performed as part of this project. His responsibilities include ensuring that all field activities are carried out in strict conformance with the Site-Specific Health & Safety Plan (HASP), USATHAMA, OSHA, and other pertinent requirements.

ESE's responsibilities include sample analyses, analytical data interpretation, and reporting results of chemical analyses through the IRDMIS data base. ESE is a USATHAMA-certified laboratory and, as such, maintains laboratory QA/QC procedures that are consistent with the USATHAMA Quality Assurance Program Plan (January 1990). These QC procedures, Standard Operating Procedures (SOPs), and the use of USATHAMA-certified analytical methods ensure that the analytical results are of acceptable accuracy and precision to support the IRDMIS data base.

The ESE Project Manager is Mr. Joseph Vondrick. The Project Manager is the primary laboratory contact for the project. His responsibilities include coordinating sample analysis activities, implementing the USATHAMA QA Program, completing method certifications, and ensuring that corrective action is taken to correct problems as they occur. The Project Manager oversees the entry of chemical data into the IRDMIS and submittal of analytical data.

The ESE Laboratory QA Coordinator, Mr. Joe Owusu-Yau, is responsible for ensuring adherence to USATHAMA QA/QC procedures, laboratory SOPs, and certified methods analyses. He establishes sample lots, including appropriate QC samples, according to the certified method, reviews all laboratory data packages, and prepares and submits QC reports and control charts.

A copy of ESE Laboratories' SOP is included as Appendix G of the QAPjP.

2.3 DATA QUALITY OBJECTIVES FOR FIELD AND LABORATORY MEASUREMENTS

Data quality objectives (DQOs) are qualitative and quantitative statements developed by data users to specify the quality of data needed from a particular data collection activity to support specific decisions or regulatory actions. The objective of this project is to ensure that the data collected is of known quality with respect to precision, accuracy, completeness, representativeness, and comparability.

DQOs for precision, accuracy, completeness, representatives, and compensability are defined as follows:

- Precision
  - Precision refers to the level of agreement among repeated measurements of the same characteristic, usually under a given set of conditions. Precision is expressed quantitatively as the measure of variability of a group of measurements compared to their average value. For this task, the precision of the total measurement system will be assessed through the collection and analysis of field duplicated samples. Analytical precision will be assessed through the analysis of laboratory replicates. The analytical precision limits established by the certified laboratory will be used for this project.

- Qualitative data quality objectives for the RI/FS include:
  - Sample soil, sediments, and groundwater according to standard procedures;
  - Analyze internal and laboratory quality control samples to ensure validity of data;
  - Define sources of contamination and contaminant concentrations in all media sampled;
  - Determine soil, groundwater and other media's characteristics that affect soil, groundwater and other media's treatability; and
  - Conduct a risk assessment and determine soil, groundwater and other media's clean-up levels.

- Accuracy
  - Accuracy refers to the degree of agreement of a measurement with an accepted reference or true value. Accuracy is a measure of bias in a measurement system. Sources of error that introduce bias are the sampling process, field contamination, preservation, sample handling, matrix, sample preparation, analysis techniques and data reduction.
  - Analytical accuracy will be assessed using standard reference materials, and surrogate spikes. The analytical accuracy limits established by the certified laboratory will be used for this project. It is not planned to assess total measurement accuracy for other field measurements due to the difficulty of spiking samples in the field; however, some information regarding total accuracy may be obtained by reviewing calibration results of blank analyses.

- Completeness
  - Completeness is a measure of the amount of valid, usable data obtained from a measurement system compared to the amount that was expected under normal conditions. A certain amount and type of data must be collected for conclusions based on that data to be valid. For this project, the objective for completeness is 90%.

- Representativeness
  - Representativeness for each media is addressed below:
    - Soils - Soil samples will be collected directly from the sampling equipment as stated in the FSP. All samples except volatiles will be homogenized prior to collection to ensure that samples are representative.
    - Surface water and sediments - Surface water will be collected beginning downstream and proceeding upstream. When possible, surface water samples will be collected directly into sample bottles. Surface water samples will be obtained before the corresponding sediment sample to prevent undue disturbance to the sediment and possible introduction of contamination into the water samples.
    - Groundwater - To obtain a representative sample of groundwater, the standing water in the well will be purged before sampling.

Purging the well allows fresh groundwater, representative of the formation, to enter the well. A minimum of five well volumes will be purged until indicator parameters have stabilized.

- Comparability
  - Comparability will be ensured through the use of SOPs for sampling and field operations that are contained in the appendices. The same SOPs and types of sampling equipment will be used for all phases of this task in order to increase comparability of results. The analytical laboratories will use SOPs as described in their laboratory QA plans. USATHAMA-approved methods will be used for all analysis. Results will be reported as µg/l for aqueous samples and µg/g for soil and sediment samples.

- Method Detection Limit
  - Procedures for establishing method detection limits are given in the laboratory QA plans. The laboratory will report the USATHAMA required detection limits or lower detection limits if achieved by the laboratory.
  - Detection limits will not be determined for analyses performed using field instruments. The detection limits established by the manufacturer will be used as a guideline.

2.4 BORING/MONITORING WELL INSTALLATION

Phase I of the RI/FS will include no boring/monitoring well installations. Phase II of the RI/FS may include boring/monitoring well installations depending on the results of the Phase I sampling and screening.

Included within this section is preliminary information discussing unexplored ordinance (UXO) and drilling concerns associated with boring/monitoring well installation.

Further information will be provided as attachments to this document and the Health and Safety Plan from drilling and UXO subcontractors before beginning Phase II field work if any well installation is warranted. As of this date, USATHAMA's UXO technical support group will provide UXO support to JAYCOR's efforts at IAAP during the RI/FS.

During the development of boring/monitoring wells at the SWMU sites, the locations will be marked, during the site reconnaissance, with four-foot wooden stakes and labeled with a well/boring site identification. The elevations of wells will permit the calculation of corrected water level elevations from which a groundwater contour map can be generated and the groundwater flow direction(s) can be determined. The horizontal coordinates of each well will establish an accurate location for each well and will permit the calculation of groundwater gradients.

All of the proposed boring/monitoring well and drilling rig locations will be cleared for underground utilities and other buried objects, to include the possibilities of unexploded ordnance. A geophysical survey will be conducted with a Ferex locator to locate metallic items to a minimum depth of three feet. All metallic contacts will be marked with stakes and alternate boring/monitoring well locations and/or drilling rig routes will be selected. All the necessary permits for boring/well installation will be obtained by JAYCOR.

A geologist experienced in conducting subsurface investigations will supervise the drilling of each borehole, the installation of the monitoring wells, and the collection of samples. The supervising geologist will draft continuous boring logs by examining samples and drill cuttings and classifying the lithologies encountered. The supervising geologist will prepare boring logs and well schematics. The supervising geologist will also ensure the correct boring/monitoring well locations, and that all operations are completed in a safe manner. In addition, a bound field logbook will be maintained by the supervising geologist to make note of all technical data, the progression of drilling operations, well development information, any problems encountered, etc. The original field notes, boring logs and well schematics, and well development records will be submitted to the appropriate authorities in accordance with their requirements. An experienced, qualified, and licensed driller will be identified to perform the drilling the borings and the installation of the monitoring wells.

A hollow-stem auger (HSA) method of drilling (10-1/2 inch OD, 6-5/8 inch ID) will be used to advance the borings at the SWMU sites. Soil samples can be obtained through the hollow stem of the augers with a split-spoon sampler. The split-spoon method to be used to collect samples will be the Standard Penetration Test (ASTM D-1586). This method consists of an 18-inch or 24-inch sampler being driven into the soil by dropping a 140-pound weight (also known as a hammer) a distance of 30 inches. The number of blows of the hammer needed to drive the sampler six inches in penetration will be recorded onto the boring logs by the supervising geologist. An organic vapor analyzer (OVA) will be used to scan drill cuttings and split-spoon samples for soil vapors (Appendix F). The use of the OVA and visual observations, will be used to make a field determination as to the presence of contamination in the subsurface. If contamination is apparent, continuous split-spoons will be obtained for the entire depth of the boring. If there is no apparent contamination, split-spoon samples will be obtained in five-foot intervals. All the soil samples obtained during the advancement of the borings will be labeled and stored in accordance with stated requirements.

During the advancement of the borehole, the auger will be retracted every four feet and a Ferex locator will be used down the borehole to locate metallic contacts. This procedure will be repeated until the drilling rig has advanced the borehole to a depth of at least 20 feet or until the groundwater is found since the detector will not function under water. If a significant metallic contact is located, the boring/monitoring well location will be abandoned and moved at least 10 feet.

Ten percent of soil samples collected by split-spoon sampling will be submitted to a soil laboratory for the analysis of Atterburg limits and grain size distribution. The Atterburg limit test (liquid limit, plastic limit, and plasticity index) and the grain size distribution analysis will be performed to classify the soils according to the Unified Soil Classification System for correlation purposes, and to determine the physical properties of the soils that could affect contaminant occurrence and migration. The Atterburg limits test will be performed in accordance with ASTM Test Procedures D-423, "Liquid Limit of Soils" and D-42, "Plastic Limit and Plasticity Index of Soils." These analyses, coupled with the results of chemical analyses, will permit an evaluation of the site's geochemistry; and hence, a further evaluation and refinement of contaminant transport and possible chemical breakdown products attributable to contaminants present at the site.

Upon completion of a boring, a monitoring well could be installed according to appropriate geotechnical requirements. In wells to be completed in the overburden, the monitoring well will first be installed through the hollow stems of the auger flights to prevent collapse. In wells to be completed in bedrock, NX rock core will be collected, labeled, photographed, and stored in accordance with appropriate requirements. The bedrock hole will then be overreamed to a nominal 6-1/2 inch bedrock hole. The overreaming will be done by utilizing either approved water or mud rotary drilling techniques. Prior to the installation of monitoring wells, a request for approval will be submitted of the bentonite and granular filter pack to be used in all of the monitoring wells. If pre-approved by the contracting agency, the only drilling fluid additive to be used will be bentonite.

The drilling rig and all associated equipment, including all sampling equipment, will be decontaminated prior to its arrival at the site and after the drilling of each boring. The drilling rig and equipment will be decontaminated using a steam/high pressure cleaning procedure. The steam temperature will be 220° F at the pressure of 1,000 pounds per square inch (psi). The decontamination areas will be pre-approved by the IAAP contracting agency and will be located as close to the proposed monitoring wells as is possible, so as to minimize the travel distance of the drilling rig for decontamination. All decontamination fluids will be containerized for disposal.

The construction of the monitoring wells and the well materials will be in accordance with geotechnical requirements (See Appendix J - USATHAMA Geotechnical Requirements). The wells will be constructed of new four-inch internal diameter schedule 40 polyvinyl chloride (PVC). However, if the geologic conditions warrant, two-inch wells and two-inch PVC will be installed with the contracting agency approval. The casing pipe and screen will be threaded and flush jointed. The length of the well screen will be approximately 15 feet, which will be sufficient to allow for water-level fluctuation in the groundwater system. An appropriate slot size for the well screen will be selected on the basis of the grain size distribution analysis. The well screen will be factory slotted, capped at the bottom, and set at not more than three feet above the bottom of the borehole. Solid casing pipe will be installed above the screen so as to provide a 2-1/2 feet stick-up above the top of the borehole.

The annular space between the screen and the borehole will be filled with a filter pack, which will be selected on the basis of the slot size of the well screen. A representative sample of the filter pack material will be submitted to the contracting officer for evaluation and approval prior to any drilling. The filter pack will extend from the bottom of the screen to as much as five feet above the top of the screen. A seal of bentonite pellets or granules will be emplaced upon the filter pack to prevent the vertical infiltration of surfacewater along the annulus of the well. The minimum thickness of the bentonite seal will be five feet. The remaining annular space between the top of the bentonite seal and the ground surface will be grouted. The grout will be composed of 20 parts Type II or V Portland cement to one part bentonite and eight gallons of water per 94 pounds of cement. The bentonite will be added to the cement-water mixture until well blended and lump free, and the grout will be pumped through a tremie pipe until undiluted grout flows to the ground surface.

Before the grout has set, the wells will be completed with a five-foot length of protective steel casing. The clean, steel casing will be installed over the PVC well stick-up and to a depth of approximately 2-½ feet below the ground surface and no more than 0.2 feet from the top of the protective casing to the top of the well casing. This, or a smaller spacing, is critical for subsequent water level determination via acoustical equipment. A mortar collar will be emplaced internally within the protective steel casing and outside the PVC well stick-up to a height of six inches above the ground surface. A hole will be drilled through the steel casing just above the mortar collar to allow for internal drainage. The protective steel casing will be painted with orange paint after the grout around the casing has thoroughly dried. An identifying number and date of installation will be painted on the well in white. The well will be secured with a hasp and lock to prevent unauthorized opening. Four steel posts will be set about four feet from the well and in a radial manner to afford additional protection. The area between the posts and the well will then be covered with six inches of gravel.

2.4.1 Monitoring Well Development

Each monitoring well will be developed to remove all material that resulted from the installation process and may clog the well screen. Well development will help to ensure representative water levels and representative groundwater samples. The wells will be developed with the over pump method of well development. A submersible pump will be used since it is generally easy to use and is effective at all depths below 20 feet of ground surface. Prior to its use, the seals of the pump will be checked to insure they are in good condition and the external case of the pump will be steam cleaned. All pump-associated tubing and hoses and external stages of the pump will be washed with approved water prior to insertion in each well. Each monitoring well will be developed no later than seven calendar days after the placement of the mortar collar, but no sooner than 48 hours. The monitoring wells will be pumped until the discharging water is relatively free of sediment or discoloration and the sediment thickness remaining in the well is less than one percent of the screen length. At least five standing water volumes (calculated as the volume of water in the well screen, casing, and saturated annulus) will be removed.

A one-pint sample of the last water removed from the well during development will be collected and retained for visual inspection and will be submitted to the supervising geologist within three working days. If the groundwater sample remains discolored or excess sediment remains in the well screen after five standing water volumes have been removed, or if the well's recovery is so slow that five volumes cannot be removed in 48 hours, the supervising geologist will request guidance from the contracting agency. During development, field measurements of temperature, pH, and specific conductance will be made to help establish a data baseline for these parameters and to characterize the geochemistry of the groundwater system. All appropriate field measurements will be recorded in the bound field logbook. The well development records will be submitted to the contracting agency by the supervising geologist within three working days after each well has been developed.

The discharged water from the wells during development will be retained and containerized in accordance with the contracting agency requirements.

2.4.2 Surveying

The locations of the new monitoring wells will be surveyed to determine horizontal coordinates and vertical elevations in order to locate them exactly and to determine their correct elevations. The coordinates of each well location will be determined with respect to either of the Universal Transverse Meridian (UTM) State Planar Coordinate Systems and will be within +3.0 feet. The elevations of the wells and the ground surface will use the National Geodetic Vertical Datum (NGVD) and will be determined to within 0.05 feet.

The surveying will be conducted and completed by a registered surveyor within 15 days of installing the last well. The measurement points of each well will be the pre-established mark of the top of casings of the wells and the ground surface. The measurement point for ground surface will be the natural ground surface underlying the gravel pad surrounding the well.

The subsurface elevation, horizontal coordinates, aquifer code, and bore pointer will be entered into Data Management System in accordance with the contracting agency requirements. Copies of the original surveying report will be forwarded to the IAAP contracting agency within two weeks of completion of this effort.

2.4.3 Monitoring Well Gauging

The static water levels in the monitoring wells will be gauged and recorded at least three times. The wells will be gauged prior to well development, 24 hours after development, and prior to sampling.

The static water level of the wells will be measured to an accuracy of 0.01 foot. An established mark on the top of the PVC well casing will be used as a measurement reference point to help insure consistent and accurate water levels. The wells will be gauged with an electronic water level probe. The gauging probe will be decontaminated between wells to prevent cross contamination. Approved water will be used for the wash and rinse decontamination procedure. The recorded water levels that will be measured 24 hours after development and prior to sampling will be cross checked for any anomalies. The gauging data will be recorded in the bound field logbook by the supervising geologist and will be evaluated and used later to generate a groundwater contour map.

2.4.4 Boring and Monitoring Well Abandonment

If a boring or a monitoring well must be abandoned during installation or upon completion, authorization for abandonment will be requested by telephone from the contracting agency. The designation of the boring/monitoring well, the status of the boring/monitoring well, and the reason for abandonment will be submitted during the request for authorization. Within five working days, a written request will be forwarded to the contracting agency.

The boring/monitoring well to be abandoned will be sealed to prevent the vertical migration of surfacewater along the annulus of the boring/monitoring well. The procedure for sealing the boring/monitoring well will be to insert a tremie pipe to the bottom of the boring/monitoring well. Grout will then be pumped through the pipe until undiluted grout flows to the ground surface. This procedure will help to ensure that the entire length of the boring/monitoring well has been sealed. The boring/monitoring well will be checked for grout settlement after 24 hours of the grouting procedure. If a depression occurs due to settlement, the depression will be filled with grout and will be checked 24 hours later. The checking and grouting process will be repeated until firm grout remains at ground level.

The grout to be used for abandonment will be composed of 20 parts (by weight) of either Type II or V Portland cement to one part of powdered bentonite, with eight gallons of approved water per 94 pound bags of cement. The bentonite will be added after the required amounts of cement and water have been mixed. The grout will be mixed on-site in a rigid container until it is thick and has a lump-free texture. No additives or drill cuttings will be mixed into the grout.

2.4.5 Aquifer Testing

Selected monitoring wells will be tested if additional information is needed to more completely characterize and assess the groundwater conditions beneath the specific area, especially the migration potential of groundwater contamination. The testing will provide data from which hydraulic properties, including hydraulic conductivity, transmissivity, flow velocity, and storage coefficient, can be calculated.

The recommendation for aquifer testing and the recommendation of which wells should be tested, will be based on data obtained during the previous tasks of the geotechnical investigation and the analytical laboratory results of the groundwater samples obtained from the on-site monitoring wells. The selection of the wells to be tested will be made in conjunction with the contracting agency.

Single well tests (commonly referred to as slug tests) will be used to test the localized groundwater system in which the wells are installed. Slug tests can be conducted relatively quickly and easily, and can provide reliable data from which hydraulic conductivities can be calculated. In addition, pump tests can provide information on the intercommunication of different groundwater systems.

A rising head method or falling head method of slug testing will be performed. Both methods measure changes in hydraulic head over time. The procedure for conducting a rising head slug test will involve instantaneously removing a predetermined volume of water from the well with a bailer and measuring the rise in hydraulic head in the well. The procedure for conducting a falling head slug test will be to instantaneously introduce a predetermined volume of water into the well with a bailer and measuring the fall in hydraulic head. Both types of slug tests are conducted until the hydraulic head has recovered to 90 percent of the static water level that was gauged just before the start of the test. A transducer type continuous data logger instrument will be used to record the water levels in the well being tested and in the nearby observation wells.

The aquifer testing equipment (bailer, hoses, and tubing, pressure transducers, etc.) that may be used for aquifer testing will be decontaminated prior to testing wells to prevent the introduction of potential contamination. Approved water will be used for the wash and rinse decontamination procedure. If pump tests are conducted, the submersible pump will be steam cleaned.

2.4.6 Geophysical Survey

A geophysical survey will be conducted as part of the geotechnical investigation to locate and avoid explosive hazards to field crews and drilling equipment. The geophysical survey will include escort to the boring/monitoring well drilling locations and downhole surveys ahead of the drill bit to a safe depth.

A visual inspection of the proposed route the drilling rig and field crews will take from the road to the boring/monitoring well sites will be made by a clearance team of qualified unexploded ordinance (UXO) technicians. The UXO technicians will, if necessary, clear a path 15 feet wide. If unexploded ordinance is encountered, the UXO technicians will attempt to find a clear path around the ordinance. The UXO technicians will mark the outer perimeter of the cleared area with stakes. The UXO technicians will then conduct a geophysical survey of the area with a Ferex locator to locate metallic materials to a minimum depth of three feet. All metallic contacts will be marked with stakes and an alternate clear path for the drilling equipment and field crews will be used.

2.4.7 RECON Multimedia Sampling System (Geoprobe)

In an effort to more effectively focus field sampling and limit laboratory sample analyses, a RECON Multimedia Sampling System (Geoprobe) will be operated by our subcontractor, Burlington Environmental Inc., for the use of taking subsurface soil samples, piezometer installation, and soil gas surveys.

The procedures for subsurface soil sampling, piezometer installation, and soil gas surveying using the Geoprobe are presented in Appendix G. These procedures have been developed by Burlington Environmental Inc. specifically for the Geoprobe and have been slightly modified to meet IAAP site specific details.

Decontamination procedures of the Geoprobe equipment will follow those procedures as outlined in Appendix B, Section 4, for the decontamination of all equipment. Disposal of IDW using the Geoprobe (Decon water, cuttings, purge water, etc.) will also follow IDW disposition practices on the site which is described in Appendix B, Section 5.

2.5 FIELD SCREENING

2.5.1 Nitroaromatics and Nitroamines in Soil and Water

In an effort to more effectively focus field sampling and limit laboratory sample analyses, field screening of both water and soil samples will be performed for Nitroaromatic and Nitroamine explosives. Field screening of soil samples will allow field personnel to identify areas of contamination as well as areas which are not contaminated, with a minimum of effort and within a relatively short time frame.

The procedures for field screening of explosives are presented as Appendix K. The procedures are both quantitative and qualitative and have been derived from EPA Method 8330, "Nitroaromatics and Nitroamines by High Performance Liquid Chromatography (HPLC)." These analyses are to be performed on soil samples within 24 hours of sample collection. Analyses can be performed immediately after sample collection and will take approximately 2 hours to complete, including standard reagent preparation time. If standard reagents are prepared in advance, as will be the case for most field situations, sample analysis will take 15 - 60 minutes, depending on which analytes are being screened. SOPs for field screening samples can be found in Section 4.2.3.1 of the FSP.

These procedures are associated with USATHAMA Class 2 certification. The results of the method certification are subject to the rank sum test as described in Appendix E of the USATHAMA Installation Restoration Quality Assurance Program.

2.5.2 XRF Analysis of Metals in Soils

In an effort to more effectively focus field sampling and limit laboratory sample analyses, field screening of soil samples will be performed for metals using X-ray fluorescence. Field screening of soil samples will allow field personnel to identify areas of contamination as well as areas which are not contaminated, with a minimum of effort and a relatively short time frame.

The procedures for field screening of metals is presented in Appendix K. The procedure is both quantitative and qualitative and has been derived from a procedure developed by Spectrace Instruments, Inc. Analysis of the samples will be done offsite by a subcontractor within 48 hours of sample collection. SOPs for field screening samples can be found in Section 4.2.3.1 of the FSP.

These procedures are associated with USATHAMA Class 2 certification. The results of the method certification are subject to the rank sum test as described in Appendix E of the USATHAMA Installation Restoration Quality Assurance Program.

2.5.3 Soil Gas Survey Using the Geoprobe

In an effort to more effectively focus field sampling and limit laboratory sample analyses, soil gas surveys will be conducted at known or suspected VOC sources using the Geoprobe. Field screening of soil gas sampling will allow field personnel to identify areas of contamination as well as areas which are not contaminated, with a minimum of effort and within a relatively short time frame.

The procedures for soil gas screening are presented in Appendix G. The procedures are both quantitative and qualitative and have been developed by Burlington Environmental Inc. for use with the Geoprobe and a GC. Analysis of the samples are to be performed on the soil gas samples within 24 hours of sample collection. SOPs for soil gas screening of samples can be found in Appendix G also.

These procedures are associated with USATHAMA Class 2 certification. The results of method certification are subject to the rank sum test as described in Appendix E of the USATHAMA Installation Restoration Quality Assurance Program.

2.6 SAMPLING PROCEDURES

Sampling operations are described in detail in the appendices of the QAPjP. The use of SOPs for all routine sampling operations will ensure the following:

- Applicable field work will be performed from sound technical guidelines;
- Work performed will consistently be of high quality, thus reducing the probability of error; and,
- Activities performed will be properly documented.

SOPs for specific field sampling procedures are described in the following appendices of the QAPjP. Procedures are provided for the following types of sampling operations:

- Monitoring well sampling (Appendix A);
- Surface water and sediment sampling (Appendix A);
- Soil sampling (Appendix A);
- Sample packaging and shipping (Appendix A);
- Field decontamination (Appendix A); and,
- Field Measurements (Appendix C).

The FSP provides a description of the following for each site area and sampling media:

- Sampling design and rationale;
- Numbers and types of samples;
- Maps delineating sample locations; and,
- Sampling devices.

Approved copies of the RI/FS FSP, QAPjP, and HASP at the IAAP will be maintained on-site in a temporary project file for referencing, at any time, by members of the field team or for audit review. In addition, the field team members will be familiar with the contents of the QAPjP and will maintain a copy of the QAPjP on-site. The original copy of the QAPjP will be stored in the main project file.

2.6.1 Sample Holding Times

Exhibit 2-3 contains information regarding the water, soil, and sediment analysis programs to be conducted at IAAP.

Sample holding times are defined in certified laboratory methods, and are never to exceed the prescribed holding times described in Appendix H of the USATHAMA Quality Assurance Program (USATHAMA PAM 11-41, January 1990).

2.6.2 Field Logbooks

Field notebooks will be used to document all data collection activities during the RI/FS at the IAAP. Entries will be descriptive and presented with sufficient detail so that a particular situation can be reconstructed without reliance on the field team members' memory.

The logbook will contain specific information about the day's activities including: date, names and affiliation of all on-site personnel; problems or delays encountered while conducting sampling activities; equipment and materials used during sampling activities; and, level of personnel protection being used on-site. Any deviations from the QAPjP will be stated. Notebooks will be permanently assigned to field personnel and will be stored in the project file when not in use. The following guidelines will be employed in all field logbooks.

- The log book itself will be permanently bound, not spiral bound, and all pages (front and back) will be serially numbered.
- The log book will contain an account of daily activities, conversations with coordinating officials, description of photographs taken during sampling, and field equipment calibrations.
- The project title and installation name will be included in the field logbook.
- All entries should be written in blue or black ballpoint pen. Felt-tip pens should be avoided. All field documentation shall be done in indelible ink.
- The first page should contain a listing of key personnel and telephone numbers specific to that job.
- Each page should be dated and initialed.
- A new page should be started at the beginning of each day.
- Entries into the log book should be chronological - a time notation (using military time) should introduce each entry.
- The log book should be signed at the end of each day. Signatures should be written on a single diagonal line drawn across the blank portion of the page following the day's last entry.
- If an error is made in the field log book, it should be corrected by simply crossing a single line through the error and entering the correct information. Errors should be corrected by the person who made the entry. All corrections must be dated and initialed.

EXHIBIT 2-3 SAMPLE CONTAINERS, HOLDING TIMES, AND PRESERVATIONS

CATEGORY	MATRIX	CONTAINER	SAMPLE SIZE	HOLDING TIME	PRESERVATION
Explosives	Water	Amber Glass	1-Liter	7 days to analysis	≤4oC
	Soil	Amber Glass	1 250-mL	7 days to extraction & 40 days to analysis	≤4oC
Volatile Organics	Water	Glass	2 40-mL	14 days	HCL, to pH<2 ≤4oC
	Soil	Glass	2 40-mL	14 days	≤4oC
Base Neutral Acids	Water	Amber Glass	2 1-Liter	7 days to extraction & 40 days to analysis	≤4oC
	Soil	Glass	1 250-mL	(Same as above)	≤4oC
Metals	Water	Polyethylene	1-Liter	6 months (Hg=28 days)	HNO3, to pH <2 ≤4oC
	Soil	Glass	1 500-mL	(Same as above)	≤4oC
Pesticides/ PCB	Water	Amber Glass	1-Liter	7 days to extraction & 40 days to analysis	≤4oC
	Soil	Glass	1 500-mL	(Same as above)	≤4oC
Radionuclides	Water	Polyethylene	1 4-Liter	6 months	HNO3, to pH <2 ≤4oC
	Soil	Amber Glass	1 250-mL	6 months	≤4oC

All sampling information will be documented in the field log book or on printed data sheets and will include, but not be limited to, the following:

- Description of sample location, (may include sketch), physical characteristics, type of sample (composite or grab);
- Volume and number of sample containers;
- Date and time;
- Weather conditions;
- Pertinent field data (e.g., pH, temperature, depth to water);
- Sample identification number;
- Sampler's name;
- Equipment calibration information; and,
- Any visual signs of contamination.

2.6.3 Disposal of Investigation-Derived Waste

Waste may be generated from field activities at the IAAP site during the RI/FS. These investigation-derived wastes must be handled, treated, or disposed of in the proper manner. Types of wastes that may be generated are listed below:

- Expendable personal protection equipment: tyvek, gloves, booties, respirator cartridges;
- Environmental samples that are not being shipped for laboratory analysis;
- Drilling cuttings and core samples;
- Decontamination fluids such as water, solvents, or other mixtures; and,
- Purge water from monitoring wells and Piezometer.

Investigation-derived wastes consisting of auger cuttings, purge water, and decontamination fluids will be containerized and labeled until laboratory analysis is completed. Final disposition of the water will be based on the laboratory results.

The field team should address the following considerations and consult with USATHAMA officials:

- Determine the likelihood and probability that hazardous waste will be generated from the field activities. This may be accomplished by review of the site records, pertinent data, and other available information.

- Identify the sampling procedures in the QAPjP and address the issue of investigation-derived wastes.

- If sampling of groundwater and soil in areas of known or suspected areas of significant contamination is to occur, then purged water or waste samples should be segregated and contained. Certain exceptions to this practice may be allowed with prior USATHAMA and EPA consultation and approval (i.e., discharging purged water onto the ground); however, it must be emphasized that off-site transportation/storage by employees of such materials is prohibited.

- If materials need to be collected in drums or other containers, solids must be segregated from liquids. The drums or containers must be clearly labeled.

- Disposable protective clothing is to be segregated and placed in large heavy duty plastic bags and/or 55 gallon drums.

- Non-disposable items such as boots, sampling equipment, and other field equipment shall be decontaminated using the appropriate decontamination solutions and procedures prior to taking any potentially contaminated equipment off site.

- Any wash waters used for decontamination shall be collected in properly-labeled drums for disposal on site.

Determination of whether the stored wastes are hazardous will be made after receipt of site analytical data. Final disposal of these wastes will be determined at that time and coordinated with plant personnel, USATHAMA, and EPA according to procedures described in Appendix B, Section B.5.

2.7 CUSTODY AND SAMPLE MANAGEMENT

2.7.1 Field Custody and Sample Management

Chain-of-custody is initiated in the field at the time of sample collection and will clearly document the date and time of collection, the individual collecting the sample, and the specific sample preservation/containers used in sample collection. Any special considerations associated with sample acquisition will also be documented. All samples will be in the custody of a responsible person and a record will be completed via a chain-of-custody form, which is detailed in Appendix E.

A sample is in someone's custody if any one of the following applies:

- In actual possession;

- In view immediately after being in one's possession;

- Placed in a larger container (e.g., cooler) that remains in view after being in one's possession;

- In physical possession and then locked up so that it cannot be tampered with; or,

- Placed in a secured area, restricted to authorized personnel only.

In addition to chain-of-custody records, all samples collected in the field are labeled in such a manner that the client, sample identification, sampling data and time, sampler name, analyses to be performed, preservative and sample custodian are documented. Information documented on sample labels should correlate exactly to the chain-of-custody records. The samples will be delivered to ESE by overnight delivery. Sample preservation will be maintained until analyses.

2.7.2 Laboratory Custody and Sample Management

2.7.2.1 Control of Incoming Samples

ESE has a designated sample custodian whose primary responsibility is to document receipt of samples, initiate the appropriate log-in procedures described below, assure proper documentation and prompt analyses of the samples. The sample custodian also maintains custody of samples and analytical data to verify the integrity of reports submitted to our clients.

When samples are received at the laboratory, accompanied by a chain-of-custody form, the sample custodian will initiate the following steps:

- Check the temperature of the samples as soon as the sample cooler is opened;

- Verify that each sample was in the packing container as recorded on the chain-of-custody record;

- Document the chain-of-custody form for any tampering of seals or sample bottles during transport to the laboratory;

- Sign and date the "received at laboratory by" box. The exact number of sample containers received by the laboratory is recorded for each sample; and,

- Enter into the Lab Data Management System (LDMS) all pertinent information about the client, sample collection, sample matrix, analyses to be performed, and number of bottles received.

All samples received by ESE will be identified and labeled showing the name of the client, sample location or code, date received, and the preservation added to the bottle. Samples are entered into the log book that contains the following:

- A number is assigned to each sample (beginning with Number 1 on the first day of the year);

- Identification of the client name;

- Date the sample was received at the laboratory;

- Number of bottles received for each sample; and,

- Initials of person who checked in samples.

To complete the sample and analysis data entry procedure, a copy of the information entered into the LDMS is generated and attached to any other information about the project. Before samples are stored, they are rechecked to ensure they are in the correct container and are properly preserved.

2.7.2.2 Maintenance of Custody and Sample Storage

ESE has implemented standard operating procedures to assure the integrity of both samples and data so that they are not degraded or disclosed to unauthorized personnel. In order to insure that this policy is maintained, the laboratory facilities are under controlled access. Only employees of the laboratories are allowed access to the laboratory facilities. Visitors must register at the front desk and, when in the laboratory, will be accompanied by an employee at all times. The buildings are secured at the end of each working day and building access cards are issued only to select personnel.
Samples are stored either in a large walk-in cooler at 4°C, at room temperature, or in a ventilated hazardous waste room. All sample storage areas have locks and are secured by the sample custodian at the end of each working day.

Samples are removed from their proper storage location by the analyst and are returned to the storage area immediately after the required sample volume has been taken. This minimizes unnecessary time spent searching for samples and helps prevent matrix degradation from prolonged exposure to room temperature.

According to USATHAMA PAM 11-41, the laboratory is responsible for holding environmental samples until told to dispose of them by the USATHAMA, Technical Support Division, Chemistry Branch.

2.7.3 Document Control

2.7.3.1 Purpose

The goal of the laboratory document control program is to assure that all documents supporting the analysis of each sample lot will be accounted for upon project completion. Accountable documents used by the laboratories shall include, but not be limited to: logbooks, chain-of-custody records, sample work sheets, bench sheets, analyst's notebooks, and other documents relating to the sample or sample analyses. The following document control procedures have been established to assure that all laboratory records are assembled and stored for delivery to USATHAMA or are available upon request from USATHAMA prior to the delivery schedule. These records shall be available for inspection by USATHAMA at the laboratory or in the project file at JAYCOR.

2.7.3.2 Application

The procedure applies to all QA and analytical personnel involved in the organization and assembly of documents relating to each project.

2.7.3.3 Procedure

Preparation of lot data packages will be assembled according to Appendix T of USATHAMA PAM 11-41. The following steps briefly summarizes their assembly:

- Using appropriate file folders, assign one folder to each sample lot.
- Place all documents into the folder, including chain-of-custody forms, copies of laboratory notebook pages and instrument log books, chromatograms, raw data sheets, control charts, and any other information pertaining to one lot.
- Documents will be arranged by document type within the lot data package.
- The completed lot data packages will be filed in a central location in a secure area in the Document Control Room.

2.7.3.4 Final Purge

The lot data packets will be submitted to USATHAMA upon completion of the project.

2.7.3.5 Responsibilities

- The LQAC has overall responsibility for ensuring that the SOP is implemented and followed.
- The Document Control Officer is responsible for ensuring that documents are filed upon receipt, filing cabinets are locked, a document inventory is completed and filed, and final purge is completed after invoicing.

2.8 CALIBRATION PROCEDURES AND FREQUENCY

2.8.1 Field Calibration

Procedures and frequency of field instrument calibrations are included in the SOPs and manufacturer's operation manuals (Appendix F). This includes information for the HNu photoionization detector, organic vapor analyzer, pH meter, and conductivity meter.

All temperature measurements will be taken using an NITS-traceable thermometer that will be calibrated annually.

2.8.2 Laboratory Calibration

Prior to sample analysis, chemical calibration of each target analyte must be performed to ensure analytical instrumentation is functioning properly within the established sensitivity range. Protocols defining the procedures and QC measurements for instrument calibration will be in accordance with criteria specified in the 1990 USATHAMA Quality Assurance Program and the individual certified methods. Calibration information for laboratory instruments is outlined in ESE's SOPs (Appendix G).

2.8.2.1 Initial Calibration

Initial calibration for the methods to be used in this project will be performed routinely by the laboratory as part of the certified analytical protocols. New initial calibrations are not required unless the instrument fails the daily calibration test procedure. The initial calibration procedure also requires the analysis of a calibration check standard (in accordance with the 1990 USATHAMA Quality Assurance Program, Section 8.2) before sample analysis can begin.

2.8.2.2 Daily Calibration

Prior to analysis, all instruments will be calibrated to ensure that the instrumental response has not changed significantly from the previous calibration. Analysis should be performed on the highest concentration standard. A response within the required percentage or two standard deviations of the mean response for the same concentration as determined from precertification, certification, and prior initial/daily calibrations, indicates the instrument calibration is acceptable and sample analysis may proceed. Should the response fail the percentage or two standard deviation criterion, the daily standard will be reanalyzed. Failure of the second analysis requires initial calibration to be performed as specified in the 1990 USATHAMA Quality Assurance Program. The laboratory will perform daily calibration for Class 1 and 1A methods at the beginning and end of the analytical sample sequence.

2.9 ANALYTICAL PROCEDURES

2.9.1 Sample Preparation

The preparation of soil, sediment, and aqueous samples for organic and inorganic analyses will be in accordance with the USATHAMA-approved guidelines and restrictions for the particular analysis of concern (i.e., as required in the USATHAMA method certification process), which are referenced in Exhibit 2-3.

2.9.2 Containers

All sample containers will be new so as to ensure the integrity of the samples. The sample containers will be compatible with the analytes of interest. All containers will be supplied by ESE Laboratories. In general, the following containers will be used:

- Septum-sealed 40 ml glass vials for volatile compounds in soil, sediment, and water;
- One liter amber glass bottles with teflon-lined lids for organic constituents other than volatiles;
- Sixteen ounce clear and amber glass for explosives, BNAs and radionuclides;
- One liter Polyethylene bottles for inorganic analytes;
- Eight ounce wide mouth glass jars for soil and sediment for organic constituents (other than volatiles) and inorganic compounds;
- Four liter polyethylene bottles for radionuclides.

All new sample containers will be cleaned by ESE, in accordance with the following procedures:

- Polyethylene Bottles and Polyethylene Caps
  - Rinse bottles and lids with five percent sodium hydroxide;
  - Rinse with deionized water;
  - Rinse with five percent Ultrex (or equivalent) nitric acid in deionized water;
  - Rinse with deionized water; and,
  - Drain and air dry.
- Amber Glass Bottles or 40 ml Vials
  - Scrub and wash bottles in detergent;
  - Rinse with copious amounts of distilled water;
  - Rinse with acetone;
  - Rinse with methylene chloride (Nanograde or equivalent);
  - Rinse with hexane (Nanograde or equivalent); and,
  - Air dry.
- Bottle Caps
  - Remove paper liners from caps;
  - Wash with detergent;
  - Rinse with distilled water; and,
  - Dry at 40° C.
- Teflon Liners (avoid contact with liners)
  - Wash with detergent;
  - Rinse with distilled water;
  - Rinse with acetone;

- Rinse with hexane (Nanograde or equivalent);
- Air dry;
- Place liners in cleaned caps;
- Heat to 40° C for two hours;
- Allow to cool; and,
- Use to cap cleaned bottles.

The reuse of sample containers will not be permitted.

2.9.3 Solution Verification

All calibration and spiking solutions are validated against working standards before initial use as described in Appendix N of the 1990 USATHAMA Quality Assurance Program.

2.10 DATA REDUCTION, VALIDATION, AND REPORTING

2.10.1 Field Data Reduction, Validation, and Reporting

2.10.1.1 Data Reduction

The field program described in this QAPjP will produce site characterization data through visual observations, direct reading instrumentation and measuring devices, and performance of chemical analyses. All field activities, direct reading instruments, and measuring devices will occur/be used in accordance to procedures in this QAPjP.

Field observations, direct reading instrument responses, and other measurements will be recorded either in field logbooks or in field data forms appropriate for the activity. The field log book and appropriate forms will be completed in the field as the activity occurs. The Field Team Leader will be responsible for ensuring that all necessary data and information is incorporated into the log books and forms as each field activity occurs. On a daily basis, the Field Team Leader will check the log books and forms for completeness.

To present field data in the site characterization reports, data in log books and on forms will need to be summarized and transferred to tables, figures, maps, or logs. To analyze data, some data will need to be entered into computer bases or onto spread sheets. The Project Manager, Field Team Leader, Project Geologist, and the Data Manager will be responsible for the data transfer activities pertinent to their project roles. The QC Coordinator will be responsible for performing spot checks of transfer activities and for ensuring that data transfers are performed accurately.

2.10.1.2 Data Validation/Review

Field measurement data review will be the responsibility of the Field Team Leader. Criteria to consider upon reviewing measurement data includes the following assurances:

- Calibration information in log books; and,
- Reasonableness of results based on what is known for the site relative to the magnitude and implications of the result.

2.10.1.3 Field Data Reporting

All samples will be identified and labeled at the time of collection. Each sample jar will be identified by a gummed label or standardized tag that will be affixed to the jar. These labels will contain the following sample identification information:

- Unique sample or log number;
- Date and time of sample collection;
- Source of sample (name, location, & sample type);
- Preservation used;
- Analysis required; and,
- Initials of sampler.

In addition, the environmental sample container lot code, type of analysis, preservatives (if appropriate), and date of shipment will be recorded in the field log book. Sample numbers have been assigned in the FSP. Duplicates, which will have received an entirely separate sample code, will be noted under the sample description. All field equipment used during the daily sampling event will be identified, along with the date of calibration. JAYCOR Team field personnel will sign and date their respective notebooks daily. Significant field notebook entries (samples collected, significant observations, etc.) will be countersigned by the Field Team Leader.

2.10.2 Laboratory Data Reduction, Validation, and Reporting

The laboratory QA Coordinator is responsible for assessing data quality. Data reduction, validation, and reporting by the laboratory will be conducted as follows:

- Raw data produced by the analyst is turned over to the respective area supervisor;
- The area supervisor reviews the data for attainment of quality control criteria as outlined in the appropriate SOPs and for overall reasonableness;
- Upon acceptance of the raw data by the area supervisor, a computerized report is generated and sent to the laboratory QA Coordinator;
- The laboratory QA Coordinator will complete a thorough audit of the data packages that together make up the reports;
- The QA Coordinator and area supervisor will decide whether any sample reanalysis is required; and,

- Upon acceptance of the preliminary reports by the QA Coordinator, final reports are generated and signed by the appropriate laboratory manager and by the laboratory project manager.

The laboratory QA Coordinator will conduct an evaluation of data reduction and reporting by the laboratories. These evaluations will consider the finished data sheets, document control forms, blank data, duplicate data, and recovery data for control analytes and surrogate spikes. The material will be checked for legibility, completeness, correctness, and the presence of necessary dates, initials, and signatures. The results of these checks will be assessed and reported to the project manager noting any discrepancies and their effect upon acceptability of the data.

Assessment of analytical and in-house data will also include checks for data consistency by looking for comparability of duplicate analyses, comparability to previous data from the same sampling location (if available), adherence to accuracy and precision criteria, evaluation of data with respect to control and reporting limits, transmittal errors, and anomalously high or low parameter values. The results of these data validations will be reported to the project manager, noting any discrepancies and their effect upon acceptability of the data.

2.10.2.1 Data Reduction

Chemical data will be received from the analytical laboratory in a raw tabular format. It will be the responsibility of the laboratory data coordinator to check the raw laboratory data for results pertinent to the site under investigation. Raw laboratory data will be reconciled with field identifiers and transferred from the laboratory reports to spread sheets, tables, or into computerized databases by either the data manager or laboratory coordinator.

It will be the responsibility of the QA Coordinator and Data Manager to ensure that all data transferred to tables, spread sheets, logs, maps, figures, or into computerized databases are transferred correctly. All data transferred will be checked at least once for completeness and accuracy of transfer. All computer programs used to analyze or reduce data will be checked at least once against a data set of known results before the program is used to process data on any site.

2.10.2.2 Data Validation/Review

Data validation is the process of screening data and accepting, rejecting, or qualifying it on the basis of sound criteria. Data validation should occur as soon after data collection as practical, and be objective in its approach. Analytical data review will be the responsibility of the laboratory data coordinator. Criteria that may be considered when reviewing analytical data are:

- Verifying sample data for identifiers, locations, date, and value;

- Comparing data to QA objectives for precision, accuracy, and completeness, as appropriate; and,

- Evaluating field duplicates, splits, rinsate and trip blanks for outliers or results inconsistent with what is expected.

2.10.2.3 USATHAMA Sample Identification Code

The USATHAMA analytical reporting system uses a six-character identification code to identify each sample.

The first three characters of this code are alpha and represent the analytical lot code assigned by the lab and USATHAMA. Each analytical lot has a different set of alpha characters. For example a set of groundwater samples for metals analysis by ICP would be designated AAA, while groundwater samples for organic GC/MS analysis would be designated BBB (multi-analyte methods, such as GC/MS, will have the same alpha designator for each analyte in a single sample).

The second half of the six-character code will be numeric characters that represent the individual samples within the lot. Total lot size is determined and approved by the USATHAMA when the analytical method is approved (i.e., the third groundwater sample for metals analysis by ICP would be labeled as AAA003).

2.10.3 Recordkeeping

All project documentation will be maintained by JAYCOR. The main project file will be kept at the JAYCOR office in Alexandria, VA, in a project-dedicated file cabinet under the control of the Program Manager. Documentation of the environmental sampling will be maintained in BRERI/FS's or CDM FPC's offices, and documentation for the laboratory analytical work will be maintained by the laboratories in their offices. FPC, BRERI/FS, and ESE will ensure that a duplicate file is available at JAYCOR's office in Alexandria, Virginia.

2.10.4 Laboratory Notebooks

Laboratory notebooks will be identified with a unique book number and will be assigned to all analysts in the laboratory. The book number will be assigned and recorded together with the analyst's name, department, date issued, and expected use of the book, and maintained by the Sample Management Officer. The log books will be bound and will contain prenumbered pages.

The laboratory notebooks will be maintained by the analyst and reviewed by the department supervisors on a periodic basis. The information to be recorded in the logbooks will include, but is not limited to, all information that would not be reported on data sheets or used to generate final results. The entries will be in indelible ink, and any corrections will be made by drawing one line through the incorrect entry, entering the correct information, and initialling and dating the change.

All laboratory notebooks used in the RI/FS field work at the IAAP will be delivered to USATHAMA upon completion of the project.

Each laboratory analytical instrument will be assigned an analytical logbook that will have a unique book number. The books will be bound, sequentially paginated, and maintained in the QA Office for distribution. The book number will be assigned and recorded together with the date, department, laboratory analytical instrument, and analyst. Additional documentation, such as chromatograms, will be referenced to the log book where appropriate. Any loose sheets of paper will be permanently affixed to the log book. At the end of each day, the analyst will sign the log book after the last entry has been made.

All analytical run sequences will be recorded in the log book in indelible ink. A single line will be drawn through mistakes accompanied by the analyst's initials and the date. Logbooks will be periodically inspected by the QA Office. Completely-filled logbooks will be maintained in the QA Office. All analytical logbooks used in the RI/FS monitoring program at the IAAP will be delivered to USATHAMA upon completion of the project.

2.10.5 Laboratory Data Packages

ESE will supply JAYCOR with a deliverables data package for each method employed in the project. The data packages will contain sufficient documentation to reconstruct the analysis on paper. The data packages will be reviewed with the validated data prior to submission to JAYCOR. A copy of ESE's SOPs for USATHAMA data packet preparation can be found in the reference document dated February 1992, Master Quality Assurance Plan, which was prepared by ESE under contract No. DAAA15-87-D0015 for USATHAMA.

The review will include the following topics:

- All dates relevant to a particular sample including: collection, preparation, and analysis;
- The limits of detection and control for each individual sample; and,
- Comparison of data on instrument printouts with data recorded on work sheets.

The review will also include all laboratory QA/QC data, including:

- All laboratory/reagent blank data and the relevant dates of preparation and analysis;
- Laboratory duplicate (sample split) data;
- All recovery data for matrix, duplicate matrix, and surrogate spikes;
- Calibration and tuning data, mass spectra, and mass spectral library searches;
- All chain-of-custody forms;
- Checking calculations on selected samples; and,
- Examination of all papers and notebooks to ensure that all pages are initialed and dated, have sufficient explanation for the changes, and are legible.

2.11 INTERNAL QUALITY CONTROL CHECKS

2.11.1 Field QA And QC Samples

Quality Control (QC) samples are samples analyzed for the purpose of assessing the quality of the sampling effort and of the analytical data. QC samples collected in the field include: duplicates of field samples; field, rinsate, and trip blanks; and, background (upgradient) samples.

Field QC samples are duplicates and rinsate or trip blank samples analyzed by the contract laboratory to help the prime contractor and contract laboratory identify and diagnose problems related to sampling, shipment, and analysis. Duplicate samples are multiple grab samples, collected separately, that equally represent a medium at a given time and location. A duplicate is required for calculating precision or the degree of agreement between repeated measurements. Duplicate or split QC samples are sent to the laboratory blind (i.e., not marked as a split or duplicate sample) and represent approximately five percent of the field samples. The actual QC duplicates must be selected in the field based on visual or instrument readings indicating the presence of contaminants. Duplicates are a check on the laboratory's ability to replicate a result; therefore, it is important that an analyte be present in the sample so that positive results can be compared. Background or analyte-free samples should not be used as duplicates. Trip blank samples are samples of analyte-free water that accompany volatile samples from the field to the laboratory. Rinsate blank samples represent collected final rinse waters following decontamination to evaluate effectiveness of decontamination procedures. Field blanks will also be collected and will provide information on ambient conditions, and potential contamination of sample containers. Blank samples represent approximately five percent of the field samples. Blanks will be used to assess laboratory induced sample contamination resulting from sample transportation and shipping or ambient site conditions.

The rinsate and field blanks for the groundwater, soil, and sediment samples will be prepared from analyte-free HPLC water. Field blanks will also be collected of tap water used in decontamination. Standard environmental sample containers will be used for all rinse and field blanks. The analyte-free water (HPLC Ultra Pure), for the rinse and field blanks, will be purchased from a laboratory supply company. The rinse and the field blanks will be analyzed for the same analytical parameters as the groundwater, surface water, sediment, or soil samples.

Rinse and field blank containers will be supplied by the laboratory and delivered to the site with the trip blanks and the containers for the groundwater and soil or sediment samples. The rinse and field blanks will be prepared during the day of sample collection and transported to the laboratory at the end of each field day with the groundwater samples and the trip blanks. The total number of rinse and trip blanks will depend on the total number of days actually spent on field sampling activities.

The rinse and field blanks will accompany the groundwater samples through handling, shipment to the laboratory, and sample analysis. Once the rinse and field blanks have been prepared in the field, they will be handled in the same manner as groundwater samples.

When required by the analytical protocol, additional sample volume for the matrix spike/duplicate analysis will be collected into the appropriate sample containers at the same sample location as the field duplicate, if possible.

2.11.2 Quality Control Sample Preparation

Blanks and duplicates will be handled and preserved in the same manner as the actual samples. Bottles and preservative requirements are listed in Exhibit 2-3.

Duplicate samples will be prepared by collecting twice the volume of samples at one location. As described earlier, the duplicate location will be selected in the field, based on the presence of contaminants, so positive results can be compared. The sample will be divided into two separate and complete samples. The actual sample location name will be assigned to one set of containers and the second set will receive a blind name.

Trip blanks will be 40 ml VOA vials filled with organic-free reagent water and preservatives (HCL) in the laboratory and shipped to the field with the other sample containers. Trip blanks will be returned to the lab in coolers with other volatile samples. One trip blank will be sent in each cooler (containing VOAs) for each shipment of volatile samples.

Rinsate samples will be collected when equipment is used to collect a sample and will be analyzed for all parameters for which the actual sample was collected. Rinsate samples will be collected for each type of equipment used.

Rinsate blank samples will be collected by pouring the final organic- and inorganic-free reagent water equipment rinse into the appropriate containers and preserved in the same manner as the actual samples (Exhibit 2-3).

Field blank samples will be prepared at the sampling location by pouring reagent-free water into the appropriate sample containers. Field blanks will be collected for the same parameters as the actual samples collected at the specific sample location. Field blanks will be preserved and handled in the same manner as the actual samples.

2.11.3 Laboratory Quality Control Checks

ESE will execute a series of QC checks to ensure a high level of data quality. These QC checks consist of analyzing method blanks, control spikes, and surrogate-spiked samples. The frequency and use of these QC checks are discussed in the analytical SOPs, and follow USATHAMA protocols. Internal QC checks and frequency for laboratory analyses will be consistent with the applicable SOPs.

2.11.4 Laboratory Reference Materials

All reference materials and calibration standards used in this program will be prepared and maintained under the laboratory standards tracking system. This system ensures preparation, checking, documentation, storage, and disposal of standards according to the specified procedures and schedules that are appropriate for each analyte of interest. Reference standards will be required to generate certification data, calibrate instruments, prepare spiking solutions, and prepare QC samples. These solutions must be of known concentration and purity to achieve the criteria necessary for validation of analytical results.

Reference standards used to conduct analyses will be either Standard Analytical Reference Materials (SARMs), interim reference materials (IRMs), or NIST standards. SARMs will be obtained from USATHAMA (if available) or from the EPA. Reference materials from the EPA do not require characterization. For other analytes, IRMs will be obtained from USATHAMA. IRMs are not as rigorously characterized as SARMs.

If SARMs, IRMs, or NIST standards are unavailable through USATHAMA, the laboratories will purchase materials from a commercial vendor. The off-the-shelf material must be characterized for purity and identity before use.

2.12 PERFORMANCE AND SYSTEM AUDITS

2.12.1 Laboratory Performance and Systems Audits

Performance and systems audits will be used to monitor project activities to assure compliance with the QA objectives and procedures. Audits may be performed by USATHAMA or JAYCOR. USATHAMA PAM 11-41 Revision No. 0, dated January 1990, describes external and internal audits as below.

External

External audits are conducted by representatives of the USATHAMA Chemistry Branch or their representatives. After reviewing the proposed QAPjP, the contractor laboratory may be visited to discuss any weaknesses in the plan, to evaluate the laboratory's capability to implement the plan, and to discuss any discrepancies in the certification documents, etc. During this visit, the USATHAMA representatives will complete an audit checklist. Copies of the completed checklist will be provided to the USATHAMA Project Officer, the Contractor Project Manager, the Contractor Analytical Task Manager, the Contractor QA Coordinator, and the USATHAMA Chemistry Branch. If deficiencies are of a serious nature, copies may be forwarded to the procurement contracting officer for official documentation and action. The visit may occur before analyses of field samples are initiated by the laboratory.

After initiation of the analysis by the contractor laboratory, a USATHAMA representative may visit the field activities or the laboratory to evaluate the effective implementation of the QAPjP. Any project related activities may be evaluated during the visit. Any documents or data required by the QAPjP are eligible for inspection. Any aspect of the internal audit may be monitored. Findings will be reported to the USATHAMA Project Officer, the Contractor Project Manager, the Contractor Analytical Task Manager, the Contractor QA Coordinator, and the USATHAMA Chemistry Branch. If deficiencies are of a serious nature, copies may be forwarded to the procurement contracting officer for official documentation and action.

Scheduling/completion of the visits noted above does not preclude additional visits, as deemed necessary or desirable.

Internal

Audits of critical functions by the QA staff will include the following:

- Verification that standards, procedures, records, charts, magnetic tapes, etc., are properly maintained;

- Verification that actual practice agrees with written instructions, accomplished through the use of a systems audit where a selected method is monitored through all the steps of its performance. This system audit must be accomplished at least once each quarter if the laboratory effort is long term, or once a month if the laboratory effort is short term. Methods must be selected so that all phases of a laboratory's effort are monitored to include, but not be limited to, sample logging, chain-of-custody, sample preparation, standard preparation, extract storage and analysis, and data reduction;

- Verification that QA records are adequately filed and maintained so as to assure protection and retrievability; and,

- Assessment of results of QA sample analyses.

Auditing will consist of observations and notations as to whether approval practices are followed. A formal audit report comprised of summary findings shall be distributed to the Project Manager, Analytical Task Leader, and USATHAMA. Deviations will be noted and discussed with staff member, appropriate management, and with USATHAMA. The audit and findings, both compliance and noncompliance, must be documented in a bound logbook, or permanently attached and maintained as part of the QA documentation. The QA office will maintain by project, a file of audit reports and findings. Copies of the report and findings that cover more than one project shall be maintained in each project file. At the conclusion of a project or task order, copies of the QA file shall be transmitted to the USATHAMA Chemistry Branch, along with the data packages.

2.12.2 Field Audits

During the course of this project a field audit may be conducted by the JAYCOR QA Coordinator or designate (internal field audit) or by the USATHAMA Chemistry Branch (external audit).

The results of the field audit will be documented in a written report and noted deficiencies will be attached with a notice of nonconformance (Exhibit 2-4) or an equivalent form. The report will be submitted to the following:

- USATHAMA Project Manager;
- JAYCOR Program Manager;
- JAYCOR Project Manager; and
- Field Team Leader.

If a deficiency was noted and a corrective action is required, the person responsible for implementing the action will be listed in the nonconformance report (used only for field audits). The auditor will be notified of the corrective action, by the named person, within 10 days of the date of the nonconformance report.

2.12.3 OFFICE AUDITS

During the course of the project an office audit may be conducted by the JAYCOR QA Coordinator or designate (internal office audit) or by the USATHAMA Chemistry Branch (external audit).

The office audit will focus on verifying that OA records are adequately filed and maintained so as to assure protection and retrievability. The results of the office audit will be documented in a written report and noted deficiencies will be attached with a Notice of Nonconformance (Exhibit 2-4) or an equivalent form. The form will have the same distribution as the field audit.

2.13 PREVENTIVE MAINTENANCE PROCEDURES AND SCHEDULES

2.13.1 Field Equipment Preventive Maintenance Procedures and Schedules

All field instruments will be maintained in such a way that ensures that measurements taken are of optimal quality. The SOPs for maintenance and the manufacturer's equipment manuals are contained in Appendix F.

2.13.2 Laboratory Instruments and Preventive Maintenance Procedures and Schedules

ESE's SOPs and QAPjP detail proper procedures and schedules for maintaining laboratory instruments.

2.14 PROCEDURES TO ACCESS PRECISION, ACCURACY, AND COMPLETENESS

2.14.1 Reporting Precision, Accuracy, and Completeness

This section presents the routine procedures for calculating precision, accuracy, and completeness. Overall guidance will be obtained from "Calculation of Precision, Bias, and Method Detection Limit for Chemical and Physical Measurement," 30 March 1984, which was authored by EPA's Quality Assurance Management and Special Studies Staff.

- Precision
  - Precision will be estimated by the analysis of replicate samples and will be expressed (if three or more values are determined) as the standard deviation, which is determined according to the following equation:

$$S = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

where

S	=	Standard deviation
X	=	Individual measurement result
$\underline{n}$	=	Number of measurements
X	=	Arithmetic mean of replicate measurements
Σ	=	Summation for all X

Relative standard deviation may also be reported. If so, it will be calculated as follows:

$$RSD = (100) * \frac{s}{\overline{x}}$$

where

RSD = Relative standard deviation, expressed in percent
s = Standard deviation
$\overline{x}$ = Arithmetic mean of replicate measurements

EXHIBIT 2-4 NOTICE OF NONCONFORMANCE

Site Name: ____________________

Work Order No.: ____________________

Deficiencies Found: ____________________

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Corrective Action Requestor & Date: ____________________
(Signature) (Date)

Responsible for Action: ____________________
(Signature)

QA Manager's Approval: ____________________
(Signature) (Date)

Corrective Actions Taken: ____________________

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Date Actions Completed: ____________________

Responsible for Actions: ____________________
(Signature)

Accepted by Requestor: ____________________
(Signature) (Date)

Accepted by QA Manager: ____________________
(Signature) (Date)

Precision will be estimated by calculation of relative percent difference (relative range) if only two values are determined using the following equation:

$$RPD = (100) \quad * \quad \frac{(D1 - D2)}{(D1 + D2)/2}$$

where

RPD = Relative percent difference
D1 = Larger of the two observed values
D2 = Smaller of the two observed values

- Accuracy
  - Accuracy is estimated from the analysis of QA samples whose true values are known, or from surrogate or matrix spike recoveries. Accuracy will be expressed as percent recovery and estimated by standard USATHAMA formulas.

- Completeness
  - Completeness will be reported as the percentage of all measurements whose results are judged to be valid. The following formula will be used to estimate completeness:

$$C = 100 \frac{(V)}{(T)}$$

where

C = Percent completeness
V = Number of measurements judged valid
T = Total number of measurements

2.14.2 Control Charts

Accuracy, precision, and sensitivity are specified in the certified methods for organic and inorganic analytes. Method accuracy, precision, and sensitivity are experimentally determined during the certification process. Analysis of the samples for the organic and inorganic analytes will utilize the USATHAMA specified quality assurance protocols. The organic and inorganic quality control limits are developed during the method certification process. The laboratory then demonstrates the ability to meet the control limits established during certification by analyzing daily QC samples.

These daily QA samples are prepared by adding a known quantity of the analytes of interest to a known volume of standard water or standard soil. The number of daily QC samples and the concentration levels are defined in the certified method.

The results of the daily QC sample analysis are plotted onto control charts using software supplied by USATHAMA. The control charts are used to monitor precision and accuracy of routine analysis. These control charts (along with a discussion of trends and out-of-control situations) are submitted to USATHAMA for approval within five working days after completion of the analytical run, before data from environmental samples are allowed into the database. A copy of ESE's SOPs for analytical data entry into the IRDMIS system can be found in their Master Quality Assurance Plan, with which the cover page for this document can be found in Appendix H.

2.15 CORRECTIVE ACTIONS

2.15.1 Field and Office Activities

One important aspect of a QA program is to maintain a technical staff that is aware of QA procedures and requirements. In addition to audits for checking and reporting on QA, the project's technical staff should also be capable of reporting deficiencies.

All technical staff will be responsible for reporting all suspected technical nonconformances by initiating a nonconformance report of any issued deliverable or document. The QA Coordinator will be responsible for ensuring that corrective actions for nonconformances are implemented by:

- Evaluating all reported nonconformances;
- Controlling additional work on nonconforming items;
- Determining disposition or action to be taken;
- Maintaining a log on nonconformances;
- Reviewing nonconformance reports;
- Evaluating disposition or actions taken; and,
- Ensuring nonconformance reports are included in the final site documentation in document control.

Any staff member who discovers or suspects a nonconformance, which is an identified or suspected deficiency in an approved document or procedure, will be responsible for initiating a nonconformance report.

The Field Team Manager will be responsible for carrying out corrective actions, as initiated by the QA Coordinator. The Field Team Manager will evaluate each nonconformance report and will provide a disposition by checking the appropriate box and describing the action to be taken. The Field Team Manager will also ensure that no additional work that depends on the nonconforming activity will be performed until the nonconformance report is corrected.

If a deficiency has been found, the auditor will be notified of the selected corrective action when the nonconformance report is returned.

When the corrective action described in the nonconformance report is approved, or if no action is required, the audit is complete. To complete an audit, the auditor will complete and submit to the Program Manager, an audit completion notice (Exhibit 2-5). This notice will indicate the completion of the audit, the identified deficiencies, corrective action taken, follow-up reviews of the corrective actions, and final recommendations concerning continued operation.

2.15.2 Laboratory Activities

The laboratory has SOPs for corrective action protocols that are consistent with USATHAMA requirements. Corrective action will be implemented if unsatisfactory performance and/or system audit results are recorded. Corrective action will also be implemented if the results of a data assessment or internal QC check warrants such action. For either immediate or long-term corrective actions, laboratory corrective action steps comprising a closed-loop corrective action system are as follows:

- Definition of the problem;
- Assignment of responsibility for investigation of the problem;
- Investigation and determination of the cause including:
  - Calculations check;
  - Sample reanalysis;
  - Standard check; and,
  - System calibration check.
- Determination of a corrective action to eliminate the problem;
- Assignment and acceptance of responsibility for implementing the corrective action;
- Establishment of effectiveness of the corrective action and implement the correction; and,
- Verification that the corrective action has eliminated the problem.

Depending on the nature of the problem, the corrective action employed will be formal or informal. In either case, occurrence of the problem, corrective action employed, and verification will be documented.

The auditor who inspected the lab work and generated the report documenting any deficiencies will be responsible for assuring the required corrective action has been performed.

Should analytical systems be shown to be unsatisfactory, a corrective action will be implemented. All data shall be reviewed and corrective actions shall be taken prior to transmittal to USATHAMA. These actions will be undertaken within the contractually required time limit. A copy of a corrective action report can be found in ESE's SOPs for analytical data entry into the IRDMIS system (Appendix G).

Corrective action will be required when work does not conform with project requirements or work procedures specified. Nonconformance activities will be documented in a report that will include the following:

- Names of individuals identifying the nonconformance;
- Description of the nonconformance;

- Any required approval signatures;
- Development of an appropriate corrective action;
- The corrective action or explanation for not initiating a corrective action; and,
- A schedule for implementation and completion of the corrective action.

2.15.3 Out-Of-Control Conditions

Corrective actions and data assessment and validation results will be documented by the laboratory, consistent with the applicable certified method and the 1990 USATHAMA Quality Assurance Program. ESE will maintain comprehensive records of the actions to provide evidence of the QA activity. Any indication of an out-of-control condition in the laboratory must be evaluated and corrected. The corrective actions will be fully documented in the laboratory records. The laboratory will submit a narrative each time a method is used for sample analysis. The narrative will describe any QA problems encountered during the analysis and any corrective actions taken by ESE to bring the condition under control. A corrective action report will be submitted with the data package.

2.16 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The results of inspections, audits, summaries of problems, and corrective action requests will be reported to USATHAMA as they become available.

Reports for the IAAP RI/FS will include a separate QA section that documents the QA/QC activities that lend support to the credibility of the data and the validity of the conclusions.

The QA section will include the following items, as appropriate:

- Changes to procedures outlined in this QAPjP;
- Limitations or constraints on the applicability of the data;
- The status of QA/QC programs, accomplishments, and corrective actions;
- Results of technical systems and/or performance evaluation QA audits; and,
- Assessments of data quality in terms of precision, accuracy, completeness, method detection limit, representativeness, and comparability.

EXHIBIT 2-5 AUDIT COMPLETION NOTICE

Site Name: ______________________________

Work Order No.: ______________________________

Auditors: ______________________________

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Audit Date: ______________________________

Type & Purpose: ______________________________

____

Audit Summary: ______________________________

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Deficiencies Found: ______________________________

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Corrective Actions Taken: ______________________________

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Recommendations: ______________________________

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Auditor: ______________________________
(Signature) (Date)

QA Manager: ______________________________
(Signature) (Date)

APPENDIX A

FIELD SAMPLING PROCEDURES

APPENDIX A
FIELD SAMPLING PROCEDURES

Field personnel will fill all sample containers using the following precautions:

- New gloves will be worn at each sample location.
- The sampler will not lay the cap down or touch the inside of the cap.
- The inside of the bottle will not come in contact with anything other than the sample (or preservative, if applicable).
- Water sample containers will be rinsed three times with sample location water prior to filling the sample containers.
- After the sample volume is placed into the container, the cap will be replaced carefully.
- Sample equipment will be decontaminated between sample locations.
- For volatile organic analysis, the bottles will be filled in a manner to minimize aeration of the samples so that no headspace exists in the container.

Following the collection of samples, containers will be placed in a cooler (4°C) and the sample custody documentation and shipping procedures will be completed as outlined in Appendix F.

A.1 SURFACE SOIL SAMPLING

This following procedures establish a uniform method for the collection of surficial soil samples.

- All sampling equipment must be made of inert and nonreactive material (i.e., stainless-steel, Teflon, glass), and if not disposable, must be cleaned before each use. Appendix B outlines decontamination procedures to be utilized.
- When carrying sampling equipment to sample location, be sure all equipment rests on plastic sheeting next to sample location. Utilize an HNu, OVA, or similar instrument to detect any organic vapors being emitted during excavation.
- Scoop soil at sample location into sample jars via a stainless-steel scoop using the surface scrape method. Surface sampling is limited to the top six inches. It should be noted that soil collected for OVA should be agitated and aerated as little as possible prior to sealing the sampling jar. If the sample is to be composited, the excavated soil will be deposited into a stainless-steel bucket (or equivalent), homogenized, and then transferred to the sample containers.
- Rocks, stones, sands, and sticks will be avoided when sampling.

A.2 SUBSURFACE SOIL SAMPLING

A.2.1 Hand Auger Sampling

The following procedures establish a uniform method for the collection of subsurface hand auger soil samples.

- All sampling equipment must be made of inert and nonreactive material, and if not disposable, must be cleaned before each use. The decontamination procedures are outlined in Appendix B.

- Carry sampling equipment to sample location and begin boring a sample hole utilizing a stainless-steel auger. Be sure all equipment rests on plastic sheeting next to sample location. Utilize a HNU or OVA or similar instrument to detect any organic vapors being emitted during excavation.

- When the desired depth is reached, the excavated soil will be dumped from the auger into a stainless-steel bucket (or equivalent), homogenized, and then transferred to the sample containers via a stainless-steel scoop either for a grab or a composite sample. Soil collected for OVA will be agitated and aerated as little as possible prior to sealing the sample jar.

- Rocks, stones, sand, and sticks will be avoided during sampling.

- Extension rods can be added as needed to complete the exploration.

A.2.2 Split-Spoon Bore Sampling

The following procedures establish a uniform method for the collection of subsurface bore samples.

- All sampling equipment must be made of inert and nonreactive material, and if not disposable, must be cleaned before each use. The decontamination procedures are outlined in Appendix B.

- Sampling equipment shall be transported to the sample location and work will begin by boring a sample hole utilizing a hollow-stem auger method of drilling. Be sure all sampling equipment rests on plastic sheeting next to sample location. Utilize a HNU or OVA or similar instrument to detect any organic vapors being emitted during drilling operations.

- When the desired depth is reached, soil samples will be obtained through the hollow stem of the augers with a split-spoon sampler. The split-spoon method to be used to collect samples will be the Standard Penetration Test (ASTM D-1586). This method consists of an 18-inch or 24-inch sampler being driven into the soil by dropping a 140-pound weight (also known as a hammer) a distance of 30 inches. The number of blows of the hammer needed to drive the sampler six inches in penetration will be recorded onto the boring logs by the supervising geologist. An organic vapor analyzer (OVA) will be used to scan drill cuttings and split-spoon samples for soil vapors (Appendix F). The use of the OVA and visual observations, will be used to make a field determination as to the presence of contamination in the subsurface. If contamination is apparent, continuous split-spoons will be obtained for the entire depth of the boring. If there is no apparent contamination, split-spoon samples will be obtained in five-foot intervals or in stated sampling intervals according to the FSP. All the soil samples obtained during the advancement of the borings will be labeled and stored in accordance with stated requirements. All samples will be homogenized, and then transferred to the sample containers via a stainless-steel scoop either for a grab or a composite sample. Soil collected for head space analysis will be agitated and aerated as little as possible prior to sealing the sample jar.

- Rocks, stones, sand, and sticks will be avoided during sampling.

A.3 GROUNDWATER SAMPLING

Temperature, specific conductance, and pH shall be measured each time a well is sampled. This information will be obtained during the purging process. The measurements for these parameters prior to sampling shall be considered the measurement of record for the well. Methodology for obtaining these field measurements is given in Appendix C.

When sampling for more than one parameter, the preferred order of sample collection is as follows:

1. Volatile organics (VOA)
2. Purgeable organic carbon (POC)
3. Purgeable organic halogens (POX)
4. Total organic halogens (TOX)
5. Total organic carbon (TOC)
6. Extractable organics
7. Explosives
8. Total metals
9. Dissolved metals
10. Phenols
11. Cyanide
12. Sulfate and Chloride
13. Turbidity
14. Nitrate and Ammonia
15. Radionuclides

For filtered groundwater samples the following filtration procedures and preservation should be used. The filter used should be a cellulose-based membrane filter of 0.45 micron nominal pore size. Samples must be filtered immediately after their collection to minimize changes in the concentration of the substances of interest. Samples are only passed through the filtration apparatus once, they are not to be passed through repeatedly until they are free of turbidity. Samples are then preserved immediately with undiluted ultrapure HNO_3 and the pH checked to ensure proper pH has been attained. After the addition of HNO_3 for water samples for metals analysis, samples will be spot-checked with pH paper to assure that the pH is <2. No samples for cyanide, conventional parameters, or organics may be filtered in this manner. All paperwork accompanying the samples to the laboratory should clearly state that the samples have been field filtered, in order to avoid a second filtration at the lab.

A.3.1 Bailer

This following procedures establish a uniform method for the purging of a well and the collection of groundwater samples via the use of a bailer.

- All sampling equipment must be made of inert and nonreactive material and if not disposable, must be cleaned before each use. The decontamination procedures are outlined in Appendix B.

- Carry sampling equipment to the sample location. Be sure all equipment rests on plastic sheeting next to the well. Remove the well cap and utilize the HNU or OVA (or equivalent) to detect any organic vapors.

- Temperature, pH, and specific conductivity will be measured before any purging of the monitoring wells. The water level will be measured first, using the procedures detailed below. A sample will be returned with a bailer, transferred to a clean four-ounce wide-mouthed jar, and, appropriate field measurements recorded.

- To obtain a representative sample of the groundwater, stagnant water in the well will first be purged (five well volumes). In order to calculate the standing water present in the well, total well depth and depth to groundwater measurements will be made prior to purging. All groundwater level measurements will be made in reference to an established reference point on the well casing. Measuring the groundwater depth will be accomplished by utilizing an electronic water-level indicator. The water-level indicator is powered with flashlight batteries and the closing of the circuit by immersion in water is registered on a millimeter and a buzzer will signal the water contact.

    - The sounder cable will be lowered slowly into the well until water contact is indicated by a buzz. The cable will be raised a few inches out of the water (determined by the termination of the buzz) and again lowered slowly into the water to obtain a more precise measurement. The depth measurement will be taken from the reference point on the well casing. The cable will be raised and relowered one more time to confirm the original measurement. The depth of well measurement will be obtained by lowering the cable until the weighted end rests on the bottom of the well.

    - Review well log for construction, size, and well depth. Utilizing the groundwater level and depth of well measurements, calculate the volume of standing water in the well and sand pack using the following method.

- Calculate purge volume

    - Note: USACE well-purging procedures specify including the volume of water in the filter (sand) pack in purge volume calculations. To prevent purging an unnecessarily large volume of water, the following procedure should be used.

    - Calculate height of water column using water level and construction data. Also using construction data, calculate volume of one casing plus filter pack volume (i.e., one purge volume) using the following formula:

$$V = 0.041d^2L$$

where

V = One well volume

d = Inside diameter (inches) of either borehole or well casing as described below

L = Length of water saturation (column) in well (feet)

Because the water contained in the sand pack will be used in the calculations, the following steps must be taken:

- Calculate the total volume of the saturated portion of the borehole. Use the radius of the overall bore hole (sand pack plus well casing) for the calculation. This is Volume A.

- Calculate the total volume of the well casing. Use the radius of the well casing for the calculation. This is Volume B.

- Determine the volume of the saturated portion of the sand (filter) pack. This is done by subtracting Volume B from A and multiplying the result by a porosity factor of 0.35. This will be Volume C, the sand pack volume:

  (Volume A - Volume B).35 = Volume C (sand pack volume)

- Add Volume B and C to produce volume of water for one filter (sand) pack and well casing. That is:

  Volume B + Volume C = Volume D, the filter pack and casing volume. Record calculations and purge volume (Volume D) in log book.

- If well construction details are not available, the samplers will make an estimate based on volume determined for similar wells located on the site.

■ Before sampling begins, five well volumes will be purged from the well by lowering the bailer into the top of the standing water column. The samples will assure that the bailer has been properly decontaminated between well sites. Field measurements will be taken during the purging process. These measurements will be stabilized over three readings prior to initiating the sample collection. If the bailer is used at additional sample locations, it will undergo decontamination as described in Appendix B.*

■ After the wells have been purged, the temperature, pH, and specific conductivity will be remeasured, in accordance with the procedures detailed above.

■ Upon completion of field measurements, sampling will begin. A stainless-steel or Teflon bottom-loading bailer will be lowered on stainless-steel wire or nylon rope. When nylon rope is used, a stainless-steel leader will be used between the bailer and the rope so that only inert materials enter the well water.

* All water removed from the monitoring wells will be containerized and labeled until laboratory analysis is completed. Final disposition of the water will be based on the laboratory results.

- The bailer should be completely lowered into the water column to collect the sample. If a sample from a specific depth is required, a double check valve bailer or a kemmerer sampler will be lowered to the specific depth to collect a discrete sample. Triple rinse all sample containers with well water prior to collecting the actual sample. If applicable, the containers used for VOA analysis will be filled first by slowly filling the vial to the top with no head space present. Ultimately, the entire bailer volume should be split between the containers to be filled.

Submersible Pump

The following procedures establish a uniform method for using a submersible pump for purging the well and a bailer for sample collection.

- All sampling apparatus must be made of inert and nonreactive material, and if not disposable, must be cleaned before each use. The decontamination procedure for the pump (if not dedicated to the well) will include running water from a municipal water supply through the pump and tubing to flush the system, then rinsing the external surface area of the pump and tubing with distilled water. The bailer will undergo the decontamination procedures outlined in Appendix B.

- Sampling equipment will be carried to the sample location. All equipment will rest on plastic sheeting next to the well. The well cap will be removed and an HNu, OVA, or similar instrument will be utilized to detect any organic vapors.

- Use an electronic water-level indicator device to measure the water depth and then the well depth (as described previously). Calculate the volume of standing water in the well as previously described. It is also important to consider the depth from which the pump is capable of pumping and then to choose the proper pump accordingly.

- Five well volumes will be purged from the well before sampling begins, by lowering the pump into the top of the standing water column. If the pump rate exceeds the recovery rate of the well, the pump will have to be lowered to accommodate the drawdown. To determine the flow rate of the submersible pump, fill a container of known volume with water from the well and, at the same time, determine the length of time required to do so. Thus, the length of time necessary to purge the well can be determined. (If a small amount of water is to be purged, a container of known volume can be filled with the required volume and the flow rate need not be determined). If the well runs dry before purging is completed, the well will be given time to recover then the samples will be collected.

- Upon completion of the purging activities, sampling will begin through the use of a bailer as described previously. Triple rinse all sample containers with well water prior to collecting the actual sample (filtered water for filtered samples, unfiltered water for unfiltered samples). VOA containers will be collected first. Ultimately, the entire bailer volume will be split between the containers to be filled. When the bailer is lowered, care will be taken to avoid excessive agitation of the water column.

A.4 SURFACE WATER SAMPLING

The following procedures describe how to obtain surface water samples from surface water bodies (i.e., streams, ponds, and lakes).

- All sampling equipment will be made of inert and nonreactive material, and if not disposable, will be cleaned before each use. The decontamination procedures are given in Appendix B.

- Carry sampling equipment to the sample location. Be sure all equipment rests on plastic sheeting next to the sample location.

- For stream sampling, the farthest downstream sample location will be sampled first. All sample containers will be triple rinsed with the surface water prior to sample collection. The mouth of the sample container will be oriented upstream, while the sampling personnel stand downstream so as not to disturb any sediment that could potentially contaminate the sample.

- For larger bodies of surface water (i.e., lakes), samples will be collected near the shore unless boats are feasible and permitted. Samples from shallow depths will be collected by submerging the sample container. Samples from nonshallow depths will be collected using a point-source bailer.

- All surface water samples will be collected before sediment samples to avoid excess suspended particles from the sediment sampling locations.

A.5 SEDIMENT SAMPLING

The following procedures establish a uniform method for the collection of sediment samples, which are samples taken of the solid matter that exists below the liquid phase of a sample medium.

- All sampling equipment will be made of inert and nonreactive material, and if not disposable, will be cleaned before each use. The decontamination procedures are outlined in Appendix B.

- Carry sampling equipment to the sample location. Be sure all equipment rests on plastic sheeting next to the sample location.

- The farthest downstream sample location will be sampled first. Sediment samples collected in upstream and downstream locations will be obtained in areas of similar environment, and whenever possible, will be obtained from slow-moving pool areas. In addition, sediment samples will be collected at approximately the same location as the associated aqueous sample. Aqueous samples will be obtained first to avoid excess suspended particles from the sediment sampling operations. To avoid the disturbance of the sampling area, sample locations in streams and other waterbodies will always be approached from the downstream side.

- Scoop sediment at the sample location into the sample jars via a stainless-steel scoop. Sediment sample jars will be tripled rinsed with the surface water from the appropriate location prior to collecting the sediment sample. If multiple aliquots are required, all aliquots (except VOA aliquot) will be placed in a stainless-steel bucket and mixed thoroughly before placement into sample containers. Sediment samples will consist of the top one to two inches of material. Sediment VOA samples will be packed as full as possible.

- When sampling, rocks, stones, sand, sticks, etc., will be avoided.

A.6 RECORDKEEPING

All notebooks will be bound and contain sequentially-numbered pages. Any documentation sheets that were originally loose will be permanently affixed to the notebook, if included as part of the entries.

All entries will be made in ink and the entries on each page will be dated and signed. Corrections will be made by drawing a single line through the incorrect entry, entering the correction, and initialing and dating the entry.

Sampling notebooks will be kept in an installation-specific notebook indicating:

- Name of the installation;
- Date and time of sampling event;
- Site information to uniquely identify sampling locations;
- Unique sequential field identification number for each sample;
- Matrix being sampled;
- Method of sampling to include filtering, if applicable;
- Sampling depth;
- Number of samples taken;
- Temperature, pH, and conductivity of well water when sampling;
- Groundwater height measurements and calculations to determine standing volume in a well;
- Volume of water removed from a well during purging;
- Preservatives added to samples;
- Analytes for which samples were taken;
- Observations that may affect the validity of the results;
- Number of shipping containers and samples shipped;
- Date of shipping; and,
- Printed name and signature of the sampler.

APPENDIX B

DECONTAMINATION PROCEDURES

APPENDIX B
DECONTAMINATION PROCEDURES

B.1 STANDARD OPERATING PROCEDURES

Decontamination involves the orderly and controlled removal of contaminants. Standard decontamination sequences are presented in Table B-1 for Level D. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination. All water (rinse and distilled) will be dispensed using plastic spray bottles and stainless steel tubs.

Table B-1 Level D Decontamination

Step 1 - Gross wash;
Step 2 - Alconox wash;
Step 3 - Detailed scrub;
Step 4 - Gross rinse with approved nonchlorinated water;
Step 5 - First rinse with distilled water;
Step 6 - Final rinse with distilled water; and,
Step 7 - Air dry.

B.2 DECONTAMINATION SITE LOCATION AND FINAL RINSE SAMPLES

The decontamination process must not contribute to the possibility of cross-contamination between sample points. After USATHAMA approval of analysis results, water used during the decontamination process will be from Well 4, Yard J. Decontamination stations will be set up on each site and all decontamination will be accomplished on site. Decontamination fluids will be containerized, labeled, and left on site pending final disposition. Equipment rinsate samples (consisting of the final de-ionized water rinse) will be collected and shipped daily to the laboratory for analyses.

B.3 LEVELS OF DECONTAMINATION PROTECTION REQUIRED

The level of protection required for personnel assisting with decontamination will be Level D. The HSO is responsible for monitoring decontamination procedures and determining their effectiveness.

B.4 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated after each sample is taken. Table B-1 provided the sequence of decontamination steps required for equipment that will be decontaminated after each sampling event. Site personnel will wear splash protection while decontaminating equipment (Tyvek, eye protection, and nitrile gloves). Personnel will stand up-wind of decontamination area while decontaminating equipment in order to minimize exposure to overspray. Plastic sheeting will be laid down to cover all of the decontamination area. A thorough wash and rinse of equipment will be done, but wash and rinse water will be limited as much as possible in order to minimize the amount of decontamination water to be contained in drums.

B.5 DISPOSITION OF DECONTAMINATION WASTES

Investigation Derived Wastes (IDW) consists of purge water from monitoring wells and piezometers decontamination fluids resulting from equipment washing, and site-derived expenditures such as Tyveks, bailers, rope, used surgical and nitrile gloves, etc. All IDW is considered to be potentially hazardous and will be disposed of accordingly.

Purge water will be containerized at the well head in a clean, 55-gallon poly drum. The drum will remain in place until Phase I tasks are completed and will be clearly labeled as potentially hazardous waste. After Phase I tasks have been completed, the drums of purge water will be transported by the IAAP Contractor Operator to one of the active production lines, where it will be introduced into the waste stream, treated through the settling tanks and disposed through the facility's carbon filter treatment system for removal of any explosives that might be present. The drums will be triple-rinsed and the rinse water also will be disposed through the carbon filter treatment system.

Gross soil contamination will be scraped from equipment before the initial decontamination wash. Decontamination fluids will be minimized by utilizing spray rinses. All decontamination fluids will be containerized in clean, 55-gallon poly drums and accumulated for the duration of the Phase I field sampling effort. The drums will be clearly labeled as potentially contaminated hazardous waste. After Phase I tasks are completed, the drums of decontamination fluids will be transported by the IAAP Contractor Operator to one of the active production lines where it will be introduced into the waste stream, treated through the settling tanks, and disposed through the carbon filter treatment system for removal of any explosives that might be present. The drums will be triple-rinsed and the rinse water also will be disposed through the carbon filter treatment system.

All expendables will be decontaminated using the same procedures as for equipment decontamination. Decontaminated expendables will be double-bagged and accumulated for the duration of the Phase I field sampling effort. The bags will be clearly labeled as potentially hazardous solid waste. After Phase I tasks have been completed, the solid wastes will be transported by the IAAP Contractor Operator to the Contaminated Waste Processor for incineration.

APPENDIX C

FIELD MEASUREMENTS

APPENDIX C
FIELD MEASUREMENTS

A spare sample jar will be utilized to collect a water aliquot for field measurements, which will consist of pH, temperature, and specific conductance for groundwater samples and will consist of pH, temperature, specific conductance, oxidation reduction potentials, and dissolved oxygen for surface water samples.

Operation, calibration, and maintenance for each piece of equipment will be dictated by the instructions given in each manufacturer's operating manual. Appendix F contains copies of the equipment manuals used for this project and will be updated throughout the project as necessary.

The probes of all instruments will be rinsed with distilled water prior to, and after, taking any measurements.

C.1 TEMPERATURE

The temperature will be measured using a mercury-filled thermometer. The temperature measuring device will be allowed enough time to equilibrate to outside temperature when removed from a field vehicle. The temperature probe will be used to swirl the water in the beaker. The temperature reading will be taken when the mercury volume stabilizes.

C.2 pH

The sample pH is determined electrochemically using either a glass electrode, in combination with a reference potential, or a combination electrode and a pH meter. The equipment manuals will be followed for the calibration and operation procedures (Appendix F).

- Allow the meter to equilibrate to ambient temperature when removed from a field vehicle.

- The meter/electrode system will be buffered at two points that bracket the expected pH of the samples and that are approximately three pH units or more apart. Approximate pH values will be obtained by using multirange pH paper, if historical data is absent.

- Thoroughly rinse the electrode with distilled water.

- Swirl the electrode at a constant rate until the meter reading reaches equilibrium. The rate of the stirring used should minimize the air transfer rate at the air-water interface of the sample.

- Note and record sample pH.

- When the meter is moved to another sampling location, recheck the meter calibration by inserting the probe into the pH seven buffer and repeat the above procedures. Specific calibration procedures referenced in the equipment manual will be followed.

The accuracy is $\pm$.01 pH for this instrument.

C.3 SPECIFIC CONDUCTANCE

The specific conductance of a sample is measured by use of a self-contained conductivity meter, such as a Wheatstone bridge-type (or equivalent). The meter will be calibrated and operated in accordance with the manufacturer's instructions (Appendix F).

C.4 OXIDATION-REDUCTION POTENTIALS WITH METALLIC ELECTRODES

Oxidation-reduction potential (ORP) measurements are useful for monitoring chemical reactions, quantitative determination of ions or determining the oxidizing or reducing properties of solutions.

An ORP measurement is made using the millivolt mode of a pH meter. Thus by substituting a metallic electrode for the pH glass electrode, many other ions besides the hydrogen ion can be detected with the same pH meter.

The pH meter will be calibrated and operated in accordance with the manufacturer's instructions (Appendix F). The oxidation-potential methodology to be used in IAAP can be found in Appendix L.

C.5 DISSOLVED OXYGEN

The dissolved oxygen of a sample is measured by the use of a self-contained dissolved oxygen meter, such as the YSI Dissolved Oxygen Meter. The meter will be calibrated and operated in accordance with the manufacturer's instructions (Appendix F).

APPENDIX D

FIELD INSTRUMENT CALIBRATION PROCEDURES

APPENDIX D
FIELD INSTRUMENT CALIBRATION PROCEDURES

Instruments used for field activities (HNu, OVA, pH meter, etc.) will be calibrated in accordance to specified parameters outlined by the manufacturers (Appendix F). A daily calibration log for the field instrumentation will be completed and maintained at the on-site field office.

Whenever possible, calibration standards will be traceable to EPA's National Institute of Standards and Technology (NIST) or other nationally-recognized standards. The source, lot numbers, receipt preparation, or expiration dates will be entered in standard logbooks or other documents.

APPENDIX E

SAMPLE CUSTODY DOCUMENTATION AND SHIPPING PROCEDURES

APPENDIX E
SAMPLE CUSTODY DOCUMENTATION AND SHIPPING PROCEDURES

Samples collected during the RI must have their possession traceable from the time the samples are collected until their derived data are reported. To maintain and document sample possession, sample custody procedures are followed. All paperwork associated with sample custody will be retained by JAYCOR unless USATHAMA requests a transfer upon completion of the contract.

A sample is under custody if:

- In your possession;
- In your view after being in your possession;
- In your possession and you locked it up; and,
- In a designated secure area.

E.1 CHAIN-OF-CUSTODY RECORD

The following procedures establish a method for maintaining custody of samples through use of a Chain-of-Custody Record (Exhibit E-1). This procedure will be followed for all samples collected or accepted.

Field Custody

- Collect only the number of samples needed to represent the sampled media. To the extent possible, determine the quantity, types, and sample locations prior to the actual field work. As few people as possible should handle samples.
- The field sampler is personally responsible for the care and custody of the samples collected until they are properly transferred or dispatched.
- Sample tags shall be completed for each sample using waterproof ink. Clear acetate tape will be placed over each label.
- The Field Team Leader determines whether proper custody procedures were followed during the field work and decides if additional samples are required.

Transfer of Custody and Shipment

- Samples are accompanied by a Chain-of-Custody Record. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and indicate the time. This record documents sample custody transfer from the sampler, often through another person, to the analyst in the appropriate laboratory.

- Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis, with a separate custody record accompanying each shipment.

- All shipments will be accompanied by the Chain-of-Custody Record identifying its contents. The original record will accompany the shipment, and a copy will be retained by the Field Team Leader. Freight bills will also be retained by the Field Team Leader as part of the permanent documentation.

Procedures for Completing Chain-of-Custody Record

- Space 1 will be completed with the project number (#2659).

- Space 2 will be completed with the name of the installation (IAAP).

- Space 3 will be completed with the name of the laboratory (ESE).

- Space 4 will be completed with the field office phone number.

- Space 5 is the pre-printed chain-of-custody record number.

- Space 6 will contain the initials of the person completing the chain-of-custody form.

- Space 7 will be completed with the date and military time of the collected sample.

- Space 8 will be completed with the site number (i.e. 01).

- Space 9 will be completed with the sample number (i.e. SA-01-01).

- Space 10 will contain information about the preservatives used in the samples (i.e. HCI, HNO_3, etc.)

- Space 11 will be completed with the sample technique used.

- Space 12 will contain the depth at which the sample was collected.

- Space 13 will contain the number of bottles collected for the appropriate parameter.

- Space 14 will contain the total number of bottles entered in Space 13.

- Space 15 will contain any remarks as necessary (i.e. indication of extra volume for a matrix spike, equipment blank, etc.).

- Space 16 & 17 will be completed with the date and signature of the person responsible for relinquishing the samples.

- Space 18 & 19 will be completed with the carrier name and airbill number, respectively.

EXHIBIT E-1 CHAIN-OF-CUSTODY RECORD

JAYCOR

CHAIN-OF-CUSTODY RECORD - USATHAMA SAMPLES

JAYCOR Project #: 1
Installation: 2
Laboratory: 3

Field Office Phone No.: 4

Administrative Offices: 1901 N. Beauregard Street • Suite 503 • Alexandria, VA 22311 • 703-671-7900

No. 5

JAYCOR FIELD SAMPLER INITIALS	DATE & TIME OF SAMPLING (MILITARY CLOCK)	SAMPLE LOCATION (SITE NUMBER)	JAYCOR FIELD SAMPLE NUMBER	PRESER-VATIVES USED	SAMPLE TECHNIQUE	DEPTH (FEET)	ANALYSIS REQUIREMENTS									TOTAL NO. OF CONTAINERS	REMARKS
							Explosives	Volatiles	Semivolatiles	Nitrates/Sulfates	Metals	Pesticides	PCBs	Radionuclides	Other		
6	7	8	9	10	11	12	13									14	15

Relinquished By: JAYCOR	Date: 16	Signature: 17	Carrier:	Air Bill No.: 18	Relinquished by: 19
Accepted By:	Date:	Signature:	Date:	Time:	Signature:
Accepted By:	Date:	Signature:	Comments:		

DISTRIBUTION. Original & Yellow Copy: accompany sample to lab. Yellow Copy: retained by lab. Pink Copy: Retained by samplers. Goldenrod Copy: extra, as needed.

684-0174/91

E.2 SAMPLE LABELS

The following procedures establish a method for the control of laboratory samples through the use of sample labels, which will be used for all samples collected or accepted.

- All sample labels will be securely attached to the sample bottle and taped over with clear acetate tape.
- One label will be completed for each sample container collected. Each label (Exhibit E-2) will be completed as follows.
    - Space 1 will be completed with the client name (USATHAMA).
    - Space 2 will be completed with the sample description (i.e., soil or water).
    - Spaces 3A and 3B will be completed with the time and date the sample was collected.
    - Space 4 will be completed with the sampler's name.
    - Space 5 will be completed with the type of analysis requested.
    - Space 6 will indicate whether or not preservatives were used.

EXHIBIT E-2 SAMPLE LABEL

JAYCOR

1901 N. Beauregard St.,Suite 503 • Alexandria, VA 22311-1703

Client: ____1____

Sample Description: ____2____

Date Collected: ____3a____ Received: ________

Collected By: ____4____ Time: ____3b____

Analysis: ____5____

Preservatives: ___ None ___ HNO_3 ___ H_2SO_4

___ NaOH ___ Acetone Rinse ___ HCl Other ________

E-3 SAMPLE SHIPPING

The following procedures establish a uniform method for sample packaging and shipping.

A Custody Seal (a tape-like seal) is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected and have been packed for shipping. The sampler will place a custody seal around the cap of the individual sample container, which will indicate tampering if removed. This procedure will be employed for all samples that are shipped.

- Sample bottles (with labels) will be placed inside plastic bags, with one bottle per bag. When packaging VOA bottles, two bottles will be placed in one bag, which will then be sealed.

- For low concentration samples, each bag will be placed slightly apart into the cooler and the remainder of the cooler will be filled with vermiculite. Ice will be placed in the cooler to maintain a sample temperature of approximately 4°C.

- For medium concentration samples, place each bag containing a labeled sample bottle into a paint can and fill the can with vermiculite. Attach DOT labels as shown at Exhibit E-3. Seal the can using three fastener pins, equally spaced. Place the can into the cooler and fill the cooler with vermiculite.

- Strapping tape and custody seals will be applied to coolers as follows:

  - A custody seal will be signed.
  - Strapping tape will be wrapped in one continuous piece around the cooler approximately three times.
  - The custody seal will be placed on top of the strapping tape so that it is half on and parallel to the tape.
  - Clear acetate tape will then be wrapped around the cooler and on top of the custody seal two more times.
  - Strapping tape will be wrapped three times around the other side of the cooler. A second custody seal will be applied to the opposite side of the cooler and clear acetate tape will be applied as described above.
  - For medium concentration samples, additional labels will have to be attached to the outside of the cooler as shown on the previous page.
  - For low concentration samples, the following procedures will be followed for completing a Federal Express airbill (Exhibit E-4), if applicable.
  - Section 1 will be completed with the Field Team Leader's name, business number, and company address.
  - Section 2 will be completed with the recipient's name, address, and phone number at the laboratory.
  - Section 3 will be completed with the charge number for the project.
  - Under the payment section, the box marked "Bill Sender" should be checked.
  - In Section 4 "Priority 1" should be checked.
  - Under the Delivery and Special Handling section, "Deliver Weekday" should be checked.
  - The space indicated by "Release Signature" will be signed by the Field Team Leader.
  - For medium concentration samples, a "Shipper's Certification Form" airbill must be used. The top of the form is completed using the same procedures as for low concentration samples. The bottom of the form is completed using the following procedures:

    - - Within Section 1, "49 CFR" should be checked.
    - - Sections 2, 3, 4, 5, and 6 are completed with the number of coolers; Flammable Solid, N.O.S.; Flammable Solid; UN 1325 (or as

applicable, Flammable Liquid, N.O.S.; Flammable Liquid; UN 1993); and the volume (in ounces) of the sample, respectively.

- - Within Section 7, "Cargo Aircraft Only" should be circled.
- - Within Section 8, "Nonradioactive" should be circled.
- - The "Name and Title of Shipper," "Place and Date," "Emergency Telephone Number," and "Signature of Shipper" should be completed by the Field Team Leader.

EXHIBIT E-3 LABELING OF MEDUIM SAMPLES

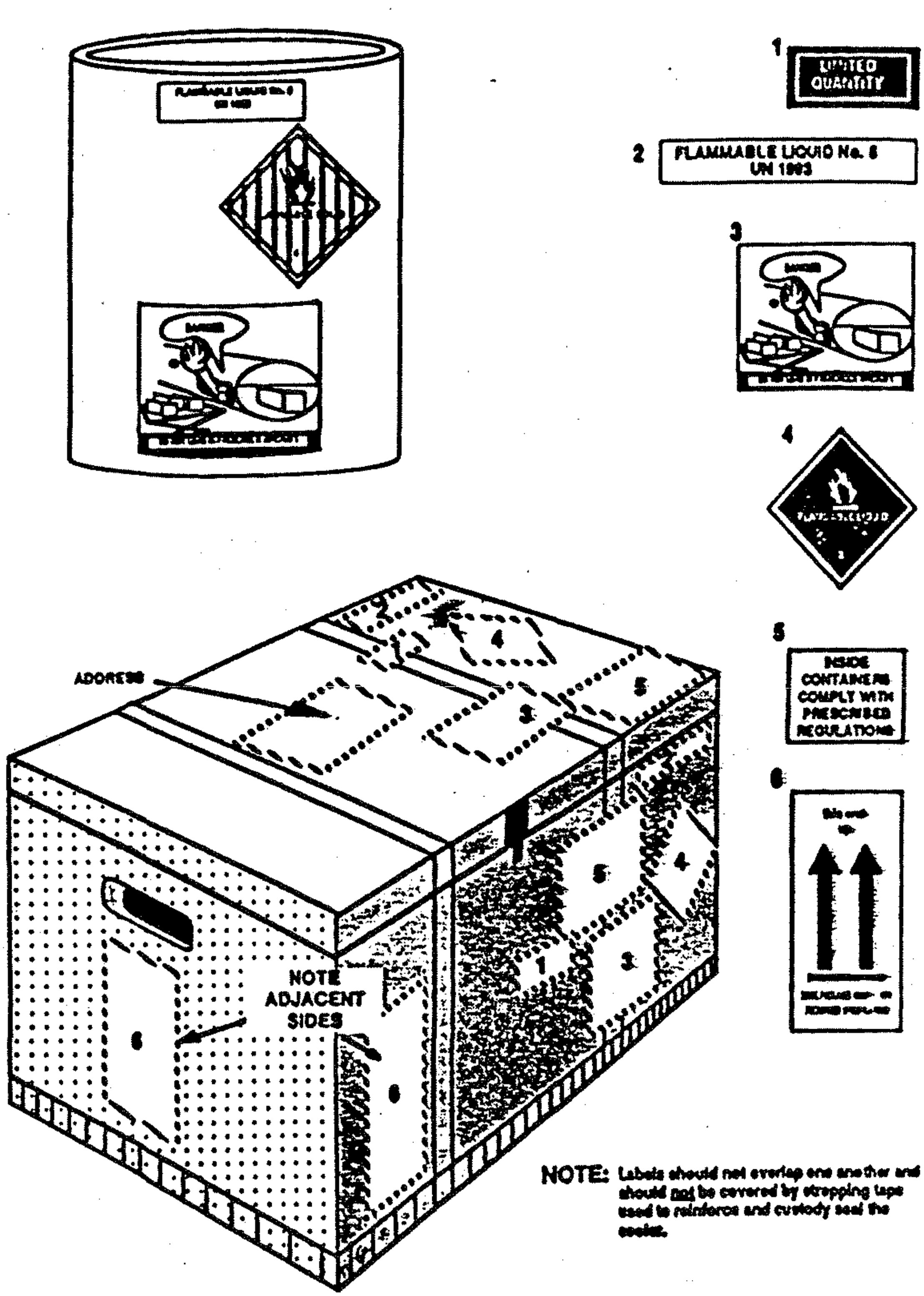


EXHIBIT E-4 FEDERAL EXPRESS AIRBILL

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 5545797235

9317N 5545797235

Sender's Federal Express Account Number	1278-0946-1
From (Your Name)	Joe Hicks
Your Phone Number	(703) 671-7900
Company	JAYCOR
Street Address	1901 N BEAUREGARD ST STE 503
City / State / ZIP	ALEXANDRIA VA 22311
To (Recipient's Name)	Scott A. Hallstrom
Recipient's Phone Number	(612) 525-3379
Company	PACE Inc.
Exact Street Address	1710 Douglas Dr. North
City / State / ZIP	Minneapolis MN 55422

SERVICES | DELIVERY AND SPECIAL HANDLING | SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

Federal Express Use: Base Charges, Declared Value Charge, Other 1, Other 2, Total Charges

014

ORIGIN COPY

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 5545797246

9317N 5545797246

Sender's Federal Express Account Number	1278-0946-1
From (Your Name)	Joe Hicks
Your Phone Number	(703) 671-7900
Company	JAYCOR
Street Address	1901 N BEAUREGARD ST STE 503
City / State / ZIP	ALEXANDRIA VA 22311
To (Recipient's Name)	Gail DeRusso
Recipient's Phone Number	(215) 524-7360
Company	R.F. Weston
Exact Street Address	208 Welsh Pool Rd.
City / State / ZIP	Lionville PA 19341-1313

SERVICES | DELIVERY AND SPECIAL HANDLING | SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

Federal Express Use: Base Charges, Declared Value Charge, Other 1, Other 2, Total Charges

014

ORIGIN COPY

APPENDIX F

FIELD EQUIPMENT MANUALS

Standard Measurement Procedure 9-1-3

YSI MODEL 33 CONDUCTIVITY METER

1.0 INTRODUCTION

This document describes procedures that CDM and subcontractor personnel must perform when using the YSI Model 33 S-C-T meter. Field personnel must perform the procedures that appear in Sections 1.2 to 1.7. The procedures in Section 1.8 may only be performed by CDM authorized service technicians.

1.1 INSTRUMENT PROFILE

Function: Salinity, conductivity, and temperature measurements.

Application: Conductivity measurements in umhos/cm indicate the concentration of salt and ionic contaminants in a water sample. Water with high conductivity can not be consumed by people or used in industrial processes. Organic contaminants are poorly soluble in highly conductive water.

Components: Meter with analog readout; Temperature Adjustment knob; Mode Select knob; Redline control knob; Cell Test button; 2 "D" size alkaline batteries; and probe assembly.

Operation: The model 33 S-C-T meter face yields a reading of the conductivity of a water sample by measuring the current flow between two electrodes in the probe. Salinity is calculated from the conductivity measurement, which includes a user-adjusted temperature compensator. The meter measures temperature by measuring changes in the resistance of a precision thermistor in the probe.

Readout: Conductivity is scaled 0-500, 0-5000, and 0-50000 umhos/cm with YSI 3300 series probes. Salinity is scaled 0-40 parts per thousands in temperature range -2 to +45 degrees C. Temperature is scaled -2 to +50 degrees C.

Calibration: The S-C-T meter and probe is factory calibrated. The meter's calibration is checked against a test solution of known conductivity prior to use to generate a correction factor which is used to obtain accurate readings.

Inherent Safety: The S-C-T meter is not approved for use in areas where flammable or explosive gases or vapors are present.

Prepared: CSEM	Reviewed: DOJ	QA:	Approved:	Issued:
Date: 3/27/89	Date: 3/31/89	Date:	Date:	Date:

1.2 EQUIPMENT AND SUPPLIES

1.2.1 Equipment needed:

- YSI Model 33 S-C-T Meter
- YSI Model 3310 Combination S-C-T Probe
- NITS-traceable laboratory thermometer (e.g. SAMA types CP10 or CP15)
- Hard-shell plastic carrying case

1.2.2 Supplies needed:

- Thirty disposable 150 ml beakers, such as Sherwood Lancer Tri-Pour polypropylene beakers
- One liter of distilled water
- One laboratory wash bottle for distilled water
- Two standard "D" size alkaline batteries
- Conductivity calibration solutions (potassium chloride in water) 1,000 (YSI 3167), 1,413 (VWR 51430), or 10,000 (YSI 3168) µmhos/cm
- Conductivity probe platinizing solution (YSI 3140).

1.3 START UP

a. Place the meter in the position in which it will be used, either vertical or flat on its back. Record the instrument model and serial numbers and last warehouse preventive maintenance date of the conductivity meter in the field log book. If the preventive maintenance occurred over a month ago, send the meter back to CDM for service (Section 1.7.5).

b. With the Mode Select knob in the OFF position, adjust the meter with the screw on the dial face until the red needle and its reflection in the dial mirror line up with the zero on the conductivity scale.

c. Plug the probe into the plug receptacle in the side of the meter. Place the probe body in clean water.

d. Turn the Mode Select knob to the RED LINE position.

e. Adjust the Red Line control knob so that the meter needle and its reflection in the dial mirror line up with the red line on the meter face. If this cannot be accomplished, replace the batteries.

f. Perform a calibration check (Section 1.4.3). If the instrument has not been used today, perform a full calibration (Section 1.4.2)

1.4 INSTRUMENT CALIBRATION

1.4.1 Frequency of Calibration

a. The user should calibrate the S-C-T meter (Section 1.4.2) before each day of use.

b. The user should check the calibration of the S-C-T meter (Section 1.4.3) whenever it is powered up and after every tenth reading.

c. CDM service technicians must perform the monthly preventive maintenance check described in Section 1.8.1.

1.4.2 Field Calibration

The S-C-T meter and probe is factory-calibrated. Check its calibration against the conductivity standard closest to the values expected in the samples. A calculated factor is used to obtain accurate readings.

a. Attach the probe to the meter and rinse it with distilled water. Soaking the probe in distilled water for up to 24 hours improves accuracy of calibration.

b. Select a conductivity standard (1,000, 1,413, or 10,000 µmhos) closest to the values expected in the samples.

c. Perform the start up procedure (Section 1.3).

d. Allow the meter to warm up for one or two minutes.

e. Place the standard in a laboratory-clean beaker or glass jar. Gently shake the probe in air to remove distilled water. Immerse the probe. Move the probe up and down in the standard to soak the electrodes.

f. Empty the beaker and refill it with solution. Repeat step "e" with this aliquot of standard before reading the meter.

g. Rotate the Mode Select knob to X10 or X100 to yield an on-scale reading.

h. Read the point on the conductivity scale at which the red needle and its reflection on the dial mirror rest. Record the meter reading and the conductivity standard's value in the field log book.

i. Depress the Cell Test button. Enter the changed reading in the field log book. If the reading changes by more than 2%, the electrode is fouled and needs to be cleaned. Measurements collected on that meter will be unreliable. See Section 1.7.3.

j. Calculate a cell constant by dividing the standard's conductivity value by the meter reading and the scale factor (10, or 100). Write this constant on the calibration sticker.

Cell Constant = Standard Value / (Meter Reading X Scale Factor)

k. Enter the time and place of calibration, the standard used, the meter readings, and the resulting cell constant in the field log book.

l. Rinse the probe with distilled water.

1.4.3 Field Calibration Check

a. Place standard solution in a laboratory-clean beaker or glass jar. Gently shake the probe in air to remove distilled water. Immerse the probe. Move the probe up and down in the standard to soak the electrodes.

b. Read the point on the conductivity scale which aligns with the red needle and its reflection on the dial mirror.

c. If the meter reading diverges from that found in the calibration step [Section 1.4.2 (j)] by 5% or more, repeat steps "a" and "b" with another aliquot of standard.

d. If this repeated meter reading diverges from that found in the calibration step (Section 1.4.2) by 5% or more, recalculate the cell constant by the method in 1.4.2 (g).

e. If the meter reading agrees within 5%, note that you performed a calibration check. If a new cell constant is necessary, enter the time and place of calibration, the standard used, the meter readings, and the resulting cell constant in the field log book.

1.5 FIELD MEASUREMENTS

1.5.1 Measuring Temperature and Conductivity

a. Place the sample, or an aliquot of medium identical to the sample, in a laboratory-clean beaker or glass jar. The beaker can be re-used if rinsed with the next sample medium.

b. Gently shake the probe in air to remove distilled water and place it into the sample solution. Move the probe up and down in the beaker to soak the electrodes with the sample.

c. Repeating steps "a" and "b" with two aliquots of sample medium before reading will improve accuracy.

d. Set the Mode Select knob to TEMPERATURE. Read the temperature on the bottom scale of the meter in degrees Celsius. Allow time for the probe to achieve temperature equilibrium before reading it. Record the temperature in the field log book.

e. Adjust the Red Line control knob so the meter needle and its reflection in the dial mirror lines up with the red line on the meter face. (Note: Temperature compensation has no affect on conductivity readings.)

f. With the probe in the solution to be tested, set the Mode Select knob to the lowest conductivity range that yields a meter reading below full scale.

g. Multiply the meter reading, in umhos/cm, by the scale factor (1, 10, or 100) selected and the cell constant from instrument calibration procedure (1.4.2). Record the direct measurement, and the calculated value directly in the field log book.

Sample Conductivity = Meter Reading X Scale Factor X Cell Constant

h. Rinse the probe with distilled water between samples.

i. Conductivity measurements may be taken by immersing the probe into rivers, tanks, lakes, etc. Keep the probe at least 6" from metallic objects.

1.5.2 Measuring Salinity

a. If the conductivity is above 500 μmhos, don't try to determine the salinity.

b. Adjust the temperature compensator dial to the water's temperature.

c. Set the Mode Select knob to SALINITY. Read the salinity in parts per thousand from the "%S" scale.

1.6 SHUT DOWN AND STORAGE

a. Store the probe in distilled water whenever feasible.

b. Store the unit in the case.

c. Don't store conductivity meters on site unless staff are on site.

d. If the meter will be inactive for more than a week, return it to the Regional Equipment Warehouse for service and/or reassignment.

1.7 TROUBLE-SHOOTING (By Instrument Users)

1.7.1 Preventive Maintenance

CDM service technicians must perform a monthly preventive maintenance (PM) check which is described in Section 1.8.1. Don't use the conductivity meter unless a calibration sticker showing a PM date within the last month appears on the meter.

1.7.2 Indicators of Instrument Malfunction

a. If the Red Line adjustment [Section 1.3 (d)] won't align the needle, its reflection, and the red line, replace the batteries.

b. If the meter reads over 10 μmhos when the probe is in distilled water, replace the water. If it still reads over 10 μmhos, the meter zero may need adjustment [Section 1.3 (b)].

c. If a reading on the X10 and X100 scales decreases more than 2% when you depress the Cell Test button, the electrode is fouled and needs to be cleaned. Measurements collected on that instrument will be unreliable. Field personnel may clean probe following the procedure in Section 1.7.4.

d. If calibrations (Section 1.4.2) performed with two different strengths of standard yield cell constants that differ by 10% or more, return the meter and probe to the CDM warehouse for service.

1.7.3 Battery Replacement

a. Replace the batteries with alkaline "D" cells only. Carbon/zinc batteries can cause errors.

b. Replace the batteries every six months to avoid damage to the meter from leaking battery fluids.

1.7.4 Probe Cleaning

a. Immerse the probe in a commercially available bathroom tile cleaner such as Lysol[R] Basin, Tub, & Tile Cleaner. Use the cleaner at full strength.

b. Soak the probe in the cleaner for five minutes.

c. Rinse the probe thoroughly with tap water.

d. Rinse the probe thoroughly in distilled water.

e. Re-calibrate the meter and probe (Section 1.4.2).

1.7.5 Other Types of Repair

a. All other types of repair may be performed only by the YSI or CDM service technicians.

b. Meters must return to the warehouse for a preventive maintenance check (Section 1.7.1) at least once a month.

c. Complete and send an Equipment Condition Report Form for the instrument each time you send it to the CDM warehouse.

1.8 PREVENTIVE MAINTENANCE AND SERVICE (By CDM Warehouse)

1.8.1 Preventive Maintenance Check

CDM service technicians must perform a preventive maintenance (PM) check once a month. The PM check shall consist of:

a. Calibrating the thermistor against an NITS-traceable glass thermometer (see Section 1.8.2).

b. Calibrating the meter against both the 10,000 and the 1,000 or the 1,413 µmhos solutions before shipping the meter to the field (Section 1.4.2). If the meter is working properly, the cell constants will be equal at both strengths. If not, the electrode may need platinizing (Section 1.8.4)

c. Performing a Cell Test on the probe. If the meter reading changes by 2% or more, the probe needs cleaning (Section 1.8.3)

1.8.2 Calibrating the Thermistor

a. Perform this temperature calibration with both cold and warm water prepared as follows:

- Withdraw tepid water from a tap, or allow cold tap water to rise to room temperature in a closed container.

- Mix approximately 400 ml of cold tap water with 400 ml of ice for 5 to 10 minutes. Decant the ice from the water before using it.

b. Fill a beaker that is at least 400 ml in volume with the water to a height of three inches.

c. Perform the start up procedure (Section 1.3) on the conductivity meter.

d. Place the probe in the water.

e. Place the NITS-traceable glass thermometer in the water alongside the probe.

f. Move the probe up and down in the water until the temperature readings stabilize.

g. If the two temperature readings agree within two degrees Celsius, note the two temperature readings on the maintenance and calibration worksheet.

h. If the temperature readings diverge by more than two degrees Celsius, contact YSI for a replacement.

1.8.3 Probe Cleaning

a. Immerse the probe in a solution of ten parts distilled water, ten parts isopropanol, and one part hydrochloric acid.

b. Soak the probe in the solution for five minutes.

c. Rinse the probe thoroughly with tap water.

d. Rinse the probe thoroughly in distilled water.

e. Re-calibrate the meter and probe (Section 1.4.2).

f. Fill in the calibration/maintenance log.

1.8.4 Re-Platinizing

a. Clean the probe according to the procedure in 1.8.3.

b. Perform the start up procedure (Section 1.3).

c. Place the probe in a clean 150 ml glass beaker and add enough platinizing solution (YSI 3140) to cover the electrode.

d. Plug the probe into the meter and set the meter on the X100 scale.

e. Read the conductivity of the platinizing solution on the meter.

f. The time required to re-platinize is determined as follows:

Meter Reading (μmhos/cm)	Time (minutes)
30,000	5
25,000	6
20,000	8
15,000	11
10,000	16

g. After the elapsed time, rinse the probe thoroughly in tap water.

h. Rinse it thoroughly in distilled water.

i. Return the platinizing solution to its container.

j. Store the probe in distilled water.

k. Complete the calibration/maintenance log.

1.8.5 Other Types of Repair

CDM service technicians may performm other types of repair with the advice of YSI technical service.

ORION SA 250 pH METER

This section outlines procedures for field operations with the ORION SA 250 pH meter.

Instrument Profile

Application:	To measure the pH of waters, wastewaters, and some types of solids.
Components:	The pH meter consists of a plastic body, electrode and an automatic temperature compensation probe.
Read Out:	The meter can display 0.1 or 0.01 pH resolution.
Calibration:	The meter is calibrated prior to use and after every 10 samples with standard buffer solutions. The calibration procedure is described in the Orion manual. If fresh buffers are prepared prior to instrument calibration, the buffer lot number, date prepared, and the technician's initials are entered in the field logbook. If standard bottled pH buffer solutions are used, the lot number(s) and expiration date(s) are entered in the field logbook.
Inherent Safety:	None.

Field Procedures

The Orion manual details the procedures to be followed in the field. EPA Method 9045 describes the soil pH procedure.

ORION

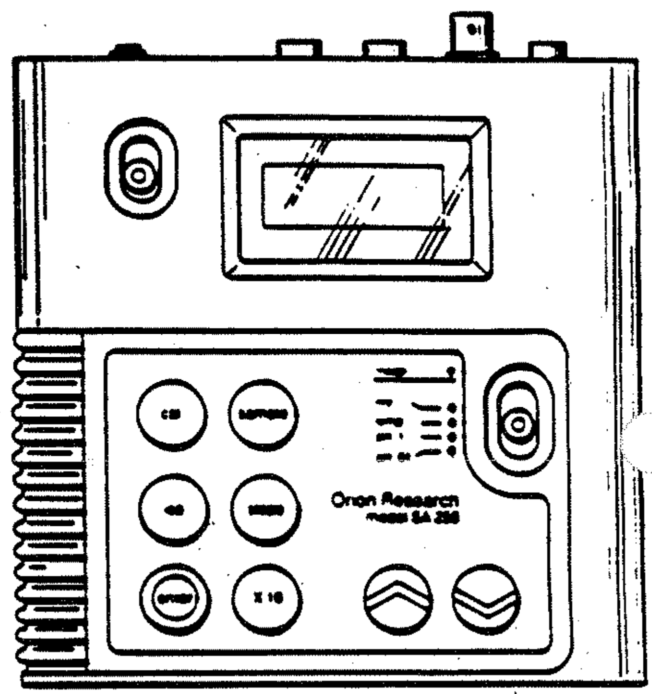
Orion Research Incorporated
Laboratory Products Group

SA 250 pH METER
TRAINING GUIDE

The ORION SA 250 Meter is an advanced portable pH meter with many features previously found only in bench-top meters.

- Autocalibration recognizes and enters 4.01, 7.00, or 10.01 pH buffers. Other buffer values can be manually entered.
- Choice of .1 or .01 pH resolution. You choose speed or better accuracy.
- Prompting you through 1 or 2 point calibration to sample measurement.
- Assistance codes diagnose errors.
- Superior design for outdoor, process, or active lab environments.
- Durable splash, dust, and corrosion-resistant housing.
- Lightweight, no slip grip for hand-held operation.
- Convenient carrying case with ROSS pH Electrode, ATC probe, and all the accessories you need for immediate start-up.

Turn this card over for instructions on a calibration with two buffers using the ATC probe. Consult the meter instruction manual for initial check out, specifications, and further operational information.



ORION SA 250 pH METER

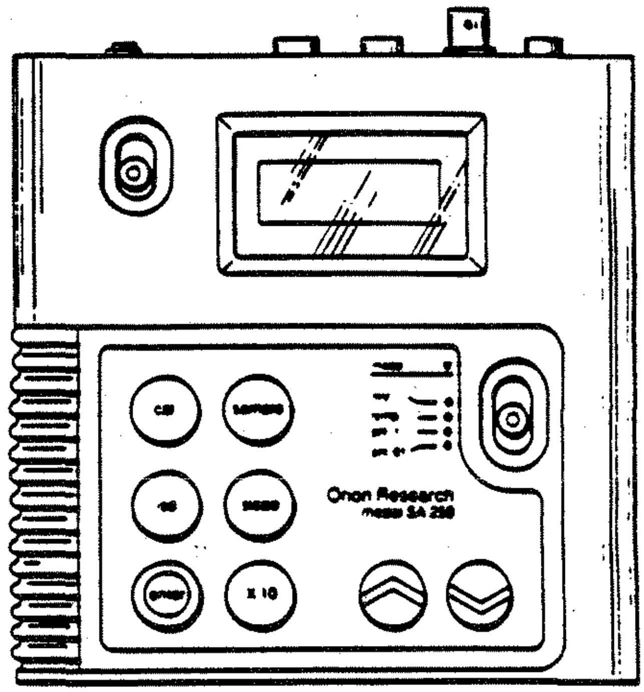
Autocalibration With Two Buffers and an ATC Probe

Select either 4.01 and 7.00, or 7.00 and 10.01 buffers; whichever will bracket the expected sample range.

An ATC probe is used for convenience and accuracy. Once the ATC probe is plugged into the input jacks, and placed into solution, entering temperature values manually is not possible. The ATC probe automatically senses buffer or sample temperature for use in calculating accurate pH values.

1. Connect electrodes and ATC probe to meter.
2. Select pH mode and resolution by sliding the mode switch to pH .1 or pH .01.
3. Press **iso** and verify that the isopotential point is 7.00.
4. Place electrodes and ATC probe into 7.00 buffer.
5. Press **cal**. The display will alternate between **.1.** and the pH value of the buffer, indicating that the electrodes are in the first buffer and a value has not yet been entered.
6. Wait for the pH value to stabilize. Press **enter**. The correct display will freeze for 3 seconds, then advance to **.2.**, indicating the meter is ready for the second buffer.
7. Rinse electrodes and ATC probe and place into the second buffer, either 4.01 or 10.01. The display will alternate between **.2.** and the pH value of the buffer.
8. Wait for the pH value to stabilize. Press **enter**. The letters ***pH*** will be displayed. The SA 250 Meter is now calibrated and automatically advances into the sample mode.
9. Rinse electrodes and ATC probe and place into sample. Read the pH directly from the display.

NOTE: A different isopotential point can be entered. However, if you do not know the isopotential point of your pH electrode, the 7.00 default setting is recommended for Ag/AgCl and ROSS pH Electrodes.



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ORION

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Part No. 205379-001

INTRODUCTION

ORION Automatic Temperature Compensation (ATC) Probes transmit a signal to the pH meter, which automatically corrects pH measurements for variation in electrode slope due to temperature change. The 917001 and 917002 ATC Probes are designed for use with the following ORION Meters:

SA 230	501	811
231	SA 520	EA 920
SA 250	SA 720	EA 940

These probes may also be used with other meters requiring a PT-100 type thermistor automatic temperature compensator with dual banana plugs.

The 917001 ATC Probe has a break resistant epoxy body. The epoxy is not recommended for use in organic solvents, but may be used on an intermittent basis in methanol or ethanol.

The 917002 ATC Probe is an all glass probe. This probe is preferred for use in solutions containing organic solvents or at temperatures over 80°C.

For automatic temperature compensation and temperature measurement procedures, consult the appropriate meter instruction manual.

SPECIFICATIONS

Temperature Range
917001: 0-80°C
917002: −5 to 100°C (ATC), 120° (TEMP only)

pH Range
0 to 14 pH

Accuracy
±0.1°C or 1%, whichever is greater

Storage
Store in air

Connector
Dual banana plugs

Size
Probe length: 15 cm
Cable length: 100 cm
Probe diameter: 8 mm

Specifications subject to change without notice

GENERAL INFORMATION

Introduction

The ORION SA 250 pH Meter is an advanced, portable pH meter with many features previously found only on bench-top meters.

Automated functions such as autocalibration, prompting, automatic temperature compensation, and diagnostic operator assistance codes make the SA 250 Meter very easy to use.

With your choice of .1 or .01 pH resolution, you decide if you need speed or better accuracy.

The meter comes with a ROSS Combination pH Electrode and ATC probe for fast, accurate results, no matter what the temperature difference between samples and standards.

Created for the outdoor, process, or active lab environment, the meter is lightweight, with a no-slip grip, large LCD display and has a rugged splash and dust-resistant housing. The SA 250 Meter meets or exceeds tests to Department of Transportation and Mil specs for shock, vibration, and moisture.

See **Figure 1**.

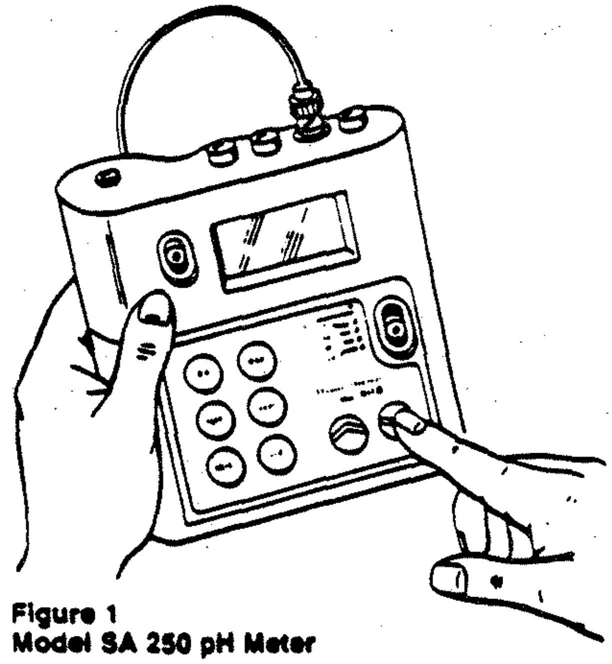

Figure 1
Model SA 250 pH Meter

INSTRUMENT DESCRIPTION

Refer to **Figure 2.**

1 **ON/OFF Switch** Controls power to the meter. Memory is maintained even when the instrument is turned off.

2 **LCD Display** SA 250 pH Meter automatically displays data on an easy-to-read 3 1/2 digit LCD.

3 **Mode Switch** Used to select mV, temp, pH .1, or pH .01 modes.

4 **Keys** Eight touch keys are used to control the meter. Each key is labelled as to the function performed. The following table summarizes the function of each key:

Key	Function
sample	Press to display pH of the sample.
cal	Press to start the calibration sequence.
iso	Press to display current isopotential point.
slope	Press to display slope in percent of theoretical.
enter	Press to enter a value into the meter memory.

The following keys, X10, ∧, ∨, are used to change the numeric display. This process is called scrolling.

X10	Increases the displayed value to the next decade — for example: pH 6.14 would increase to 7.00. At the upper end of the scale pressing X10 will cause the display to wrap around — for example: pH 19.00 would go to −2.00.
∧ up	Increases the value displayed by increments equal to the least significant digit.
∨ down	Decreases the value displayed by increments equal to the least significant digit.

If the ∧ or ∨ key is pressed and held, the next significant digit will change.

The sample, cal, iso, and slope keys function only while the mode control is in either pH .1 or pH .01.

The ∧ or ∨ keys function in temp, pH .1, or pH .01 modes.

5 **Electrode Input**: Accepts BNC connector from combination or sensing electrodes. A separate pin tip input accepts reference electrodes.

6 **ATC Probe Jack**: Accepts ATC probe for automatic temperature compensation.

7 **Line Converter Jack**: Accepts an AC line converter for use without batteries.

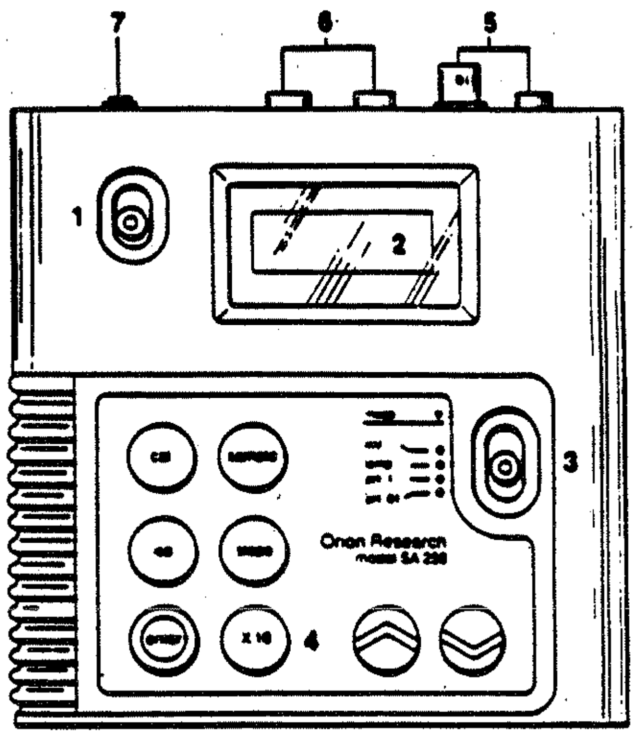

Figure 2
SA 250 Meter Controls

INSTRUMENT SET-UP

Support Rod

See **Figure 3.**

1. Attach support rod base to side of meter carrying case and tighten clamp screw
2. Insert support rod into base. Tighten rod by turning clockwise.
3. Attach electrode holder to top of support rod.

Power Source

The ORION SA 250 pH Meter operates on one 9 volt nonrechargeable alkaline battery. If the SA 250 pH Meter is left on while using battery power, there will be approximately 30 hours of continuous life. Optional AC line converters are available for both 110 and 220 volt mains. Refer to **ORDERING INFORMATION**.

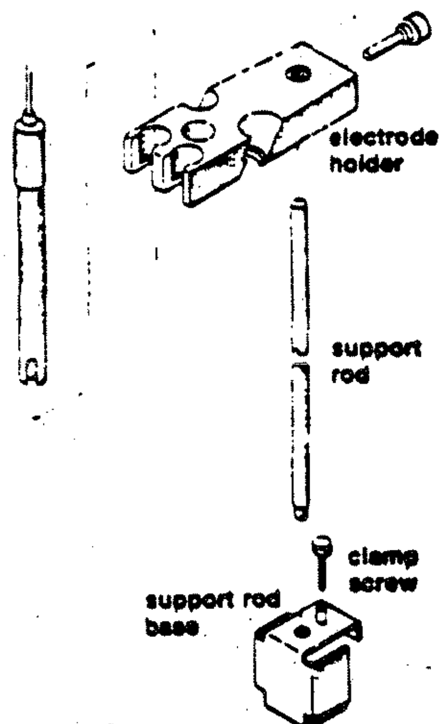

Figure 3
Support Rod and Clamp

Battery Installation

See **Figure 4.**

1. Remove access panel on back of meter, by sliding cover towards bottom of meter.
2. Attach battery connector clip to battery terminals, install battery and replace access panel.

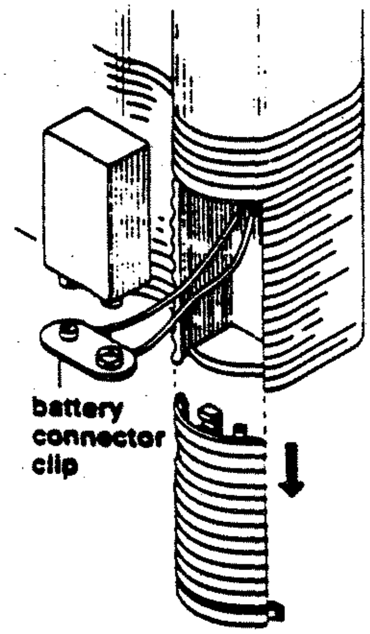

Figure 4
Battery Installation

Meter Check Out Procedure

1. Slide power switch to ON position. Attach BNC Shorting Plug (Orion Cat. No. 090045) to BNC connector on top of meter. Refer to **Figure 5**.
2. If using optional AC line converter, connect it to meter and appropriate power source. Proceed to step 4
3. If **LO BAT** indicator on LCD remains on, the battery must be replaced.
4. Slide mode switch to mV. Display should read **0 ± 0.3**.
5. Slide mode switch to temp. Display should read ***25.0***. If ***25.0*** is not displayed, scroll, using ∧, ∨, and X10 keys, until ***25.0*** is displayed and press **enter**.
6. Slide mode switch to pH .01. Press **iso**. Display should read the letters ***ISO*** then a value of ***7.00***. If ***7.00*** is not displayed, scroll until ***7.00*** is displayed and press **enter**.
7. Press **slope**. Display should read the letters ***SLP*** then a value of ***100.0***. If ***100.0*** is not displayed, scroll until ***100.0*** is displayed and press **enter**.
8. Press **sample**. Observe the letters ***pH*** then a steady reading of ***7.00 ± 0.02*** should be obtained. If not, press **cal** and scroll until ***7.00*** is displayed and press **enter**. Press **sample** and observe a reading of ***7.00***.
9. Remove the shorting plug. After a successful completion of steps 1-8 the meter is ready to use with an electrode.

Electrode Connections

Refer to **Figure 5**.

1 Attach electrodes with BNC connectors to sensor input by sliding connector onto input, pushing down and turning clockwise to lock into position. Connect reference electrodes with pin tip connectors by pushing connector straight into reference input.

NOTE: If using a combination electrode with a BNC connector, the reference pin-tip jack is not used (4 in Figure 5).

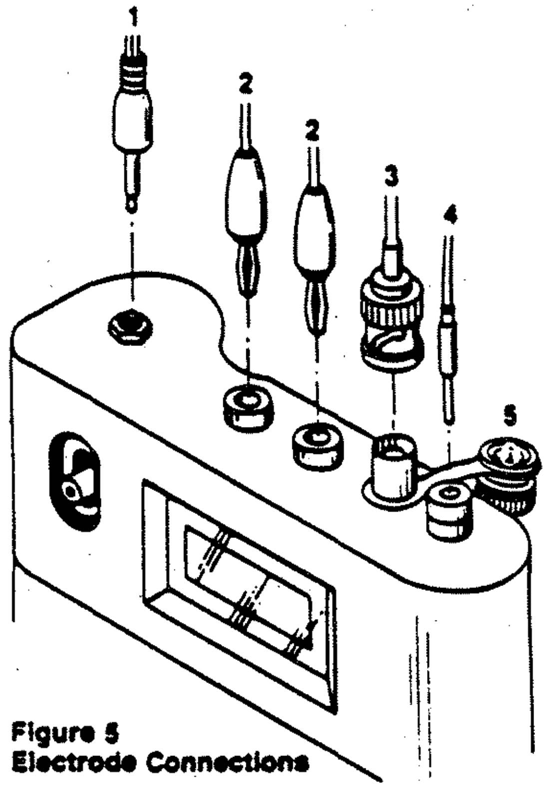

Figure 5
Electrode Connections

Legend

1 AC line converter to line converter jack
2 ATC plugs to ATC jacks
3 BNC connector to sensor input (shown with shorting plug disconnected)
4 Reference pin-tip plug to reference input
5 BNC shorting plug (Orion Cat. No. 090045)

MEASUREMENT PROCEDURES

pH Measurements

See Figure 6.

A calibration with one or two buffers should be performed before pH is measured. It is recommended that a calibration with two buffers be performed at the beginning of each day to determine the correct slope of the electrode. This serves the dual purpose of determining if the electrode is working properly and storing the slope value in the meter's memory. Perform a one buffer calibration every two hours to compensate for electrode drift.

Check the stored value for ***ISO*** before calibration. Unless the isopotential point of the electrode is known verify that the display reads ***7.00***. If not, scroll until ***7.00*** is displayed and press **enter**. See **Isopotential Point**.

There are two ways of calibrating the SA 250 Meter, autocalibration or manual calibration.

NOTE: It is recommended to select either autocalibration or manual calibration and not use a combination of the two methods. Following is a description and instructions for each method.

Autocalibration

Autocalibration is a feature of the SA 250 Meter that automatically recognizes the 7.00, 4.01 and 10.01 buffers with a range of ±0.5 pH units. The user waits until the pH display is stable and presses **enter**. The SA 250 Meter automatically calibrates to the correct buffer value using temperature compensation. Do not scroll when using autocalibration.

When calibrating, the SA 250 Meter compares actual values to theoretical values to determine if the buffer is within range. Buffers greater than ±0.5 pH units from the correct value will trigger an operator assistance code.

It is recommended that an ATC probe be used for autocalibration. If an ATC probe is not used, all samples and buffers should be at the same temperature or use manual temperature compensation. See **Temperature Mode**.

Autocalibration With Two Buffers

1. Connect electrode(s) to meter. Slide the mode switch to either pH .1 or pH .01. Choose either 4.01 and 7.00, or 7.00 and 10.01 buffers, whichever will bracket your expected sample range.
2. Place electrode(s) into either 4.01, 7.00 or 10.01 buffer.
3. Press **cal**. The display will alternate between ***.1.*** and the pH value of the buffer, indicating this is the first buffer and a value has not been entered. Wait for a stable pH display and press **enter**. The correct display will freeze for 3 seconds then advance to ***.2.*** indicating the meter is ready for the second buffer.
4. Rinse electrode(s) and place into a second buffer. Wait for a stable pH display and press **enter**.

   After the second buffer value has been entered the letters ***PH*** will be displayed. The meter is now calibrated and automatically advances to **sample** mode.
5. Rinse electrode(s), place into sample. Record pH directly from the meter's display.

Autocalibration With One Buffer

1. Check slope term by pressing **slope**. If necessary, scroll and enter the correct value. If slope value is unknown, either enter 100.0 or perform a two buffer calibration. A single buffer calibration does not change the slope term.
2. Connect electrode(s) to meter. Slide mode switch to either pH .1 or pH .01.
3. Place electrodes into either 4.01, 7.00 or 10.01 buffer.
4. Press **cal**. The display will alternate between ***.1.*** and the pH value of the buffer, indicating this is the first buffer and a value has not been entered.
5. Wait for a stable pH reading and press **enter**.

   After **enter** is pressed the correct display will freeze for 3 seconds then advance to ***.2.***, indicating the meter is ready for the second buffer. By pressing **sample** the letters ***PH*** will be displayed, indicating the meter has advanced into the sample mode.
6. Rinse electrode(s) and place into sample. Read the pH directly from the display.

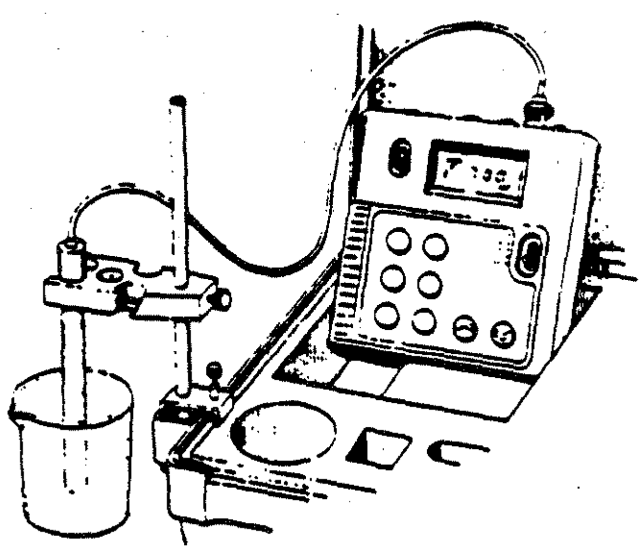

Figure 6
Optional Way to Set Up SA 250 Meter for Sample Measurements

Manual Calibration

To calibrate with buffers other than 4.01, 7.00 or 10.01, use the manual calibration technique. The calibration sequence is the same as autocalibration, except buffer values are scrolled in.

It is recommended that an ATC probe be used. If an ATC probe is not used, all samples and buffers should be the same temperature or use manual temperature compensation. See **Temperature Mode**.

NOTE: Even if scrolling is not necessary, scroll one digit and return to correct value before pressing enter. Otherwise meter will assume autocalibration is to be used.

Manual Calibration With Two Buffers

1. Connect electrode(s) to meter. Slide mode switch to either pH .1 or pH .01. Choose two buffers that will bracket your expected sample range.
2. Place electrode(s) into the first buffer.
3. Press **cal**. The display will alternate between ***.1.*** and the pH value of the buffer, indicating this is the first buffer and a value has not been entered.
4. Wait for a stable pH display. Using ∧, ∨ or X10 keys, scroll in the correct value and press **enter**.

   The display will freeze for 3 seconds then advance to ***.2.*** indicating the meter is ready for the second buffer.
5. Rinse electrode(s) and place into the second buffer. Wait for a stable pH display. Scroll in the correct value and press **enter**.

   After the second buffer value has been entered the letters ***PH*** will be displayed. The meter is now calibrated and automatically advances to the **sample** mode.
6. Rinse electrode(s) and place into sample. Record pH directly from the meter's display.

Manual Calibration With One Buffer

1. Verify slope by pressing **slope**. If necessary scroll in correct value, using ∧, ∨ and X10 keys, and press **enter**. If correct slope is unknown, either enter ***100.0*** or perform a two buffer calibration.
2. Connect electrode(s) to meter. Slide mode switch to either pH .1 or pH .01.
3. Place electrodes into the buffer.
4. Press **cal**. The display will alternate between ***.1.*** and the pH value of the standard, indicating this is the first buffer and a value has not been entered.

   Wait for a stable pH display; scroll until the correct value is displayed and press **enter**.

   The display will freeze for 3 seconds then advance to ***.2.*** indicating the meter is ready for the second buffer. By pressing **sample** the letters ***PH*** will be displayed. The meter is now calibrated and automatically advances to **sample** mode.
5. Rinse electrode(s) and place into sample. Read the pH directly from the display.

NOTE FOR MANUAL CALIBRATION: In the event that scrolling was started but the value was not entered and the mode switch was changed, either a P1 or a P2 will be displayed upon returning to the pH mode. P1 indicates that a value has not been entered for the first buffer while P2 indicates a value has not been entered for the second buffer.

Slope

By pressing the slope key the slope is displayed as a percent of theoretical. A properly functioning electrode will have a 92% to 102% slope. See **Troubleshooting**, if the slope is out of range. The slope value is retained in the meter's memory until another two buffer calibration is performed or another value is entered. A one buffer calibration does not change the slope value.

At the beginning of each day and every time a different electrode is used a two buffer calibration should be performed for accurate measurements.

To enter a slope value:

1. Slide the mode switch to either pH .1 or pH .01.
2. Press the **slope** key.
3. Scroll, using ∧, ∨ or X10 keys, until the correct value is displayed.
4. Press **enter**.

Isopotential Point

The isopotential point is the pH at which the potential (mV) of the electrode will not vary with temperature.

For the majority of pH electrodes the isopotential point is pH 7.00. There are some exceptions where the operating range used for a particular electrode is primarily at one end of the pH scale.

If your pH electrode has an isopotential point other than 7.00, the correct value may be entered as follows:

1. Slide **mode** switch to **pH .1** or **pH .01**.
2. Press **iso**.
3. Scroll, using ∧, ∨, or **X10** keys, until correct value is displayed.
4. Press **enter**.

A two buffer calibration should be performed after an isopotential point value has been changed. It is good practice to verify the isopotential point whenever the meter has been turned on.

Temperature Mode

Sliding the mode switch to **temp** will display the temperature in °C. When the temperature is outside of the operating range −5.0 to 105.0°C, an operator assistance code will be displayed. ***E-1*** for below −5°C, or ***E 1*** for above 105°C.

During a calibration or sample measurement, the mode switch can be changed to **temp**. When an ATC probe is connected the temperature can be monitored and automatic temperature compensation will take place.

To use manual temperature compensation:

1. Using a thermometer accurate to ±1°C determine the temperature of the solutions to be measured.
2. Slide **mode** switch to **temp**.
3. Scroll, using ∧, ∨ or **X10** keys, until the correct temperature value is displayed.
4. Press **enter**.
5. Return **mode** switch to either **pH .1** or **pH .01**

When an ATC probe is not connected, the last entered value of temperature is displayed. If a temperature value has not been entered since the removal of an ATC probe, a default value of 25°C is displayed.

Potentiometric Measurements

Potentiometric titrations are performed in **mV** mode using either pH, ion-selective or redox electrodes. Detailed instructions for any ORION Electrode are given in the electrode instruction manual. Titration instructions are included in ORION Redox Electrode (Model 96-78 or 97-78) Instruction Manual, or in standard analytical texts. Electrodes that have a U.S. Standard Connector need a U.S. Standard to BNC Adaptor which are available from Orion (Cat. No. 090033).

Dissolved Oxygen Measurements

Dissolved oxygen measurements are displayed in ppm O_2 when ORION Model 97-08 Dissolved Oxygen Electrode is used with ORION SA 250 Meter. Follow these instructions for calibrating the electrode.

1. Connect the Model 970899 to meter and leave electrode mode switch "off".
2. Unplug and do not use an ATC probe.
3. Set the **mode** switch of the SA 250 Meter to **temp** and scroll in 25.0°C, press **enter**.
4. Set the **mode** switch to **pH .1** or **pH .01**.
5. Press the **slope** key. Scroll until the value ***100.0*** appears and press **enter**.
6. Press the **iso** key and verify that it is ***7.00***. If not, scroll in the value ***7.00*** and press **enter**.
7. Press the **cal** key. Scroll in the value ***7.00*** and press **enter**.
8. Press **sample**.
9. Turn the mode switch on the electrode to BT CK. Good battery operation is indicated by a reading of ***13.00*** or greater on the meter.
10. Turn the mode switch on the electrode to ZERO. Use the zero calibration control on the electrode to set the meter to read ***0.00***.
11. Insert the reservoir (funnel) into a BOD sample bottle containing enough water to just cover the bottom. Insert the electrode, making sure that the electrode tip is *not* immersed in the water and does not have water droplets clinging to the outside of the membrane. Let stand approximately 30 minutes to ensure water saturation of air in BOD bottle. This bottle should be used for electrode storage between measurements.
12. Turn the electrode mode switch to the AIR position. If measurements are being made at sea level, use the AIR calibration control on the electrode to set the pH meter reading to the prevailing barometric pressure in mm Hg (divided by 100). If the barometric pressure is unknown, if the elevation is above sea level or if the sample has a salinity greater than 2 parts per thousand, consult **Table 1** found in the Model 97-08 Instruction Manual to obtain the correct AIR setting.
13. Turn electrode mode switch to H_2O for sample analysis.

OPERATOR ASSISTANCE CODES

Operator assistance codes are used to inform the user of an out of range value. The following table outlines the operator assistance codes that are available in the SA 250 pH Meter and suggests a remedy. The table is divided according to the modes of the meter.

Code	Problem	Remedy
MV MODE		
E 1 *E-1*	mV out of range	1. If occurs when electrodes are out of solution, code will disappear when electrodes are returned to solution. 2. Verify electrodes are properly connected and filled. 3. Dilute standards or samples. 4. Review calibration and operating procedures.
TEMP MODE		
E 1 *E-1*	Temp out of range	1. Verify ATC probe is properly connected.
pH .1 or pH .01 MODES while in sample function		
E 1 *E-1*	mV, temp or pH out of range	1. Go to mV mode and check. If mV is out of range, perform remedy steps described above for mV mode. 2. Go to temp mode and check. If temp is out of range, perform remedy steps described above for temp mode. 3. Check the sample. 4. Check slope and iso values. 5. Recalibrate.
While in cal function:		
E 1 *E-1*	mV, temp or pH out of range	1. Go to mV mode and check. If mV is out of range, perform remedy steps described above for mV mode. 2. Go to temp mode and check. If temp is out of range, perform remedy steps described above for temp mode. 3. Check the buffer. 4. Check iso value.
E21	Slope not in the range 80.0 to 100.0%	1. Press enter to acknowledge code and repeat calibration using fresh buffers. 2. Clean electrode and refill reference. 3. Refer to electrode instruction manual for check out.
E31	First cal point out	1. Press enter and repeat calibration using fresh buffers. 2. Check iso, slope, and temp values. 3. Verify electrodes are properly connected.
E35 *E36*	pH Autocalibration error. Electrode voltage being measured is greater than ± 0.5 pH units from nominal value for the pH buffer	1. Press enter and repeat calibration using fresh buffers. 2. Clean electrodes and refill reference. Recalibrate. 3. Perform a manual calibration. Certain electrodes may operate out of acceptable range for pH autocalibration

TROUBLESHOOTING GUIDE

Malfunction	Possible Cause	Remedy
No Display	No power to meter	1. Check that switch is in ON position. 2. Replace battery. 3. Check that adaptor is receiving power and is plugged in securely.
Erratic readings or reading out of range	Meter or electrode failure	1. Follow meter checkout procedure. 2. Follow instructions in electrode instruction manual.
Unable to calibrate	Isopotential error	1. Verify iso.
Unable to calibrate in autocalibration	Certain electrodes may operate outside the limits of ±0.5 pH units.	1. Try scrolling value to within range and press enter to cal if ***E 1*** or ***E-1*** appearing. 2. Check temp, slope, and iso and repeat.

Orion Technical Service Chemists can be consulted for troubleshooting advice by calling 800-225-1480 or 617-242-3900. Outside North America contact your local authorized Orion Representative.

Required Equipment

Meter – Any ORION pH or ion selective meter or other pH/ISE meter with appropriate connectors

Combination pH Electrode or pH and Reference Electrode Half Cells – Use the ORION Model 81-01 ROSS pH Half Cell only with a ROSS Reference Half Cell Electrode, Model 80-05.

Thermometer – Readable to ±0.5°C.

Beakers – Plastic or glass.

Magnetic Stirrer – Suggested for precision measurements.

Required Solutions

pH Buffers – Two are recommended for precise measurement. The first, near the electrode isopotential point (pH 7), and the second near the expected sample pH (e.g., pH 4 or 10)

ROSS Internal Filling Solution – 3M KCl. Orion Cat. No. 810007. ***Do not use any filling solution which contains silver.*** (Electrode damage may result.)

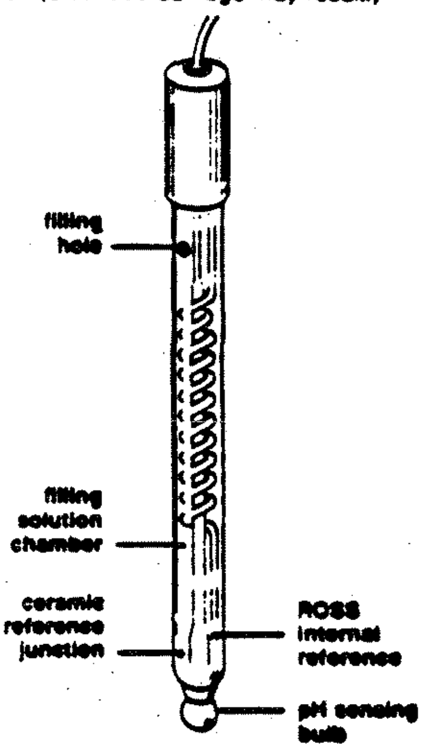

Figure 1
ROSS Combination Electrode – Cat. No. 81-02

USING THE ELECTRODE

Set up

Electrode Preparation

1. Remove the protective shipping cap from sensing element and save for storage. Remove plastic covering from sleeve junction of Model 81-66.
2. Clean any salt deposits from exterior by rinsing distilled water.
3. Uncover filling hole and add ROSS Filling Solution, Orion Cat. No. 810007, to electrode. See **Figure 2**. To maintain an adequate flow rate, the level of filling solution must always be above the reference junction and at least one inch above the sample level on immersion. The filling hole should be open whenever the electrode is in use.
4. Place the electrode in the electrode holder and suspend in air for 15 minutes to thoroughly wet the reference junction. Once the junction is wet, do not allow the electrode to dry out.
5. Shake down the electrode (as a clinical thermometer) to remove air bubbles.
6. Soak electrode in pH Electrode Storage Solution, Orion Cat. No. 910001, for one hour. If ORION Storage Solution is not available, use 200 ml pH 7 buffer to which about 1 g KCl has been added, as a temporary substitute.
7. Connect electrode to meter.

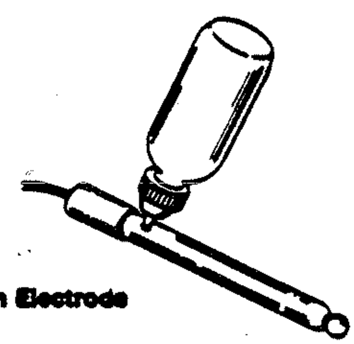

Figure 2
Filling an Electrode

Before Analysis

Sample Requirements

One of the benefits of the ROSS pH Electrode is that the filling solution composition may be changed depending on sample requirements.

The ROSS pH Electrode Filling Solution, Orion Cat. No. 810007 is 3M KCl. For solutions which precipitate in the presence of chloride ion, the ROSS pH Electrode could be filled with 10% KNO_3.

Samples should be aqueous if using epoxy body electrodes (e.g., Models 81-55 or 81-35).

In organic solutions, use an all-glass ROSS Electrode. For good results a minimum of 20% water must be present in the sample. If there is a great deal of drift when using the ROSS Electrode filled with ROSS Filling Solution (Orion Cat. No. 810007), try filling the ROSS Electrode with a mixture of 2 parts methanol and 8 parts ROSS Electrode Filling Solution.

Measuring Hints See Figure 3

- Always use fresh buffers for calibration. Choose buffers that are no more than 3 pH units apart.
- Check electrode slope daily by performing two-buffer calibration. Slope should be 92 to 102%.
- Only use ROSS Internal Filling Solution, Orion Cat. No. 810007, for ROSS Combination pH and Reference Electrodes. Do not use any filling solution which may contain silver.
- Remove filling hole cover during measurement to ensure uniform flow of filling solution.
- Between measurements, rinse electrodes with distilled water and then with the next solution to be measured.
- Stir all buffers and samples.
- Place a piece of insulating material (e.g., styrofoam or cardboard) between magnetic stirrer and beaker to prevent error from transfer of heat to sample. Since ROSS Electrodes respond faster than conventional electrodes, changes in pH which result from temperature changes will be noticed.
- Avoid rubbing or wiping electrode bulb, to reduce chance of error due to polarization.
- Model 81-35 may be used on any moist surface or in liquids. See Figure 4.
- Model 81-63 should not be forced into solids; cut an X into sample and insert electrode. Always immerse electrode to the same depth. See Figure 5.
- Model 81-66 is shipped with parafilm between the ground glass sleeve and cone. Carefully remove parafilm before use. Immerse the entire sleeve assembly when measuring. See Figure 6.

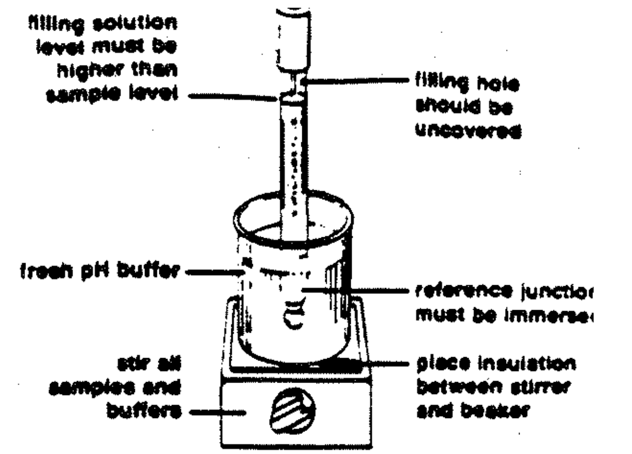

Figure 3
Measuring Hints

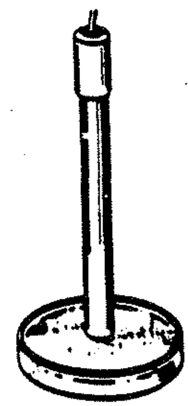

Figure 4
Use of Model 81-35

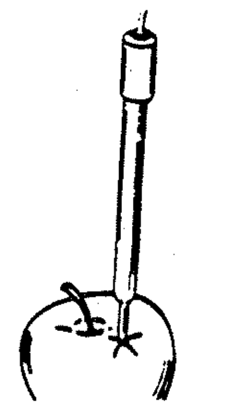

Figure 5
Use of Model 81

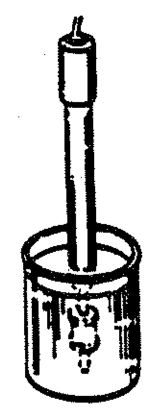

Figure 6
Use of Model 81-66

pH Calibration & Measurement

General Calibration Procedure

For detailed calibration and temperature compensation procedures, consult your meter instruction manual.

Single Buffer Calibration

1. Ensure that all buffers are at room temperature. If samples are at varying temperatures, temperature compensation is recommended. (See meter instruction manual).
2. Set up meter according to meter instruction manual.
3. Rinse electrode first with distilled water and then with the buffer being used for calibration (the buffer should be near the expected sample pH.) Place the electrode in the buffer.
4. Wait for a stable display. Set the meter to the pH value of the buffer at its measured temperature. See **Table 1**. (A table of pH values at various temperatures is supplied on the buffer bottle.) Proceed to **pH Measurement** section.

Two Buffer Calibration

This procedure is recommended for precise measurement.

1. Ensure that all buffers are at the same temperature. If samples are at varying temperatures, temperature compensation is recommended. (See meter instruction manual).
2. Select two buffers which bracket the expected sample pH. The first should be near the electrode isopotential point (pH 7) and the second near the expected sample pH (e.g., pH 4 or pH 10).
3. Rinse electrode first with distilled water and then with pH 7 buffer. Place the electrode in pH 7 buffer.
4. Wait for a stable display. Set the meter to the pH value of the buffer at its measured temperature. (A table of pH values at various temperatures is supplied on the buffer bottle.) See **Table 1.**
5. Rinse electrode first with distilled water and then with the second buffer. Place the electrode in the second buffer.
6. When display is stable, set meter to the actual pH value of the buffer as described in the meter instruction manual.
7. If all steps are performed correctly, proceed to the **pH Measurement** section. If any of the above procedures does not work, refer to **Troubleshooting.**

pH Measurement

1. Calibrate the electrode as described in previous section.
2. Rinse the electrode with distilled water and then with sample.
3. Place the electrode in the sample.
4. When the display is stable, record sample pH.

Table 1
pH Values of Buffers at Various Temperatures

Nominal value at 25°C	Temperature 0°C	5°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°C
1 68	1 67	1 67	1 67	1.67	1 68	1.69	1.71	1.72	1.74	1.77	1.79
3.78	3 86	3 84	3 82	3.79	3.77	3.75	3.75				
4 01	4 00	4 00	4 00	4.00	4.02	4.03	4.06	4.08	4.13	4.16	4 21
6 86	6.98	6.95	6.92	6.87	6.85	6.84	6.83	6.84	6.85	6.86	6.88
7 00	7.11	7.08	7.06	7.01	6.98	6.97	6.97				
7 41	7 53	7.50	7.47	7.43	7.40	7.38	7.37				
9 18	9.46	9.40	9.33	9.23	9.14	9.07	9.01	8.96	8.92	8.89	8.85
10 01	10.32	10.25	10 18	10 06	9 97	9.89	9.83				

Electrode Storage

To ensure a quick response and free-flowing liquid junction, the sensing element and reference junction must not be allowed to dry out.

Short-term Storage (up to one week)
Soak electrode in pH Electrode Storage Solution Orion Cat. No. 910001. If ORION Storage Solution is not available, use about 200 ml pH 7 buffer to which about 1 gram KCl has been added, as a temporary substitute.

Long-term Storage
The reference chamber should be filled and the filling hole securely covered. Cover the sensing element and/or reference junction with its protective cap containing a few drops of storage solution. The Model 81-66 also requires that the ground glass sleeve and cone be separated and the liquid junction securely covered with a plastic film. Before returning the electrode to use, prepare it as a new electrode.

Electrode Maintenance

Weekly

1. Inspect the electrode for scratches, cracks, salt crystal build-up, or membrane/junction deposits.
2. Rinse off any salt build-up with distilled water, and remove any membrane/junction deposits as directed in the cleaning procedures below.
3. Drain the reference chamber, flush it with fresh ROSS Filling Solution, Orion Cat. No. 810007, and refill the chamber.

Cleaning Electrode
General — Soak in 0.1M HCl or HNO_3 for half an hour, followed by soaking in storage solution for at least one hour.

Removal of Membrane/Junction Deposits

Protein — Soak in 1% pepsin in 0.1M HCl, for 15 minutes.*

Inorganic — Soak in 0.1M tetrasodium EDTA solution for 15 minutes.*

Grease and Oil — Rinse with mild detergent or methanol solution.*

* *After any of these cleaning procedures, drain and refill the reference chamber and soak the electrode in storage solution for at least one hour.*

Troubleshooting Guide

Follow a systematic procedure to isolate the problem. The pH measuring system can be divided into four components for ease in troubleshooting: pH meter, electrodes, sample/application, and operator error.

pH meter
The meter is the component which is easiest to eliminate as a possible cause of error. ORION pH meters are provided with an instrument checkout procedure and shorting strap for convenience in troubleshooting. Consult your pH meter instruction manual for directions.

Electrodes
To test electrode operation:

1. Connect electrode to a working meter.
2. Set function switch to absolute mV mode.
3. Immerse electrode in fresh pH 7 buffer.
4. Displayed value should be 0 ± 30 mV.
5. Rinse electrode and immerse in fresh pH 4 buffer.
6. Displayed value should be approximately 160 mV greater than in step 4.

If electrode fails this procedure, clean thoroughly as directed in **Maintenance**.

If electrode response is slow or drifting, drain and refill with fresh ROSS Filling Solution, Orion Cat. No. 810007. See **Measuring Hints**.

If cleaning and maintenance fail to rejuvenate the electrode:

1. For separate pH and reference half cells, substitute each electrode (one at a time) with a known working electrode and repeat test procedure. By process of elimination, determine which electrode should be replaced.
2. For combination electrodes, replace the entire electrode.

Sample/Application
The electrode and meter may operate with buffers but not with your sample. In this case, check sample composition for interferences, incompatibilities, or temperature effects.

Operator Error
If trouble persists, review operating procedures. Reread calibration and measurement sections, to be sure proper technique has been followed.

Troubleshooting (cont.)

Assistance

If after checking each component of your measuring system the source of the trouble remains unknown, call Orion's Technical Service Chemists.

In the United States (except Massachusetts, Alaska, and Hawaii) 1-800-225-1480. In Massachusetts, Alaska, and Hawaii or Canada, call 617-242-3900.

In Europe, the Middle East, and Africa contact your local authorized Orion dealer, or:

ORION RESEARCH AG
Fahnlibrunnenstrasse 3
CH-8700 Kusnacht, Switzerland
TEL 01-910-7858 / TLX 57829

Elsewhere, contact your authorized Orion dealer or:

ORION RESEARCH INCORPORATED
Laboratory Products Group
The Schrafft Center
529 Main Street, Boston, MA 02129 U.S.A.
TLX 4430019

ELECTRODE CHARACTERISTICS

Temperature Effects

The most common cause of error in pH measurement is temperature. Ordinary electrodes drift with temperature changes. The ROSS pH Electrode eliminates the stability problems associated with the use of conventional electrodes in samples of varying temperature.

There are, however, two effects of temperature change that should be kept in mind.

1. Electrode slope will change with varying temperature. This slope change may be compensated for either manually, or, automatically with an automatic temperature compensator (ATC) probe and properly designed pH meter. Consult your pH meter instruction manual for details.
2. Buffer and sample pH values vary with temperature because of their temperature dependent chemical equilibrium. The problem of differing pH values is easily solved by calibrating the electrode with characterized standard buffers whose true pH values at different temperatures are known. Buffer values at different temperatures are given in **Table 1**. The problem of the sample equilibrium varying with temperature in an uncharacterizable manner will always remain. Therefore, pH values should be reported along with the temperature at which the measurement was made.

Interferences

Sodium ion is the principal interference of the pH electrode, causing increasing error at higher pH (lower hydrogen ion activities) and at higher temperatures. Because the ROSS pH membrane is composed of special low sodium error glass, error due to sodium is negligible when measuring at pH values less than 12. When measuring at pH values greater than 12, add the correction value from the nomograph in **Figure 7** to the observed pH reading.

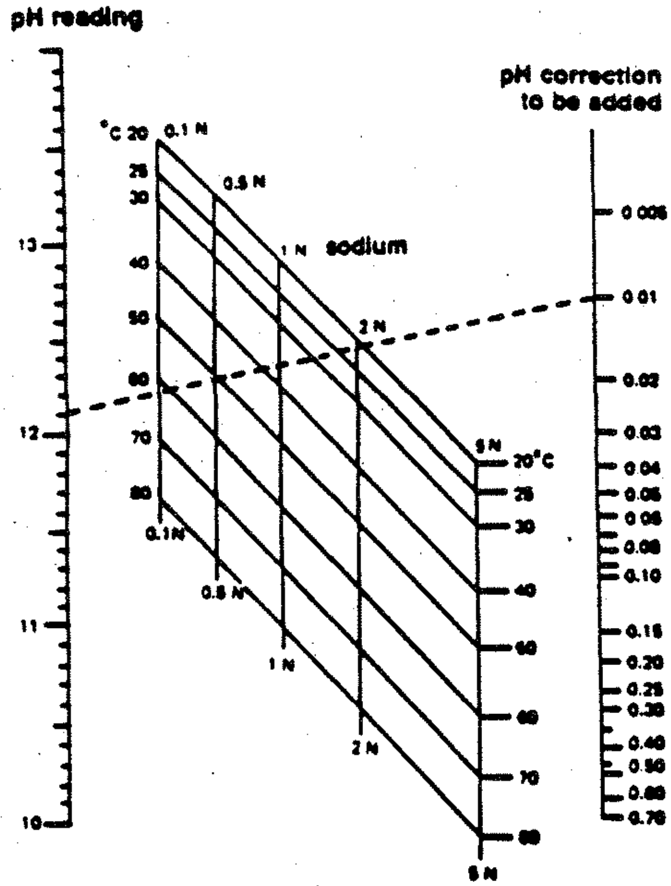

Figure 7
Typical Sodium Error Observed at pH > 12

Example:

pH reading	12.10
Sodium concentration	0.5N
Temperature	50°C
Correction	0.01
Corrected pH reading	12.11

Laboratory instruments are warranted to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase by the user or eighteen (18) months from date of shipment from Orion, whichever is earlier provided when used under normal laboratory conditions and in accordance with the operating limitations and maintenance procedures in the instruction manual and when not having been subjected to accident, alteration, misuse or abuse.

In the event of failure within the warranty period, Orion, or its authorized distributor, will, at Orion's option, repair or replace product not conforming to this warranty, or will refund the purchase price of the non-conforming product. There may be additional charges, including freight, for warranty service performed in some countries. For service, call Orion or its authorized dealer. Orion reserves the right to ask for proof of purchase, such as the original invoice or packing slip.

Economy Line electrodes are warranted to be free from defects in material and workmanship for a period of three (3) months from date of purchase by customer or six (6) months from date of shipment if the electrode fails for any reason (including breakage) except abuse, provided the electrode is not used in solutions containing silver, sulfide, perchlorate, or hydrofluoric acid; or in solutions more than 1 molar in strong acid or base at temperatures above 50°C and providing the electrode is used at room temperature (use at extreme temperatures can shorten electrode life). For service, Orion or its authorized dealer will replace product not conforming to this warranty or refund the purchase price of the nonconforming product.

Ion-selective electrodes and pH electrodes (excluding the Economy Line electrodes) are warranted to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase by the customer or eighteen (18) months from date of shipment from Orion, except this warranty does not cover etching of the sensing elements of Models 94-17, 96-17, 97-17, and 94-06 or the breakage of non-Economy Series pH electrodes. 93 Series sensing modules are warranted to give six (6) months of operation if placed in service before the date indicated on the package, except the nitrate sensing modules are warranted to give thirty (30) days of operation if placed in service before the date indicated on the package. Replacement parts for the 92 and 95 Series electrodes and 97-08 electrode (O-rings, membranes, filling solution, etc.) are warranted to be free of defects in material and workmanship for thirty (30) days from the date of shipment.

THE WARRANTIES DESCRIBED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM THE COURSE OF DEALING OR USAGE OF TRADE. THE BUYER'S SOLE AND EXCLUSIVE REMEDY IS FOR REPAIR OR REPLACEMENT OF THE NON-CONFORMING PRODUCT OR PART THEREOF, OR REFUND OF THE PURCHASE PRICE, BUT IN NO EVENT SHALL ORION (ITS CONTRACTORS AND SUPPLIERS OF ANY TIER) BE LIABLE TO THE BUYER OR ANY PERSON FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHETHER THE CLAIMS ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE), OR OTHERWISE WITH RESPECT TO OR ARISING OUT OF THE PRODUCT FURNISHED HEREUNDER.

Representations and warranties made by any person, including its authorized dealers, representatives, and employees of Orion which alter or are in addition to the terms of this warranty shall not be binding upon Orion unless in writing and signed by one of its officers.

Electrodes

ROSS Electrodes are available with a variety of connectors. For more information, consult your ORION pH Electrode Catalog and price list or your local ORION Distributor

Model Number	Description	Type of Connector
800500	ROSS Reference Half Cell, glass body	Pin-tip
810100	ROSS pH Half Cell, glass body	U.S. Std
8101BN	Same as above	BNC
810200	ROSS Combination pH Electrode, glass body	U.S. Std.
8102BN	Same as above	BNC
810300	Semimicro ROSS pH Electrode, glass body	U.S. Std
8103BN	Same as above	BNC
810400	ROSS Combination pH Electrode, glass body with rugged bulb	U.S. Std.
8104BN	Same as above	BNC
811500	Semimicro ROSS Combination pH Electrode, epoxy body	U.S. Std.
8115BN	Same as above	BNC
813500	ROSS Combination Flat Surface pH Electrode, epoxy body	U.S. Std.
8135BN	Same as above	BNC
815500	ROSS Combination pH Electrode, epoxy body with bulb guard	U.S. Std.
815600	Same as above	BNC
816300	ROSS Combination Spear-tip pH Electrode, glass body	U.S. Std.
8163BN	Same as above	BNC
816600	ROSS Combination pH Electrode, sleeve reference junction, glass body	U.S. Std.
8166BN	Same as above	BNC

SECTION 1.0 HNU PI-101 PHOTOIONIZER

The following section outlines procedures for field operations with the HNU Systems Model PI 101 Portable Photoionization Analyzer.

1.1 Instrument Profile

Hazard Monitored: Organic and inorganic vapors and gases

Application: To determine relative concentrations of air contaminants. Information is used to establish level of protection and other control measures such as action levels. It will not detect methane.

Components: Survey probe with ultraviolet lamp (9.5, 10.2, 11.7 eV); needle meter read out; lead-acid gel battery; span potentiometer; range selector; zero control.

Detection Method: Photoionization.

Operation: Ultraviolet light photons are generated by the UV lamp and directed at the sample. If the energy of the photons are sufficient they will ionize the molecules of vapor/gas in the sample. The amount of energy necessary to photoionize a molecule is represented by its Ionization Potential (IP). Thus the lamp energy must be equal to or greater than the IP of a compound. Once ionized, the freed electrons are collected at an electrode to generate an electrical current. The greater the current the higher the concentration.

Read Out: The meter can be read on the following ranges: 0-20, 0-200, 0-2000 ppm (span = 9.8 - benzene equivalent).

Calibration: The instrument is factory calibrated to benzene. The calibration should be checked before and after use with a calibration check gas such as isobutylene, supplied by the manufacturer and corrected to benzene. Once calibrated, the span setting can be changed if necessary. Since the response of various compounds to photoionization can differ, readings taken on the instrument must be expressed as equivalent to the gas the instrument was calibrated. HNU Systems supplies isobutylene as a check gas for the instrument to which a correction factor is applied so that the calibration is to benzene-equivalence.

Inherent Safety: The HNU Photoionizer can be purchased with the following approvals: Class I Division 1 Groups ABCD: Class I Division 2 Groups ABCD; and non-approved. Be sure to examine the instrument to determine its approval.

Limitations: Because the instrument is sensitive to many organic and inorganic vapors/gases it cannot be used as a qualitative instrument in unknown situations. It is strictly quantitative except when the nature of the contamination is known and the instrument has been calibrated to, or a calibration curve has been generated for, the contaminant being monitored. High humidity reduces sensitivity. High concentrations of methane can cause a downscale deflection of the meter (quenching). Atmospheres with concentrations of vapors and gases above the detection limits of the instrument will cause inconsistent instrument behavior.

EPA Action Guides: None are established. It depends on the toxicity of the specific compound being measured.

1.2 Field Procedures

The following sections detail the procedures that are to be followed when using the HNU in the field.

Procedure	*Section*	*Frequency*
Start-up Procedure	1.2.1	Prior to each use of the instrument
Operational Check	1.2.2	Prior to each use of the instrument
Field Calibration Check	1.2.3	Prior to each use of the instrument
Routine Service	1.3.1	Monthly

1.2.1 Start Up Procedure

a. Before attaching the probe, check the function switch on the control panel to ensure that it is in the off position. Attach the probe by plugging it into the interface on the top of the read out module.

b. Turn the function switch to the battery check position. The needle on the meter should read within or above the green battery arc on the scale. If not, recharge the battery. If the red indicator light comes on, the battery needs recharging. Do not use the instrument.

c. Turn the function switch to any range setting. Look into the end of the probe for no more than two to three seconds to see if the lamp is on. If it is on, it will give off a purple glow. Do not stare into the probe any longer than three seconds. Long term exposure to UV light can damage eyes. Also, listen for the hum of the fan motor.

d. To ZERO the instrument, turn the function switch to the standby position and rotate the zero adjustment until the meter reads zero. A calibration gas is not needed since this is an electronic zero adjustment. If the span adjustment setting is changed after the zero is set, the zero should be rechecked and adjusted, if necessary. Wait 15 to 20 seconds to ensure that the zero reading is stable. If necessary, readjust the zero.

1.2.2 Operational Check

a. Follow the start up procedure in section 1.2.1.

b. With the instrument set on the 0-20 range, hold a solvent-based magic marker near the probe tip. If the meter deflects upscale, the instrument is working.

1.2.3 Field Calibration Procedure

a. Follow the start-up procedure in section 1.2.1 and the operational check in section 1.2.2.

b. Set the function switch to the range setting for the concentration of the calibration gas.

c. Attach a regulator (HNU 101-351) to a disposable cylinder of isobutylene gas (HNU 101-351). Connect the regulator to the probe of the HNU with a piece of clean Tygon tubing. Turn on the value on the regulator.

d. After fifteen seconds, adjust the span dial until the meter reading equals the concentration of the calibration gas used. Be careful to unlock the span dial before adjusting it.

e. Record in the field log: the instrument ID No. (EPA decal or serial number if the instrument is a rental); the initial and final span settings; the date and time; concentration and type of calibration gas used; and the name of person who calibrated the instrument.

f. If the HNU does not start-up, check-out, or calibrate properly, the CDM Regional Field Equipment Manager is to be notified immediately. Under no circumstances is work requiring monitoring with an HNU to be done with a malfunctioning HNU.

1.2.4 Operation

a. Follow the start up procedure, operational check and calibration check.

b. Set the function switch to the appropriate range. If the concentration of gases or vapors is unknown, set the function switch to the 0 - 20 ppm range. Adjust it if necessary.

c. While taking care not to permit the HNU to be exposed to excessive moisture, dirt, or contamination, monitor the work activity as specified in the CDM Site Health and Safety Plan.

d. When the activity is completed or at the end of the day, carefully clean the outside of the HNU with a damp disposable towel to remove any visible dirt. Return the HNU to a secure area and place on charge.

e. With the exception of the probe's inlet and exhaust, the HNU can be wrapped in clear plastic to prevent it from becoming contaminated and to prevent water from getting inside in the event of precipitation.

1.3 Servicing Procedures

The following sections cover those activities which are to be done by the CDM Regional/ Subsidiary Field Equipment Manager, or a trained designee. **These procedures are not intended for use by CDM field personnel and are not to be attempted by CDM field personnel under any circumstances.**

The appropriate calibration/maintenance logs are to be filled in completely whenever an HNU receives servicing and a new calibration sticker attached. This is true of both CDM and rental instruments.

1.3.1 Routine Service

The HNU's performance is affected by a number of factors. These include but are not limited to the decay of the UV lamp output over time and the accumulation of dust and other particulates and material on the lamp and in the ion chamber. Because of these factors, **HNUs should not be left in the field for a period of more than a month before being serviced or replaced with a fresh instrument.** If a site is going to be inactive for a period of more than a week, all monitoring instruments are to be returned to the CDM Regional Field Equipment Manager or his trained designee for servicing and/or reassignment.

The following procedures are to be performed for routine service.

Procedure	*Section*	*Frequency*
Operational Check	1.2.2	Prior to use and at instrument return
Calibration Check	1.2.3	Prior to use and at instrument return
Calibration	1.3.2	Monthly or following lamp and ion chamber cleaning, or lamp replacement
Clean UV Lamp and Ion Chamber	1.3.4	Monthly or as needed
Replace UV Lamp	1.3.5	As needed
Factory Maintenance	1.3.6	Yearly

1.3.2 Calibration

a. With the function switch in the off position, carefully remove the meter assembly from the protective metal case.

b. Attach the probe to the interface on the meter assembly.

c. Turn the function switch to the battery check position. The lamp should light, the probe fan motor begin running, and the meter should deflect into the green battery arc on the scale. If one or more of these fails to occur, refer to section 1.4 to determine the potential problem.

d. Turn the function switch to the STANDBY position and zero the meter. The lamp will not be lit at this position. This is an electronic zero adjustment.

e. Adjust the span control to 9.8 for a 10.2 eV probe and to 5.0 for an 11.7 eV probe.

f. Attach a source of calibration gas, HNU 101-350 isobutylene or equivalent, to the probe. The adapter which HNU sells for the 101-350 gas is set to provide the proper flow rate to the probe. The value on the cylinders of isobutylene which is sold by HNU Systems is corrected to be a benzene-equivalent value. If another cylinder of isobutylene is used, divide the value of the gas by 0.70 if it is desired to obtain the benzene-equivalence value. When using a cylinder of gas other than the 101-350 supplied by HNU, use a T connector to connect the cylinder to both the probe and a rotometer. Adjust the flow so that the rotometer shows a slight flow while the probe is operating. An accurate flow is not needed but only a slight excess of flow while the probe is running. Alternately, a gas bag (tedlar recommended) can be flushed and filled with the calibration gas which can be fed into the probe.

g. Using a small screw driver, adjust the R48 gain control potentiometer on the power supply board until the meter reading equals the concentration of the calibration gas. The instrument is now calibrated to benzene. If the instrument will not calibrate, refer to section 1.4 to determine the potential problem.

h. Record the calibration results on a calibration/maintenance log sheet (Exhibit A) and attach a new calibration sticker to the instrument.

i. If the calibration gas is not HNU 101-350, then it should be a gas which has a value which is National Bureau of Standards (NBS) traceable.

1.3.3 Calibration To A Gas Other Than Isobutylene

The HNU may be calibrated to any certified hydrocarbon calibration gas. This requires the approval of the appropriate CDM Regional/Subsidiary Health and Safety Manager. **After calibration to another gas, all subsequent instrument readings must be expressed as ppm in the gas used** (i.e. 19 ppm vinyl chloride equivalent). To calibrate to another gas, use the following procedure.

a. Calibrate according to procedure 1.3.2.

b. Fill and flush three to four times a gas bag (tedlar recommended) with the certified NBS traceable calibration gas. Then fill the bag with two to three liters of the calibration gas. **If the gas is toxic, this must be done in a fume hood.**

c. Feed the calibration gas into the probe with the range set for the value of the gas. After fifteen seconds adjust the span control until the meter reads the value of the calibration gas.

d. Record the results of the calibration on the calibration/maintenance log sheet (Exhibit A) and attach a new calibration sticker to the instrument. Make certain that the instrument is clearly marked as to the gas for which it is calibrated.

CALIBRATION/MAINTENANCE FORM
FOR HNU PI-101

Date:________ Time: ____________

Name: ________________ Region: __________ Site: __________

EPA Tag no.: __________ Rental: ☐ yes ☐ no Rental Source: ______ Serial no.: ______

Last used at region: ________________ Site: ________________

Last Calibrated by: ________________ Region: __________ Date: ________

CONDITION OF UNIT

Were any PARTS/ACCESSORIES missing or damaged ☐ yes ☐ no

if YES, list & describe:

____

____

Was unit returned CLEAN and in WORKING order ☐ yes ☐ no

if NO, describe condition:

____

____

FUNCTION TEST

1. Battery test (in green area) ________ 2. Control knobs tight ________
3. Meter zeros with no drift ________ 3. Fan works ________
5. Stable meter at all settings ________

CALIBRATION

Probe energy: ☐ 10.2 ☐ 11.7

Initial span setting: ☐ 9.8 ☐ 5.0

Calibration source ________________ Concentration ________ ppm

Initial reading ________________ Final reading

R48 adjustmentment ☐ yes ☐ no

Final span setting

Calibration satisfactory ☐ yes ☐ no

CALIBRATION CHECK

Probe energy: ☐ 10.2 ☐ 11.7

Calibration source ________________ Concentration ________ ppm

Initial span setting ________________ Final span setting ________

Calibration satisfactory ☐ yes ☐ no

Comments:

____

____

____

Title: ________________ Signature: ________________

1.3.4 UV Lamp and ION Chamber Cleaning

During periods of analyzer operation, dust and other foreign materials are drawn into the probe, forming deposits on the surface of the UV lamp and in the ion chamber. This condition is usually indicated by meter readings that are low, erratic, unstable, non-repeatable, drifting, and which show apparent moisture sensitivity. These deposits interfere with the ionization process and cause erroneous readings. Check for this condition monthly or as required to insure that the HNU is functioning properly. Disassembly and cleaning is accomplished as follows:

a. Turn the function switch on the control panel to the OFF position before disassembly. Otherwise, high voltage of 1200 V DC will be present.

b. Disconnect the probe cable connector at the read out assembly. Disassemble the probe by first removing the exhaust screw at the base of the probe adjacent to the handle. Grasp the end cap in one hand and the probe shell in the other, gently pull to separate the end cap and the lamp housing from the shell.

c. Hold the lamp housing with the black end cap upright. Loosen the screws on the top of the end cap, separate the end cap and ion chamber from the lamp and lamp housing. Care must be taken so that the ion chamber does not fall out of the end cap or that the light source does not fall out of the lamp housing. Turn the end cap over in the hand. Tap it lightly on the top. The ion chamber should fall out of the end cap into the hand. Place one hand over the top of the lamp housing and tilt slightly. The light source will slide out of the housing.

d. Check the lamp window for fouling by looking at the surface at an incident angle. Deposits, films or discoloration interfere with the ionization process. Clean the window as follows:

10.2 eV lamps

e. Clean the window by rubbing it gently with a non-abrasive tissue (e.g. Kim-Wipe) or a lens tissue dipped in a mild detergent solution.

f. If this does not remove the deposit, apply a small amount of HNU cleaning compound directly onto the window of the lamp and spread it evenly over the surface with a lens tissue.

g. Wipe off the compound with a new tissue.

h. Rinse the window with warm water (about 80 degrees F) or gently wipe it with a damp tissue to remove all traces of grit, oils and any static charge that may have built up on the window. Dry with a new tissue.

11.7 eV lamp

i. Clean the window by putting a Freon, a chlorinated organic solvent (i.e. 1,1,1-trichloroethane), or hexane on a tissue, rubbing gently, and then drying with another tissue. This must be done in a fume hood or in a well ventilated area. **Do not clean an 11.7 eV lamp with water, with a water miscible solvent (i.e methanol or acetone) or with the cleaning compound used for the 9.5 and 10.2 eV lamps. This will damage the 11.7 eV lamps.**

k. Next, inspect the ion chamber for dust or particulate deposits. If such matter is present, the assembly can be swirled gently in methanol, rubbed gently with a methanol-soaked cotton swab, and dried gently at 50-60 degrees Centigrade for approximately thirty minutes. **Liquid must not be present at reassembly.** This would adversely affect the HNU's performance. **DO NOT clean the ion chamber with the HNU cleaning compound cited above.**

l. Reassemble the probe by first sliding the lamp back into the lamp housing. Place the ion chamber on top of the lamp housing, making certain that the rubber O-ring is on the lamp and that the contacts are properly aligned. The ion chamber fits only one way. If the ion chamber is to be replaced, always use one identical to the one being removed. Check the aperture (small: 3.0 mm; large: 6.0 mm) at the top of the ion chamber and materials of construction (gold-plated or Teflon) to ensure proper replacement.

m. Place the end cap on top of the ion chamber and replace the two screws. Tighten the screws only enough to seal the O-ring. Do not over-tighten these screws.

n. Line up the pins (pogo contacts) on the base of the lamp housing with the pins inside the probe shell. Gently slide the housing assembly into the probe shell. The end cap should meet the probe shell evenly after final assembly. If not, the ion chamber may be installed wrong. **Do not force the assembly into the shell. It fits only one way.** If it does not reassemble readily, remove the assembly and check the pin alignment. Check to ensure that the pogo contacts are not bent. Refasten the exhaust screw at the base of the probe.

o. Align the 12-pin probe connector to the read out assembly and reconnect with a twisting motion until a click occurs. Check to ensure the high voltage microswitch is properly depressed. The lamp should light if the function switch is turned to any position except STANDBY.

p. Check the analyzer operation.

q. If the HNU's performance is still unsatisfactory, replace the lamp.

r. Complete a calibration/maintenance form.

1.3.5 Lamp Replacement

To replace the lamp, disassemble the probe, remove the old lamp, install a new one of the same eV rating, reassemble and calibrate.

Do not exchange lamps of different eV ratings in a probe. The amplifier and components are selected for a specific eV lamp. A probe balanced for one lamp will not function properly with a lamp of a different energy.

When the calibration is completed, turn the analyzer OFF, replace the read out assembly in its case and complete a calibration/maintenance forms.

1.3.6 Lamp eV Change

If an application for the analyzer would require different eV lamps, separate probes, each with its own eV lamp, must be used. A single read out assembly could be use with both probes. However, changing the probe will require resetting of the zero control, the span pot, and recalibrating to verify proper operation.

1.3.7 Factory Service

The HNU 101 requires annual servicing at the factory. The CDM Regional/Subsidiary Field Equipment Manager will make the arrangements for this service.

1.4 Indicators of Malfunction HNU Model PI-101 Photoionizer

Indication	*Possible Causes*
• Meter indicates low battery	1. Blown fuse 2. Bad connections 3. Broken meter movement 4. Battery dead 5. Battery charge low
• Low battery	1. Power supply defective
• UV lamp not on	1. High Voltage interlock (Micro-switch S2) at probe cable connector on read out assembly not operating 2. High voltage supply out or faulty 3. Lamp not making proper connection with high voltage contacts. 4. Lamp faulty 5. Short in high voltage lines
• Fan not running	1. Fan stuck 2. Fan connections faulty 3. Low or dead battery 4. Fan voltage not correct
• Meter does not respond	1. Dirty or open probe connection 2. Broken meter 3. Dirty or open connections to meter 4. Low or dead battery 5. Blown fuse
• Drifting meter or apparent moisture sensitivity	1. Ion chamber contaminated
• Meter does not return to zero in STANDBY	1. Broken meter movement 2. Dirty or open connections to meter 3. Dirty or open connections in probe 4. Zero adjust faulty

	5. Amplifier faulty 6. Ion chamber shorted
• Meter readings, too high or low	1. Incorrect calibration 2. Lamp dirty 3. Contamination in ion chamber 4. Power supply board faulty 5. Dirty or loose connections
• Meter erratic, unstable or non-repeatable	1. Loose cable connection 2. Dirty or loose meter connections 3. Contamination in ion chamber 4. Power supply board faulty 5. Unstable or noisy lamp 6. Function switch in high gain, most sensitive position 7. Fan not operating properly 8. Gas flow slow or stopped 9. Meter contacts dirty or loose

1.5 Additional Precautions

- The HNU PI-101 is designed to sample air or vapors only. DO NOT allow any liquids to get into the probe or meter assembly.
- High concentrations of methane and/or high humidity can cause the instrument reading to vary significantly from the actual concentration of gases or vapors present. This is true even though the HNU cannot read methane or water vapor.
- Turn the function switch on the control panel to the OFF position before any disassembly. Otherwise, high voltage of 1200 V DC will be present.
- Use great care when operating the analyzer with the read out assembly outside its case due to the presence of 1200 V DC.
- Do not look at the light source from any closer than six inches with unprotected eyes. Observe only briefly. Continued exposure to ultraviolet energy generated by the light source can be harmful to eyesight.
- Place the instrument on charge after each use. The newer units require that the probe be attached to the read out case to charge the instrument. To determine if this is the case with a particular instrument, turn the function switch to BATTERY without a probe attached. Turn the function switch to OFF and repeat with a probe attached. If the needle deflects to the battery OK point with the the probe attached and not attached, the unit will charge without a probe attached. If the needle only deflects when the probe is attached, then the unit requires that the probe be attached to charge. If the needle does not deflect at all, the unit is broken.

- If at any time the instrument does not check out or calibrate properly in the field, the CDM Regional Field Equipment Manager is to be notified immediately and a replacement provided for the malfunctioning instrument. Under no circumstances should field work requiring continuous air monitoring for organic vapors and/or gases be done with a malfunctioning HNU or without an HNU or an approved comparable instrument.

SECTION 2.0 FOXBORO ORGANIC VAPOR ANALYZER 128

The following section outlines procedures for field operations with the Foxboro OVA Model 128.

2.1 Instrument Profile

Hazard Monitored:	Toxic concentrations of organic vapors
Application:	To determine relative concentrations of air contaminants. The information is used to establish levels of protection and other control measures such as site specific action levels. When equipped with the gas chromatographic option it can be used for limited qualitative and quantitative assessment of samples.
Components:	A survey probe with a meter read out; self contained hydrogen cylinder for the detector; low and high audible alarm; range selector; lead-acid gel battery; gas select control; pressure gauges.
Detection Method:	Flame ionization.
Operation:	The sample is drawn by a pump to the detector where it is ionized (combusted). The electrons released are collected at an electrode which generates a current. The greater the current, the higher the concentration. The instrument will detect only organic compounds.
Read Out:	The meter can be read on the following ranges: 0-10, 0-100, or 0-1000 ppm methane equivalent.
Calibration:	The instrument is factory calibrated to methane. The calibration should be checked before each use with a calibration check gas.
Inherent Safety:	The OVA is approved for Class I Division 1 Groups ABCD.
Limitations:	The instrument used in the survey mode in unknown atmospheres is strictly quantitative with the reading equivalent to methane. Because the instrument is extremely sensitive to methane, it has a limited application in areas where toxic vapors and gases are found with methane because methane masks the other compounds. The limit of use is about eight hours due to both the hydrogen supply and battery life. It requires very high grade hydrogen (Prepurified or Zero grade, less than 0.5 ppm total hydrocarbons as methane). It requires more training than other instruments, especially when used in the chromatographic mode.
EPA Action Guides:	None established. It depends on the toxicity of the specific compound being monitored.

2.2 Field Procedures

The following sections detail the procedures that are to be followed when using the OVA in the field.

Procedure	*Section*	*Frequency*
Start-up Procedure	2.2.1	Prior to each use of the instrument
Operational Check	2.2.2	Prior to each use of the instrument
Pumping System Check	2.2.3	Prior to each use of the instrument
Shut Down Procedure	2.2.4	After each use of the instrument
Battery Charging	2.2.5	After each use
Field Calibration Check	2.2.6	Prior to each use of the instrument
Hydrogen Refilling	2.2.7	As Needed
Clean Particle Filters	2.2.8	Daily under dusty conditions; weekly under good conditions
Routine Service	2.3.1	Monthly

2.2.1 Start Up Procedure (Survey Mode)*

a. Attach the probe to the main instrument package. Be careful to properly line-up the electronic jack and the sample line. Check the battery condition by moving the instrument switch to the battery position. **The needle should deflect past the white line on the probe. If it does not, do not use the instrument.** Place the unit on charge. A deflection of the meter beyond the white line indicates that the battery has more than four hours of operation at 22 degrees C before it is necessary to recharge it. (Lower temperatures will shorten the operating time.)

b. Move the instrument switch to on and allow a five minute warm-up.

c. Move the pump switch to the on position and then place the instrument panel in the vertical position and check the sample flow rate. The flow should be 1.5 to 2.5 liters per minute at 760 mm of pressure and 22 degrees C.

d. Set the calibrate switch to X10 position and use the calibrate knob and set the meter to read 0. Use the calibrate knob to set the level the warning alarm. **Turn the volume knob fully clockwise.**

e. Open the hydrogen tank valve and the hydrogen supply valve one or two turns. The hydrogen supply value gauge should read between 8 and 12 psi. (For eight hours of operation, the hydrogen tank pressure should be at least 1500 psi). About 150 psi of hydrogen is required per each hour of survey operation. (If the GC option is used, the amount of hydrogen used will increase.)

f. After approximately one minute, depress the igniter button. A barely audible popping sound will be heard when the detector lights and a sudden sharp positive deflection of the meter on the probe will be observed. **Do not depress the igniter button for more than five seconds.** If the detector does not light, (indicated by a slowly rising positive deflection of the meter) wait for one minute before attempting to light the detector.

g. After the detector is lit, use the calibrate knob to zero out the ambient background. For maximum sensitivity below 10 ppm, set the calibrate switch to X1 and readjust the zero on the meter. To avoid a false flame-out alarm indication, set the meter to 1 ppm with the calibrate knob and make differential readings from there.

h. When using the OVA in the survey mode, make certain that the sample inject valve remains in the full out (up) position and that the backflush valve is either full in (down) or full out (up).

* For a description of the *Survey Mode*, refer to section 2.4.1.

2.2.2 Operational Check

a. Follow the start-up procedure in 2.2.1.

b. With the range switch set on the X-10 position, hold the tip of a solvent-based magic marker at the probe opening. If the meter deflects upscale, the detector is lit and the instrument is working properly. If the instrument will not start-up or check-out properly, notify the CDM Regional Field Equipment Manager to obtain a replacement.

2.2.3 Pumping System Check

a. Follow the start-up procedure and operational check.

b. Block the intake of the probe. **The pump should stall.** If it does not stall, check the seals at the probe and the connection of the probe to the main instrument case. If the pump still does not stall, notify the CDM Regional Field Equipment Manager to obtain a replacement.

2.2.4 Shut Down Procedure

a. Close the hydrogen supply valve and the hydrogen tank valve. **Do not over-tighten these values.** As soon as the values stop turning, they are closed. They are easily damaged by overtightening.

b. Move the instrument switch to off.

c. Wait 5 seconds and then move pump switch to off. The instrument is now in a shut down configuration.

d. If possible, immediately place the instrument on charge.

2.2.5 Battery Charging

a. **In a non-hazardous environment**, plug the charger connector into the mating connector on the battery cover and insert the ac plug into a standard 115 v ac wall outlet.

b. Move the battery charger switch to the ON position. The light above the switch should light.

c. The battery charging is indicated by the meter on the charger fully deflected to the left. A fully charged battery is indicated when the meter pointer is in line with the *charged* marker above the scale.

d. Approximately one hour of charging is required for every hour of operation. Overnight charging is recommended after each use. The batteries are of a type which cannot be damaged if left on the charger for a long period of time.

e. When the charging is complete, turn the battery charger switch to OFF and disconnect the charger from the battery assembly.

2.2.6 Calibration Check

a. Follow the start-up and operational check procedures.

b. Flush a gas bag (tedlar recommended) three to four time with a known methane standard near 100 ppm (i.e. Foxboro HGC-225 methane in air or equivalent). Fill the bag with about two liters of the gas.

c. Put the OVA on the X-10 scale and zero.

d. Using clean tygon tubing, feed the standard into the instrument. After fifteen seconds adjust the gas select dial until the reading on the meter is the same as the value of the gas standard. If the instrument will not calibrate, notify the CDM Regional Field Equipment Manager and obtain a replacement.

e. Record in the field log the instrument ID No.; the initial and final gas select dial settings; the date and time; the concentration of the calibration gas; and the name of the person who calibrated the instrument.

2.2.7 Hydrogen Refilling

a. **In a well ventilated area, away from any source of flame or spark,** attach the hydrogen filling hose securely to a cylinder of zero grade hydrogen (less than 0.5 ppm total hydrocarbons as methane).

b. Attach the filling hose to the instrument fill connection.

c. Check to ensure that all of the values on the instrument are closed and open the supply valve on the hydrogen cylinder.

d. Turn the fill/bleed valve slowly to bleed and purge the hose for ten to fifteen seconds.

e. Turn the fill/bleed valve to the close position. Open the refill valve on the instrument slightly, open the hydrogen tank valve on the instrument panel, and turn the fill/bleed valve to fill.

f. After the hydrogen tank is filled, close all the valves. Bleed the filling hose and disconnect it from the instrument. Then disconnect the hose from the hydrogen cylinder. (A small amount of hydrogen at high pressure will be present in the hydrogen supply system.)

g. As a leak check, with the instrument shut down, observe the hydrogen tank pressure gauge. A decrease of more than 350 psi/hour indicates a significant leak in the hydrogen supply system.

2.2.8 Particle Filter Cleaning

Under dusty conditions and repeated use, the particle filters in the OVA will require cleaning. They are cleaned in the following manner.

- A filter is located behind the sample inlet connector on the Side Pack Assembly. It is removed for cleaning by using a 7/16 inch thin wall socket to unscrew the Fitting Assembly. The filter cup, "O" ring and loading spring will then come out. The porous stainless filter cup can be cleaned by blowing out with air. Reassemble in reverse order ensuring that the "O" ring seal on the Fitting Assembly is intact.
- A particle filter is located in each pick-up fixture. One of these filters must be in the sample line whenever the instrument is in use. Sampling fixtures should be cleaned by blowing out with air to remove particles of dirt.

An SCBA cylinder can be used to supply air for cleaning. However, in very dusty situations, other air may be required.

2.2.9 Operation

a. Follow the start up, operational check, and calibration check procedures.

b. Set the range switch to the appropriate range. If the concentration of gases or vapors is unknown, set the function switch to the 0 - 10 ppm range and adjust it if necessary.

c. While taking care not to permit the OVA to be exposed to excessive moisture, dirt, or other contamination, monitor the work activity as specified in the CDM Site Health and Safety Plan.

d. When the activity is completed or at the end of the day, carefully clean the outside of the OVA with a damp (not dripping wet) disposable towel to remove any visible dirt. Return the OVA to a secure area, shut it off (2.2.4), and place the unit on charge.

e. With the exception of the the probe inlet and the exhaust, the OVA may be wrapped in clear plastic to prevent it from becoming contaminated and to prevent moisture from getting inside in the event of precipitation.

2.3 Servicing Procedures

The following sections cover those activities which are to be done by the CDM Regional/Subsidiary Field Equipment Manager or a trained designee only. **They are not intended for use by CDM field personnel and should not be attempted by CDM field personnel under any circumstances.**

The a calibration/maintenance form is to be filled in completely and a new calibration sticker attached whenever an OVA receives servicing. This is true of both CDM and rental instruments.

2.3.1 Routine Service

The OVA's performance is affected by a number of factors. These include but are not limited to the clogging of the dust filters, formation of deposits on in the detector assembly, leaks in the air and hydrogen lines, and the drift of the calibration. Because of these factors, OVA's are not to be left out for more than one month before receiving routine servicing or being replaced with a fresh instrument. If a site is going to be inactive for more than one week, all monitoring instruments are to be returned to the Regional Warehouse/Staging Area for servicing and/or reassignment.

Maintenance personnel should be thoroughly familiar with instrument operation before performing maintenance. It is essential that all matters relating to safety of operation, servicing and maintenance, be thoroughly understood. There should be no potential igniters or flame in the area when filling, emptying or purging the hydrogen system and the instrument should be turned off.

Extreme care should be exercised to ensure that required parts replacement is accomplished with the parts specified by Foxboro. Modifications to an OVA are not permitted. Any modifications, substitution of parts not specified by Foxboro, or any incorrect repair will invalidate the inherent Safety rating. Disassemble the instrument only in a non-hazardous atmosphere.

Procedure	*Section*	*Frequency*
Check Pumping System	2.2.3	Prior to use
Check Calibration	2.2.5	Prior to use and at instrument return
Calibration	2.3.2	Monthly and after servicing
Check Particle Filters	2.3.4	Weekly
Clean Burner Chamber	2.3.6	Weekly
Change Charcoal	2.3.7	As needed
Purge Hydrogen System	2.3.8	As needed

2.3.2 Calibration

a. Carefully remove the instrument from its case.

b. Turn on the electronics and zero the OVA on the X-10 scale. Set the gas select dial to 300.

c. Turn on the pump and open the hydrogen values. Ignite the detector. Go to the survey mode.

d. Introduce a National Bureau of Standards (NBS) traceable methane standard near 100 ppm into the OVA. This can be done from a gas bag (tedlar recommended) or a cylinder of gas. If a cylinder of compressed gas is used, use a T connector to supply gas to both the OVA and a rotometer. With the OVA pump on, adjust the gas flow to so that the rotometer shows a slight excess of flow. Adjust R-32 trimpot on circuit board to make meter read to value of the standard.

e. Turn off the hydrogen and adjust meter to 40 ppm. Switch to X1 scale and adjust R-31 trimpot to make meter read 4 ppm. Return to X10 scale and adjust meter needle to 40 ppm. Switch to X100 scale and adjust R-33 trimpot to make meter read 400 ppm.

f. **Fill in the calibration/maintenance log (Exhibit B) and place a new calibration sticker on the instrument.**

2.3.3 Calibration To A Gas Other Than Methane

The OVA may be calibrated to any certified hydrocarbon calibration gas. This is to be done only at the direction of the CDM Regional/Subsidiary Health and Safety Manager. After calibration, all subsequent instrument readings must be expressed as ppm in the gas used (i.e. 20 ppm benzene equivalent). To calibrate to another gas, use the following

CALIBRATION/MAINTENANCE FORM FOR OVA 128

Date: ______ Time: ______

Name: ______ Region: ______ Site: ______

EPA Tag no.: ______ Rental: ☐ yes ☐ no Rental Source: ______ Serial no.: ______

Last used at region: ______ Site: ______

Last Calibrated by: ______ Region: ______ Date: ______

CONDITION OF UNIT

Was unit STORED/SHIPPED with slight amount of H2 in tank ☐ yes ☐ no

Were any PARTS/ACCESSORIES missing or damaged ☐ yes ☐ no

if YES, list & describe:

Were any of the three VALVES OVERTIGHTENED or left OPEN ☐ yes ☐ no

Was unit returned Clean and in WORKING order ☐ yes ☐ no

if NO, describe condition:

FUNCTION TEST

1. Battery test on/above line ______
2. Pump flow rate ______ LPM
3. Flame out audio at speaker ______
3. H2 low valve pres. ______ PSI
5. PPM alarm audio at speaker ______
6. QUAD RINGS checked ______
7. SAMPLE INJECT valve operates ______
8. Backflush valve operates ______
9. Check for AIR/H2 leaks ______
10. IGNITION response time ______ (less than 2 sec.)

CALIBRATION

Methane + air std. ______ PPM

Gas select (SPAN) setting ☐ 3.0

Alternate calibration Gas ______

PPM ______

[WARNING - R38 factory adjustment only]

Background reading ______ PPM {0-6 PPM acceptable tolerance}

X100 CH4 test (before adj. R32) ______ PPM after ______ PPM

X10 flame/pump off (before adj. R31) ______ PPM after ______ PPM

X1000 flame/pump off before adj. R33) ______ PPM after ______ PPM

CALIBRATION CHECK

Methane standard ______ PPM

Initial gas select ______

Final gas select ______

Alternate Calibration Gas ______

PPM ______

Calibration satisfactory: ☐ yes ☐ no

Signature: ______ Title: ______

procedure.

a. Follow the calibration procedure 2.3.2.

b. Fill and flush three or four times a gas bag (tedlar recommended) with the certified NBS traceable calibration gas. Fill the bag with two to three liters of the gas. If the gas is toxic, this must be done in a fume hood.

c. Set the OVA scale to the setting for the concentration of the gas and feed the gas into the probe through clean tygon tubing. After fifteen seconds, adjust the gas select switch to adjust the meter reading to the value of the gas.

d. Record the calibration results on a calibration/maintenance log sheet (Exhibit B) and attach a new calibration sticker to the OVA. Make certain that the instrument is clearly marked as to the gas for which it is calibrated.

2.3.4 Particle Filters

The particle filters in the OVA are cleaned in the following manner.

Primary Filter

This filter is located behind the sample inlet connector on the Side Pack Assembly. It is removed for cleaning by using a 7/16 in thin wall socket to unscrew the Fitting Assembly. The filter cup, "O" ring and loading spring will then come out. The porous stainless filter cup can be cleaned by blowing out or washing in solvent. If a solvent is used, care should be taken to ensure that all solvent is removed by blowing out or heating the filter. Reassemble in reverse order ensuring that the "O" ring seal on the Fitting Assembly is intact.

Secondary Filter

A particle filter is located in each pick-up fixture. One of these filters must be in the sample line whenever the instrument is in use. Sampling fixtures should be periodically cleaned with an air hose and/or detergent water to eliminate foreign particle matter. If a solvent is used, the fixture should be subsequently cleaned with detergent and baked out at 120 degrees F to eliminate residual hydrocarbons.

Mixer/Burner Assembly Filter

A porous metal particle filter is incorporated in the Mixer/ Burner Assembly which screws into the Preamp Assembly. This filter is used as the sample mixer and inlet flame arrestor in the chamber. The filter should not become contaminated under normal conditions but can be cleaned or the assembly replaced if necessary.

Access to this filter or output surface does not require removing the instrument from the case. For access, remove the safety cover using a hex key wrench (supplied) then un-screw the exhaust port. The Filter Assembly can now be seen on the side of the chamber (Preamp Assembly) and can be cleaned with a small wire brush.

Exhaust Flame Arrestor

A porous metal flame arrestor is located in the exhaust port of the detector chamber (Preamp Assembly). It acts as a particle filter on the chamber output and restricts foreign matter from from entering the chamber. This filter may be cleaned by removing the exhaust port. For access, see Mixer/Burner section above. Note that the filter is captive to the exhaust port. Clean the filter with a solvent or detergent and ensure that it is dry and completely baked out at 120 degrees F before reinstalling.

2.3.5 Hydrogen Tank Supply & Refill Valves

After some time, the Teflon washers under each valve packing nut can "cold flow" (move with pressure) and allow hydrogen to leak. Leakage can be determined by using Leak-Tec, Snoop or a soap solution around the valve stems. This leakage can usually be stopped by tightening the compression nut (adapter) as outlined below.

a) Unscrew the packing nut with a 7/16 inch wrench.

b) Unscrew the valve.

c) Replace the compression rings.

This compression is against soft material and only a small amount of force is necessary to sufficiently compress the Teflon washers. If, after tightening, leakage still occurs, it would be advisable to replace the two Teflon washers, as follows:

a) Drain hydrogen system slowly and to the extent necessary to work on the leaking valve(s). Observe appropriate safety precautions. There should be no potential igniters in the area.

b) Remove all three (3) knob screws and knobs.

c) Remove the compression nut on the valve that is not sealing properly. Remove the stem by unscrewing it from the valve body. Observe the sandwich of metal and Teflon washers and note their order.

d) Visually check the Kel-FTM seat on the stem for cracks or foreign material. Wipe clean, if necessary, with a lint free cloth (no solvents or oils) and replace if damaged.

e) Remove the washers and replace the Teflon washers (the factory procedure is a light wipe of hydrocarbon free silicone grease).

F) Replace the stem assembly in the valve body and tighten lightly.

g) Push the washers down into the compression area in the same order as noted upon removal. Replace the compression nut and tighten smugly.

h) Close the low pressure valve and fill the tank assembly. Check valves for leaks. Tighten again, if necessary, and reassemble the unit.

2.3.6 Burner Chamber Cleaning

a. Remove the safety cover and the exhaust port of the detector chamber (on the bottom of the case) and clean the cavity and the electrode using the small wire brush supplied with the analyzer.

b. After cleaning, replace the exhaust port and safety cover and reignite and recalibrate the OVA.

c. Fill in the calibration/maintenance log.

2.3.7 Charcoal Replacement

a. Remove the charcoal cartridge from the instrument and carefully empty the used charcoal.

b. Refill the cartridge with fresh charcoal. Foxboro P/N CSC004 or equivalent. Fill the cartridge completely.

c. Replace the cartridge on the OVA.

d. Complete a calibration/maintenance log.

2.3.8 Purging of Hydrogen Supply Lines

Contamination in the hydrogen fuel system is usually the direct result of contaminated hydrogen gas or contamination introduced during the filling operation. Filling hose contamination can be caused by storing the hose in a contaminated area.

To remove contamination, the fuel system should be purged with hydrogen. Effective purging is accomplished as follows:

a. Disconnect the capillary tube fitting to the manifold block which has the low pressure gauge (Hydrogen Supply Pressure Gauge and Hydrogen Supply Valve). This disconnects the capillary tubing from the hydrogen line so that hydrogen may be purged at a reasonable rate from the tank assembly through the regulators, gauges and valves. After disconnecting the capillary, fill the hydrogen tank in the normal manner.

b. Open the tank valve and hydrogen supply valve. This will bleed the hydrogen from the tank through the hydrogen fuel system, purging contamination which is in vapor form. There is the possibility that contamination has been introduced into the hydrogen fuel system which is not readily purged by the hydrogen gas, but this is unlikely.

c. After purging with clean hydrogen two or three times, the capillary tube should be reconnected and the background again checked. Five or ten minutes should be allowed before assessing the background reading, since contaminated hydrogen can be trapped in the capillary tube.

d. If another clean instrument is available, the fuel system from the clean instrument can be connected to the contaminated instrument to verify whether the problem is associated with the hydrogen fuel supply system. The interconnection should be made to the capillary tube of the contaminated instrument.

e. Recalibrate and fill in the calibration/maintenance log.

2.4 Air Sampling System Maintenance

A potential problem associated with the OVA instrument is that leaks can develop in the air sample pumping system. These leaks can result in dilution or loss of sample, causing low reading of vapor concentration and slow response.

The OVA is equipped with a flow gauge that provides a method to check for air leaks. Assemble the pickup-probe selected for use to the read out assembly and then position the sidepack vertically so the flow gauge may be observed. Cover the end of the pickup probe with your finger and observe that the ball in the flow gauge goes to the bottom, indicating no air flow (if the ball has a slight chatter while on the bottom, this is acceptable). Cover the center of the chamber exhaust port with your thumb and again observe the ball going to the bottom. Another simple check is to expose the pickup probe to a light vapor (butane) and observe that the meter responds in approximately 2.0 seconds. It should be noted that slow meter response may also indicate a restriction in the air sampling system.

Failure of the ball to go to the bottom when the inlet is blocked indicates a leak in the system between the probe and the pump inlet or the inlet check valve. To isolate the problem, remove parts, one at a time, and again block off the air inlet. Remove the pickup probe(s) and cover the air inlet at the Read Out Assembly. If the ball goes to the bottom, check that the *read out to probe* seal washer is in place and replace the probes, holding them back against the seal while tightening the nut. Recheck, and if leakage is till present, it is probably in the probe (pickup fixture), which should be repaired or replaced.

If leakage is indicated as being past the read out handle when the connection to the sidepack is tight, disconnect the sample line at the fitting on the sidepack and cover this inlet with your finger. If the flow gauge ball goes to the bottom, the problem should be a leak in the umbilical cord/Read Out Assembly, which should be investigated and repaired. There is also the possibility of a leaking check valve in the pump which would not show up on this test. If the leakage is not found in the umbilical cord, it is most likely in the pump check valve. The pump should be replaced.

If the ball does not go to the bottom, the leak will be either in the flow gauge or its connecting tubing. Visually check that the tubing is connected and if so, the flow gauge should be repaired or replaced. Check the *O ring* installation in the sample inlet connector (Fitting Assembly).

As an alternate approach, leaks on the inlet side of the pump can be detected by using alcohol on a *Q Tip* and lightly swabbing the connection one at a time or by directing organic vapor or smoke at the potential leakage points and observing the meter response or audible alarm.

Leaks beyond the pump are easier to locate, as any of the commercially available leak detection solutions can be used. Cover the exhaust port, which will place the exhaust system under pressure, and check each connection, one at a time. Replace the Teflon tubing or retape the threaded connections with Teflon joint tape. Check the igniter and Mixer/Burner Assembly where they screw into the detector, the high voltage terminal screw on the side of the Mixer/Burner and exhaust port itself. If after these checks, the flow gauge ball still will not go to the bottom with the exhaust blocked, the problem is likely a leaking exhaust check valve in the pump, which should be repaired or replaced.

2.5 Gas Chromatograph (GC) Option

The OVA provides efficient and accurate indication of total organic compound concentrations on a continuous sampling basis. However, in areas where mixtures of organic vapors are present, it often becomes necessary to determine the relative concentration of the components and/or to make quantitative analysis of specific compounds.

To provide this capability, a gas chromatograph (GC) option is available. When the GC option is used, the capability of the OVA includes both qualitative and on-the-spot quantitative analysis of specific components present in the ambient environment.

This section is applicable only to an OVA with the optional gas chromatograph (GC) system. It presents maintenance and trouble shooting procedures for common problems associated with the GC mode of operation. It is not intended to give instructions in in the uses of the GC option. Only trained personnel should operate the OVA in the GC mode in the field.

2.5.1 Modes of Operation

The OVA with GC option has two modes of operation. The first mode is the measurement of total organic vapors in the same manner as described for the basic OVA instrument. This mode is referred to as the *Survey Mode*. The OVA is in the Survey Mode of operation whenever the Sample Inject Valve is in the *out* position.

The second mode of operation is called the *GC Mode*. The OVA is in this mode of operation any time a sample has been injected into the GC system and the sample is being transported through the GC column. This section provides a brief description of how a gas chromatograph (GC) option operates. A comprehensive discussion of gas chromatography theory, column selection, and data analysis is beyond the scope of this manual.

The OVA with GC option can be utilized for many types of analysis in the outdoor or indoor ambient environment or for specific laboratory type analysis. The OVA was not designed to compete with the research or process gas chromatograph but to complement these instruments or eliminate their need in field applications. Foxboro publishes Application/Technical Notes to assist the operators in applying the instrument to field monitoring situations.

The OVA in GC mode requires the following: 1) A carrier gas to transport the sample through the column; 2) Hydrogen gas for operation of the FID; 3) A clean air supply to support combustion to the FID. In addition, a method for injecting a known volume of sample air (aliquot) to be analyzed is required. The OVA GC system uses the hydrogen fuel for the FID also as the carrier gas. The clean air supply is simply the normal air sample pumped to the FID. During the GC analysis, this air is scrubbed in a charcoal filter to provide the clean air supply.

A valving arrangement is incorporated to provide a method for transferring a fixed volume of air into the GC system for analysis. The sample air injected into the GC column is the same sample being analyzed by the OVA for total organic vapor concentration. Therefore, the instrument provides the unique capability to observe the total organic vapor concentration of the sample prior to injecting it into the GC system.

2.5.2 GC Columns

Columns are available in 4, 8, 12, 24, 36, and 48 inch lengths as standard offerings with any of the column packings listed below. Longer lengths are available from Foxboro in 12-inch increments on a *non-standard* basis.

Foxboro Designation	Material
A	20% Dioctyl Phthalate on Chromosorb-P, AW 60/80 Mesh
C	Chromosorb 101, 60/80 Mesh
D	20% Ucon 50 HB 280 on Chromosorb-P. AW 60/80 Mesh
E	20% Carbowax 400 Chromosorb-P. AW 60/80 Mesh
F	5/1.75% Diethylhexyl Sebecate/Bentone 34 on Chromosorb W, AW 60/80 Mesh

G	10% OV-101 on Chromosorb W, HP 60/80 Mesh
T	10% 1,2,3-Tris (2-cyanoethoxy) Propane on Chromosorb P, AW 60/80 Mesh
B	3% Diisodecyl Phthalate on Chromosorb W, AW 60/80 Mesh
PT	Poropak T, 60/80 Mesh
Q	Poropak Q, 60/80 Mesh
H	20% Carbowax 20M Chromosorb P, AW 60/80 Mesh
J	n-Octane on Porasil C, 80/100 Mesh
N	Poropak N, 60/80 mesh

2.5.3 Column Maintenance

Any column can be contaminated with compounds having long retention times. This will result in high background readings. This condition can be checked by installing a new column or a blank column (tubing only). If this reduces the background reading, the contaminated column should be baked at 100 degrees C for three to four hours in a drying oven while passing nitrogen through the column. Higher temperatures may permanently damage the column packing.

When installing any column, avoid touching the ends, as this may cause contamination. Also, ensure that the fittings are tight to avoid hydrogen leakage.

The following simple test may be run to determine whether the GC column is contaminated. While in a clean ambient air background, place the Sample Inject Valve in the In (GC Mode) position. Observe the background reading on the meter or recorder. After one to two minutes, change the position of the Backflush Valve and again observe the background reading. If the background reading went down and the started to increase in one to two minutes, the column is probably contaminated and needs to be cleaned. If hydrogen flows into one end of the column for a long period of time, the contamination is pushed into the column. Then when the hydrogen flow is reversed, the exhaust end of the column will be clean until the contamination is again pushed through. To clean a column, the purge gas must be run through the column in one direction until all contamination is removed. Contaminated columns can be avoided by backflushing the column after every analysis.

2.5.4 Charcoal Filter Assembly

After repeated use, the Charcoal Filter Assembly will become saturated. Periodically, the operator should check the effectiveness of the activated charcoal.

This is done by operating the unit with the Sample Injection Valve in and passing the probe near a concentrated sample of compound being analyzed. The read out should remain nearly steady should not rise more than 0 to 2 ppm. If rise is more than 2 ppm. replace the old charcoal with new activated charcoal according to the procedure in section 2.3.8. Care should be taken to completely fill the tube to prevent a path for sample to bypass the charcoal. The life of the charcoal depends on the length of time of exposure and the concentration level during that exposure. When changing charcoal. remove any fine charcoal dust from the assembly.

Another test of the charcoal filter is to note the background reading with the Sample Inject Valve out and then the reading with the valve in. The level should never be higher when the valve is in the in position and the charcoal filter is in the air line. If the reading with the valve in the in position is higher, the charcoal filter is probably contaminated and acting like a contamination emitter.

2.6 High Background Reading

On occasion, the background reading may be relatively high under normal ambient conditions. Ambient background reading will vary somewhat depending on the geographical location where the instrument is being used. However, the background reading normally should be in the range of 3 to 5 ppm as methane. The acceptable background reading consists of 1 to 1.5 ppm of methane which is present in the normal air environment. In addition to the measurement of a normal methane background, there will normally be 2 to 4 ppm of equivalent methane background caused by acceptable levels of contamination in the hydrogen fuel and/or hydrogen fuel handling system resulting in a total of equivalent methane reading of 3 to 5 ppm in clean air.

If the background reading goes above 5 ppm to 6 or 7 ppm, this is normally still acceptable since any measurement is additive to that background reading, i.e., 2 ppm on top of 5 or 2 ppm on top of 7 provides the same differential reading, however, the lower background is obviously desirable.

The background reading is zeroed out or nulled even though in reality the background still exists. The background reading is measured by zeroing the meter with the flame out and noting the meter indication after the flame is on.

The cause for a high background reading is usually associated with contamination in the hydrogen fuel system. This will, of course, cause a background reading since this is the function of the basic detector to measure contamination entering the detector chamber. In addition, contamination present in the hydrogen will many times leave a small unobservable deposit on the burner face which can continue to generate a background reading when the detector is in operation and the burner assembly is heated.

Another possible cause of contamination is the Mixer/Burner Assembly when the contamination is trapped in the porous bronze sample filter. This is not a common problem and usually only happens when an unusually high level of contaminant is drawn into the assembly. Another possible cause of high background reading is contamination in the air sample line to the detector. this is uncommon but can be the source of the problem.

An OVA that has the Chromatograph Option can have high background caused by saturation or contamination of the activated charcoal filter, which is in the line during chromatograph analysis, or of the column which is in the hydrogen line at all times.

Prior to analyzing the problem, the OVA should be checked for proper operation. Calibrate the instrument to methane as referenced. If, after checking that the OVA is properly calibrated, the background is still higher than normal for ambient conditions, the following procedure should be followed to isolate the cause of the problem:

a. Let the OVA run for a period of time (15 to 30 minutes) and see if the background level decreases as a function of time. The background could go down as a result of clearing line contamination which is removable simply by the normal flow of air through the sample line.

b. Take a reading in a know, relatively clean air environment. Normally, outside air environment is clean enough to assess by comparison whether the background reading is internal to the instrument or is present in the location where the instrument is being used.

c. If the OVA has the Gas Chromatography Option, depress the sample inject valve, so that the activated charcoal is in the line, and observe whether the background reading goes down and stays steady after elution of the air peak. The reading should always to down or stay the same but never increase when the sample valve is depressed, since the charcoal filter will remove trace elements of organic vapors in the air sample heavier than ethane. If another activated charcoal filter is available, this may be attached to the end of the probe to scrub the air so that a clean air sample is supplied to the detector. The external activated charcoal filter can be used on any instrument, with or without chromatograph, for providing a clean air sample to assess background level.

d. If the background cannot be reduced by any of the previous steps, remove the safety cover and the exhaust port of the detector chamber (on the bottom of the case) and clean the cavity and the electrode using the small wire brush supplied with the analyzer (2.3.7). This will remove any small quantities of contamination which could be the source of the background vapor. After cleaning, replace the exhaust port and safety cover and reignite the OVA. If detector contamination was the cause, the problem should be immediately resolved and the ambient background will drop to an acceptable level.

e. If the high background is still present, the various parts of the sample flow line such as pickup probes, umbilical cord to the instrument, etc., should be investigated by the process of elimination to see if the contamination can be isolated.

f. Serious contamination in the air sample line is very uncommon. However, if very large doses of low vapor pressure compounds are sampled, there is a possibility of residual contamination. This would eventually clear itself out but may take a considerable period of time. A typical cause for high background from the sample line is a contaminated Mixer/Burner Assembly. If heavy contamination of the Mixer/Burner is indicated, replace the Mixer/Burner Assembly.

g. In the event of contamination in the pump or other internal parts of the sample flow lines which cannot be removed, the sample flow components have to be disassembled and cleaned. This is normally a factory operation, however, components such as the pump can be replaced in the field along with any contaminated tubing.

h. High background readings on OVAs which include the Gas Chromatograph Option can be caused by other sources of contamination. If the charcoal filter mounted on the instrument panel is saturated, contaminated air would be supplied to the detector and raise the ambient level background. To check for this, refill the cartridge with fresh charcoal, Foxboro P/N CSC004 or equivalent. This would determine if the charcoal was the source of the background reading. It is also possible that a high background reading could be due to contamination in the column. This could be caused by compounds slowly eluting from a column which has become contaminated. The easiest way to check for column contamination is to replace the column with a clean column or a short empty piece of column tubing and see if the high background reading drops.

i. If the above steps do not correct the high background, the cause will normally be contamination in the hydrogen fuel system.

Contamination in the hydrogen fuel system is usually the direct result of contaminated hydrogen gas or contamination introduced during the filling operation. Filling hose contamination can be caused by storing the hose in a contaminated area.

To remove contamination, follow the procedure in 2.3.8.

2.7 Troubleshooting

The a summary of field troubleshooting procedures is presented below. If necessary, the instrument can be easily removed from the case by unlocking the four (4) 1/4 turn fasteners on the panel face and removing the refill cap. The battery pack is removed by taking out the four (4) screws on the panel and disconnecting the power connector.

Indication	*Possible Causes*
High Background Reading (more than 10 ppm)	1. Contaminated Hydrogen 2. Contaminated Sample Line 3. Contaminated Burner Chamber
Continual Flameout	1. Hydrogen Leak 2. Dirty Burner Chamber 3. Dirty Air Filters
Low Air Flow	1. Dirty Air Filter 2. Pump Malfunction 3. Line Obstruction
Flame will not Light	1. Low Battery 2. Ignitor Broken 3. Hydrogen Leak 4. Dirty Burner Chamber 5. Air Flow Restricted
No Power to Pump	1. Low Battery 2. Short Circuit
Hydrogen Leak (Instrument not in use)	1. Leak in Regulator 2. Leak in Valves
Slow Meter Response	1. Probe Not Seated Tightly 2. Flow Rate Too Low
High Reading Persists After source Removed	1. Sample Imput Line Dirty 2. Detector Dirty

2.8 Additional Precautions

- The calibration gas mixture must be balance in air.
- Keep battery on charger when not in use.
- Recharge battery as soon as possible after use.
- Avoid dropping the meter/probe assembly.
- **Avoid intake of high boiling vapors and all liquids.**
- Backflush the GC column after each chromatogram.
- **Do not overtighten valves.**
- Use zero grade hydrogen; i.e. contains less than 2 ppm hydrocarbons.
- When draining the hydrogen tank, leave a small amount in the tank.
- Whenever an OVA will not calibrate or operate properly, it is to be returned to the CDM Regional Field Equipment Manager who will arrange a replacement. Under no circumstances is field work requiring monitoring with an OVA to be done without an OVA or with a malfunctioning unit.

SECTION 10.0 YSI DISSOLVED OXYGEN METER

The following section outlines procedures for field operations with the YSI Dissolved Oxygen Meter.

10.1 Instrument Profile

Application: To determine dissolved oxygen in water.wastewater, and certain other liquids.

Components: Meter with analog read out; mode switch; red line knob; zero knob calibrate knob;salinity knob; stirrer control knob; cable and probe assembly.

Operation: The probe uses a polargraphic sensor with built in thermisters for temperature measurement and compensation. A thin, permeable membrane stretched over the sensor isolates the sensor elements from the environment but allows oxygen to enter. When voltage is applied across the sensor, oxygen that has passed through the membrane reacts at the cathode, causing a current to flow. The membrane passes oxygen at a rate proportional to the pressure difference across it. Since oxygen is rapidly consumed at the cathode, it is assumed that the oxygen pressure inside the membrane is zero. Hence the force causing the oxygen to diffuse through the membrane is proportional to the absolute pressure of oxygen outside the membrane. If the oxygen pressure increases. more oxygen diffuses through the membrane and more current flows through the sensor. A low pressure results in less current flow.

Read Out: Dissolved oxygen is indicated on the analog read out in mg/l (milligrams per liter) on 0-5, 0-10 and 0-20 mg/l scales.

Calibration: Three methods of calibration can be used: Winkler titration, saturated water, and moist air.

10.2 Field Procedures

The following sections detail the procedures that are to be followed when using the YSI Dissolved Oxygen Meter in the field.

Procedure	*Section*	*Frequency*
Start Up Procedure	10.2.1	Prior to use
Calibration Check	10.2.2	Prior to use
Routine Service	10.3	Monthly
Membrane Replacement	10.4	As needed

10.2.1 Start Up Procedure

a. Placed the instrument in one position prior to calibration and use: vertical, tilted or on its back.

b. With switch in the OFF position, adjust the meter pointer to zero with the screw in the center of the meter panel. Readjustment may be necessary if the instrument position is changed.

c. Switch to RED LINE and adjust the RED LINE knob until the meter needle aligns with the red mark at the 31 degrees centigrade position.

d. Switch to ZERO and adjust to zero with zero control knob.

e. Attach the prepared probe to the PROBE connector of the instrument and adjust the retaining finger tight.

10.2.2 Calibration

a. Before calibrating, turn the instrument on and allow a 15 minutes warm up period for optimum probe stabilization.

b. Place the probe in moist air. If the YSI calibration chamber is not available place the probe in the small storage bottle (the one with the hole in the bottom) along with a few drops of water. The probe can also be wrapped loosely in a damp cloth taking care the cloth does not touch the membrane. Wait approximately 10 minutes for temperature stabilization.

c. Switch to TEMPERATURE and read. Refer to Table 1 and determine the calibration value.

d. Determine altitude or atmospheric correction factor from Table 2.

e. Multiply the calibration value from Table 1 by the correction Factor from table 2.

f. Switch to the appropriate mg/l range, set the SALINITY knob to zero and adjust the CALIBRATE knob until the meter reads the correct calibration value from step 4. Wait two minutes to verify calibration stability. Readjust if necessary.

g. When finished, return the probe to its storage container which should be kept damp to prevent the probe from drying out.

h. Record in the field log the date and time of the calibration; and the samples that the calibration applies.

10.2.3 Dissolved Oxygen Measurement

a. Follow the calibration procedure.

b. Place the probe in the sample and slowly raise and lower it in the sample.

c. Adjust the salinity knob to the salinity of the sample.

d. Allow about two minutes for the probe to stabilize to sample temperature and dissolved oxygen and read dissolved oxygen.

Table 1
Solubility of Oxygen in Fresh Water

Temperature (degrees C)	Dissolved Oxygen (mg/l)	Temperature (degrees C)	Dissolved Oxygen (mg/l)
0	14.60	23	8.56
1	14.19	24	8.40
2	13.81	25	8.24
3	13.44	26	8.09
4	13.09	27	7.95
5	12.75	28	7.81
6	12.43	29	7.67
7	12.12	30	7.54
8	11.83	31	7.41
9	11.55	32	7.28
10	11.27	33	7.16
11	11.01	34	7.05
12	10.76	35	6.93
13	10.52	36	6.82
14	10.29	37	6.71
15	10.07	38	6.61
16	9.85	39	6.51
17	9.65	40	6.41
18	9.45	41	6.31
19	9.26	42	6.22
20	9.07	43	6.13
21	8.90	44	6.04
22	8.72	45	5.95

Table 2
Altitude Correction

Atmospheric Pressure (mm Hg)	Equivalent Altitude (feet)	Correction Factor
775	-540	1.02
760	0	1.00
745	542	0.98
730	1094	0.96
714	1688	0.94
699	2274	0.92
684	2864	0.90
669	3466	0.88
654	4082	0.86
638	4756	0.84
623	5403	0.82
608	6065	0.80
593	6744	0.78
578	7440	0.76
562	8204	0.74
547	8939	0.72
532	9694	0.70
517	10472	0.68
502	11273	0.66

10.3 Routine Service

The YSI Dissolved Oxygen Meter's performance is affected by a number of factor. Most of the problems are the result of the probe being allowed to dry out. Should this happen the probe will need serviced or replaced. If the probe has dried out or has a wrinkled membrane or bubbles in the solution, do not use it to make measurements. Contact the CDM Regional/Subsidiary Field Equipment Manager to obtain a replacement meter.

Under no circumstances is a dissolved oxygen meter to be left in the field for more than a week on an inactive site. Meters on an active site are to be replaced with a fresh instrument at least once a month.

10.4 Membrane Replacement

Should the membrane which covers the probe become wrinkled, dirty, or worn, it will need to be replaced. The following procedure is for replacement of the membrane.

a. Prepare a satuated solution of potassium chloride (KCl) by adding crystals of reagent grade KCl to 30 ml of distilled water until the crystals stop dissolving. Decant about 25 ml of the solution into another container and add another 25 ml of distilled water to it.

b. Unscrew the sensor guard from the probe and remove the O ring and the membrane. Rinse the sensor thoroughly and fill it with the prepared KCl solution.

c. Secure the new membrane to the sensor by pressing it near the top of the sensor with your thumb. Handle the membrane carefully.

d. Add the KCl solution until the gold sensor is completely covered.

e. Grasp the free end of the membrane with the free hand and, using a continuous motion, stretch the membrane up, over, and down the other side of the sensor.

f. Secure the membrane under the forefingers of the hand holding the probe. Carefully roll the O ring over the membrane in such a way as to avoid trapping air bubbles and creating wrinkles in the membrane.

g. Replace the sensor guard and store the probe in KCl solution. The probe must not be permitted to dry out.

GENERAL USE CALIBRATION/MAINTENANCE FORM

Date:________________ Time:____________________________

Name:__________________________ Region:______________Site:______________

Equipment type:__________________________ Model.:______________________

EPA Tag no.:____________________________ Serial no.:____________________

Last used at region:_____________________ Site:_________________________

Last Calibrated by:______________________Region:______________ Date:__________

CONDITION OF UNIT

Were any PARTS/ACCESSORIES missing or damaged ☐ yes ☐ no

if YES, list & describe:____

____

____

Was unit returned CLEAN and in WORKING order ☐ yes ☐ no

if NO, describe condition:____

____

____

FUNCTION TEST

Batteries good/charged: ☐ yes ☐ no Batteries replaced: ☐ yes ☐ no

Instrument calibration: (describe method of calibration)

____

____

____

____

____

Repair Section: List repairs made/parts replaced (if none write "NONE"):

____

____

____

____

____

APPENDIX G

GEOPROBE SAMPLING
AND
INSTALLATION METHODOLOGIES

SUBSURFACE SOIL SAMPLING AND ANALYSIS METHODOLOGIES

Burlington Environmental Inc. (Burlington) proposes to perform the subsurface investigation and to define the areas of contamination by collecting soil samples with Burlington's RECON[sm] Multimedia Sampling System.

Project Site

Site conditions are expected to permit the work to be performed utilizing a 2-wheel-drive van. Provisions for road building or towing the van have not been included.

Sampling is not scheduled to be required in concrete-paved areas. If test locations in driveways, sidewalks, and buildings are necessary, an attempt will be made to advance the hole a maximum of 18 inches through the concrete at no extra charge. A maximum of two concrete points per day can be sampled before productivity levels are adversely affected. Additional concrete drilling through thicker concrete or at additional locations will be regarded as an extra-charge item.

Our personnel will comply with Burlington's and JAYCOR's health and safety requirements on site. We have assumed that dermal and respiratory protection will not be required for any activities being performed.

Air-purifying respirators will be used if personnel exposures could exceed the Occupational Safety and Health Administration (OSHA) permissible exposure limits specified in 29 CFR 1910.1000 (revised January 1989). All Burlington Environmental employees assigned to the project have been trained to use Air-purifying respirators in accordance with OSHA regulations, have passed a respirator fit test, and are participating in a medical monitoring program. The use of respirators and disposable personal protective clothing (Level C) will be regarded as extra-charge items.

At the project location, JAYCOR will provide all utility clearances prior to investigation efforts. Availability at an on-site water source (10 gallons per minute) has been assumed.

Soil sampling using the soil-gas van is a method for obtaining subsurface soils to confirm the vertical and horizontal extent of contamination as indicated by soil-gas or groundwater samples.

Subsurface soil samples will be obtained by inserting a .0.75-inch O.D. steel probe equipped with a retractable drive-point sampler to the desired sampling depth. The sampling depth will be determined on site. The sampler will be advanced a minimum of 12 inches beyond the desired sampling depth to impact soil into the sampling sleeve.

Samples will be extruded into a glass vial and analyzed on site by Burlington Environmental. Samples will be analyzed with a laboratory-grade gas chromatograph (GC) using a flame ionization detector (FID) and modified U.S. Environmental Protection Agency (USEPA) Method 8010/8020. The modifications include the use of an FID in the GC, a volatile organics capillary column, static headspace analysis, a single point calibration standard, and no sample spikes. The sample will be placed into a glass vial with a septum cap. A sodium sulfate saturated solution will be added to the vial, and the vial shaken for two minutes. This procedure partitions the volatile compounds between the saturated solution and headspace in the vial. The vial will be allowed to sit for one minute to equilibrate the sample. A sample aliquot will be removed from the vial with a gas-tight syringe and injected directly into the GC.

Quality assurance/quality control (QA/QC) guidelines will be maintained so the data collected from this survey are accurate and reliable. Field QC samples will be collected at the beginning of each day of field activity, after every 20 samples, and at the end of each day of field activity. These QA/QC samples will consist of duplicate samples of soil, chromatographic equipment blank samples, equipment blanks obtained from regularly decontaminated sample probes, and calibration standards.

Prior to use in sample collection, all sampling equipment and probe rods will be decontaminated by pressure washing and purging. We have assumed that all tools and equipment can be effectively decontaminated with detergent washing and pressure cleaning. If this decontamination procedure is unsuccessful, alternative decontamination methods or equipment replacement costs will be extra-charge items.

The data will be presented in a final report summarizing the sampling and analysis of target compounds in the soil. The presence of detectable concentrations of target compounds is dependent upon several factors, including the permeability of soils, the depth of groundwater, and whether sufficient concentrations of target compounds are present in the aqueous phase to facilitate volatilization. If for any reason the survey is deemed unfeasible, JAYCOR will be advised immediately and will be billed only for services and expenses actually incurred.

SOIL GAS SAMPLING AND ANALYSIS METHODOLOGIES

Burlington Environmental Inc., (Burlington) proposes to perform the subsurface investigation and to define the areas of contamination by collecting and analyzing soil-gas samples with the Burlington's RECON^{sm} Multimedia Sampling System. The soil-gas samples will be analyzed on site, providing on-site results that will allow for efficient utilization of the equipment and personnel resources.

Project Site

Site conditions are expected to permit the work to be performed utilizing a two wheel drive van. Provisions for road building or towing the van have not been included.

Sampling is not scheduled to be required in concrete paved areas. If test locations in driveways, sidewalks, and building are necessary, an attempt will be made to advance the hole a maximum of 18 inches through the concrete at no extra charge. A maximum of two concrete points per day can be sampled before productivity levels are adversely affected. Additional concrete drilling through thicker concrete or at additional locations may extend the duration of the project.

Our personnel will comply with Burlington's and JAYCOR's health and safety requirements on site. We have assumed that dermal and respiratory protection will not be required for any activities being performed.

Air purifying respirators will be used if personnel exposures could exceed Occupational Safety and Health Administration (OSHA) permissible exposure limits specified in 29 CFR 1910.1000 (revised January 19, 1989). All Burlington employees assigned to the project have been trained to use air-purifying respirators in accordance with OSHA regulations, have passed a respirator fit test, and are participating in a medical monitoring program. The use of respirators and disposable personal protective clothing (Level C) will be regarded as extra charge items.

At the project location, JAYCOR will provide all utility clearances prior to investigation efforts. Availability at an on-site water source (10 gallons per minute) has been assumed.

Soil Gas Survey

Soil gas samples will be obtained by inserting a 0.75 inch O.D. steel probe into the ground. The in situ vapor sample will be withdrawn through the probe and captured in an air-tight sampling bulb.

For a standard soil-gas investigation, a vertical profile at a single probe hole will be performed in an area to identify the approximate depth where samples can be collected to obtain optimum results. Vertical profiling increases project costs and duration because of the increased number of sample analyses performed in the field.

After sample collection, the sampling bulb will be marked for identification and removed from the sampling system. A portion of the soil-gas sample will be withdrawn from the sampling bulb with a gas tight syringe and will be injected into the GC for analysis. All of the soil gas samples collected will be analyzed using a flame-ionization detector (FID) and a volatile organic compound capillary column. The results of the analysis will be automatically recorded in the computer, which is directly linked to the GC. The analytical data will be sorted and available for on-site recall.

Quality assurance/quality control (QA/QC) guidelines will be maintained so the data collected from this survey are accurate and reliable. Field QC samples will be collected at the beginning of each day of field activity, after every 20 samples, and at the end of each day of field activity. These QA/QC samples will consist of duplicate samples of in-situ soil gas, chromatographic equipment blank samples obtained from regularly decontaminated sample probes, and calibration standards.

Prior to use in sample collection, all sampling equipment and probe rods will be decontaminated by pressure washing and purging. We have assumed that all tools and equipment can be effectively decontaminated with detergent washing and pressure cleaning. If this decontamination procedure is unsuccessful, alternative decontamination methods or equipment replacement costs will be extra charge items.

The soil-gas survey data will be presented in a final report summarizing the sampling and analysis of target compound vapors in the vadose zone. The presence of detectable levels of target compounds is dependent upon several factors, including the permeability of soils, the depth of groundwater, and whether sufficient concentrations of target compounds are present in the aqueous phase to facilitate volatilization into the vadose zone. If for any reason the survey is deemed unfeasible, JAYCOR will be advised immediately and will be billed only for services and expenses actually incurred.

BURLINGTON ENVIRONMENTAL
RECON^{sm} SYSTEMS
FIELD SCREENING FOR VOLATILE ORGANIC COMPOUNDS
USING STATIC HEADSPACE METHOD

Scope and Application

This method covers the determination of volatile organic compounds in soil-gas, groundwater, and soil.

Method

Headspace-Gas Chromatography using megabore capillary columns and Flame-ionization detection (FID).

Reference

"EPA Test Methods for Evaluating Solid Waste", SW-846 Methods 3810, 8010 and 8020 with modifications.

Lower Quantifiable Limits (LQL)

Headspace 1.0-10 ug/L or less (compound specific).

Sample Handling

Water and soil samples are to be collected in 40 ml vials with open screw-caps and teflon faced silicon septa. Water samples should be collected so that no headspace remains in the bottle. Soil gas samples are to be collected in 250 ml glass bulbs. Samples should be collected in a manner to ensure the complete purging of the bulb. All samples should be protected from sunlight and transported to the field laboratory as soon as possible. Water samples will be held on ice prior to analysis.

Reagents and Apparatus

1 Open screw cap 40 ml vial (ICHEM). Detergent washed, distilled water rinsed and dried at 105°C before use.

2. Septum - Teflon-faced silicon (ICHEM). Detergent washed, distilled water rinsed and dried at 105° C before use.

3. 250 ml gas sampling bulbs (teflon stop-cocks and septum inlet).

4. Gas chromatograph-Hewlett Packard (HP) Model 5890A equipped FID.

5. Computing integrator HP Model 3396 A/B and dual disk drive storage device.

6. Column 1 - J&W DB-624/0.53mm id. capillary column, 30 meter, 3.0 micron phase - volatile organic compounds.

7. Syringes - Assorted glass gas-tight microliter syringes and liquid syringes (10-1000 ul volumes).

8. Balance - ± 0.0001 g - Sartorius Analytical Balance (not on board RECON System Van).

9. Reagent Water - organic free water or distilled deionized water that has been shown to be organic-free at the method detection limit.

10. Constant temperature heat block - 70°C (capable of ± 0.5°C temperature control).

11. Volumetric flasks - assorted.

12. Pipettes - assorted

Calibration Standard Preparation

1. Stock standard solutions: Prepare a VOC standard at 2500 ug/ml in methanol.

   a. Add about 30 ml of methanol to 50 ml volumetric flask. Allow the flask to stand unstoppered until the methanol on the neck of the flask has dried.

b. Tare the flask on the analytical balance.

c. Using a 100 ul syringe, add 0.125 g. (correct for percent purity) of the reference material to the flask. Make sure the drops fall directly into the methanol without contacting the neck of the flask.

d. Determine the mass of reference material added. Rinse the syringe with methanol, tare the flask, and add the next standard.

e. After all the reference materials are added, fill to volume with methanol, cap and invert to mix.

f. Transfer stock standard solution to 40 ml VOA vials, cap, and store in a cool, dark location.

Calibration - Vapor Standard - Single Point Calibration Procedure

1. Prepare a vapor standard using a nonapproved modification to U.S. EPA Method TO-1, calibration standard preparation using a static dilution bottle-technique. Add appropriate amount of stock standard to a known volume vessel, fitted with a mininert valve and heat to 70°C (at $\pm$ 0.5°C). Inject aliquot directly into the gas chromatograph.

2. Use a single point standard curve of peak area response versus total concentration injected for each of the compounds of interest.

3. A continuing calibration check is performed after each set of 10 samples and as the last sample of the date. If the response for any of the compounds varies from the expected response by more than $\pm$ 30 percent, the average response should be used.

Sample Analysis

Soil Gas Samples

1. Soil gas samples will be received in 250/ml glass bulbs. When received, they are allowed to equilibrate to the ambient air temperature.

2. Remove an aliquot of sample and inject directly into the gas chromatograph.

3. If any compound of interest is outside the calibration curve and an accurate concentration is required, a smaller aliquot is taken from the same sample bulb.

Water Samples

1. Water samples are received in 40 ml VOA vials. Uncap and remove a 10 ml aliquot of the sample from the vial. Dispense the sample into a headspace vial.
2. The vials are placed in a 70^{o}C Aluminium heat block and heated for 10 minutes.
3. Remove an aliquot of headspace and inject directly into the gas chromatograph.
4. If any compound of interest is outside the calibration curve and an accurate concentration is required, a smaller sample volume is injected into the instrument and the analysis repeated.

Soil Samples

1. Soil samples are received in 40 ml VOA vials. A 10 gram quantity of soil is placed in a clean VOA vial.
2. Ten milliliters of a sodium sulfate solution is added to the vial.
3. Shake the vial vigorously to disperse the soil.
4. Place the vial in a 70^{o}C heat block and heat for ten minutes.

3. Remove an aliquot of headspace and inject directly into the gas chromatograph.

4. If any compound of interest is outside the calibration curve and an accurate concentration is required, a smaller sample volume is injected into the instrument and the analysis repeated.

Chromatographic Conditions

Column: 30 meter J&W DB-624 Volatile Organic Compound Column, 0.53 mm i.d. /3.0 micron phase.

Carrier Gas: Hydrogen - Ultra High Purity Grade 8 ml/min.

Data Reporting

1. All results, chromatographic parameters, analytical results, sampling locations, and notes will be recorded in daily G.C. field worksheets.

2. All data generated by the field G.C. will be considered as tentatively identified, with the concentrations being estimated.

3. All raw field data will be forwarded to Burlington for final review and QA/QC prior to final reporting.

Quality Control

1. Each daily analytical run should begin with a G.C. system blank and a headspace standard calibration. Calibration check standards should be analyzed every 10 samples. Continuing calibration standards should be within 30 percent of the original standards or a new standard curve should be prepared and samples analyzed since the last check standard should be reanalyzed.

2. A minimum of 5 percent duplicate samples should be analyzed or a minimum of one per day. Duplicates should be within ±25 percent.

3. Gas chromatograph sample blanks will be analyzed at least one every twenty samples, or a minimum of 1 per day.

4. New stock standards should be prepared monthly in the laboratory. New working standards should be prepared daily.

Detector: flame-ionization detector (FID)

Detector Temperature:	300°C
Hydrogen flow:	35 ml/min.
Zero Air Flow:	450 ml/min.
Nitrogen Make-up Gas:	20-25 ml/min.
Hydrogen Carrier Flow:	8 ml/min.
Injector: Temperature -	200°C

Oven Temperature Profile:

Initial -	45°C - 3.5 min.
Rate -	5°C/min.
Final -	110°C - 0.5 min.

Conditions listed can be varied as needed for changing applications.

Analytical Calculations

All calculations will be automatically performed by the computing integrator.

1. Review the chromatograms and data reports for analysis. Check for gross errors such as incomplete data reports because of faulty integration.

2. Prepare external standard calibration curves for each compound using a single point calibration curve. Calculate the lower quantifiable limit (LQL) for each target compound.

3. Calculate the concentration found in the samples from the calibration curves using the following equations:

   (μg/L = Area Comp *RF Target *DF)

   DF = Dilution Factor
   RF = Response Factor (Target Compound)
   Area Compound = Area of compound in sample.

GROUNDWATER SAMPLING AND ANALYSIS METHODOLOGIES

Burlington Environmental Inc. (Burlington) proposes to perform the subsurface investigation and to define the areas of contamination by collecting groundwater samples with Burlington's RECON[sm] Multimedia Sampling System.

Project Site

Site conditions are expected to permit the work to be performed utilizing a two wheel drive van. Provisions for road building or towing the van have not been included.

Sampling is not scheduled to be required in concrete paved areas. If test locations in driveways, sidewalks, and building are necessary, an attempt will be made to advance the hole a maximum of 18 inches through the concrete at no extra charge. A maximum of two concrete points per day can be sampled before productivity levels are adversely affected. Additional concrete drilling through thicker concrete or at additional locations may extend the duration of the project.

Our personnel will comply with Burlington's and JAYCOR's health and safety requirements on site. We have assumed that dermal and respiratory protection will not be required for any activities being performed.

Air purifying respirators will be used if personnel exposures could exceed Occupational Safety and Health Administration (OSHA) permissible exposure limits specified in 29 CFR 1910.1000 (revised January 19, 1989). All Burlington employees assigned to the project have been trained to use air-purifying respirators in accordance with OSHA regulations, have passed a respirator fit test, and are participating in a medical monitoring program. The use of respirators and disposable personal protective clothing (Level C) will be regarded as extra charge items.

At the project location, JAYCOR will provide all utility clearances prior to investigation efforts. Availability at an on-site water source (10 gallons per minute) has been assumed.

Groundwater sampling using Burlington's mobile sampling unit is a method for rapidly screening an area for approximate levels of contamination. Data collected by this method should not be considered a replacement for more accurate measurements that can be obtained using monitoring wells.

Groundwater grab samples will be obtained by inserting a 0.75 inch O.D. steel probe to a depth that will intercept the groundwater table. Samples will be collected by one of three methods for groundwater grab sampling with the hydraulic probe unit. The method used will depend on several factors, including decontamination requirements, efficient use of time and materials, analytical requirements, and the depth to groundwater. Samples can be collected by pump, miniature stainless-steel bailer or a polyethylene tubing and check valve assembly. If a pump is used, either a peristaltic or vacuum pump will be used to draw the sample to the surface through polyethylene tubing.

The groundwater samples will be collected in glass vials and analyzed on site by Burlington. Samples will be analyzed with a laboratory-grade GC using an FID and modified U.S. Environmental Protection Agency (USEPA) SW-846 Methods 8010/8020. The modifications include the use of an FID in the GC, a volatile organic compound capillary column, static headspace analysis, a single-point calibration standard, and no sample spikes. The sample will be placed in a glass vial fitted with a septum cap. The vial will be shaken for two minutes.This procedure partitions the volatile compounds between the samples and headspace in the vial. The vial will be allowed to sit for one minute to equilibrate the sample. A sample aliquot will be removed from the vial with a gas-tight syringe and injected directly into the GC.

Quality assurance/quality control (QA/QC) guidelines will be maintained so the data collected from this survey are accurate and reliable. Field QC samples will be collected at the beginning of each day of field activity, after every 20 samples, and at the end of each day of field activity. These QA/QC samples will consist of duplicate samples of in-situ groundwater, chromatographic equipment blank samples obtained from regularly decontaminated sample probes, and calibration standards.

Prior to use in sample collection, all sampling equipment and probe rods will be decontaminated by pressure washing and purging. We have assumed that all tools and equipment can be effectively decontaminated with detergent washing and pressure cleaning. If this decontamination procedure is unsuccessful, alternative decontamination methods or equipment replacement costs will be extra charge items.

The groundwater survey data will be presented in a final report summarizing the piezometers installed. If for any reason the survey is deemed unfeasible, JAYCOR will be advised immediately and will be billed only for services and expenses actually incurred.

PIEZOMETER INSTALLATION METHODOLOGY

Project Site

Site conditions are expected to permit the work to be performed utilizing a two wheel drive van. Provisions for road building or towing the van have not been included.

Sampling is not scheduled to be required in concrete paved areas. If test locations in driveways, sidewalks, and building are necessary, an attempt will be made to advance the hole a maximum of 18 inches through the concrete at no extra charge. A maximum of two concrete points per day can be sampled before productivity levels are adversely affected. Additional concrete drilling through thicker concrete or at additional locations may extend the duration of the project.

Our personnel will comply with Burlington's and JAYCOR's health and safety requirements on site. We have assumed that dermal and respiratory protection will not be required for any activities being performed.

Air purifying respirators will be used if personnel exposures could exceed Occupational Safety and Health Administration (OSHA) permissible exposure limits specified in 29 CFR 1910.1000 (revised January 19, 1989). All Burlington employees assigned to the project have been trained to use air-purifying respirators in accordance with OSHA regulations, have passed a respirator fit test, and are participating in a medical monitoring program. The use of respirators and disposable personal protective clothing (Level C) will be regarded as extra charge items.

At the project location, JAYCOR will provide all utility clearances prior to investigation efforts. Availability at an on-site water source (10 gallons per minute) has been assumed.

Piezometer Installation

Piezometer installation will be conducted using the Burlington mobile sampling unit.

The piezometer consists of threaded one-inch-diameter polyvinyl chloride (PVC) 0.01-inch slotted screen and riser pipe.

The PVC material is attached to a drive point then the 0.75-inch-diameter flush threaded steel probe rods are inserted inside the piezometer material. The hydraulic probe unit is used to drive the piezometer assembly to the desired depth. A hydraulic hammer is used to assist in driving the assembly through unusually hard soil. The hydraulic probe unit is also used to extract the probe rods after the piezometer has been driven to the appropriate depth.

Piezometers should not be considered as a replacement for monitoring wells. The use of piezometers is a rapid method to determine product thickness, groundwater gradients or vacuum pressure measurements. Groundwater sampling with piezometers is a method to rapidly screen an area for approximate levels of contamination. Data collected by this method should not be considered a replacement for more accurate measurements obtained using monitoring wells.

APPENDIX H

ESE'S
MASTER QUALITY ASSURANCE PLAN

Contract No. DAAA15-87-D-0015
Delivery Orders 0066 and 0067

MASTER QUALITY ASSURANCE PLAN

February, 1992

Distribution limited to U.S. Government Agencies only for protection of priviledged information evaluating another command: April, 1990. Requests for this document must be referred to: Commander, U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, MD. 21010-5401

Prepared for:

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground, MD. 21010-5401

APPENDIX I

USATHAMA-CERTIFIED METHODS, JULY 1991; WATER AND SOIL ANALYSIS PROGRAMS

List of ESE's USATHAMA Certifications

-- Gainesville, FL. --

Record#	M_LAB	M_METH_NO	METH_NAME	M_TST_NAM	CERTREPLIM	MAXCON	CERTDATE
446	ES	00			0.000000	0.0000	01/01/85
447	ES	99			0.000000	0.0000	01/01/85
1	ES	A6	PESTICIDES/TISSUE/GCEC	44DCBZ	0.012000	0.2330	11/24/86
2	ES	A6	PESTICIDES/TISSUE/GCEC	ALDRN	0.026000	0.2330	11/24/86
3	ES	A6	PESTICIDES/TISSUE/GCEC	DLDRN	0.043000	0.2070	11/24/86
4	ES	A6	PESTICIDES/TISSUE/GCEC	ENDRN	0.039000	0.2000	11/24/86
5	ES	A7	METALS/AIR/COLDVAPORAA	HG	0.062900	0.6940	10/21/86
6	ES	A8	METALS/WATER/AA	AS	3.880000	50.0000	02/25/86
7	ES	A8A	METALS/WATER/GFAA	AS	3.070000	50.0000	08/08/87
939	ES	AA01	VOLATILES/AIR/GCMS	CCL4	0.120000	1.0000	05/01/86
941	ES	AA01	VOLATILES/AIR/GCMS	CH2CL2	1.000000	90.0000	05/01/86
940	ES	AA01	VOLATILES/AIR/GCMS	CHCL3	13.000000	320.0000	05/01/86
8	ES	AA8	METALS/WATER/AA	K	1256.000000	50000.0000	03/10/86
9	ES	AAA9	AGENTPRODS/SOIL/IONCHROM	FC2A	2.000000	40.0000	03/04/87
10	ES	AAA9	AGENTPRODS/SOIL/IONCHROM	IMPA	2.110000	40.0000	03/04/87
11	ES	AAA9	AGENTPRODS/SOIL/IONCHROM	MPA	2.000000	40.0000	03/04/87
12	ES	AD01	METALS/AIR/GFAA	SE	0.002130	0.0100	01/05/87
13	ES	AD02	METALS/AIR/GFAA	AS	0.003060	0.0100	01/05/87
14	ES	B7	METALS/AIR/ICPLASMA-AA	AS	0.003100	0.0100	07/31/86
15	ES	B7	METALS/AIR/ICPLASMA-AA	CD	0.001980	0.1000	07/31/86
16	ES	B7	METALS/AIR/ICPLASMA-AA	CR	0.002600	0.1000	07/31/86
17	ES	B7	METALS/AIR/ICPLASMA-AA	CU	0.016400	0.2000	07/31/86
18	ES	B7	METALS/AIR/ICPLASMA-AA	PB	0.007700	0.2000	07/31/86
19	ES	B7	METALS/AIR/ICPLASMA-AA	ZN	0.009700	0.5000	07/31/86
20	ES	B8	METALS/WATER/ICP	CA	500.000000	50000.0000	02/25/86
21	ES	B8	METALS/WATER/ICP	CD	5.160000	5000.0000	02/25/86
22	ES	B8	METALS/WATER/ICP	CR	5.960000	5000.0000	02/25/86
23	ES	B8	METALS/WATER/ICP	CU	7.930000	10000.0000	02/25/86
24	ES	B8	METALS/WATER/ICP	MG	500.000000	20000.0000	02/25/86
25	ES	B8	METALS/WATER/ICP	NA	764.000000	50000.0000	02/25/86
26	ES	B8	METALS/WATER/ICP	PB	18.600000	5000.0000	02/25/86
27	ES	B8	METALS/WATER/ICP	ZN	20.100000	20000.0000	02/25/86
28	ES	BB8	ORGANICS/WATER/GCMS	13DBD4	23.000000	94.0000	03/21/86
29	ES	BB8	ORGANICS/WATER/GCMS	2CLPD4	7.400000	94.0000	03/21/86
30	ES	BB8	ORGANICS/WATER/GCMS	ALDRN	4.700000	94.0000	03/21/86
31	ES	BB8	ORGANICS/WATER/GCMS	ATZ	5.900000	94.0000	03/21/86
32	ES	BB8	ORGANICS/WATER/GCMS	CL6CP	11.000000	46.9000	03/21/86
33	ES	BB8	ORGANICS/WATER/GCMS	CLDAN	5.100000	94.0000	03/21/86
34	ES	BB8	ORGANICS/WATER/GCMS	CPMS	14.000000	94.0000	03/21/86
35	ES	BB8	ORGANICS/WATER/GCMS	CPMSO	17.000000	94.0000	03/21/86
36	ES	BB8	ORGANICS/WATER/GCMS	CPMSO2	8.000000	94.0000	03/21/86
37	ES	BB8	ORGANICS/WATER/GCMS	DBCP	15.000000	94.0000	03/21/86
38	ES	BB8	ORGANICS/WATER/GCMS	DCPD	4.700000	19.0000	03/21/86
39	ES	BB8	ORGANICS/WATER/GCMS	DDVP	9.000000	47.0000	03/21/86
40	ES	BB8	ORGANICS/WATER/GCMS	DEPD4	5.800000	94.0000	03/21/86
41	ES	BB8	ORGANICS/WATER/GCMS	DIMP	5.700000	94.0000	03/21/86
42	ES	BB8	ORGANICS/WATER/GCMS	DITH	11.000000	94.0000	03/21/86
43	ES	BB8	ORGANICS/WATER/GCMS	DLDRN	4.700000	94.0000	03/21/86
44	ES	BB8	ORGANICS/WATER/GCMS	DNOPD4	13.000000	94.0000	03/21/86
45	ES	BB8	ORGANICS/WATER/GCMS	ENDRN	7.600000	47.0000	03/21/86
46	ES	BB8	ORGANICS/WATER/GCMS	ISODR	5.900000	94.0000	03/21/86
47	ES	BB8	ORGANICS/WATER/GCMS	MLTHN	7.600000	47.0000	03/21/86
48	ES	BB8	ORGANICS/WATER/GCMS	OXAT	6.100000	94.0000	03/21/86
49	ES	BB8	ORGANICS/WATER/GCMS	PPDDE	4.700000	94.0000	03/21/86
50	ES	BB8	ORGANICS/WATER/GCMS	PPDDT	10.000000	47.0000	03/21/86
51	ES	BB8	ORGANICS/WATER/GCMS	PRTHN	14.000000	94.0000	03/21/86
52	ES	BB8	ORGANICS/WATER/GCMS	SUPONA	6.500000	94.0000	03/21/86
53	ES	C7	VOLATILES/AIR/GCMS	111TCE	22.000000	220.0000	08/15/86
54	ES	C7	VOLATILES/AIR/GCMS	112TCE	6.000000	220.0000	08/15/86
55	ES	C7	VOLATILES/AIR/GCMS	11DCLE	27.000000	220.0000	08/15/86
56	ES	C7	VOLATILES/AIR/GCMS	12DCE	27.000000	220.0000	08/15/86
57	ES	C7	VOLATILES/AIR/GCMS	12DCLE	26.000000	220.0000	08/15/86
58	ES	C7	VOLATILES/AIR/GCMS	12DMB	19.000000	88.0000	08/15/86
59	ES	C7	VOLATILES/AIR/GCMS	BCHPD	19.000000	220.0000	08/15/86
60	ES	C7	VOLATILES/AIR/GCMS	C6H6	26.000000	220.0000	08/15/86
61	ES	C7	VOLATILES/AIR/GCMS	CCL4	12.000000	220.0000	08/15/86
62	ES	C7	VOLATILES/AIR/GCMS	CH2CL2	11.000000	90.0000	08/15/86
63	ES	C7	VOLATILES/AIR/GCMS	CHCL3	13.000000	220.0000	08/15/86
64	ES	C7	VOLATILES/AIR/GCMS	CLC6H5	29.000000	220.0000	08/15/86
65	ES	C7	VOLATILES/AIR/GCMS	DBCP	40.000000	44.0000	08/15/86
66	ES	C7	VOLATILES/AIR/GCMS	DCPD	19.000000	89.0000	08/15/86
67	ES	C7	VOLATILES/AIR/GCMS	DMDS	22.000000	220.0000	08/15/86
68	ES	C7	VOLATILES/AIR/GCMS	ETC6H5	20.000000	220.0000	08/15/86
69	ES	C7	VOLATILES/AIR/GCMS	MEC6H5	7.000000	220.0000	08/15/86
70	ES	C7	VOLATILES/AIR/GCMS	MIBK	8.000000	220.0000	08/15/86
71	ES	C7	VOLATILES/AIR/GCMS	TCLEE	18.000000	220.0000	08/15/86
72	ES	C7	VOLATILES/AIR/GCMS	TRCLE	19.000000	220.0000	08/15/86
73	ES	C7	VOLATILES/AIR/GCMS	XYLEN	31.000000	170.0000	08/15/86
74	ES	CM01	VOLATILES/AIR/GCMS	111TCE	22.000000	220.0000	08/15/86
75	ES	CM01	VOLATILES/AIR/GCMS	112TCE	6.000000	220.0000	08/15/86
76	ES	CM01	VOLATILES/AIR/GCMS	11DCLE	27.000000	220.0000	08/15/86

77	ES	CM01	VOLATILES/AIR/GCMS	12DCE	27.000000	220.0000	08/15/86
78	ES	CM01	VOLATILES/AIR/GCMS	12DCLE	26.000000	220.0000	08/15/86
79	ES	CM01	VOLATILES/AIR/GCMS	12DMB	19.000000	88.0000	08/15/86
80	ES	CM01	VOLATILES/AIR/GCMS	BCHPD	22.000000	220.0000	08/15/86
81	ES	CM01	VOLATILES/AIR/GCMS	C6H6	26.000000	220.0000	08/15/86
82	ES	CM01	VOLATILES/AIR/GCMS	CCL4	12.000000	220.0000	08/15/86
83	ES	CM01	VOLATILES/AIR/GCMS	CH2CL2	11.000000	90.0000	08/15/86
84	ES	CM01	VOLATILES/AIR/GCMS	CHCL3	13.000000	220.0000	08/15/86
85	ES	CM01	VOLATILES/AIR/GCMS	CLC6H5	29.000000	220.0000	08/15/86
86	ES	CM01	VOLATILES/AIR/GCMS	DBCP	40.000000	44.0000	08/15/86
87	ES	CM01	VOLATILES/AIR/GCMS	DCPD	19.000000	89.0000	08/15/86
88	ES	CM01	VOLATILES/AIR/GCMS	DMDS	19.000000	220.0000	08/15/86
89	ES	CM01	VOLATILES/AIR/GCMS	ETC6H5	20.000000	220.0000	08/15/86
90	ES	CM01	VOLATILES/AIR/GCMS	MEC6H5	7.000000	220.0000	08/15/86
91	ES	CM01	VOLATILES/AIR/GCMS	MIBK	8.000000	220.0000	08/15/86
92	ES	CM01	VOLATILES/AIR/GCMS	TCLEE	18.000000	220.0000	08/15/86
93	ES	CM01	VOLATILES/AIR/GCMS	TRCLE	19.000000	220.0000	08/15/86
94	ES	CM01	VOLATILES/AIR/GCMS	XYLEN	31.000000	170.0000	08/15/86
95	ES	D7	ORGANICS/AIR/GCMS	ATZ	0.023000	0.7900	10/21/86
96	ES	D7	ORGANICS/AIR/GCMS	DLDRN	0.018000	0.0990	10/21/86
97	ES	D7	ORGANICS/AIR/GCMS	ENDRN	0.015000	0.0990	10/21/86
98	ES	D7	ORGANICS/AIR/GCMS	PPDDE	0.011000	0.0990	10/21/86
99	ES	D7	ORGANICS/AIR/GCMS	PPDDT	0.022000	0.0990	10/21/86
100	ES	D7	ORGANICS/AIR/GCMS	PRTHN	0.046000	0.7900	10/21/86
964	ES	G007	EXPLOSIVES/SURFACE/NONE	XPLOSV	0.360000	0.0000	07/12/91
450	ES	H2	PHENOLS/WATER/TECHNICON	PHENLC	7.120000	50.0000	01/28/86
451	ES	J2	METALS/WATER/TECHNICON	CRHEX	2.500000	50.0000	04/01/86
101	ES	JB01	METALS/SOIL/CVAA	HG	0.050000	1.0000	12/29/85
102	ES	JD02	METALS/SOIL/GFAA	AS	4.700000	50.0000	12/29/85
103	ES	JD03	METALS/SOIL/GFAA	SE	8.300000	50.0000	02/11/87
799	ES	JD15	METALS/SOIL/GFAA	SE	0.250000	10.0000	02/10/89
800	ES	JD16	METALS/SOIL/GFAA	V	0.775000	20.0000	02/10/89
801	ES	JD17	METALS/SOIL/GFAA	PB	0.177000	10.0000	02/10/89
802	ES	JD18	METALS/SOIL/GFAA	AG	0.025000	1.0000	02/10/89
803	ES	JD19	METALS/SOIL/GFAA	AS	0.250000	10.0000	02/10/89
963	ES	JD24	METALS/SOIL/FURNACE	TL	0.319000	10.0000	05/28/91
962	ES	JD25	METALS/SOIL/FURNACE	SB	1.090000	20.0000	05/28/91
104	ES	JS01	METALS/SOIL/ICP	AG	6.020000	50.0000	12/29/85
453	ES	JS01	METALS/SOIL/ICP	BA	0.863000	200.0000	03/28/88
105	ES	JS01	METALS/SOIL/ICP	BE	5.100000	50.0000	12/29/85
106	ES	JS01	METALS/SOIL/ICP	CD	3.490000	50.0000	12/29/85
107	ES	JS01	METALS/SOIL/ICP	CR	7.720000	50.0000	12/29/85
108	ES	JS01	METALS/SOIL/ICP	CU	6.560000	50.0000	12/29/85
109	ES	JS01	METALS/SOIL/ICP	NI	5.410000	50.0000	12/29/85
110	ES	JS01	METALS/SOIL/ICP	PB	6.810000	50.0000	12/29/85
452	ES	JS01	METALS/SOIL/ICP	SB	4.640000	200.0000	03/28/88
111	ES	JS01	METALS/SOIL/ICP	TL	12.300000	50.0000	12/29/85
112	ES	JS01	METALS/SOIL/ICP	ZN	12.400000	50.0000	12/29/85
876	ES	JS11	METALS/SOIL/ICP	AG	2.500000	50.0000	02/17/89
877	ES	JS11	METALS/SOIL/ICP	AL	14.100000	50000.0000	02/17/89
878	ES	JS11	METALS/SOIL/ICP	B	32.700000	200.0000	02/17/89
879	ES	JS11	METALS/SOIL/ICP	BA	29.600000	200.0000	02/17/89
880	ES	JS11	METALS/SOIL/ICP	BE	1.860000	20.0000	02/17/89
881	ES	JS11	METALS/SOIL/ICP	BI	31.500000	5000.0000	02/17/89
882	ES	JS11	METALS/SOIL/ICP	CA	59.000000	50000.0000	02/17/89
883	ES	JS11	METALS/SOIL/ICP	CD	3.050000	20.0000	02/17/89
884	ES	JS11	METALS/SOIL/ICP	CO	15.000000	5000.0000	02/17/89
885	ES	JS11	METALS/SOIL/ICP	CR	12.700000	5000.0000	02/17/89
886	ES	JS11	METALS/SOIL/ICP	CU	58.600000	5000.0000	02/17/89
887	ES	JS11	METALS/SOIL/ICP	FE	50.000000	50000.0000	02/17/89
888	ES	JS11	METALS/SOIL/ICP	K	37.500000	5000.0000	02/17/89
889	ES	JS11	METALS/SOIL/ICP	MG	50.000000	50000.0000	02/17/89
890	ES	JS11	METALS/SOIL/ICP	MN	0.275000	5000.0000	02/17/89
891	ES	JS11	METALS/SOIL/ICP	MO	1.150000	5000.0000	02/17/89
892	ES	JS11	METALS/SOIL/ICP	NA	150.000000	5000.0000	02/17/89
893	ES	JS11	METALS/SOIL/ICP	NI	12.600000	5000.0000	02/17/89
894	ES	JS11	METALS/SOIL/ICP	PB	6.620000	5000.0000	04/11/90
895	ES	JS11	METALS/SOIL/ICP	SB	3.800000	5000.0000	02/17/89
896	ES	JS11	METALS/SOIL/ICP	SE	9.530000	5000.0000	02/17/89
897	ES	JS11	METALS/SOIL/ICP	TE	54.200000	5000.0000	02/17/89
898	ES	JS11	METALS/SOIL/ICP	TL	31.300000	5000.0000	02/17/89
899	ES	JS11	METALS/SOIL/ICP	V	13.000000	5000.0000	02/17/89
900	ES	JS11	METALS/SOIL/ICP	ZN	30.200000	5000.0000	02/17/89
965	ES	JS16	METALS/SOIL/ICP	AG	0.589000	10.0000	08/29/91
1017	ES	JS16	METALS/SOIL/ICP	AL	2.350000	50000.0000	08/29/91
1018	ES	JS16	METALS/SOIL/ICP	AL	2.350000	50000.0000	08/29/91
966	ES	JS16	METALS/SOIL/ICP	AS	5.710000	5000.0000	08/29/91
967	ES	JS16	METALS/SOIL/ICP	B	5.910000	5000.0000	08/29/91
968	ES	JS16	METALS/SOIL/ICP	BA	5.180000	2500.0000	08/29/91
969	ES	JS16	METALS/SOIL/ICP	BE	0.500000	1000.0000	08/29/91
970	ES	JS16	METALS/SOIL/ICP	BI	52.800000	2500.0000	08/29/91
1012	ES	JS16	METALS/SOIL/ICP	CA	100.000000	50000.0000	08/29/91
971	ES	JS16	METALS/SOIL/ICP	CD	0.700000	1000.0000	08/29/91
972	ES	JS16	METALS/SOIL/ICP	CO	1.420000	1000.0000	08/29/91

973	ES	JS16	METALS/SOIL/ICP	CR	4.050000	5000.0000	08/29/91
974	ES	JS16	METALS/SOIL/ICP	CU	0.965000	2500.0000	08/29/91
1014	ES	JS16	METALS/SOIL/ICP	FE	3.680000	50000.0000	08/29/91
1013	ES	JS16	METALS/SOIL/ICP	K	100.000000	50000.0000	08/29/91
1015	ES	JS16	METALS/SOIL/ICP	MG	100.000000	50000.0000	08/29/91
975	ES	JS16	METALS/SOIL/ICP	MN	2.050000	5000.0000	08/29/91
976	ES	JS16	METALS/SOIL/ICP	MO	1.120000	1000.0000	08/29/91
1016	ES	JS16	METALS/SOIL/ICP	NA	100.000000	50000.0000	08/29/91
978	ES	JS16	METALS/SOIL/ICP	NI	1.710000	5000.0000	08/29/91
979	ES	JS16	METALS/SOIL/ICP	PB	10.500000	5000.0000	08/29/91
980	ES	JS16	METALS/SOIL/ICP	SB	7.140000	5000.0000	08/29/91
981	ES	JS16	METALS/SOIL/ICP	SE	2.420000	5000.0000	08/29/91
982	ES	JS16	METALS/SOIL/ICP	TE	10.700000	1000.0000	08/29/91
983	ES	JS16	METALS/SOIL/ICP	TL	6.620000	5000.0000	08/29/91
984	ES	JS16	METALS/SOIL/ICP	V	3.390000	1000.0000	08/29/91
985	ES	JS16	METALS/SOIL/ICPP	ZN	8.030000	5000.0000	08/29/91
946	ES	JY02	INORGANIC/SOIL/SPECTRO	CRHEX	0.514000	5.0000	04/11/90
113	ES	K8	ANIONS/WATER/TECHNICON	NIT	10.000000	200.0000	12/08/80
448	ES	KF10	ANIONS/SOIL/TECHNICON	NIT	0.600000	12.0000	03/14/88
942	ES	KF14	INORGANIC/SOIL/TECHNICON	TPO4	7.490000	100.0000	10/17/89
911	ES	KT05	ANIONS/SOIL/IONCHROM	BR	5.000000	200.0000	04/18/89
910	ES	KT05	ANIONS/SOIL/IONCHROM	CL	6.050000	204.0000	04/18/89
908	ES	KT05	ANIONS/SOIL/IONCHROM	F	3.620000	51.2000	04/18/89
909	ES	KT05	ANIONS/SOIL/IONCHROM	SO4	90.400000	512.0000	04/18/89
114	ES	KY01	CYANIDE/SOIL/TECHNICON	CYN	0.920000	10.0000	12/29/85
115	ES	L8	METALS/WATER/CVAA	HG	0.242000	10.0000	09/05/80
476	ES	LF03	EXPLOSIVES/SOIL/TECHNICON	NC	10.400000	125.0000	09/02/88
116	ES	LG01	HALOCARBONS/SOIL/GCCON	111TCE	0.120000	0.9800	12/31/86
117	ES	LG01	HALOCARBONS/SOIL/GCCON	112TCE	0.120000	1.0000	12/31/86
118	ES	LG01	HALOCARBONS/SOIL/GCCON	11DCE	0.120000	0.9400	12/31/86
119	ES	LG01	HALOCARBONS/SOIL/GCCON	11DCLE	0.130000	0.9700	12/31/86
120	ES	LG01	HALOCARBONS/SOIL/GCCON	12DCE	0.150000	1.0200	12/31/86
121	ES	LG01	HALOCARBONS/SOIL/GCCON	12DCLE	0.080000	1.0000	12/31/86
122	ES	LG01	HALOCARBONS/SOIL/GCCON	CCL4	0.120000	1.0300	12/31/86
123	ES	LG01	HALOCARBONS/SOIL/GCCON	CH2CL2	0.150000	0.9900	12/31/86
124	ES	LG01	HALOCARBONS/SOIL/GCCON	CHCL3	0.100000	1.0400	12/31/86
125	ES	LG01	HALOCARBONS/SOIL/GCCON	CLC6H5	0.180000	1.0200	12/31/86
126	ES	LG01	HALOCARBONS/SOIL/GCCON	TCLEE	0.120000	1.0100	12/31/86
127	ES	LG01	HALOCARBONS/SOIL/GCCON	TRCLE	0.090000	1.0000	12/31/86
128	ES	LH02	HALOCARBONS/SOIL/GCCON	TRCLE	0.023000	2.0000	02/05/87
696	ES	LH10	PESTICIDES/SOIL/GCEC	ABHC	0.009070	0.0270	09/30/88
703	ES	LH10	PESTICIDES/SOIL/GCEC	AENSLF	0.006020	0.0244	09/30/88
701	ES	LH10	PESTICIDES/SOIL/GCEC	ALDRN	0.007290	0.0257	09/30/88
700	ES	LH10	PESTICIDES/SOIL/GCEC	BBHC	0.002570	0.0254	09/30/88
708	ES	LH10	PESTICIDES/SOIL/GCEC	BENSLF	0.006630	0.0244	09/30/88
904	ES	LH10	PESTICIDES/SOIL/GCEC	CLDAN	0.017700	0.1970	01/01/89
698	ES	LH10	PESTICIDES/SOIL/GCEC	DBHC	0.005550	0.0252	09/30/88
705	ES	LH10	PESTICIDES/SOIL/GCEC	DLDRN	0.006290	0.0254	09/30/88
706	ES	LH10	PESTICIDES/SOIL/GCEC	ENDRN	0.006570	0.0252	09/30/88
710	ES	LH10	PESTICIDES/SOIL/GCEC	ENDRNA	0.024000	0.0302	09/30/88
711	ES	LH10	PESTICIDES/SOIL/GCEC	ESFSO4	0.007630	0.0286	09/30/88
699	ES	LH10	PESTICIDES/SOIL/GCEC	HPCL	0.006180	0.0262	09/30/88
702	ES	LH10	PESTICIDES/SOIL/GCEC	HPCLE	0.006200	0.0260	09/30/88
903	ES	LH10	PESTICIDES/SOIL/GCEC	ISODR	0.004610	0.0412	01/01/89
697	ES	LH10	PESTICIDES/SOIL/GCEC	LIN	0.006380	0.0262	09/30/88
712	ES	LH10	PESTICIDES/SOIL/GCEC	MEXCLR	0.071100	0.2490	09/30/88
707	ES	LH10	PESTICIDES/SOIL/GCEC	PPDDD	0.008260	0.0246	09/30/88
704	ES	LH10	PESTICIDES/SOIL/GCEC	PPDDE	0.007650	0.0286	09/30/88
709	ES	LH10	PESTICIDES/SOIL/GCEC	PPDDT	0.007070	0.0281	09/30/88
713	ES	LH10	PESTICIDES/SOIL/GCEC	TXPHEN	0.444000	1.1200	09/30/88
736	ES	LH11	HERBICIDES/SOIL/HPLC	245TP	0.008500	0.1090	10/10/88
735	ES	LH11	HERBICIDES/SOIL/HPLC	24D	0.017700	0.2020	10/10/88
936	ES	LH16	PESTICIDES/SOIL/GCEC	PCB016	0.066600	0.3670	07/24/89
937	ES	LH16	PESTICIDES/SOIL/GCEC	PCB260	0.080400	0.4070	07/21/89
796	ES	LL03	ORGANOSULFURS/SOIL/GCFP	BTZ	1.080000	13.2000	12/13/88
795	ES	LL03	ORGANOSULFURS/SOIL/GCFP	CPMS	1.080000	21.6000	12/13/88
797	ES	LL03	ORGANOSULFURS/SOIL/GCFP	CPMSO	2.250000	45.0000	12/13/88
798	ES	LL03	ORGANOSULFURS/SOIL/GCFP	CPMSO2	2.370000	47.4000	12/13/88
794	ES	LL03	ORGANOSULFURS/SOIL/GCFP	DITH	1.470000	11.4000	12/13/88
792	ES	LL03	ORGANOSULFURS/SOIL/GCFP	DMDS	0.692000	13.8000	12/13/88
793	ES	LL03	ORGANOSULFURS/SOIL/GCFP	OXAT	0.856000	17.1000	12/13/88
129	ES	LM02	VOLATILES/SOIL/GCMS	111TCE	0.250000	25.0000	12/05/86
130	ES	LM02	VOLATILES/SOIL/GCMS	112TCE	0.250000	25.0000	12/05/86
131	ES	LM02	VOLATILES/SOIL/GCMS	11DCLE	0.250000	25.0000	12/05/86
132	ES	LM02	VOLATILES/SOIL/GCMS	12DCD4	0.850000	25.0000	12/05/86
133	ES	LM02	VOLATILES/SOIL/GCMS	12DCE	0.250000	25.0000	12/05/86
134	ES	LM02	VOLATILES/SOIL/GCMS	12DCLE	0.280000	25.0000	12/05/86
135	ES	LM02	VOLATILES/SOIL/GCMS	13DMB	0.250000	25.0000	12/05/86
136	ES	LM02	VOLATILES/SOIL/GCMS	BCHPD	0.250000	25.0000	12/05/86
137	ES	LM02	VOLATILES/SOIL/GCMS	C6H6	0.250000	25.0000	12/05/86
138	ES	LM02	VOLATILES/SOIL/GCMS	CCL4	0.250000	25.0000	12/05/86
139	ES	LM02	VOLATILES/SOIL/GCMS	CD2CL2	1.100000	25.0000	12/05/86
140	ES	LM02	VOLATILES/SOIL/GCMS	CH2CL2	0.250000	25.0000	12/05/86
141	ES	LM02	VOLATILES/SOIL/GCMS	CHCL3	0.250000	25.0000	12/05/86

142	ES	LM02	VOLATILES/SOIL/GCMS	CLC6H5	0.250000	25.0000	12/05/86
143	ES	LM02	VOLATILES/SOIL/GCMS	DBCP	0.330000	25.0000	12/05/86
144	ES	LM02	VOLATILES/SOIL/GCMS	DCPD	0.270000	26.5000	12/05/86
145	ES	LM02	VOLATILES/SOIL/GCMS	DMDS	0.250000	25.0000	12/05/86
146	ES	LM02	VOLATILES/SOIL/GCMS	ETBD10	0.730000	25.0000	12/05/86
147	ES	LM02	VOLATILES/SOIL/GCMS	ETC6H5	0.250000	25.0000	12/05/86
148	ES	LM02	VOLATILES/SOIL/GCMS	MEC6H5	0.250000	25.0000	12/05/86
149	ES	LM02	VOLATILES/SOIL/GCMS	MIBK	0.500000	25.0000	12/05/86
150	ES	LM02	VOLATILES/SOIL/GCMS	TCLEE	0.250000	25.0000	12/05/86
151	ES	LM02	VOLATILES/SOIL/GCMS	TRCLE	0.250000	25.0000	12/05/86
152	ES	LM02	VOLATILES/SOIL/GCMS	XYLEN	0.500000	50.0000	12/05/86
153	ES	LM03	ORGANICS/SOIL/GCMS	13DBD4	0.280000	100.0000	12/05/86
154	ES	LM03	ORGANICS/SOIL/GCMS	2CLPD4	0.340000	25.0000	12/05/86
155	ES	LM03	ORGANICS/SOIL/GCMS	ALDRN	0.940000	100.0000	12/05/86
156	ES	LM03	ORGANICS/SOIL/GCMS	ATZ	0.730000	100.0000	12/05/86
157	ES	LM03	ORGANICS/SOIL/GCMS	CL6CP	1.100000	50.0000	12/05/86
158	ES	LM03	ORGANICS/SOIL/GCMS	CLDAN	1.000000	100.0000	12/05/86
159	ES	LM03	ORGANICS/SOIL/GCMS	CPMS	0.250000	50.0000	12/05/86
160	ES	LM03	ORGANICS/SOIL/GCMS	CPMSO	0.350000	50.0000	12/05/86
161	ES	LM03	ORGANICS/SOIL/GCMS	CPMSO2	0.290000	100.0000	12/05/86
162	ES	LM03	ORGANICS/SOIL/GCMS	DBCP	0.330000	50.0000	12/05/86
163	ES	LM03	ORGANICS/SOIL/GCMS	DCPD	0.260000	25.0000	12/05/86
164	ES	LM03	ORGANICS/SOIL/GCMS	DDVP	0.250000	25.0000	12/05/86
165	ES	LM03	ORGANICS/SOIL/GCMS	DEPD4	0.250000	50.0000	12/05/86
166	ES	LM03	ORGANICS/SOIL/GCMS	DIMP	0.500000	10.0000	12/05/86
167	ES	LM03	ORGANICS/SOIL/GCMS	DITH	0.250000	100.0000	12/05/86
168	ES	LM03	ORGANICS/SOIL/GCMS	DLDRN	0.250000	100.0000	12/05/86
169	ES	LM03	ORGANICS/SOIL/GCMS	DMMP	1.500000	10.0000	12/05/86
170	ES	LM03	ORGANICS/SOIL/GCMS	DNOPD4	0.570000	100.0000	12/05/86
171	ES	LM03	ORGANICS/SOIL/GCMS	ENDRN	0.700000	50.0000	12/05/86
172	ES	LM03	ORGANICS/SOIL/GCMS	ISODR	0.330000	100.0000	12/05/86
173	ES	LM03	ORGANICS/SOIL/GCMS	MLTHN	0.590000	2.5000	12/05/86
174	ES	LM03	ORGANICS/SOIL/GCMS	OXAT	0.270000	100.0000	12/05/86
175	ES	LM03	ORGANICS/SOIL/GCMS	PPDDE	0.290000	100.0000	12/05/86
176	ES	LM03	ORGANICS/SOIL/GCMS	PPDDT	0.370000	100.0000	12/05/86
177	ES	LM03	ORGANICS/SOIL/GCMS	PRTHN	0.630000	100.0000	12/05/86
178	ES	LM03	ORGANICS/SOIL/GCMS	SUPONA	0.490000	10.0000	12/05/86
691	ES	LM18	ORGANICS/SOIL/GCMS	124TCB	0.040000	13.0000	06/20/88
692	ES	LM18	ORGANICS/SOIL/GCMS	12DCLB	0.110000	13.0000	06/20/88
694	ES	LM18	ORGANICS/SOIL/GCMS	13DCLB	0.130000	13.0000	06/20/88
695	ES	LM18	ORGANICS/SOIL/GCMS	14DCLB	0.098000	13.0000	06/20/88
659	ES	LM18	ORGANICS/SOIL/GCMS	245TCP	0.100000	13.0000	06/20/88
631	ES	LM18	ORGANICS/SOIL/GCMS	246TBP	0.380000	13.0000	06/20/88
591	ES	LM18	ORGANICS/SOIL/GCMS	246TCP	0.170000	13.0000	06/20/88
678	ES	LM18	ORGANICS/SOIL/GCMS	24DCLP	0.180000	13.0000	06/20/88
672	ES	LM18	ORGANICS/SOIL/GCMS	24DMPN	0.690000	1.3000	06/20/88
675	ES	LM18	ORGANICS/SOIL/GCMS	24DNP	1.200000	6.7000	06/20/88
693	ES	LM18	ORGANICS/SOIL/GCMS	24DNT	0.140000	13.0000	06/20/88
589	ES	LM18	ORGANICS/SOIL/GCMS	26DNT	0.085000	13.0000	06/20/88
641	ES	LM18	ORGANICS/SOIL/GCMS	2CLP	0.060000	13.0000	06/20/88
667	ES	LM18	ORGANICS/SOIL/GCMS	2CNAP	0.036000	13.0000	06/20/88
661	ES	LM18	ORGANICS/SOIL/GCMS	2FBP	0.021000	6.7000	06/20/88
664	ES	LM18	ORGANICS/SOIL/GCMS	2FP	0.170000	13.0000	06/20/88
670	ES	LM18	ORGANICS/SOIL/GCMS	2MNAP	0.049000	6.7000	06/20/88
683	ES	LM18	ORGANICS/SOIL/GCMS	2MP	0.029000	1.3000	06/20/88
660	ES	LM18	ORGANICS/SOIL/GCMS	2NANIL	0.062000	13.0000	06/20/88
633	ES	LM18	ORGANICS/SOIL/GCMS	2NP	0.140000	13.0000	06/20/88
682	ES	LM18	ORGANICS/SOIL/GCMS	33DCBD	6.300000	13.0000	06/20/88
644	ES	LM18	ORGANICS/SOIL/GCMS	3NANIL	0.450000	13.0000	06/20/88
668	ES	LM18	ORGANICS/SOIL/GCMS	46DN2C	0.550000	13.0000	06/20/88
687	ES	LM18	ORGANICS/SOIL/GCMS	4BRPPE	0.033000	6.7000	06/20/88
666	ES	LM18	ORGANICS/SOIL/GCMS	4CANIL	0.810000	3.3000	06/20/88
679	ES	LM18	ORGANICS/SOIL/GCMS	4CL3C	0.095000	13.0000	06/20/88
636	ES	LM18	ORGANICS/SOIL/GCMS	4CLPPE	0.033000	13.0000	06/20/88
656	ES	LM18	ORGANICS/SOIL/GCMS	4MP	0.240000	1.3000	06/20/88
657	ES	LM18	ORGANICS/SOIL/GCMS	4NANIL	0.410000	13.0000	06/20/88
652	ES	LM18	ORGANICS/SOIL/GCMS	4NP	1.400000	13.0000	06/20/88
634	ES	LM18	ORGANICS/SOIL/GCMS	ANAPNE	0.036000	13.0000	06/20/88
638	ES	LM18	ORGANICS/SOIL/GCMS	ANAPYL	0.033000	6.7000	06/20/88
639	ES	LM18	ORGANICS/SOIL/GCMS	ANTRC	0.033000	13.0000	06/20/88
632	ES	LM18	ORGANICS/SOIL/GCMS	B2CEXM	0.059000	13.0000	06/20/88
685	ES	LM18	ORGANICS/SOIL/GCMS	B2CIPE	0.200000	13.0000	06/20/88
686	ES	LM18	ORGANICS/SOIL/GCMS	B2CLEE	0.033000	6.7000	06/20/88
688	ES	LM18	ORGANICS/SOIL/GCMS	B2EHP	0.620000	13.0000	06/20/88
642	ES	LM18	ORGANICS/SOIL/GCMS	BAANTR	0.170000	13.0000	06/20/88
643	ES	LM18	ORGANICS/SOIL/GCMS	BAPYR	0.250000	13.0000	06/20/88
645	ES	LM18	ORGANICS/SOIL/GCMS	BBFANT	0.210000	3.3000	06/20/88
673	ES	LM18	ORGANICS/SOIL/GCMS	BBZP	0.170000	6.7000	06/20/88
647	ES	LM18	ORGANICS/SOIL/GCMS	BGHIPY	0.250000	3.3000	06/20/88
648	ES	LM18	ORGANICS/SOIL/GCMS	BKFANT	0.066000	0.6700	06/20/88
665	ES	LM18	ORGANICS/SOIL/GCMS	BZALC	0.190000	13.0000	06/20/88
635	ES	LM18	ORGANICS/SOIL/GCMS	CHRY	0.120000	6.7000	06/20/88
690	ES	LM18	ORGANICS/SOIL/GCMS	CL6BZ	0.033000	6.7000	06/20/88
649	ES	LM18	ORGANICS/SOIL/GCMS	CL6CP	6.200000	13.0000	06/20/88

655	ES	LM18	ORGANICS/SOIL/GCMS	CL6ET	0.150000	13.0000	06/20/88
654	ES	LM18	ORGANICS/SOIL/GCMS	DBAHA	0.210000	13.0000	06/20/88
637	ES	LM18	ORGANICS/SOIL/GCMS	DBZFUR	0.035000	6.7000	06/20/88
677	ES	LM18	ORGANICS/SOIL/GCMS	DEP	0.240000	6.7000	06/20/88
669	ES	LM18	ORGANICS/SOIL/GCMS	DMP	0.170000	13.0000	06/20/88
681	ES	LM18	ORGANICS/SOIL/GCMS	DNBP	0.061000	3.3000	06/20/88
590	ES	LM18	ORGANICS/SOIL/GCMS	DNOP	0.190000	6.7000	06/20/88
650	ES	LM18	ORGANICS/SOIL/GCMS	FANT	0.068000	13.0000	06/20/88
671	ES	LM18	ORGANICS/SOIL/GCMS	FLRENE	0.033000	13.0000	06/20/88
680	ES	LM18	ORGANICS/SOIL/GCMS	HCBD	0.230000	13.0000	06/20/88
640	ES	LM18	ORGANICS/SOIL/GCMS	ICDPYR	0.290000	13.0000	06/20/88
689	ES	LM18	ORGANICS/SOIL/GCMS	ISOPHR	0.033000	13.0000	06/20/88
676	ES	LM18	ORGANICS/SOIL/GCMS	NAP	0.037000	3.3000	06/20/88
653	ES	LM18	ORGANICS/SOIL/GCMS	NB	0.045000	13.0000	06/20/88
684	ES	LM18	ORGANICS/SOIL/GCMS	NBD5	0.025000	6.7000	06/20/88
646	ES	LM18	ORGANICS/SOIL/GCMS	NNDNPA	0.200000	13.0000	06/20/88
588	ES	LM18	ORGANICS/SOIL/GCMS	NNDPA	0.190000	13.0000	06/20/88
651	ES	LM18	ORGANICS/SOIL/GCMS	PCP	1.300000	6.7000	06/20/88
662	ES	LM18	ORGANICS/SOIL/GCMS	PHANTR	0.033000	13.0000	06/20/88
592	ES	LM18	ORGANICS/SOIL/GCMS	PHEND6	0.230000	13.0000	06/20/88
658	ES	LM18	ORGANICS/SOIL/GCMS	PHENOL	0.110000	3.3000	06/20/88
674	ES	LM18	ORGANICS/SOIL/GCMS	PYR	0.033000	3.3000	06/20/88
663	ES	LM18	ORGANICS/SOIL/GCMS	TRPD14	0.340000	6.7000	06/20/88
597	ES	LM19	VOLATILES/SOIL/GCMS	111TCE	0.004400	0.2000	06/20/88
598	ES	LM19	VOLATILES/SOIL/GCMS	112TCE	0.005400	0.2000	06/20/88
630	ES	LM19	VOLATILES/SOIL/GCMS	11DCE	0.003900	0.1000	06/20/88
628	ES	LM19	VOLATILES/SOIL/GCMS	11DCLE	0.002300	0.2000	06/20/88
608	ES	LM19	VOLATILES/SOIL/GCMS	12DCD4	0.003200	0.2000	06/20/88
600	ES	LM19	VOLATILES/SOIL/GCMS	12DCE	0.003000	0.1000	06/20/88
629	ES	LM19	VOLATILES/SOIL/GCMS	12DCLE	0.001700	0.2000	06/20/88
593	ES	LM19	VOLATILES/SOIL/GCMS	12DCLP	0.002900	0.2000	06/20/88
616	ES	LM19	VOLATILES/SOIL/GCMS	4BFB	0.002900	0.2000	06/20/88
596	ES	LM19	VOLATILES/SOIL/GCMS	ACET	0.017000	0.1000	06/20/88
606	ES	LM19	VOLATILES/SOIL/GCMS	BRDCLM	0.002900	0.2000	06/20/88
620	ES	LM19	VOLATILES/SOIL/GCMS	C13DCP	0.003200	0.2480	06/20/88
601	ES	LM19	VOLATILES/SOIL/GCMS	C2AVE	0.003200	0.1000	06/20/88
604	ES	LM19	VOLATILES/SOIL/GCMS	C2H3CL	0.006200	0.2000	06/20/88
618	ES	LM19	VOLATILES/SOIL/GCMS	C2H5CL	0.012000	0.2000	06/20/88
605	ES	LM19	VOLATILES/SOIL/GCMS	C6H6	0.001500	0.2000	06/20/88
599	ES	LM19	VOLATILES/SOIL/GCMS	CCL3F	0.005900	0.1000	06/20/88
614	ES	LM19	VOLATILES/SOIL/GCMS	CCL4	0.007000	0.2000	06/20/88
595	ES	LM19	VOLATILES/SOIL/GCMS	CH2CL2	0.012000	0.2000	06/20/88
610	ES	LM19	VOLATILES/SOIL/GCMS	CH3BR	0.005700	0.2000	06/20/88
623	ES	LM19	VOLATILES/SOIL/GCMS	CH3CL	0.008800	0.1000	06/20/88
607	ES	LM19	VOLATILES/SOIL/GCMS	CHBR3	0.006900	0.2000	06/20/88
619	ES	LM19	VOLATILES/SOIL/GCMS	CHCL3	0.000870	0.2000	06/20/88
615	ES	LM19	VOLATILES/SOIL/GCMS	CLC6H5	0.000860	0.2000	06/20/88
612	ES	LM19	VOLATILES/SOIL/GCMS	CS2	0.004400	0.1000	06/20/88
626	ES	LM19	VOLATILES/SOIL/GCMS	DBRCLM	0.003100	0.2000	06/20/88
621	ES	LM19	VOLATILES/SOIL/GCMS	ETC6H5	0.001700	0.2000	06/20/88
609	ES	LM19	VOLATILES/SOIL/GCMS	MEC6D8	0.001500	0.2000	06/20/88
602	ES	LM19	VOLATILES/SOIL/GCMS	MEC6H5	0.000780	0.2000	06/20/88
611	ES	LM19	VOLATILES/SOIL/GCMS	MEK	0.070000	0.2000	06/20/88
624	ES	LM19	VOLATILES/SOIL/GCMS	MIBK	0.027000	0.1000	06/20/88
622	ES	LM19	VOLATILES/SOIL/GCMS	MNBK	0.032000	0.1000	06/20/88
617	ES	LM19	VOLATILES/SOIL/GCMS	STYR	0.002600	0.2000	06/20/88
594	ES	LM19	VOLATILES/SOIL/GCMS	T13DCP	0.002800	0.1520	06/20/88
625	ES	LM19	VOLATILES/SOIL/GCMS	TCLEA	0.002400	0.2000	06/20/88
627	ES	LM19	VOLATILES/SOIL/GCMS	TCLEE	0.000810	0.2000	06/20/88
603	ES	LM19	VOLATILES/SOIL/GCMS	TRCLE	0.002800	0.2000	06/20/88
613	ES	LM19	VOLATILES/SOIL/GCMS	XYLEN	0.001500	0.2000	06/20/88
749	ES	LN01	NITROSAMINES/SOIL/GCNP	24DNT	0.092000	1.0000	11/26/88
748	ES	LN01	NITROSAMINES/SOIL/GCNP	26DNT	0.055800	1.0000	11/26/88
751	ES	LN01	NITROSAMINES/SOIL/GCNP	NB	0.096200	5.0000	11/26/88
746	ES	LN01	NITROSAMINES/SOIL/GCNP	NNDMEA	0.108000	0.5000	11/26/88
750	ES	LN01	NITROSAMINES/SOIL/GCNP	NNDNPA	0.231000	1.0000	11/26/88
747	ES	LN01	NITROSAMINES/SOIL/GCNP	NNDPA	0.163000	5.0000	11/26/88
916	ES	LN05	NP-PESTICIDES/SOIL/GCFP	ATZ	0.250000	2.0000	04/24/89
919	ES	LN05	NP-PESTICIDES/SOIL/GCFP	DDVP	0.452000	5.0000	04/24/89
917	ES	LN05	NP-PESTICIDES/SOIL/GCFP	MLTHN	0.580000	5.0000	04/24/89
918	ES	LN05	NP-PESTICIDES/SOIL/GCFP	PRTHN	0.733000	5.0000	04/24/89
920	ES	LN05	NP-PESTICIDES/SOIL/GCFP	SUPONA	0.250000	5.0000	04/24/89
805	ES	LO02	VOLATILES/SOIL/GCDUAL	111TCE	0.040000	5.0000	02/13/89
806	ES	LO02	VOLATILES/SOIL/GCDUAL	112TCE	0.081000	5.0000	02/13/89
807	ES	LO02	VOLATILES/SOIL/GCDUAL	11DCE	0.051000	5.0000	02/13/89
808	ES	LO02	VOLATILES/SOIL/GCDUAL	11DCLE	0.055000	5.0000	02/13/89
812	ES	LO02	VOLATILES/SOIL/GCDUAL	12DCLE	0.071000	5.0000	02/13/89
813	ES	LO02	VOLATILES/SOIL/GCDUAL	12DCLP	0.043000	5.0000	02/13/89
814	ES	LO02	VOLATILES/SOIL/GCDUAL	13DCLB	0.032000	5.0000	02/13/89
815	ES	LO02	VOLATILES/SOIL/GCDUAL	13DMB	0.056000	5.0000	02/13/89
817	ES	LO02	VOLATILES/SOIL/GCDUAL	2CLEVE	0.075000	5.0000	02/13/89
818	ES	LO02	VOLATILES/SOIL/GCDUAL	BRDCLM	0.047000	5.0000	02/13/89
819	ES	LO02	VOLATILES/SOIL/GCDUAL	C13DCP	0.062000	5.0000	02/13/89
820	ES	LO02	VOLATILES/SOIL/GCDUAL	C2H3CL	0.031000	5.0000	02/13/89

821	ES	L002	VOLATILES/SOIL/GCDUAL	C2H5CL	0.029000	5.0000	02/13/89
822	ES	L002	VOLATILES/SOIL/GCDUAL	C6H6	0.085000	5.0000	02/13/89
810	ES	L002	VOLATILES/SOIL/GCDUAL	CCL2F2	0.032000	5.0000	02/13/89
865	ES	L002	VOLATILES/SOIL/GCDUAL	CCL3F	0.037000	5.0000	02/13/89
823	ES	L002	VOLATILES/SOIL/GCDUAL	CCL4	0.044000	5.0000	02/13/89
811	ES	L002	VOLATILES/SOIL/GCDUAL	CH2CL2	0.083000	5.0000	02/13/89
809	ES	L002	VOLATILES/SOIL/GCDUAL	CH3BR	0.031000	5.0000	02/13/89
824	ES	L002	VOLATILES/SOIL/GCDUAL	CH3CL	0.180000	5.0000	02/13/89
825	ES	L002	VOLATILES/SOIL/GCDUAL	CHBR3	0.031000	5.0000	02/13/89
826	ES	L002	VOLATILES/SOIL/GCDUAL	CHCL3	0.038000	5.0000	02/13/89
816	ES	L002	VOLATILES/SOIL/GCDUAL	CL2BZ	0.060000	10.0000	02/13/89
827	ES	L002	VOLATILES/SOIL/GCDUAL	CLC6H5	0.026000	5.0000	02/13/89
829	ES	L002	VOLATILES/SOIL/GCDUAL	DBRCLM	0.081000	5.0000	02/13/89
830	ES	L002	VOLATILES/SOIL/GCDUAL	ETC6H5	0.062000	5.0000	02/13/89
831	ES	L002	VOLATILES/SOIL/GCDUAL	MEC6H5	0.028000	5.0000	02/13/89
866	ES	L002	VOLATILES/SOIL/GCDUAL	T12DCE	0.063000	5.0000	02/13/89
832	ES	L002	VOLATILES/SOIL/GCDUAL	T13DCP	0.081000	5.0000	02/13/89
833	ES	L002	VOLATILES/SOIL/GCDUAL	TCLEA	0.045000	5.0000	02/13/89
834	ES	L002	VOLATILES/SOIL/GCDUAL	TCLEE	0.045000	5.0000	02/13/89
835	ES	L002	VOLATILES/SOIL/GCDUAL	TRCLE	0.049000	5.0000	02/13/89
828	ES	L002	VOLATILES/SOIL/GCDUAL	XYLEN	0.086000	10.0000	02/13/89
179	ES	LW03	HERBICIDES/SOIL/HPLC	BRMCIL	0.970000	20.7000	01/27/87
462	ES	LW12	EXPLOSIVES/SOIL/HPLC	135TNB	0.488000	24.4000	06/16/88
454	ES	LW12	EXPLOSIVES/SOIL/HPLC	13DNB	0.496000	24.8000	06/16/88
463	ES	LW12	EXPLOSIVES/SOIL/HPLC	246TNT	0.456000	22.8000	06/16/88
455	ES	LW12	EXPLOSIVES/SOIL/HPLC	24DNT	0.424000	21.2000	06/16/88
456	ES	LW12	EXPLOSIVES/SOIL/HPLC	26DNT	0.524000	26.2000	06/16/88
977	ES	LW12	EXPLOSIVES/SOIL/HPLC	2NT	0.307000	61.3000	05/01/91
457	ES	LW12	EXPLOSIVES/SOIL/HPLC	HMX	0.666000	33.3000	06/16/88
458	ES	LW12	EXPLOSIVES/SOIL/HPLC	NB	2.410000	27.4000	06/16/88
459	ES	LW12	EXPLOSIVES/SOIL/HPLC	NG	4.000000	200.0000	06/16/88
460	ES	LW12	EXPLOSIVES/SOIL/HPLC	PETN	4.000000	80.0000	06/16/88
464	ES	LW12	EXPLOSIVES/SOIL/HPLC	RDX	0.587000	21.9000	06/16/88
461	ES	LW12	EXPLOSIVES/SOIL/HPLC	TETRYL	0.731000	20.2000	06/16/88
474	ES	LW15	EXPLOSIVES/SOIL/HPLC	NQ	0.475000	9.5000	09/02/88
901	ES	LW18	AGENTPRODS/SOIL/HPLC	CLC2A	18.000000	302.0000	03/03/89
902	ES	LW18	AGENTPRODS/SOIL/HPLC	TDGCL	3.940000	102.0000	03/03/89
932	ES	LW24	PHENOLS/SOIL/HPLC UV	24DCLP	0.023000	4.1200	02/23/89
933	ES	LW24	PHENOLS/SOIL/HPLC UV	2NP	0.043000	2.5000	02/23/89
931	ES	LW24	PHENOLS/SOIL/HPLC UV	4CL3C	0.021000	4.0200	02/23/89
934	ES	LW24	PHENOLS/SOIL/HPLC UV	CL3P	0.040000	5.0600	02/23/89
180	ES	M8	VOLATILES/WATER/GCMS	111TCE	1.000000	160.0000	01/14/86
181	ES	M8	VOLATILES/WATER/GCMS	112TCE	1.000000	160.0000	01/14/86
182	ES	M8	VOLATILES/WATER/GCMS	11DCLE	2.000000	80.0000	01/14/86
183	ES	M8	VOLATILES/WATER/GCMS	12DCD4	2.900000	160.0000	01/14/86
184	ES	M8	VOLATILES/WATER/GCMS	12DCE	1.200000	160.0000	01/14/86
185	ES	M8	VOLATILES/WATER/GCMS	12DCLE	1.000000	160.0000	01/14/86
186	ES	M8	VOLATILES/WATER/GCMS	13DMB	1.000000	160.0000	01/14/86
187	ES	M8	VOLATILES/WATER/GCMS	BCHPD	1.000000	160.0000	01/14/86
188	ES	M8	VOLATILES/WATER/GCMS	C6H6	1.100000	160.0000	01/14/86
189	ES	M8	VOLATILES/WATER/GCMS	CCL4	1.500000	160.0000	01/14/86
190	ES	M8	VOLATILES/WATER/GCMS	CD2CL2	2.000000	160.0000	01/14/86
191	ES	M8	VOLATILES/WATER/GCMS	CH2CL2	4.800000	160.0000	01/14/86
192	ES	M8	VOLATILES/WATER/GCMS	CHCL3	1.000000	160.0000	01/14/86
193	ES	M8	VOLATILES/WATER/GCMS	CLC6H5	2.100000	160.0000	01/14/86
194	ES	M8	VOLATILES/WATER/GCMS	DBCP	4.000000	80.0000	01/14/86
195	ES	M8	VOLATILES/WATER/GCMS	DCPD	1.100000	170.0000	01/14/86
196	ES	M8	VOLATILES/WATER/GCMS	DMDS	2.500000	160.0000	01/14/86
197	ES	M8	VOLATILES/WATER/GCMS	ETBD10	1.000000	160.0000	01/14/86
198	ES	M8	VOLATILES/WATER/GCMS	ETC6H5	1.000000	160.0000	01/14/86
199	ES	M8	VOLATILES/WATER/GCMS	MEC6H5	1.000000	160.0000	01/14/86
200	ES	M8	VOLATILES/WATER/GCMS	MIBK	2.000000	80.0000	01/14/86
201	ES	M8	VOLATILES/WATER/GCMS	TCLEE	1.000000	160.0000	01/14/86
202	ES	M8	VOLATILES/WATER/GCMS	TRCLE	1.000000	160.0000	01/14/86
203	ES	M8	VOLATILES/WATER/GCMS	XYLEN	2.000000	320.0000	01/14/86
204	ES	MM9	AGENTPRODS/SOIL/HPLC	CLC2A	18.000000	302.0000	10/15/86
205	ES	MM9	AGENTPRODS/SOIL/HPLC	TDGCL	2.550000	102.0000	10/15/86
206	ES	Q9	ORGANICS/SOIL/GCMS	13DBD4	0.270000	100.0000	04/25/85
207	ES	Q9	ORGANICS/SOIL/GCMS	2CLPD4	0.340000	25.0000	04/25/85
208	ES	Q9	ORGANICS/SOIL/GCMS	ALDRN	0.940000	100.0000	04/25/85
209	ES	Q9	ORGANICS/SOIL/GCMS	ATZ	0.730000	100.0000	04/25/85
210	ES	Q9	ORGANICS/SOIL/GCMS	CL6CP	1.100000	50.0000	04/25/85
211	ES	Q9	ORGANICS/SOIL/GCMS	CLDAN	1.500000	100.0000	04/25/85
212	ES	Q9	ORGANICS/SOIL/GCMS	CPMS	0.250000	50.0000	04/25/85
213	ES	Q9	ORGANICS/SOIL/GCMS	CPMSO	0.350000	50.0000	04/25/85
214	ES	Q9	ORGANICS/SOIL/GCMS	CPMSO2	0.290000	100.0000	04/25/85
215	ES	Q9	ORGANICS/SOIL/GCMS	DBCP	0.330000	50.0000	04/25/85
216	ES	Q9	ORGANICS/SOIL/GCMS	DCPD	0.260000	25.0000	04/25/85
217	ES	Q9	ORGANICS/SOIL/GCMS	DDVP	0.250000	25.0000	04/25/85
218	ES	Q9	ORGANICS/SOIL/GCMS	DEPD4	0.250000	50.0000	04/25/85
219	ES	Q9	ORGANICS/SOIL/GCMS	DIMP	0.500000	10.0000	04/25/85
220	ES	Q9	ORGANICS/SOIL/GCMS	DITH	0.250000	100.0000	04/25/85
221	ES	Q9	ORGANICS/SOIL/GCMS	DLDRN	0.250000	100.0000	04/25/85
222	ES	Q9	ORGANICS/SOIL/GCMS	DMMP	1.500000	10.0000	04/25/85

223	ES	Q9	ORGANICS/SOIL/GCMS	DNOPD4	0.570000	100.0000	04/25/85
224	ES	Q9	ORGANICS/SOIL/GCMS	ENDRN	0.700000	50.0000	04/25/85
225	ES	Q9	ORGANICS/SOIL/GCMS	ISODR	0.330000	100.0000	04/25/85
226	ES	Q9	ORGANICS/SOIL/GCMS	MLTHN	0.590000	2.5000	04/25/85
227	ES	Q9	ORGANICS/SOIL/GCMS	OXAT	0.260000	100.0000	04/25/85
228	ES	Q9	ORGANICS/SOIL/GCMS	PPDDE	0.290000	100.0000	04/25/85
229	ES	Q9	ORGANICS/SOIL/GCMS	PPDDT	0.370000	100.0000	04/25/85
230	ES	Q9	ORGANICS/SOIL/GCMS	PRTHN	0.630000	100.0000	04/25/85
231	ES	Q9	ORGANICS/SOIL/GCMS	SUPONA	0.490000	10.0000	04/25/85
232	ES	R9	METALS/SOIL/ICP	CD	0.921000	50.0000	04/24/85
233	ES	R9	METALS/SOIL/ICP	CR	7.160000	500.0000	04/24/85
234	ES	R9	METALS/SOIL/ICP	CU	4.810000	500.0000	04/24/85
235	ES	R9	METALS/SOIL/ICP	PB	16.800000	500.0000	04/24/85
236	ES	R9	METALS/SOIL/ICP	ZN	16.400000	500.0000	04/24/85
237	ES	S8	PESTICIDES/WATER/GCEC	ALDRN	0.070000	1.0200	10/01/85
238	ES	S8	PESTICIDES/WATER/GCEC	CL6CP	0.070000	0.9900	10/01/85
239	ES	S8	PESTICIDES/WATER/GCEC	DLDRN	0.060000	1.0400	10/01/85
240	ES	S8	PESTICIDES/WATER/GCEC	ENDRN	0.052000	1.0300	10/01/85
241	ES	S8	PESTICIDES/WATER/GCEC	ISODR	0.060000	1.1000	10/01/85
242	ES	S8	PESTICIDES/WATER/GCEC	PPDDE	0.053000	1.0600	10/01/85
243	ES	S8	PESTICIDES/WATER/GCEC	PPDDT	0.070000	1.0800	10/01/85
244	ES	SB01	METALS/WATER/CVAA	HG	0.243000	10.0000	01/20/87
245	ES	SD02	METALS/WATER/GFAA	SE	5.220000	25.0000	01/02/87
246	ES	SD03	METALS/WATER/GFAA	AS	3.880000	50.0000	01/20/87
443	ES	SD09	METALS/WATER/GFAA	AG	0.280000	2.0000	11/25/87
433	ES	SD09	METALS/WATER/GFAA	AL	31.000000	300.0000	11/25/87
435	ES	SD09	METALS/WATER/GFAA	AS	14.100000	200.0000	11/25/87
436	ES	SD09	METALS/WATER/GFAA	BE	2.950000	10.0000	11/25/87
437	ES	SD09	METALS/WATER/GFAA	CD	7.400000	50.0000	11/25/87
439	ES	SD09	METALS/WATER/GFAA	MN	5.930000	10.0000	11/25/87
440	ES	SD09	METALS/WATER/GFAA	MO	12.700000	75.0000	11/25/87
441	ES	SD09	METALS/WATER/GFAA	NI	37.800000	375.0000	11/25/87
438	ES	SD09	METALS/WATER/GFAA	PB	22.200000	300.0000	11/25/87
434	ES	SD09	METALS/WATER/GFAA	SB	23.800000	300.0000	11/25/87
442	ES	SD09	METALS/WATER/GFAA	SE	9.660000	100.0000	11/25/87
444	ES	SD09	METALS/WATER/GFAA	TL	6.990000	25.0000	11/25/87
445	ES	SD09	METALS/WATER/GFAA	ZN	25.200000	50.0000	11/25/87
741	ES	SD19	METALS/WATER/GFAA	V	3.820000	200.0000	11/26/88
742	ES	SD20	METALS/WATER/GFAA	PB	1.260000	100.0000	11/26/88
743	ES	SD21	METALS/WATER/GFAA	SE	3.020000	100.0000	11/26/88
744	ES	SD22	METALS/WATER/GFAA	AS	2.540000	100.0000	11/26/88
745	ES	SD23	METALS/WATER/GFAA	AG	0.250000	10.0000	11/26/88
947	ES	SD28	METALS/WATER/GFAA	SB	3.030000	200.0000	11/09/90
247	ES	SS01	METALS/WATER/ICP	AG	13.500000	5000.0000	10/17/86
248	ES	SS01	METALS/WATER/ICP	BA	10.400000	10000.0000	10/17/86
249	ES	SS01	METALS/WATER/ICP	CA	500.000000	20000.0000	10/17/86
250	ES	SS01	METALS/WATER/ICP	CD	5.160000	5000.0000	10/17/86
251	ES	SS01	METALS/WATER/ICP	CR	5.960000	5000.0000	10/17/86
252	ES	SS01	METALS/WATER/ICP	CU	7.930000	10000.0000	10/17/86
253	ES	SS01	METALS/WATER/ICP	MG	500.000000	20000.0000	10/17/86
254	ES	SS01	METALS/WATER/ICP	NA	764.000000	50000.0000	10/17/86
255	ES	SS01	METALS/WATER/ICP	PB	18.600000	5000.0000	10/17/86
256	ES	SS01	METALS/WATER/ICP	ZN	20.100000	20000.0000	10/17/86
928	ES	SS10	METALS/WATER/ICP	AG	4.600000	2500.0000	12/10/88
761	ES	SS10	METALS/WATER/ICP	AL	141.000000	500000.0000	12/06/88
762	ES	SS10	METALS/WATER/ICP	B	50.000000	50000.0000	12/06/88
763	ES	SS10	METALS/WATER/ICP	BA	5.000000	10000.0000	12/06/88
764	ES	SS10	METALS/WATER/ICP	BE	5.000000	1000.0000	12/06/88
765	ES	SS10	METALS/WATER/ICP	BI	109.000000	25000.0000	12/06/88
766	ES	SS10	METALS/WATER/ICP	CA	500.000000	500000.0000	12/06/88
767	ES	SS10	METALS/WATER/ICP	CD	4.010000	5000.0000	12/06/88
768	ES	SS10	METALS/WATER/ICP	CO	25.000000	50000.0000	12/06/88
769	ES	SS10	METALS/WATER/ICP	CR	6.020000	5000.0000	12/06/88
770	ES	SS10	METALS/WATER/ICP	CU	8.090000	10000.0000	12/06/88
771	ES	SS10	METALS/WATER/ICP	FE	38.800000	500000.0000	12/06/88
772	ES	SS10	METALS/WATER/ICP	K	375.000000	500000.0000	12/06/88
773	ES	SS10	METALS/WATER/ICP	MG	500.000000	500000.0000	12/06/88
774	ES	SS10	METALS/WATER/ICP	MN	2.750000	50000.0000	12/06/88
775	ES	SS10	METALS/WATER/ICP	MO	15.300000	8000.0000	12/06/88
776	ES	SS10	METALS/WATER/ICP	NA	500.000000	500000.0000	12/06/88
777	ES	SS10	METALS/WATER/ICP	NI	34.300000	15000.0000	12/06/88
778	ES	SS10	METALS/WATER/ICP	PB	18.600000	5000.0000	12/06/88
779	ES	SS10	METALS/WATER/ICP	SB	38.000000	6000.0000	12/06/88
780	ES	SS10	METALS/WATER/ICP	SE	71.100000	75000.0000	12/06/88
930	ES	SS10	METALS/WATER/ICP	SN	47.100000	200.0000	01/01/89
781	ES	SS10	METALS/WATER/ICP	TE	103.000000	2000.0000	12/06/88
782	ES	SS10	METALS/WATER/ICP	TL	81.400000	40000.0000	12/06/88
783	ES	SS10	METALS/WATER/ICP	V	11.000000	1000.0000	12/06/88
784	ES	SS10	METALS/WATER/ICP	ZN	21.100000	20000.0000	12/06/88
986	ES	SS18	METALS/WATER/ICP	AG	4.420000	1000.0000	08/29/91
987	ES	SS18	METALS/WATER/ICP	AL	23.500000	500000.0000	08/29/91
988	ES	SS18	METALS/WATER/ICP	AS	34.500000	50000.0000	08/29/91
989	ES	SS18	METALS/WATER/ICP	B	50.000000	50000.0000	08/29/91
990	ES	SS18	METALS/WATER/ICP	BA	2.500000	25000.0000	08/29/91

991	ES	SS18	METALS/WATER/ICP	BE	5.000000	10000.0000	08/29/91
992	ES	SS18	METALS/WATER/ICP	BI	109.000000	25000.0000	08/29/91
993	ES	SS18	METALS/WATER/ICP	CA	1000.000000	500000.0000	08/29/91
994	ES	SS18	METALS/WATER/ICP	CD	3.010000	10000.0000	08/29/91
995	ES	SS18	METALS/WATER/ICP	CO	25.000000	50000.0000	08/29/91
996	ES	SS18	METALS/WATER/ICP	CR	6.960000	50000.0000	08/29/91
997	ES	SS18	METALS/WATER/ICP	CU	5.000000	25000.0000	08/29/91
998	ES	SS18	METALS/WATER/ICP	FE	36.800000	500000.0000	08/29/91
999	ES	SS18	METALS/WATER/ICP	K	1000.000000	500000.0000	08/29/91
1000	ES	SS18	METALS/WATER/ICP	MG	378.000000	500000.0000	08/29/91
1001	ES	SS18	METALS/WATER/ICP	MN	2.500000	50000.0000	08/29/91
1002	ES	SS18	METALS/WATER/ICP	MO	10.000000	10000.0000	08/29/91
1003	ES	SS18	METALS/WATER/ICP	NA	2290.000000	500000.0000	08/29/91
1004	ES	SS18	METALS/WATER/ICP	NI	7.110000	50000.0000	08/29/91
1005	ES	SS18	METALS/WATER/ICP	PB	25.000000	5000.0000	08/29/91
1006	ES	SS18	METALS/WATER/ICP	SB	29.500000	6000.0000	08/29/91
1007	ES	SS18	METALS/WATER/ICP	SE	50.000000	50000.0000	08/29/91
1008	ES	SS18	METALS/WATER/ICP	TE	103.000000	2000.0000	08/29/91
1009	ES	SS18	METALS/WATER/ICP	TL	50.000000	50000.0000	08/29/91
1010	ES	SS18	METALS/WATER/ICP	V	4.690000	10000.0000	08/29/91
1011	ES	SS18	METALS/WATER/ICP	ZN	35.800000	10000.0000	08/29/91
257	ES	SS9	PESTICIDES/SOIL/GCEC	ALDRN	0.050000	1.0000	06/24/86
258	ES	SS9	PESTICIDES/SOIL/GCEC	CL6CP	0.051000	1.0100	06/24/86
259	ES	SS9	PESTICIDES/SOIL/GCEC	CLDAN	0.203000	4.0500	06/24/86
260	ES	SS9	PESTICIDES/SOIL/GCEC	DLDRN	0.051000	1.0100	06/24/86
261	ES	SS9	PESTICIDES/SOIL/GCEC	ENDRN	0.060000	1.0400	06/24/86
262	ES	SS9	PESTICIDES/SOIL/GCEC	ISODR	0.053000	1.0700	06/24/86
263	ES	SS9	PESTICIDES/SOIL/GCEC	PPDDE	0.053000	1.0500	06/24/86
264	ES	SS9	PESTICIDES/SOIL/GCEC	PPDDT	0.050000	1.0100	06/24/86
265	ES	SS9A	PESTICIDES/SOIL/GCEC	ALDRN	0.001820	0.0400	05/19/87
266	ES	SS9A	PESTICIDES/SOIL/GCEC	CL6CP	0.002580	0.0400	05/19/87
267	ES	SS9A	PESTICIDES/SOIL/GCEC	CLDAN	0.111000	0.4360	05/19/87
268	ES	SS9A	PESTICIDES/SOIL/GCEC	DLDRN	0.001210	0.0408	05/19/87
269	ES	SS9A	PESTICIDES/SOIL/GCEC	ENDRN	0.001000	0.0404	05/19/87
270	ES	SS9A	PESTICIDES/SOIL/GCEC	ISODR	0.001110	0.0412	05/19/87
271	ES	SS9A	PESTICIDES/SOIL/GCEC	PPDDE	0.001000	0.0400	05/19/87
272	ES	SS9A	PESTICIDES/SOIL/GCEC	PPDDT	0.002340	0.0412	05/19/87
273	ES	T8	ORGANOPHOSPHOR/WATER/GCFP	DIMP	10.500000	210.0000	09/13/85
274	ES	T8	ORGANOPHOSPHOR/WATER/GCFP	DMMP	15.200000	305.0000	09/13/85
275	ES	T9	METALS/SOIL/GFAA	AS	4.700000	50.0000	04/19/85
449	ES	TF18	CYANIDE/WATER/TECHNICON	CYN	2.500000	50.0000	03/14/88
935	ES	TF21	ANIONS/WATER/TECHNICON	PO4ORT	11.000000	500.0000	03/03/89
804	ES	TF22	NIT/WATER/TECHNICON	NIT	10.000000	200.0000	02/10/89
905	ES	TF25	AMMONIUM/WATER/TECHNICON	NH3	60.000000	1000.0000	04/18/89
906	ES	TF26	TOTAL NITROGEN/WATER/TECH	N2KJEL	183.000000	5000.0000	04/18/89
907	ES	TF27	PHOSHATES/WATER/TECHNICON	PO4	13.300000	500.0000	04/18/89
912	ES	TT10	ANIONS/WATER/IONCHROM	BR	1000.000000	25000.0000	04/18/89
913	ES	TT10	ANIONS/WATER/IONCHROM	CL	2120.000000	30000.0000	04/18/89
914	ES	TT10	ANIONS/WATER/IONCHROM	F	1230.000000	10000.0000	04/18/89
915	ES	TT10	ANIONS/WATER/IONCHROM	SO4	10000.000000	300000.0000	04/18/89
276	ES	TT9	ORGANOPHOSPHOR/SOIL/GCFP	DIMP	0.114000	4.5700	03/21/86
277	ES	TT9	ORGANOPHOSPHOR/SOIL/GCFP	DMMP	0.133000	4.1800	03/21/86
929	ES	TY10	SULFIDE/WATER/SPECTRO	SULFID	32.027000	750.0000	06/21/89
278	ES	U8	ORGANOSULFURS/WATER/GCFP	BTZ	1.970000	42.2000	11/28/86
279	ES	U8	ORGANOSULFURS/WATER/GCFP	CPMS	1.260000	25.3000	10/01/85
280	ES	U8	ORGANOSULFURS/WATER/GCFP	CPMSO	4.230000	106.0000	10/01/85
281	ES	U8	ORGANOSULFURS/WATER/GCFP	CPMSO2	4.660000	106.0000	10/01/85
282	ES	U8	ORGANOSULFURS/WATER/GCFP	DITH	1.110000	22.2000	10/01/85
283	ES	U8	ORGANOSULFURS/WATER/GCFP	DMDS	1.770000	22.8000	10/01/85
284	ES	U8	ORGANOSULFURS/WATER/GCFP	OXAT	1.610000	39.5000	10/01/85
285	ES	U9	PESTICIDES/SOIL/GCEC	DBCP	0.005000	0.1000	04/16/85
477	ES	UF03	NC/WATER/TECHNICON	NC	553.000000	6000.0000	09/02/88
286	ES	UG02	HALOCARBONS/WATER/GCCON	111TCE	1.700000	196.0000	12/31/86
287	ES	UG02	HALOCARBONS/WATER/GCCON	112TCE	1.000000	196.0000	12/31/86
288	ES	UG02	HALOCARBONS/WATER/GCCON	11DCE	1.100000	196.0000	12/31/86
289	ES	UG02	HALOCARBONS/WATER/GCCON	11DCLE	1.200000	194.0000	12/31/86
290	ES	UG02	HALOCARBONS/WATER/GCCON	12DCE	1.200000	194.0000	12/31/86
291	ES	UG02	HALOCARBONS/WATER/GCCON	12DCLE	0.610000	196.0000	12/31/86
292	ES	UG02	HALOCARBONS/WATER/GCCON	CCL4	2.400000	200.0000	12/31/86
293	ES	UG02	HALOCARBONS/WATER/GCCON	CH2CL2	5.000000	198.0000	12/31/86
294	ES	UG02	HALOCARBONS/WATER/GCCON	CHCL3	1.400000	194.0000	12/31/86
295	ES	UG02	HALOCARBONS/WATER/GCCON	CLC6H5	0.580000	200.0000	12/31/86
296	ES	UG02	HALOCARBONS/WATER/GCCON	TCLEE	1.300000	196.0000	12/31/86
297	ES	UG02	HALOCARBONS/WATER/GCCON	TRCLE	1.100000	194.0000	12/31/86
298	ES	UH02	PESTICIDES/WATER/GCEC	PCB016	0.160000	6.4000	02/17/87
299	ES	UH02	PESTICIDES/WATER/GCEC	PCB260	0.190000	6.3000	02/17/87
714	ES	UH13	PESTICIDES/WATER/GCEC	ABHC	0.030500	0.6380	09/30/88
721	ES	UH13	PESTICIDES/WATER/GCEC	AENSLF	0.023000	0.5750	09/30/88
719	ES	UH13	PESTICIDES/WATER/GCEC	ALDRN	0.091800	0.6060	09/30/88
718	ES	UH13	PESTICIDES/WATER/GCEC	BBHC	0.024000	0.6000	09/30/88
726	ES	UH13	PESTICIDES/WATER/GCEC	BENSLF	0.023000	0.5750	09/30/88
731	ES	UH13	PESTICIDES/WATER/GCEC	CLDAN	0.265000	5.3000	09/30/88
716	ES	UH13	PESTICIDES/WATER/GCEC	DBHC	0.029300	0.5940	09/30/88
723	ES	UH13	PESTICIDES/WATER/GCEC	DLDRN	0.024000	0.6000	09/30/88

724	ES	UH13	PESTICIDES/WATER/GCEC	ENDRN	0.023800	0.5940	09/30/88
728	ES	UH13	PESTICIDES/WATER/GCEC	ENDRNA	0.028500	0.7130	09/30/88
729	ES	UH13	PESTICIDES/WATER/GCEC	ESFSO4	0.078600	0.6750	09/30/88
717	ES	UH13	PESTICIDES/WATER/GCEC	HPCL	0.042300	0.6190	09/30/88
720	ES	UH13	PESTICIDES/WATER/GCEC	HPCLE	0.024500	0.6130	09/30/88
938	ES	UH13	PESTICIDES/WATER/GCEC	ISODR	0.056200	1.1000	09/30/88
715	ES	UH13	PESTICIDES/WATER/GCEC	LIN	0.050700	0.6190	09/30/88
730	ES	UH13	PESTICIDES/WATER/GCEC	MEXCLR	0.057000	1.1600	09/30/88
733	ES	UH13	PESTICIDES/WATER/GCEC	PCB016	0.486000	8.2500	09/30/88
734	ES	UH13	PESTICIDES/WATER/GCEC	PCB260	0.636000	5.8800	09/30/88
725	ES	UH13	PESTICIDES/WATER/GCEC	PPDDD	0.023300	0.5810	09/30/88
722	ES	UH13	PESTICIDES/WATER/GCEC	PPDDE	0.027000	0.6750	09/30/88
727	ES	UH13	PESTICIDES/WATER/GCEC	PPDDT	0.034000	0.6630	09/30/88
732	ES	UH13	PESTICIDES/WATER/GCEC	TXPHEN	1.350000	11.6000	09/30/88
740	ES	UH14	HERBICIDES/WATER/HPLC	245TP	0.170000	1.3600	08/18/88
739	ES	UH14	HERBICIDES/WATER/HPLC	24D	0.802000	2.5200	08/18/88
789	ES	UL04	ORGANOSULFURS/WATER/GCFP	BTZ	2.110000	42.2000	12/13/88
788	ES	UL04	ORGANOSULFURS/WATER/GCFP	CPMS	1.260000	25.3000	12/13/88
790	ES	UL04	ORGANOSULFURS/WATER/GCFP	CPMSO	4.230000	106.0000	12/13/88
791	ES	UL04	ORGANOSULFURS/WATER/GCFP	CPMSO2	4.720000	106.0000	12/13/88
787	ES	UL04	ORGANOSULFURS/WATER/GCFP	DITH	1.110000	22.2000	12/13/88
785	ES	UL04	ORGANOSULFURS/WATER/GCFP	DMDS	1.140000	22.8000	12/13/88
786	ES	UL04	ORGANOSULFURS/WATER/GCFP	OXAT	1.980000	39.5000	12/13/88
300	ES	UM04	VOLATILES/WATER/GCMS	111TCE	1.000000	160.0000	12/29/86
301	ES	UM04	VOLATILES/WATER/GCMS	112TCE	1.000000	160.0000	12/29/86
302	ES	UM04	VOLATILES/WATER/GCMS	11DCLE	2.000000	80.0000	12/29/86
303	ES	UM04	VOLATILES/WATER/GCMS	12DCD4	2.900000	160.0000	12/29/86
304	ES	UM04	VOLATILES/WATER/GCMS	12DCE	1.200000	160.0000	12/29/86
305	ES	UM04	VOLATILES/WATER/GCMS	12DCLE	1.000000	160.0000	12/29/86
306	ES	UM04	VOLATILES/WATER/GCMS	13DMB	1.000000	160.0000	12/29/86
307	ES	UM04	VOLATILES/WATER/GCMS	BCHPD	1.000000	160.0000	12/29/86
308	ES	UM04	VOLATILES/WATER/GCMS	C6H6	1.100000	160.0000	12/29/86
309	ES	UM04	VOLATILES/WATER/GCMS	CCL4	1.500000	160.0000	12/29/86
310	ES	UM04	VOLATILES/WATER/GCMS	CD2CL2	2.000000	160.0000	12/29/86
311	ES	UM04	VOLATILES/WATER/GCMS	CH2CL2	4.800000	160.0000	12/29/86
312	ES	UM04	VOLATILES/WATER/GCMS	CHCL3	1.000000	160.0000	12/29/86
313	ES	UM04	VOLATILES/WATER/GCMS	CLC6H5	2.100000	160.0000	12/29/86
314	ES	UM04	VOLATILES/WATER/GCMS	DBCP	4.000000	80.0000	12/29/86
315	ES	UM04	VOLATILES/WATER/GCMS	DCPD	1.100000	170.0000	12/29/86
316	ES	UM04	VOLATILES/WATER/GCMS	DMDS	2.500000	160.0000	12/29/86
317	ES	UM04	VOLATILES/WATER/GCMS	ETBD10	1.000000	160.0000	12/29/86
318	ES	UM04	VOLATILES/WATER/GCMS	ETC6H5	1.000000	160.0000	12/29/86
319	ES	UM04	VOLATILES/WATER/GCMS	MEC6H5	1.000000	160.0000	12/29/86
320	ES	UM04	VOLATILES/WATER/GCMS	MIBK	2.000000	80.0000	12/29/86
321	ES	UM04	VOLATILES/WATER/GCMS	TCLEE	1.000000	160.0000	12/29/86
322	ES	UM04	VOLATILES/WATER/GCMS	TRCLE	1.000000	160.0000	12/29/86
323	ES	UM04	VOLATILES/WATER/GCMS	XYLEN	2.000000	320.0000	12/29/86
324	ES	UM08	ORGANICS/WATER/GCMS	245TCP	5.200000	200.0000	10/09/87
326	ES	UM08	ORGANICS/WATER/GCMS	246TBP	13.000000	200.0000	10/09/87
325	ES	UM08	ORGANICS/WATER/GCMS	246TCP	4.200000	100.0000	10/09/87
327	ES	UM08	ORGANICS/WATER/GCMS	24DCLP	1.000000	200.0000	10/09/87
328	ES	UM08	ORGANICS/WATER/GCMS	24DMPN	2.100000	100.0000	10/09/87
329	ES	UM08	ORGANICS/WATER/GCMS	24DNP	21.000000	100.0000	10/09/87
330	ES	UM08	ORGANICS/WATER/GCMS	2CLP	1.100000	200.0000	10/09/87
331	ES	UM08	ORGANICS/WATER/GCMS	2FBP	12.000000	100.0000	10/09/87
332	ES	UM08	ORGANICS/WATER/GCMS	2FP	17.000000	200.0000	10/09/87
333	ES	UM08	ORGANICS/WATER/GCMS	2MP	0.500000	200.0000	10/09/87
334	ES	UM08	ORGANICS/WATER/GCMS	2NP	3.700000	100.0000	10/09/87
335	ES	UM08	ORGANICS/WATER/GCMS	46DN2C	17.000000	100.0000	10/09/87
336	ES	UM08	ORGANICS/WATER/GCMS	4CL3C	0.840000	200.0000	10/09/87
337	ES	UM08	ORGANICS/WATER/GCMS	4MP	0.520000	200.0000	10/09/87
338	ES	UM08	ORGANICS/WATER/GCMS	4NP	12.000000	100.0000	10/09/87
340	ES	UM08	ORGANICS/WATER/GCMS	BENZOA	8.000000	100.0000	10/09/87
339	ES	UM08	ORGANICS/WATER/GCMS	BZALC	0.720000	200.0000	10/09/87
341	ES	UM08	ORGANICS/WATER/GCMS	NBD5	11.000000	100.0000	10/09/87
342	ES	UM08	ORGANICS/WATER/GCMS	PCP	21.000000	100.0000	10/09/87
343	ES	UM08	ORGANICS/WATER/GCMS	PHEND6	36.000000	200.0000	10/09/87
344	ES	UM08	ORGANICS/WATER/GCMS	PHENOL	13.000000	200.0000	10/09/87
345	ES	UM08	ORGANICS/WATER/GCMS	TRPD14	14.000000	100.0000	10/09/87
478	ES	UM18	ORGANICS/WATER/GCMS	124TCB	1.800000	50.0000	03/25/88
479	ES	UM18	ORGANICS/WATER/GCMS	12DCLB	1.700000	50.0000	03/25/88
480	ES	UM18	ORGANICS/WATER/GCMS	13DCLB	1.700000	200.0000	03/25/88
481	ES	UM18	ORGANICS/WATER/GCMS	14DCLB	1.700000	200.0000	03/25/88
482	ES	UM18	ORGANICS/WATER/GCMS	245TCP	5.200000	200.0000	03/25/88
483	ES	UM18	ORGANICS/WATER/GCMS	246TBP	13.000000	200.0000	03/25/88
583	ES	UM18	ORGANICS/WATER/GCMS	246TCP	4.200000	100.0000	03/25/88
484	ES	UM18	ORGANICS/WATER/GCMS	24DCLP	2.900000	200.0000	03/25/88
485	ES	UM18	ORGANICS/WATER/GCMS	24DMPN	5.800000	100.0000	03/25/88
486	ES	UM18	ORGANICS/WATER/GCMS	24DNP	21.000000	100.0000	03/25/88
487	ES	UM18	ORGANICS/WATER/GCMS	24DNT	4.500000	200.0000	03/25/88
584	ES	UM18	ORGANICS/WATER/GCMS	26DNT	0.790000	200.0000	03/25/88
488	ES	UM18	ORGANICS/WATER/GCMS	2CLP	0.990000	200.0000	03/25/88
489	ES	UM18	ORGANICS/WATER/GCMS	2CNAP	0.500000	200.0000	03/25/88
490	ES	UM18	ORGANICS/WATER/GCMS	2FBP	12.000000	100.0000	03/25/88

491	ES	UM18	ORGANICS/WATER/GCMS	2FP	17.000000	200.0000	03/25/88
492	ES	UM18	ORGANICS/WATER/GCMS	2MNAP	1.700000	50.0000	03/25/88
493	ES	UM18	ORGANICS/WATER/GCMS	2MP	3.900000	200.0000	03/25/88
494	ES	UM18	ORGANICS/WATER/GCMS	2NANIL	4.300000	100.0000	03/25/88
495	ES	UM18	ORGANICS/WATER/GCMS	2NP	3.700000	100.0000	03/25/88
496	ES	UM18	ORGANICS/WATER/GCMS	33DCBD	12.000000	100.0000	03/25/88
497	ES	UM18	ORGANICS/WATER/GCMS	3NANIL	4.900000	100.0000	03/25/88
498	ES	UM18	ORGANICS/WATER/GCMS	46DN2C	17.000000	100.0000	03/25/88
499	ES	UM18	ORGANICS/WATER/GCMS	4BRPPE	4.200000	100.0000	03/25/88
585	ES	UM18	ORGANICS/WATER/GCMS	4CANIL	7.300000	100.0000	03/25/88
500	ES	UM18	ORGANICS/WATER/GCMS	4CL3C	4.000000	200.0000	03/25/88
501	ES	UM18	ORGANICS/WATER/GCMS	4CLPPE	5.100000	100.0000	03/25/88
502	ES	UM18	ORGANICS/WATER/GCMS	4MP	0.520000	200.0000	03/25/88
503	ES	UM18	ORGANICS/WATER/GCMS	4NANIL	5.200000	100.0000	03/25/88
504	ES	UM18	ORGANICS/WATER/GCMS	4NP	12.000000	100.0000	03/25/88
505	ES	UM18	ORGANICS/WATER/GCMS	ANAPNE	1.700000	50.0000	03/25/88
506	ES	UM18	ORGANICS/WATER/GCMS	ANAPYL	0.500000	50.0000	03/25/88
507	ES	UM18	ORGANICS/WATER/GCMS	ANTRC	0.500000	100.0000	03/25/88
508	ES	UM18	ORGANICS/WATER/GCMS	B2CEXM	1.500000	50.0000	03/25/88
509	ES	UM18	ORGANICS/WATER/GCMS	B2CIPE	5.300000	200.0000	03/25/88
510	ES	UM18	ORGANICS/WATER/GCMS	B2CLEE	1.900000	50.0000	03/25/88
511	ES	UM18	ORGANICS/WATER/GCMS	B2EHP	4.800000	100.0000	03/25/88
512	ES	UM18	ORGANICS/WATER/GCMS	BAANTR	1.600000	100.0000	03/25/88
513	ES	UM18	ORGANICS/WATER/GCMS	BAPYR	4.700000	100.0000	03/25/88
514	ES	UM18	ORGANICS/WATER/GCMS	BBFANT	5.400000	50.0000	03/25/88
515	ES	UM18	ORGANICS/WATER/GCMS	BBZP	3.400000	100.0000	03/25/88
516	ES	UM18	ORGANICS/WATER/GCMS	BENZOA	13.000000	100.0000	03/25/88
517	ES	UM18	ORGANICS/WATER/GCMS	BGHIPY	6.100000	50.0000	03/25/88
518	ES	UM18	ORGANICS/WATER/GCMS	BKFANT	0.870000	100.0000	03/25/88
519	ES	UM18	ORGANICS/WATER/GCMS	BZALC	0.720000	100.0000	03/25/88
520	ES	UM18	ORGANICS/WATER/GCMS	CHRY	2.400000	100.0000	03/25/88
521	ES	UM18	ORGANICS/WATER/GCMS	CL6BZ	1.600000	100.0000	03/25/88
522	ES	UM18	ORGANICS/WATER/GCMS	CL6CP	8.600000	100.0000	03/25/88
523	ES	UM18	ORGANICS/WATER/GCMS	CL6ET	1.500000	50.0000	03/25/88
524	ES	UM18	ORGANICS/WATER/GCMS	DBAHA	6.500000	50.0000	03/25/88
525	ES	UM18	ORGANICS/WATER/GCMS	DBZFUR	1.700000	50.0000	03/25/88
526	ES	UM18	ORGANICS/WATER/GCMS	DEP	2.000000	200.0000	03/25/88
527	ES	UM18	ORGANICS/WATER/GCMS	DMP	1.500000	100.0000	03/25/88
528	ES	UM18	ORGANICS/WATER/GCMS	DNBP	3.700000	200.0000	03/25/88
586	ES	UM18	ORGANICS/WATER/GCMS	DNOP	15.000000	100.0000	03/25/88
529	ES	UM18	ORGANICS/WATER/GCMS	FANT	3.300000	100.0000	03/25/88
530	ES	UM18	ORGANICS/WATER/GCMS	FLRENE	3.700000	50.0000	03/25/88
531	ES	UM18	ORGANICS/WATER/GCMS	HCBD	3.400000	100.0000	03/25/88
532	ES	UM18	ORGANICS/WATER/GCMS	ICDPYR	8.600000	100.0000	03/25/88
533	ES	UM18	ORGANICS/WATER/GCMS	ISOPHR	4.800000	50.0000	03/25/88
534	ES	UM18	ORGANICS/WATER/GCMS	NAP	0.500000	20.0000	03/25/88
535	ES	UM18	ORGANICS/WATER/GCMS	NB	0.500000	50.0000	03/25/88
536	ES	UM18	ORGANICS/WATER/GCMS	NBD5	11.000000	100.0000	03/25/88
537	ES	UM18	ORGANICS/WATER/GCMS	NNDNPA	4.400000	50.0000	03/25/88
538	ES	UM18	ORGANICS/WATER/GCMS	NNDPA	3.000000	200.0000	03/25/88
539	ES	UM18	ORGANICS/WATER/GCMS	PCP	18.000000	100.0000	03/25/88
540	ES	UM18	ORGANICS/WATER/GCMS	PHANTR	0.500000	100.0000	03/25/88
587	ES	UM18	ORGANICS/WATER/GCMS	PHEND6	36.000000	200.0000	03/25/88
541	ES	UM18	ORGANICS/WATER/GCMS	PHENOL	9.200000	200.0000	03/25/88
542	ES	UM18	ORGANICS/WATER/GCMS	PYR	2.800000	100.0000	03/25/88
543	ES	UM18	ORGANICS/WATER/GCMS	TRPD14	14.000000	100.0000	03/25/88
544	ES	UM20	VOLATILES/WATER/GCMS	111TCE	0.500000	200.0000	06/20/88
545	ES	UM20	VOLATILES/WATER/GCMS	112TCE	1.200000	200.0000	06/20/88
546	ES	UM20	VOLATILES/WATER/GCMS	11DCE	0.500000	200.0000	06/20/88
547	ES	UM20	VOLATILES/WATER/GCMS	11DCLE	0.680000	200.0000	06/20/88
548	ES	UM20	VOLATILES/WATER/GCMS	12DCD4	23.000000	200.0000	06/20/88
549	ES	UM20	VOLATILES/WATER/GCMS	12DCE	0.500000	200.0000	06/20/88
550	ES	UM20	VOLATILES/WATER/GCMS	12DCLE	0.500000	50.0000	06/20/88
551	ES	UM20	VOLATILES/WATER/GCMS	12DCLP	0.500000	200.0000	06/20/88
552	ES	UM20	VOLATILES/WATER/GCMS	2CLEVE	0.710000	200.0000	06/20/88
553	ES	UM20	VOLATILES/WATER/GCMS	4BFB	6.500000	200.0000	06/20/88
554	ES	UM20	VOLATILES/WATER/GCMS	ACET	13.000000	50.0000	06/20/88
555	ES	UM20	VOLATILES/WATER/GCMS	BRDCLM	0.590000	200.0000	06/20/88
556	ES	UM20	VOLATILES/WATER/GCMS	C13DCP	0.580000	230.0000	06/20/88
557	ES	UM20	VOLATILES/WATER/GCMS	C2AVE	8.300000	50.0000	06/20/88
558	ES	UM20	VOLATILES/WATER/GCMS	C2H3CL	2.600000	200.0000	06/20/88
559	ES	UM20	VOLATILES/WATER/GCMS	C2H5CL	1.900000	200.0000	06/20/88
560	ES	UM20	VOLATILES/WATER/GCMS	C6H6	0.500000	200.0000	06/20/88
561	ES	UM20	VOLATILES/WATER/GCMS	CCL3F	1.400000	50.0000	06/20/88
562	ES	UM20	VOLATILES/WATER/GCMS	CCL4	0.580000	200.0000	06/20/88
563	ES	UM20	VOLATILES/WATER/GCMS	CH2CL2	2.300000	100.0000	06/20/88
564	ES	UM20	VOLATILES/WATER/GCMS	CH3BR	5.800000	100.0000	06/20/88
565	ES	UM20	VOLATILES/WATER/GCMS	CH3CL	3.200000	200.0000	06/20/88
566	ES	UM20	VOLATILES/WATER/GCMS	CHBR3	2.600000	200.0000	06/20/88
567	ES	UM20	VOLATILES/WATER/GCMS	CHCL3	0.500000	200.0000	06/20/88
568	ES	UM20	VOLATILES/WATER/GCMS	CLC6H5	0.500000	200.0000	06/20/88
569	ES	UM20	VOLATILES/WATER/GCMS	CS2	0.500000	200.0000	06/20/88
570	ES	UM20	VOLATILES/WATER/GCMS	DBRCLM	0.670000	100.0000	06/20/88
571	ES	UM20	VOLATILES/WATER/GCMS	ETC6H5	0.500000	200.0000	06/20/88

572	ES	UM20	VOLATILES/WATER/GCMS	MEC6D8	0.500000	200.0000	06/20/88
573	ES	UM20	VOLATILES/WATER/GCMS	MEC6H5	0.500000	200.0000	06/20/88
574	ES	UM20	VOLATILES/WATER/GCMS	MEK	6.400000	200.0000	06/20/88
575	ES	UM20	VOLATILES/WATER/GCMS	MIBK	3.000000	200.0000	06/20/88
576	ES	UM20	VOLATILES/WATER/GCMS	MNBK	3.600000	200.0000	06/20/88
577	ES	UM20	VOLATILES/WATER/GCMS	STYR	0.500000	200.0000	06/20/88
578	ES	UM20	VOLATILES/WATER/GCMS	T13DCP	0.700000	280.0000	06/20/88
579	ES	UM20	VOLATILES/WATER/GCMS	TCLEA	0.510000	200.0000	06/20/88
580	ES	UM20	VOLATILES/WATER/GCMS	TCLEE	1.600000	200.0000	06/20/88
581	ES	UM20	VOLATILES/WATER/GCMS	TRCLE	0.500000	200.0000	06/20/88
582	ES	UM20	VOLATILES/WATER/GCMS	XYLEN	0.840000	200.0000	06/20/88
921	ES	UN07	NP-PESTICIDES/WATER/GCFP	ATZ	0.512000	5.0000	04/24/89
922	ES	UN07	NP-PESTICIDES/WATER/GCFP	DDVP	0.250000	5.0000	04/24/89
923	ES	UN07	NP-PESTICIDES/WATER/GCFP	MLTHN	0.250000	5.0000	04/24/89
924	ES	UN07	NP-PESTICIDES/WATER/GCFP	PRTHN	0.250000	5.0000	04/24/89
925	ES	UN07	NP-PESTICIDES/WATER/GCFP	SUPONA	0.235000	4.7000	04/24/89
873	ES	UN08	NITROSAMINES/WATER/GC-NPD	24DNT	0.341000	5.0000	02/17/89
872	ES	UN08	NITROSAMINES/WATER/GC-NPD	26DNT	0.250000	5.0000	02/17/89
875	ES	UN08	NITROSAMINES/WATER/GC-NPD	NB	0.285000	5.0000	02/17/89
874	ES	UN08	NITROSAMINES/WATER/GC-NPD	NNDNPA	0.294000	5.0000	02/17/89
871	ES	UN08	NITROSAMINES/WATER/GC-NPD	NNDPA	0.250000	5.0000	02/17/89
836	ES	UO02	VOLATILES/WATER/GCDUAL	111TCE	2.900000	50.0000	02/13/89
837	ES	UO02	VOLATILES/WATER/GCDUAL	112TCE	0.332000	49.0000	02/13/89
838	ES	UO02	VOLATILES/WATER/GCDUAL	11DCE	0.393000	51.0000	02/13/89
839	ES	UO02	VOLATILES/WATER/GCDUAL	11DCLE	0.334000	49.5000	02/13/89
842	ES	UO02	VOLATILES/WATER/GCDUAL	12DCLE	2.950000	49.0000	02/13/89
843	ES	UO02	VOLATILES/WATER/GCDUAL	12DCLP	3.160000	49.0000	02/13/89
844	ES	UO02	VOLATILES/WATER/GCDUAL	13DCLB	1.340000	50.0000	02/13/89
845	ES	UO02	VOLATILES/WATER/GCDUAL	13DMB	1.560000	49.5000	02/13/89
846	ES	UO02	VOLATILES/WATER/GCDUAL	2CLEVE	22.100000	49.5000	02/13/89
847	ES	UO02	VOLATILES/WATER/GCDUAL	BRDCLM	3.060000	50.5000	02/13/89
848	ES	UO02	VOLATILES/WATER/GCDUAL	C13DCP	3.230000	48.5000	02/13/89
849	ES	UO02	VOLATILES/WATER/GCDUAL	C2H3CL	2.070000	50.0000	02/13/89
850	ES	UO02	VOLATILES/WATER/GCDUAL	C2H5CL	1.600000	50.0000	02/13/89
851	ES	UO02	VOLATILES/WATER/GCDUAL	C6H6	0.651000	49.0000	02/13/89
868	ES	UO02	VOLATILES/WATER/GCDUAL	CCL2F2	2.040000	50.0000	02/13/89
869	ES	UO02	VOLATILES/WATER/GCDUAL	CCL3F	0.503000	51.5000	02/13/89
852	ES	UO02	VOLATILES/WATER/GCDUAL	CCL4	2.810000	49.0000	02/13/89
853	ES	UO02	VOLATILES/WATER/GCDUAL	CH2CL2	3.100000	49.0000	02/13/89
867	ES	UO02	VOLATILES/WATER/GCDUAL	CH3BR	2.680000	50.0000	02/13/89
854	ES	UO02	VOLATILES/WATER/GCDUAL	CH3CL	1.980000	50.0000	02/13/89
855	ES	UO02	VOLATILES/WATER/GCDUAL	CHBR3	4.030000	52.0000	02/13/89
856	ES	UO02	VOLATILES/WATER/GCDUAL	CHCL3	1.260000	50.0000	02/13/89
841	ES	UO02	VOLATILES/WATER/GCDUAL	CL2BZ	6.220000	111.0000	02/13/89
857	ES	UO02	VOLATILES/WATER/GCDUAL	CLC6H5	0.582000	50.5000	02/13/89
858	ES	UO02	VOLATILES/WATER/GCDUAL	DBRCLM	0.352000	51.5000	02/13/89
859	ES	UO02	VOLATILES/WATER/GCDUAL	ETC6H5	0.857000	49.5000	02/13/89
860	ES	UO02	VOLATILES/WATER/GCDUAL	MEC6H5	0.716000	49.5000	02/13/89
840	ES	UO02	VOLATILES/WATER/GCDUAL	T12DCE	0.427000	49.0000	02/13/89
861	ES	UO02	VOLATILES/WATER/GCDUAL	T13DCP	0.326000	49.5000	02/13/89
862	ES	UO02	VOLATILES/WATER/GCDUAL	TCLEA	1.090000	52.0000	02/13/89
863	ES	UO02	VOLATILES/WATER/GCDUAL	TCLEE	0.677000	51.0000	02/13/89
864	ES	UO02	VOLATILES/WATER/GCDUAL	TRCLE	3.590000	50.0000	02/13/89
870	ES	UO02	VOLATILES/WATER/GCDUAL	XYLEN	1.730000	102.0000	02/13/89
945	ES	UT02	ORGANICS/WATER/IC	FC2A	100.000000	9000.0000	03/09/90
943	ES	UT02	ORGANICS/WATER/IC	IMPA	100.000000	9000.0000	03/09/90
944	ES	UT02	ORGANICS/WATER/IC	MPA	128.000000	9000.0000	03/09/90
346	ES	UU9	ORGANOSULFURS/SOIL/GCFP	BTZ	1.080000	13.2000	04/23/87
347	ES	UU9	ORGANOSULFURS/SOIL/GCFP	CPMS	1.080000	21.6000	04/23/86
348	ES	UU9	ORGANOSULFURS/SOIL/GCFP	CPMSO	2.250000	45.0000	04/23/86
349	ES	UU9	ORGANOSULFURS/SOIL/GCFP	CPMSO2	2.370000	47.4000	04/23/86
350	ES	UU9	ORGANOSULFURS/SOIL/GCFP	DITH	0.571000	11.4000	04/23/86
351	ES	UU9	ORGANOSULFURS/SOIL/GCFP	DMDS	0.692000	13.8000	04/23/86
352	ES	UU9	ORGANOSULFURS/SOIL/GCFP	OXAT	0.856000	17.1000	04/23/86
353	ES	UW04	HERBICIDES/WATER/HPLC	BRMCIL	3.830000	61.5000	01/29/87
467	ES	UW14	EXPLOSIVES/WATER/HPLC	135TNB	0.626000	42.1000	07/01/88
468	ES	UW14	EXPLOSIVES/WATER/HPLC	13DNB	0.519000	40.1000	07/01/88
471	ES	UW14	EXPLOSIVES/WATER/HPLC	246TNT	0.588000	40.2000	07/01/88
473	ES	UW14	EXPLOSIVES/WATER/HPLC	24DNT	0.612000	40.2000	07/01/88
472	ES	UW14	EXPLOSIVES/WATER/HPLC	26DNT	1.150000	52.4000	07/01/88
465	ES	UW14	EXPLOSIVES/WATER/HPLC	HMX	1.650000	28.9000	07/01/88
469	ES	UW14	EXPLOSIVES/WATER/HPLC	NB	1.070000	54.9000	07/01/88
466	ES	UW14	EXPLOSIVES/WATER/HPLC	RDX	2.110000	43.9000	07/01/88
470	ES	UW14	EXPLOSIVES/WATER/HPLC	TETRYL	0.556000	44.5000	07/01/88
475	ES	UW17	EXPLOSIVES/WATER/HPLC	NQ	30.900000	620.0000	09/02/88
760	ES	UW18	PHENOLS/WATER/HPLC	246TCP	1.900000	111.0000	11/26/88
754	ES	UW18	PHENOLS/WATER/HPLC	24DCLP	0.617000	115.0000	11/26/88
753	ES	UW18	PHENOLS/WATER/HPLC	2CLP	1.690000	88.0000	11/26/88
756	ES	UW18	PHENOLS/WATER/HPLC	2NP	0.363000	27.2000	11/26/88
755	ES	UW18	PHENOLS/WATER/HPLC	46DN2C	0.295000	25.8000	11/26/88
752	ES	UW18	PHENOLS/WATER/HPLC	4CL3C	5.560000	69.7000	11/26/88
759	ES	UW18	PHENOLS/WATER/HPLC	4NP	0.273000	31.9000	11/26/88
757	ES	UW18	PHENOLS/WATER/HPLC	PCP	1.490000	16.4000	11/26/88
758	ES	UW18	PHENOLS/WATER/HPLC	PHENOL	7.990000	103.0000	11/26/88

737	ES	UW19	EXPLOSIVES/WATER/HPLC	NG	10.000000	200.0000	09/30/88
738	ES	UW19	EXPLOSIVES/WATER/HPLC	PETN	20.000000	400.0000	09/30/88
927	ES	UW22	ORGANOSULFURS/WATER/HPLC	TDGCL	48.800000	4880.0000	04/08/89
926	ES	UW22	ORGANOSULFURS/WATER/HPLC	TDGCLA	52.700000	1780.0000	04/08/89
955	ES	UW32	EXPLOSIVES/WATER/HPLC-U	135TNB	0.449000	59.2000	05/06/91
948	ES	UW32	EXPLOSIVES/WATER/HPLC-U	13DNB	0.611000	55.0000	05/06/91
956	ES	UW32	EXPLOSIVES/WATER/HPLC-U	246TNT	0.635000	112.0000	05/06/91
949	ES	UW32	EXPLOSIVES/WATER/HPLC-U	24DNT	0.063700	21.2000	05/06/91
950	ES	UW32	EXPLOSIVES/WATER/HPLC-U	26DNT	0.073800	24.4000	05/06/91
958	ES	UW32	EXPLOSIVES/WATER/HPLC-U	2A46DT	0.158000	22.0000	05/06/91
959	ES	UW32	EXPLOSIVES/WATER/HPLC-U	2NT	0.406000	122.6000	05/06/91
960	ES	UW32	EXPLOSIVES/WATER/HPLC-U	3NT	1.400000	116.8000	05/06/91
957	ES	UW32	EXPLOSIVES/WATER/HPLC-U	4A26DT	1.570000	20.8000	05/06/91
961	ES	UW32	EXPLOSIVES/WATER/HPLC-U	4NT	1.110000	120.4000	05/06/91
951	ES	UW32	EXPLOSIVES/WATER/HPLC-U	HMX	1.210000	120.8000	05/06/91
952	ES	UW32	EXPLOSIVES/WATER/HPLC-U	NB	0.645000	129.0000	05/06/91
953	ES	UW32	EXPLOSIVES/WATER/HPLC-U	RDX	1.170000	116.8000	05/06/91
954	ES	UW32	EXPLOSIVES/WATER/HPLC-U	TETRYL	2.489000	107.5000	05/06/91
354	ES	V8	PESTICIDES/WATER/GCEC	DBCP	0.112000	2.0100	09/05/85
355	ES	V9	METALS/SOIL/CVAA	HG	0.050000	1.0000	04/16/85
356	ES	VV9	PESTICIDES/SOIL/GCNPD	ATZ	0.251000	5.0200	10/09/86
357	ES	VV9	PESTICIDES/SOIL/GCNPD	DDVP	0.700000	5.1500	10/09/86
358	ES	VV9	PESTICIDES/SOIL/GCNPD	MLTHN	0.251000	5.0200	10/09/86
359	ES	VV9	PESTICIDES/SOIL/GCNPD	PRTHN	0.251000	5.0100	10/09/86
360	ES	VV9	PESTICIDES/SOIL/GCNPD	SUPONA	0.250000	4.9900	10/09/86
361	ES	W8	AROMATICS/WATER/GCPID	13DMB	1.350000	8.6800	06/10/85
362	ES	W8	AROMATICS/WATER/GCPID	C6H6	1.340000	8.6700	06/10/85
363	ES	W8	AROMATICS/WATER/GCPID	ETC6H5	1.280000	8.9000	06/10/85
364	ES	W8	AROMATICS/WATER/GCPID	MEC6H5	1.210000	8.5500	06/10/85
365	ES	W8	AROMATICS/WATER/GCPID	XYLEN	2.470000	17.5000	06/10/85
366	ES	W9	VOLATILES/SOIL/GCMS	111TCE	0.250000	25.0000	03/18/85
367	ES	W9	VOLATILES/SOIL/GCMS	112TCE	0.250000	25.0000	03/18/85
368	ES	W9	VOLATILES/SOIL/GCMS	11DCLE	0.250000	25.0000	03/18/85
369	ES	W9	VOLATILES/SOIL/GCMS	12DCD4	0.850000	25.0000	03/18/85
370	ES	W9	VOLATILES/SOIL/GCMS	12DCE	0.250000	25.0000	03/18/85
371	ES	W9	VOLATILES/SOIL/GCMS	12DCLE	0.280000	25.0000	03/18/85
372	ES	W9	VOLATILES/SOIL/GCMS	13DMB	0.250000	25.0000	03/18/85
373	ES	W9	VOLATILES/SOIL/GCMS	BCHPD	0.250000	25.0000	03/18/85
374	ES	W9	VOLATILES/SOIL/GCMS	C6H6	0.250000	25.0000	03/18/85
375	ES	W9	VOLATILES/SOIL/GCMS	CCL4	0.250000	25.0000	03/18/85
376	ES	W9	VOLATILES/SOIL/GCMS	CD2CL2	1.100000	25.0000	03/18/85
377	ES	W9	VOLATILES/SOIL/GCMS	CH2CL2	0.250000	25.0000	03/18/85
378	ES	W9	VOLATILES/SOIL/GCMS	CHCL3	0.250000	25.0000	03/18/85
379	ES	W9	VOLATILES/SOIL/GCMS	CLC6H5	0.250000	25.0000	03/18/85
380	ES	W9	VOLATILES/SOIL/GCMS	DBCP	0.330000	25.0000	03/18/85
381	ES	W9	VOLATILES/SOIL/GCMS	DCPD	0.270000	27.0000	03/18/85
382	ES	W9	VOLATILES/SOIL/GCMS	DMDS	0.250000	25.0000	03/18/85
383	ES	W9	VOLATILES/SOIL/GCMS	ETBD10	0.730000	25.0000	03/18/85
384	ES	W9	VOLATILES/SOIL/GCMS	ETC6H5	0.250000	25.0000	03/18/85
385	ES	W9	VOLATILES/SOIL/GCMS	MEC6H5	0.250000	25.0000	03/18/85
386	ES	W9	VOLATILES/SOIL/GCMS	MIBK	0.500000	25.0000	03/18/85
387	ES	W9	VOLATILES/SOIL/GCMS	TCLEE	0.250000	25.0000	03/18/85
388	ES	W9	VOLATILES/SOIL/GCMS	TRCLE	0.250000	25.0000	03/18/85
389	ES	W9	VOLATILES/SOIL/GCMS	XYLEN	0.500000	50.0000	03/18/85
390	ES	WW9	AROMATICS/SOIL/GCPID	13DMB	0.053000	4.2800	09/15/86
391	ES	WW9	AROMATICS/SOIL/GCPID	C6H6	0.081000	4.3400	09/15/86
392	ES	WW9	AROMATICS/SOIL/GCPID	ETC6H5	0.043000	4.2700	09/15/86
393	ES	WW9	AROMATICS/SOIL/GCPID	MEC6H5	0.096000	4.3000	09/15/86
394	ES	WW9	AROMATICS/SOIL/GCPID	XYLEN	0.086000	8.6400	09/15/86
395	ES	X8	ANIONS/WATER/IONCHROM	CL	4800.000000	300000.0000	07/25/85
396	ES	X8	ANIONS/WATER/IONCHROM	F	1220.000000	10000.0000	07/25/85
397	ES	X8	ANIONS/WATER/IONCHROM	SO4	10000.000000	600000.0000	01/20/86
398	ES	XX9	ANIONS/SOIL/IONCHROM	CL	16.400000	205.0000	10/20/85
399	ES	XX9	ANIONS/SOIL/IONCHROM	F	4.500000	51.2000	10/20/85
400	ES	XX9	ANIONS/SOIL/IONCHROM	SO4	95.300000	512.0000	10/20/85
401	ES	Y8	HALOCARBONS/WATER/GCCON	111TCE	1.700000	196.0000	07/18/85
402	ES	Y8	HALOCARBONS/WATER/GCCON	112TCE	1.000000	196.0000	07/18/85
403	ES	Y8	HALOCARBONS/WATER/GCCON	11DCE	1.100000	196.0000	07/18/85
404	ES	Y8	HALOCARBONS/WATER/GCCON	11DCLE	1.200000	194.0000	07/18/85
405	ES	Y8	HALOCARBONS/WATER/GCCON	12DCE	1.200000	194.0000	07/18/85
406	ES	Y8	HALOCARBONS/WATER/GCCON	12DCLE	0.610000	196.0000	07/18/85
407	ES	Y8	HALOCARBONS/WATER/GCCON	CCL4	2.400000	200.0000	07/18/85
408	ES	Y8	HALOCARBONS/WATER/GCCON	CH2CL2	5.000000	198.0000	07/18/85
409	ES	Y8	HALOCARBONS/WATER/GCCON	CHCL3	1.400000	194.0000	07/18/85
410	ES	Y8	HALOCARBONS/WATER/GCCON	CLC6H5	0.580000	200.0000	07/18/85
411	ES	Y8	HALOCARBONS/WATER/GCCON	TCLEE	1.300000	196.0000	07/18/85
412	ES	Y8	HALOCARBONS/WATER/GCCON	TRCLE	1.100000	194.0000	07/18/85
413	ES	YY8	AGENTPRODS/WATER/HPLC	TDGCL	65.900000	4880.0000	03/04/87
414	ES	YY8	AGENTPRODS/WATER/HPLC	TDGCLA	52.700000	1780.0000	03/04/87
415	ES	YY9	HALOCARBONS/SOIL/GCCON	111TCE	0.120000	0.9800	08/06/86
416	ES	YY9	HALOCARBONS/SOIL/GCCON	112TCE	0.120000	1.0000	08/06/86
417	ES	YY9	HALOCARBONS/SOIL/GCCON	11DCE	0.120000	0.9400	08/06/86
418	ES	YY9	HALOCARBONS/SOIL/GCCON	11DCLE	0.130000	0.9700	08/06/86
419	ES	YY9	HALOCARBONS/SOIL/GCCON	12DCE	0.150000	1.0200	08/06/86

420	ES	YY9	HALOCARBONS/SOIL/GCCON	12DCLE	0.080000	1.0000	08/06/86
421	ES	YY9	HALOCARBONS/SOIL/GCCON	CCL4	0.120000	1.0300	08/06/86
422	ES	YY9	HALOCARBONS/SOIL/GCCON	CH2CL2	0.150000	0.9900	08/06/86
423	ES	YY9	HALOCARBONS/SOIL/GCCON	CHCL3	0.100000	1.0400	08/06/86
424	ES	YY9	HALOCARBONS/SOIL/GCCON	CLC6H5	0.180000	1.0200	08/06/86
425	ES	YY9	HALOCARBONS/SOIL/GCCON	TCLEE	0.120000	1.0100	08/06/86
426	ES	YY9	HALOCARBONS/SOIL/GCCON	TRCLE	0.090000	1.0000	08/06/86
427	ES	Z8	VOLATILES/WATER/GCFID	BCHPD	7.340000	102.0000	07/18/85
428	ES	Z8	VOLATILES/WATER/GCFID	DCPD	5.120000	102.0000	07/18/85
429	ES	Z8	VOLATILES/WATER/GCFID	MIBK	5.240000	105.0000	07/18/85
430	ES	ZZ9	VOLATILES/SOIL/GCFID	BCHPD	5.080000	102.0000	07/18/85
431	ES	ZZ9	VOLATILES/SOIL/GCFID	DCPD	5.120000	102.0000	07/18/85
432	ES	ZZ9	VOLATILES/SOIL/GCFID	MIBK	5.240000	105.0000	07/18/85

APPENDIX J

USATHAMA - GEOTECHNICAL REQUIREMENTS

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I. OBJECTIVE.

The objective of these requirements is to set forth the geotechnical criteria and procedures of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). These requirements are used in technical support of the Contracting Officer for geotechnical exploration and reporting. The application of geotechnology to environmental programs should begin with project conception. The Geotechnical Requirements join this application during the design of the field program, after the initial magnitude of the study has been determined and tentative well sites selected. The application of these requirements is intended to provide acceptable technical data and tracking procedures to accurately obtain, describe, and evaluate representative samples of the subsurface environment in terms of geology, hydrology, and groundwater chemistry. This sample-specific data can be merged with site-operational knowledge to characterize and appraise the contaminant potential of the site.

II. GENERAL POLICY.

A. The Geotechnical Requirements shall be a part of and attached to each Request for Proposal or Quotation (RFP/RFQ) involving subsurface exploration and resulting contracts and/or task orders. A verbatim copy of these Requirements, modified by only the initial contract or task order and subsequent amendments, shall be made part of and attached to the contractor's Technical Plan (or equivalent document).

B. The Geotechnical Requirements were written as a generalized document. Application to a specific contract or task is likely to generate obvious or subtle conflicts. When conflicts exist between the Geotechnical Requirements and specific contractual documents; i.e., the RFP/RFQ, contract, task order, or contractual amendments, the latest contractual documents shall take precedence.

C. Technically, the Contracting Officer is the only Governmental agent who has the authority to change a given contract. Some administrative aspects of this authority are usually delegated in writing to certain USATHAMA personnel serving as Contracting Officer's Representatives (COR). These aspects include the approval for use of specified items; e.g., the drilling water, granular filter pack, bentonite, etc., as discussed in the Geotechnical Requirements. USATHAMA's approval of these items is performed through and under the authority of the Contracting Officer. Therefore, the contractor's requests for approval of, variance from, or notification of problems with the technical items within these Geotechnical Requirements shall be directly sent from the contractor to the USATHAMA COR responsible for that contract or task.

D. Any deviation from the contract shall be requested of and approved by the Contracting Officer. Deviations approved for a given contract or task shall not be applicable to any other contract or task unless specified in the approval.

E. These requirements will be updated as required incorporating new technology, experience, and policy.

III. SPECIFIC ELEMENTS.

A. Drilling Operations.

1. Drilling Methods.

a. The object of drilling method selection is to use that technique which:

(1) Minimizes subsurface contamination or cross contamination.

(2) Provides representative data.

(3) Minimizes drilling costs.

b. To this end, the following drilling methods are typically used:

(1) Hollow-stem augers.

(2) Water/mud rotary.

(3) Cable tool/churn drill.

(4) Air rotary.

c. Of these, air rotary is the least desirable and is further discussed in section III.A.2. Other methods, like reverse circulation, may have applicability in certain cases. Unless specified in the RFP/RFQ, the drilling method shall be suggested and described by the contractor in his RFP/RFQ response and/or technical plan, for the Contracting Officer's consideration and approval.

2. Air Rotary.

a. Air systems, including bottled gas, shall not be used for drilling, well installation, well development, presample purging, or sampling unless specified in the statement of work. However, when alternative bids or proposals are allowed, the contractor may present as part of the bid/proposal package an alternative using an air system(s) for a given operation(s). The contractor's alternative shall include:

(1) Situation.

(2) Recommendation.

(3) The effect of usage upon groundwater and soil chemical analyses.

(4) Alternatives with cost savings or increases, as appropriate.

b. The above item shall be quantified, costed (in the appropriate section of the bid/proposal package), and shall incorporate the appropriate criteria discussed in paragraph III.A.2.c. below. Consideration and a recommendation by USATHAMA will be made during the course of bid/proposal evaluation, prior to contract award.

c. In general, air system plans shall:

(1) Specify the type of air compressor and lubricating oil and require a pint sample of each oil be retained by the contractor, along with a record of oil loss (on the boring log), for evaluation in the event of future problems. The oil sample(s) may be disposed of upon contract/task completion.

(2) Require an air line oil filter and that the filter be changed per manufacturer's recommendation during operation with a record kept (on the boring log) of this maintenance. More frequent changes shall be made if oil is visibly detected in the filtered air.

(3) Prohibit the use of any additive except approved water (III.A.10.b.) for dust control and cuttings removal.

(4) Detail the use of any downhole hammer/bit with emphasis upon those procedures to be taken to preclude residual groundwater sample contamination caused by the lubrication of the downhole equipment.

d. Air usage shall be fully described in the log or associated geotechnical report to include equipment description(s), manufacturer(s), model(s), air pressures used, frequency of oil filter change, and evaluations of the system performance, both design and actual.

3. Recirculation Tanks and Sumps. Portable recirculation tanks are suggested for mud/water rotary operations and similar requirements. The use of dug sumps/pits (lined or unlined) is expressly prohibited.

4. Site Geologist. A geologist shall be present and responsible at each operating drill rig for the logging of samples, monitoring of drilling operations, recording of water losses/gains and groundwater data, preparing the boring logs and well diagrams, and recording the well installation procedures of that rig. Each geologist shall be responsible for only one operating rig. Each geologist shall have onsite sufficient tools and professional equipment in operable condition to efficiently perform his/her duties as outlined in these Geotechnical Requirements and other contractual documents. Items in the possession of each geologist shall include, as a minimum: a copy of the geotechnical portion of the statement of work, the USATHAMA-approved Technical Plan (or equivalent) which incorporates these Geotechnical Requirements, the approved Safety Plan (approved after contract award), a 10X (minimum) hand lens, and a weighted (with steel or iron) tape(s), long enough to measure the deepest well within the contract, heavy enough to reach that depth, and small enough to readily fit within the annulus between the well and drill casing. Each geologist shall also have onsite a water level measuring device, preferably electrical.

5. Permits, Rights-of-Entry, and Licenses. The contractor shall be responsible for securing and complying with any and all boring or well drilling permits and/or procedures required by state or local authorities and

for determining and complying with any and all state or local regulations with regard to the submission of well logs, samples, etc. Submission of these items to state or local authorities shall be coordinated through USATHAMA. The contractor shall telephonically notify USATHAMA immediately in the event of any apparent discrepancy between contractual and state or local requirements. Notification shall include the nature of the discrepancy; the name, agency, and telephone number of the person noting the discrepancy; and the current status. Any rights-of-entry (for off-post drilling) will be obtained for and supplied to the contractor by the Contracting Officer. The contractor shall ensure that all drilling of boreholes, well installation, and topographic surveying is accomplished by companies appropriately licensed in the project State. A copy of each current license (denoting expiration date) shall be provided in the contractor's Technical Plan. If the project State does not require a licensed driller for this project, then a statement to that effect shall be included in the technical plan.

6. Drilling Safety and Underground Utility Detection. The contractor shall be responsible for determining and complying with any and all (to include host installation) regulations, requirements, and permits with regard to drilling safety and underground utility detection. The contractor shall include a discussion of his actions with regard to these items in his proposal and Safety Plan (also see III.A.12.b., III.A.12.d., and III.G.).

7. Lubricants. Only petroleum jelly, teflon tape, lithium grease, or vegetable-based lubricants shall be used on the threads of downhole drilling equipment. Additives containing lead or copper shall not be used. Any hydraulic or other fluids in the drilling rig, pumps, or other field equipment/vehicles shall NOT contain any polychlorinated biphenyls (PCBs).

8. Surface Runoff. Surface runoff; e.g., precipitation, wasted or spilled drilling fluid, and miscellaneous spills and leaks, shall not enter any boring or well either during or after drilling/well construction. To help preclude this, the use of starter casing, recirculation tanks, berms about the borehole, and surficial bentonite packs, as appropriate, are suggested.

9. Antifreeze. If antifreeze is added to any pump, hose, etc., in an area in contact with drilling fluid, this antifreeze shall be completely purged prior to the equipment's use in drilling, mud mixing, or any other part of the overall drilling operation. Only antifreeze without rust inhibitors and/or sealants shall be used. The contractor shall note on the boring log the dates, reasons, quantities, and brand names of antifreeze per above.

10. Materials.

a. Bentonite is the only drilling fluid additive allowed. No organic additives shall be used. Exception is usually made for some high yield bentonites to which the manufacturer has added a small quantity of polymer. The use of any bentonite must be approved by the Contracting Officer prior to the arrival onsite of the drilling equipment (rigs). This includes bentonites (powders, pellets, etc.) intended for drilling mud, grout, seals, etc. The following data, III.A.10.a.(1)-(5), shall be submitted in writing (see Figure 1) through USATHAMA to the Contracting Officer as part of the approval request. Allow six working days from the time of receipt by USATHAMA for request evaluation and recommendation.

(1) Brand names(s).

(2) Manufacturer(s).

(3) Manufacturer's address(es) and telephone number(s).

(4) Product description(s) from package label(s)/manufacturer's brochure(s).

(5) Intended use(s) for this product.

b. Water.

(1) The source of any water to be used in drilling, grouting, sealing, filter placement, well installation, or equipment washing must be approved by the Contracting Officer prior to arrival of the drilling equipment onsite. Parameters for approval include:

(a) A deep aquifer origin (ideally, greater than 200 feet below ground surface).

(b) Well head upgradient of potential contaminant sources.

(c) Free of survey-related contaminants by virtue of pretesting (sampling and analysis) by the contractor using a laboratory certified by or in the process of being certified by USATHAMA for those contaminants. Pretesting shall be conducted on duplicate samples, each analyzed at a different time, using separate lots.

(d) The water to be non-treated and non-filtered.

(e) The tap to have 24-hour per day, 7-day per week access with plumbing sufficient to allow the filling of a 500 gallon tank in less than 20 minutes.

(f) The use of only one designated tap for access.

(2) Periodic testing of the approved water source may be required when the water is used to clean the sampling equipment after well installation. A detailed discussion of these requirements is provided in th USATHAMA Quality Assurance Program.

(3) Surface water bodies shall not be used, if at all possible.

(4) If a suitable source exists onsite, the contractor shall be directed to that source. If no onsite water is available, the contractor shall locate a potential source and submit the following data, III.A.10.b.(4)(a)-(h), in writing to USATHAMA (see Figure 2) for the Contracting Officer's approval prior to the arrival of any drilling equipme onsite. Allow three calendar weeks from the time of receipt by USATHAMA fo request evaluation and recommendation.

(a) Owner/address/telephone number.

(b) Location of tap/address.

(c) Type of source (well, pond, river, etc.). If a well, specify static water level (depth), date measured, well depth, and aquifer description.

(d) Type of treatment and filtration prior to tap (chlorination, fluoridation, softening, etc.).

(e) Time of access (24-hours per day, 5-days per week, etc.).

(f) Cost per gallon charged by Owner/Operator.

(g) Results and dates of all available chemical analyses over past two years. Include the name(s) and address(s) of the analytical laboratory(s)

(h) Results and date(s) of duplicate chemical analysis (see III.A.10.b.(1)(c)) for project contaminants by a laboratory certified by or in the process of being certified by USATHAMA for those contaminants.

(5) The contractor has the responsibility to procure, transport, and store the water required for project needs in a manner to avoid the chemical contamination or degradation of the water once obtained. The contractor is also responsible for any heating, thermal insulation, or agitation of the water to maintain the water as a fluid for its intended uses.

(6) The contractor shall enter the chemical and geotechnical data for the approved water source into the Data Management System.

c. Grout.

(1) Materials. Grout, when used in monitor well construction or well abandonment, shall be composed by weight of 20 parts cement (Portland cement, type II or V) up to 1 part bentonite with a maximum of 8 gallons of approved water per 94 pound bag of cement. Neither additives nor borehole cuttings shall be mixed with the grout. Bentonite shall be added after the required amount of cement is mixed with water.

(2) Equipment. All grout materials shall be combined in an above-ground rigid container or mixer and mechanically (not manually) blended onsite to produce a thick, lump-free mixture throughout the mixing vessel. The mixed grout shall be recirculated through the grout pump prior to placement. Grout shall be placed using a grout pump and tremie. The grout pump for recirculation and placement shall be a commercially available product specifically manufactured to pump cement grouts. The tremie pipe shall be of rigid, not flexible, construction. Drill rods, rigid polyvinyl chloride (PVC) or metal pipes are acceptable tremies. Hoses and flexible PVC are unacceptable. Grout placement, via gravity and the grout head, using an elevated grout tank is expressly prohibited.

(3) Grout shall be placed in the monitor wells as follows:

(a) When a bentonite seal is used as shown in Figures 5 or 6:

(i) Prior to exposing any portion of the borehole above the seal by the removal of any drill casing (to include hollow-stem augers), the annulus between the well casing and drill casing shall be filled with grout.

(ii) The grout shall be placed from within a rigid tremie pipe, located just over the top of the seal.

(iii) The grout shall be pumped through this pipe to the bottom of the open annulus until undiluted grout flows from the annulus at ground surface, forming a continuous grout column from the seal to ground surface. The grout shall not penetrate the well screen or granular filter pack. Disturbance of the bentonite seal should be minimal.

(iv) The drill casing shall then be removed and more grout immediately added to compensate for settlement.

(v) If drill casing (to include hollow-stem auger) was not used, proceed with grouting to ground surface in one, continuous operation.

(vi) After 24 hours, the contractor shall check the site for grout settlement and that day add more grout to fill any settlement depression.

(vii) Repeat this process until firm grout remains at ground surface.

(viii) Incremental quantities of grout added in this manner shall be recorded as added and the data submitted to the Contracting Officer through USATHAMA on the well diagram (or addendum).

(b) When no bentonite seal is used (unusual occurrence requiring specific Contracting Officer approval):

(i) The contractor shall mix, place, monitor, and report grout usage as described above: III.A.10.c.(1) to (3)(a)(viii), but position the rigid tremie pipe just above the granular filter pack.

(ii) Place the grout so as to avoid grout penetration into the underlying granular filter pack and screen.

(4) If field conditions permit, the contractor may incrementally place grout and remove drill casing so as to constantly maintain 10 feet of grout (minimally) within the casing yet to be removed from the ground. Using this method requires at least 20 feet of grout to be within the casing before removing 10 feet of casing.

(5) For grout placement at depths less than ten feet in a DRY hole, the grout may be poured in place from ground surface.

d. Granular Filter Pack. For this discussion, refer to section III.C.5.

e. Well Screens, Casings, and Fittings. For a discussion of these materials, see section III.C.2.

f. Well Caps and Centralizers. These items are discussed in sections III.C.3. and 4, respectively.

g. Well Protection. Elements of well protection are covered in section III.C.8.

h. Tracers, dyes, or other substances shall not be used or otherwise introduced into borings, wells, grout, backfill, groundwater, or surface water unless specifically required by contract.

i. Summarize the usage of these and any other drilling/well construction materials which potentially could have a bearing on subsequent interpretation of the analytical results. Include this summary within the geotechnical report. An example summary is provided at Table 1.

11. Abandonment. Abandonment is that procedure by which any boring or well is permanently closed. Abandonment procedures shall preclude any current or subsequent discharges from entering the abandoned boring or well and thereby terminate access to the subsurface environment.

a. The abandonment of any borings or wells not scheduled for abandonment per contract, must be approved by the Contracting Officer prior to any casing removal, sealing, or backfilling. Abandonment requests shall be submitted telephonically through USATHAMA to the Contracting Officer with the following data, III.A.11.a.(1)-(3), plus recommendation. Allow four consecutive hours from the time of receipt by USATHAMA for request evaluation and decision. Frequently, resolution is made within minutes. Infrequent circumstances may preclude a four-hour resolution. A written followup memorandum shall be submitted by the contractor within five working days of the telephonic request. This document shall be forwarded through USATHAMA to the Contracting Officer and contain the following data:

(1) Designation of well/bore in question.

(2) Current status (depth, contents of hole, stratigraphy, water level, etc.).

(3) Reason for abandonment.

(4) Action taken, to include any replacement boring or well.

b. Each boring or well to be abandoned shall be sealed by grouting from the bottom of the boring/well to ground surface. This shall be done by placing a grout pipe to the bottom of the boring/well (i.e., to the maximum depth drilled/bottom of well screen) and pumping grout through this pipe until undiluted grout flows from the boring/well at ground surface. Any open or ungrouted portion of the annular space between the well casing and borehole shall be grouted in the same manner also. Grout composition, equipment, and placement procedures are covered in section III.A.10.c.

c. After 24 hours, the contractor shall check the abandoned site for grout settlement. That day, any settlement depression shall be filled with grout and rechecked 24 hours later. This process shall be repeated until firm grout remains at ground surface.

d. Normally an abandoned well shall be grouted with the well screen and casing in place. However, a lack of data concerning well construction or other factors may dictate the removal of the well materials and a partial or total hole redrilling prior to sealing the well site.

e. For each abandoned boring/well, a record shall be prepared to include the following, III.A.11.e.(1)-(13), as applicable. Report all depths/heights from ground surface. The original record shall be submitted to USATHAMA within three working days after abandonment is completed.

(1) Boring/well designation.

(2) Location with respect to the replacement boring or well (if any); e.g., 20 feet north and 20 feet west of Well 14.

(3) Open depth prior to grouting and depth to which grout pipe placed. This includes the depth of open hole, open depth to the bottom of the well, and the open depth in the well-borehole annulus.

(4) Casing left in hole by depth, composition, and size.

(5) Copy of the boring log.

(6) Copy of construction diagram for abandoned well.

(7) Drilled and sampled depth prior to decision to abandon site.

(8) Items left in hole by depth, description, and composition.

(9) Description and total quantity of grout used initially.

(10) Description and daily quantities of grout used to compensate for settlement.

(11) Dates of grouting.

(12) Water or mud level (specify) prior to grouting and date measured.

(13) Remaining casing above ground surface: height above ground, size, and composition.

f. Ideally, replacement wells/borings (if any) will be offset at least 20 feet from any abandoned site in a presumed up- or cross-gradient groundwater direction. Site-specific conditions may necessitate variation to this placement.

12. Soil Samples.

a. Unless otherwise specified in the contract, intact soil samples for physical descriptions, retention, and potential physical analyses shall be taken and retained every five feet or at each major change of material, whichever occurs first. The contractor may propose an alternate sampling frequency in his technical plan. These samples shall be representative of their host environment and are to be obtained with driven (e.g., split spoon), pushed (e.g., thin wall), or rotary (e.g., Denison) type samplers. Auger flight or wash samples will not satisfy this requirement.

b. At the detection of any unusual odors off the auger turnings or intact samples, drilling shall cease for an evaluation of their nature and crew safety. After the field crew completes this evaluation and implements any appropriate safety precautions, drilling shall resume. If the odors are judged by the field crew to be contaminant-related, intact samples shall be continuously taken until the odors are no longer detected in the samples. At that time, normal sampling shall resume. Specific procedures shall be detailed in the contractor's proposal and Safety Plan.

c. Representative soil samples from each sampler shall be placed in half- or one-pint glass jars with air-tight, screw-type lids (canning jars). These jars shall be stored in individual compartments in cardboard boxes. A single box shall not contain more than 24 one-pint jars or 48 half-pint jars. For thin wall (shelby) samples, retain a sample from each tube as described above. The remaining portion may be wasted or sealed in the tube, as per testing requirements. Minimum information on each sample container shall include the boring and sample number. No geotechnical data shall appear on the container that is not specified on the boring log. Jars and tubes shall be kept from freezing.

d. Physical soil testing shall be conducted on ten (10) to twenty (20) percent of the soil samples using procedures and equipment described in the current U.S. Army Corps of Engineers Manual, EM 1110-2-1906: Laboratory Soils Testing, or current Annual Book of ASTM Standards, American Society of Testing and Materials, Part 19. Tested samples shall be representative of the range and frequency of soil types encountered. In addition, they shall be obtained from borings that cover the geographic and geologic range within the study area of the host Army installation. The contractor shall select the particular samples. Tests shall include Atterberg Limits, sieve grain size distribution, and assignment of Unified Soil Classification System symbols. Laboratory and summary sheets shall be submitted to the COR within ten working days of final test completion. The contractor shall address any contaminant-related safety precautions for the physical analysis of these samples in his proposal and Safety Plan.

e. Soil samples for chemical analysis taken from borings shall be obtained in a manner to provide intact specimens; using a split spoon or solid barrel sampler, Denison sampler, etc. These samples shall be extracted from their host environment in as near an intact, undisturbed condition as technically practical. Once at the surface, the sampler shall be opened, sample extracted, peeled, and bottled in as short a time as possible. "Peeling" is a process whereby that portion of the sample which was in direct contact with the sampler, as well as the ends of the sample, are removed and discarded. Samples for volatile analysis shall be peeled, bottled, and capped within fifteen (15) seconds from the time of opening the sampler. Additional acquisition, preservation, and handling criteria for the chemical analysis of soils are found in the current Quality Assurance Program.

f. All soil samples, except those for physical and/or chemical analysis and reference shall remain onsite, neatly stored at a USATHAMA-designated location. The disposition of these samples will be arranged between USATHAMA and the host installation.

13. Rock Core. The preferred method of drilling bedrock is through coring. This method, using a diamond or carbide studded bit, produces a generally intact sample of the bedrock lithology, structure, and physical condition. The use of a gear-bit, tricone, etc., to penetrate bedrock should only be considered for the confirmation of the "top of rock" (where penetration is limited to a few feet), the enlargement of a previously cored hole, or the drilling of highly fractured intervals.

a. The coring of bedrock or any firm stratigraphic unit shall be conducted in a manner to obtain at least 90% intact recovery. The physical character of the bedrock; i.e., fractures, poor cementation, weathering, or solution cavities, may lessen the desired recovery, even with the best of drillers and equipment.

b. While drilling in bedrock, and especially while coring, drilling fluid pressures shall be adjusted to minimize drilling fluid losses and hydraulic fracturing.

c. Rock cores shall be stored in covered wooden boxes in such a manner as to preserve their relative position by depth. Intervals of lost core shall be noted in the core sequence with annotated wooden blocks. Boxes shall be marked inside and out to provide boring number, cored interval, and box number in cases of multiple boxes. The weight of each fully loaded box shall not exceed 75 pounds. No geotechnical data shall appear on or within the box that is not specified on the boring log. As a minimum, the estimated number of boxes required for each boring shall be on hand prior to coring that site.

d. The core within each completed box shall be photographed after the core surface has been cleaned/peeled and wetted. Photos shall be taken using color film (ASA as appropriate), 35mm camera, 55mm (minimum) lens, light meter, with one box per frame. Each photo shall be in sharp focus and contain both a legible scale in feet and tenths of feet (or centimeters) and a USATHAMA-supplied photographic color chart for color comparison. The core shall be oriented so that the top of the core is at the top of the photo. One set of 3 x 5 inch glossy color prints plus all negatives shall be sent to USATHAMA via registered mail within 2 weeks of the last coring. Each photo shall be annotated on the back as to the bore/well designation, box number, and cored depths denoted in the photograph. The photos shall be used to enhance the interpretation of core sketches and corresponding narrative descriptions.

e. All rock core, except that for analysis and reference, shall remain onsite, neatly stored at a USATHAMA-designated location. The disposition of these samples will be arranged between USATHAMA and the host installation.

14. Drilling in Contaminated Areas. Many borings and wells are drilled in areas that are clean relative to the deeper horizons of interest. However, circumstances do arise which require drilling where the overlying soils or shallow aquifer may be contaminated relative to the underlying environment. This situation requires the placement of, at least, double casing: an outer permanent (or temporary) casing sealed in place and cleaned of all previous drill fluids prior to proceeding into the deeper, "cleaner" environment. These situations shall be addressed by the contractor on a case-by-case basis in the technical plan.

15. Equipment Cleaning. The steam cleaning of all drilling equipment to include rigs, water tanks (inside and out), augers, drill casings, rods, samplers, tools, recirculation tanks, etc., shall be done prior to project site (installation) arrival followed by onsite steam cleaning with approved water (III.A.10.b.) upon site arrival and between boring/well sites. Prior to use onsite, all casings, augers, recirculation and water tanks, etc., shall be devoid both inside and out of any asphaltic, bituminous, or other encrusting or coating materials, grease, grout, soil, etc. Paint, applied by the equipment manufacturer, need not be removed from drilling equipment. To the extent practical, all cleaning shall be performed in an area that is remote from and surficially cross- or downgradient from any site to be sampled.

16. Work Area Restoration, Disposal of Borehole Cuttings and Well Water. All work areas around the wells and/or borings installed as part of this contract shall be restored to a physical condition equivalent to that of preinstallation. This includes cuttings removal or spreading and rut removal. Borehole cuttings, drilling fluids, and water removed from a well during installation, development, aquifer testing, and presample purging shall be disposed of in a manner approved by the Contracting Officer and the host installation. The contractor shall suggest a disposal procedure and location(s) as part of his technical plan.

17. Physical Security.

a. On Post: While physical security measures are present on most Army properties, the contractor has the ultimate responsibility for securing his own equipment. The contractor shall address any special needs to the onsite installation personnel and include these items in his technical plan.

b. Off Post: For any operations off post, the contractor is totally responsible for his own physical security.

B. Borehole Logging. Each boring log shall fully describe the subsurface environment and the procedures used to gain that description.

1. Format. The format of the boring log shall be determined by the contractor. A suggested format is presented in Figure 4.

2. Submittal. Each original boring log shall be submitted directly from the field to the Contracting Officer's designated office within three working days after the boring is completed. In those cases where a monitor well or other instrument is to be inserted into the boring, both the log for that boring and the installation diagram must be submitted within three working days after the instrument is installed.

3. Originals. Only the original boring log (and diagram) shall be submitted from the field to fulfill the above requirement. Carbon, typed, or reproduced copies shall not suffice.

4. Time of Recording. Logs shall be recorded directly in the field without transcribing from a field book or other document. This technique reduces offsite work hours for the geologist, lessens the chance for errors of manual copying, and allows the completed document to be field-reviewed closer to the time of drilling.

5. Routine Entries. In addition to the data desired by the contractor and uniquely required by contract, the following information shall be routinely entered on the boring log or attached to the log:

a. Depths/heights shall be recorded in feet and fractions thereof (tenths or inches). Metric measurements are acceptable if typically used by the geologist. The DMS does not accept entries in inches.

b. Soil classifications shall be in accordance with the Unified Soil Classification System (equivalent to ASTM D 2487-69).

c. Soil classifications shall be prepared in the field at the time of sampling by the geologist and are subject to change based upon laboratory tests and/or subsequent review. The mere difference between laboratory and field classification is not sufficient to change the field classification. Additional factors to consider before changing a field determination include the expertise of the field geologist and laboratory personnel, representative character of the tested sample, labeling errors, etc. Any changes made after this consideration shall be discussed and incorporated in the project report(s). The contractor shall also initiate any subsequent corrections to the Data Management System.

d. Each soil sample taken (see III.A.12.) shall be fully described on the log. The descriptions of intact samples shall include the following parameters:

PARAMETER	EXAMPLE
Classification	Sandy Clay
Unified Soil Classification System Symbol	CL
Secondary Components and Estimated Percentages	Sand: 25% (Fine sand 5%, Coarse sand 20%)
Color (using Munsell Soil or Geological	Gray: 7.5 YR 5.0 (Munsell)

Society of America (GSA) Rock Color Chart), give both narrative and numerical description and note which chart used.	
Plasticity	Low Plasticity
Consistency (cohesive soil)	Stiff
Density (non-cohesive soil)	Loose
Moisture Content. Use relative term. Do not express as a percentage unless a value has been measured.	Dry, moist, wet, etc.
Texture/Fabric/Bedding and Orientation	No apparent bedding: numerous vertical, iron-stained, tight fractures
Grain Angularity	Rounded
Depositional Environment and Formation, if named	Glacial till, Twin Cities Formation

e. In the field, visual numeric estimates shall be made of secondary soil constituents; e.g., "silty sand with 20 percent fines" or "sandy gravel with 40 percent sand." If such terms as "trace," "some," "several," etc., are used, their quantitative meaning is to be defined on each log or within a general legend.

f. When used to supplement other sampling techniques, disturbed samples; e.g., wash samples, cuttings, and auger flight samples, shall be described in terms of the appropriate soil/rock parameters to the extent practical. "Classification" shall be minimally described for these samples, along with a description of drill action and water losses/gains for the corresponding depth.

g. Rock core shall be visually described for the following parameters:

PARAMETER	EXAMPLE
Classification	Limestone, Sandstone, Granite
Lithologic Characteristics	Shaly, Calcareous, Siliceous, Micaceous
Bedding/Banding Characteristics	Laminated, Thin bedded, Massive, Cross bedded, Foliated
Color (using Munsell Soil or GSA Rock Color Chart), give both narrative and numerical description and note which chart was used.	Mod. brown: 5 YR 3/4 GSA

Hardness	Soft, Very hard
Degree of Cementation	Poorly cemented, Well cemented
Texture	Dense, Fine-, Medium-, Coarse-grained, Glassy, Porphyritic, Crystalline
Structure and Orientation	Horizontal bedding, Dipping beds at 30°, Highly fractured, Open vertical joints, Healed 30° faults/ fractures, Slickensides at 45°, Fissile
Degree of Weathering	Unweathered, Badly weathered
Solution or Void Conditions	Solid, Cavernous, Vuggy with partial infilling by clay
Primary and Secondary Permeability, include estimates and rationale	Low primary: Well cemented High secondary: Several open joints
Lost Core, interval and reason for loss	50-51', noncemented sandstone likely

h. For rock core, provide a scaled graphic sketch of the core on or with the log denoting by depth the location, orientation, and nature (natural or coring-induced) of all core breaks. Note also the intervals by depth of all lost core and hydrologically significant details. This sketch shall be prepared at the time of core logging, concurrent with drilling.

i. Record the brand name and amount of any bentonite used for each boring along with the reason for and start (by depth) of this use.

j. The drilling equipment used shall be generally described either on each log or in a general legend. Record such information as rod size, bit type, pump type, rig manufacturer and model.

k. Each log shall record the drilling sequence; e.g.:

(1) Opened hole with 8" auger to 9'.

(2) Set 8" casing to 10'.

(3) Cleaned out and advanced hole with 8" roller bit to 15' (clean water, no water loss).

(4) Drove standard sampler to 16.5'.

(5) Advanced with 8" roller bit to 30', 15 gallon water loss

(6) Drove standard sampler to 31.5'.

(7) Hole heaved to 20'.

(8) Mixed 25 pounds of ABC bentonite in 100 gallons of water for hole stabilization and advanced with 8" roller bit to 45', etc.

l. Record all special problems and their resolution on the log; e.g., hole squeezing, recurring problems at a particular depth, sudden tool drops, excessive grout takes, drilling fluid losses, unrecovered tools in hole, lost casings, etc.

m. The dates for the start and completion of borings shall be recorded on the log along with notation by depth for drill crew shifts and individual days.

n. Each sequential boundary between the various soils and individual lithologies shall be noted on the log by depth. When depths are estimated, the estimated range shall be noted along the boundary.

o. The depth of first encountered free water shall be indicated along with the method of determination; e.g., "37.6' from direct measurement after drilling to 40.0';" or "40.1' from direct measurement in 60' hole when boring left overnight, hole dry at end of previous shift;" or "25.0' based on saturated soil sample while sampling 24-26'." Allow the first encountered water to partially stabilize (5 to 10 minutes) and record this secondary level and time between measurements before proceeding. Also describe any other distinct water level(s) found below the first.

p. The estimated interval by depth for each sample taken, classified, and/or retained shall be noted on the log. For each driven (split spoon), thin wall (shelby), and cored sample, record the length of sampled interval and length of sample recovery. Record the sampler type and size (diameter and length).

q. Record the blow counts, hammer weight, and length of hammer fall for driven samplers. For thin wall samplers, indicate whether the sampler was pushed or driven. Blow counts shall be recorded in half foot increments when standard (1 3/8" ID by 2" OD) samplers are used. For penetration less than a half foot, annotate the count with the distance over which the count was taken.

r. When drilling fluid is used, quantitatively record fluid losses and/or gains and the interval over which they occur. Adjust fluid losses for spillage and intentional wasting (e.g., recirculation tank cleaning) to more accurately estimate the amount of fluid lost to the subsurface environment.

s. Record the pumping pressures typically used during all rotary drilling operations.

t. Note the total depth of drilling or sampling, whichever is deeper, on the log.

u. Record significant color changes in the drilling fluid return, even when intact soil samples or rock core are being obtained. Include the color change (from and to), depth at which change occurred, and a lithologic description of the cuttings before and after the change.

v. Special abbreviations used on a log and/or well diagram shall be defined either in the log/diagram where used, or in a general legend. The general legend, if used, shall be forwarded to USATHAMA with the first log/diagram submittal. An addendum, if required, shall be sent to USATHAMA with the last log/diagram.

C. Well Installation. In the Geotechnical Requirements, the term "monitor well" is used in a generic sense to include observation wells and piezometers. Observation wells differ from piezometers in the length of the open or screened section of the well and location of the well seal (usually bentonite) in relation to the potentiometric or phreatic surface of the aquifer being measured (see Figure 10). Each monitor well is intended for use as a mechanism through which to obtain a representative sample of groundwater and measure the potentiometric surface seen by that well. The installation of either well type is covered by these Requirements. These Requirements are also applicable to other types of hydrogeologic instrumentation; e.g., lysimeters and well points (see Figure 10). The criteria for these and other special instrumentation will be discussed in the specific RFP/RFQ, contract, task, and/or amendment. Any questions regarding these items should be addressed to the COR.

1. Beginning Well Installation.

a. The installation of each monitor well shall begin within 12 consecutive hours of boring completion for holes uncased or partially cased with temporary drill casing. Installation shall begin within 48 consecutive hours in holes fully cased with temporary drill casing. Once installation has begun, no breaks in the installation process shall be made until the well has been grouted and drill casing removed. Anticipated exceptions shall be requested in writing by the contractor to the Contracting Officer through USATHAMA for consideration prior to drilling. Allow three working days from the time of receipt by USATHAMA for request evaluation and recommendation. Data to include in this request are:

(1) Well(s) in question.

(2) Circumstances.

(3) Recommendation and alternatives.

b. In cases of unscheduled delays such as personal injury, equipment breakdowns, sudden inclement weather; or scheduled delays such as borehole geophysics, no advance approval of delayed well installation is needed. In those cases, resume installation as soon as practical. In cases where a partially cased hole into bedrock is to be partially developed prior to well insertion (III.D.11.), the well installation shall begin within 12 consecutive hours after this initial development.

c. Once begun, well installation shall not be interrupted due to the end of the contractor's/driller's work shift, darkness, weekend, or holiday.

d. The contractor shall ensure that all materials and equipment for drilling and installing a given well are available and onsite prior to drilling that well. The contractor shall have all equipment and materials onsite prior to drilling and installing any well if the total well drilling and installation effort is scheduled to take 14 consecutive days or less. ("Consecutive days" refers to the continuous combination of "working" and "nonworking days;" i.e., "calendar days."). For longer schedules, the contractor shall ensure that the above materials needed for at least 14 consecutive days of operation are onsite prior to well drilling. The balance of materials shall be either on order or in transit prior to well drilling.

2. Screens, Casings, and Fittings.

a. Typically, only polyvinyl chloride (PVC), polytetrafluoroethylene (PTFE), and/or stainless steel shall be used. All PVC screens, casings, and fittings shall conform to National Sanitation Foundation (NSF) Standard 14 for potable water usage (or American Society for Testing and Materials (ASTM) equivalent) and bear the appropriate rating logo. If a contractor uses a screen and/or casing manufacturer or supplier who removes or does not apply this logo, the contractor shall include in the Technical Plan a written statement from the manufacturer/supplier (and endorsed by the contractor) that the screens and/or casing have been appropriately rated by NSF/ASTM. Specific materials will be specified in the RFP/RFQ or proposed by the contractor in his RFP/RFQ response for the Contracting Officer's approval. All materials shall be as chemically inert with respect to the site environment as technically possible and practical.

b. All well screens shall be commercially fabricated, slotted or continuously wound, and have an inside diameter equal to or greater than the well casing. For PVC and PTFE screens, their schedule/thickness shall be the same as that of the well casing. Stainless steel screens may be used with PVC or PTFE well casing. No fitting shall restrict the inside diameter of the joined casing and/or screen. All screens, casings, and fittings shall be new.

c. All well screens and well casings shall be free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.) and washed with approved water prior to use. Pipe nomenclature stamped or stenciled directly on the well screen and/or blank casing within and below the bentonite seal shall be removed (via SANDING). Solvents shall NOT be used for marking removal. Washed screens and casings shall be stored in plastic sheeting or kept on racks prior to insertion.

d. Well screens shall be placed no more than three feet above the bottom of the drilled borehole.

e. All screen bottoms shall be securely fitted with a threaded cap or plug of the same composition as the screen. This cap/plug shall be within 0.5' of the open portion of the screen (see Figures 5 and 6). No solvents or glues shall be permitted for attachment.

f. Silt traps (also called "cellars") shall not be used. A silt trap is a blank length of casing attached to and below the screen. Their use fosters a stagnant environment which could influence analytical results for trace concentrations.

g. Joints within and between the casing and screen shall be compatibly threaded. Thermally welded joints or couplings shall not be used. This prohibition includes threaded or slip joint couplings thermally welded to casing by the manufacturer or in the field. Solvent welded joints may be used only to make casing repairs or to adjust casing height. Any glue or solvent usage shall be described on the log or well diagram. During these repairs or adjustments which require solvent/glue usage, a clean rag should be tightly fit into the intact well casing to catch any glue spillage. This rag shall be attached to a strong twine for ease of rag removal and to preclude rag loss dow the well. The rag and twine shall be removed upon repair completion.

h. Gaskets shall not be used on monitor wells.

i. The top of each well installed under these Requirements shall be level such that the difference in elevation between the highest and lowest part of the well casing/riser shall be less than or equal to 0.02'.

3. Caps and Vents. The tops of all well casings shall be telescopically capped with loosely fitting PVC, PTFE, or stainless steel covers. These covers shall be constructed to preclude binding to the well casing due to tightness of fit, unclean surface, or frost and secure enough to preclude debris and insects from entering the well. No vents shall be placed these caps (or well risers/stickup). Therefore, the caps shall be loose enough to allow pressure equalization between the well and atmosphere.

4. Centralizers. Well centralizers, when used, shall be of PVC, PTFE, or stainless steel and attached to the casing via stainless steel fasteners or strapping. Centralizers shall not be attached to the well screen or to that part of the well casing exposed to the granular filter or bentonite seal.

5. Granular Filter Pack.

a. All granular filters must be approved by the Contracting Officer prior to drilling. A one-pint representative sample of each proposed granular filter pack, accompanied by the data below, III.C.5.a.(1)-(6), shall submitted by the contractor to the Contracting Officer through USATHAMA for consideration prior to drilling. Allow eight working hours for evaluation and recommendation once all of the above data are received by USATHAMA. Each sample shall be described, in writing (see Figure 3), in terms of:

(1) Lithology.

(2) Grain size distribution.

(3) Brand name, if any.

(4) Source, both manufacturing company and location of pit quarry of origin.

(5) Processing method; e.g., pit run, screened and unwashed, screened and washed with water from well/river/pond, etc.

(6) Slot size of intended screen.

b. Granular filter packs shall be chemically and texturally clean (as seen through a 10X hand lens), inert, siliceous, and of appropriate size for the well screen and host environment.

c. The filter pack shall extend above the top of the screen by at least five feet, unless otherwise specified in the statement of work.

d. The final depth to the top of the granular filter shall be directly measured (via tape or rod) and recorded. Final depths are not to be estimated; as, for example, based on volumetric measurements of placed filter.

6. Bentonite Seals.

a. Bentonite seals shall be composed of commercially available pellets. Pellet seals shall be a minimum of five feet thick as measured immediately after placement, without allowance for swelling.

b. Slurry seals shall be used only as a last resort, as when the seal location is too far below water to allow for pellet or containerized-bentonite placement or within a narrow well-borehole annulus. Slurry seals shall have a thick, batter-like (high viscosity) consistency with a placement thickness of five feet maximum.

c. In wells designed to monitor bedrock, the top of the bentonite seal shall be located at least three feet below the top of firm bedrock, as may be determined by drilling. "Firm bedrock" refers to that portion of solid or relatively solid, moderately to unweathered bedrock where the frequency of loose and fractured rock is markedly less than in the overlying, highly weathered bedrock. The interval between the top of the bentonite seal and the top of the highly weathered bedrock shall be filled with grout. Figure 6 denotes the seal location.

d. The final depth to the top of the bentonite seal shall be directly measured (via tape or rod) and recorded. Final depths are not to be estimated; as, for example, based on volumetric measurements of placed bentonite.

7. Grouting. Grout mix design and placement are detailed in paragraph III.A.10.c.

8. Well Protection.

a. Protective casing shall be installed around each monitor well the same day as initial grout placement around that well. Any annulus formed between the outside of the protective casing and borehole shall be filled to ground surface with grout as part of the grouting procedure. Requests for exceptions in usage, design, and timing of placement will be considered on a case-by-case basis by the Contracting Officer. Request in writing shall be made prior to drilling. Include in the request the well(s) involved, reason for request, cost savings, recommendation, and alternatives. Allow six working days for evaluation and recommendation after the request is received by USATHAMA.

b. All protective casing shall be steam cleaned prior to placement, free of extraneous openings, devoid of any asphaltic, bituminous, encrusting, and/or coating materials (except the black paint or primer applied by the manufacturer).

c. Minimum elements of protection design include:

(1) A 5-foot minimum length of new, black iron/steel pipe extending about 2.5 feet above ground surface and set in grout (see Figures 5, 6 and 7).

(2) An 8" protector pipe for 5" wells.

(3) A 6" protector pipe for 4" wells.

(4) A 5" protector pipe for 3" wells.

(5) A 4" protector pipe for 2" wells.

(6) A hinged cover or loose fitting telescoping cap to keep direct precipitation and cover runoff out of the casing.

(7) All protective casing covers/caps secured to the casing by means of a padlock from the date of protective casing installation..

(8) All padlocks at a given site (Army installation) opened by the same key. The contractor shall provide two of these keys to a Contracting Officer's designated representative at the installation and two keys to USATHAMA upon the conclusion of well placement.

(9) No more than .2' from the top of protective casing to the top of well casing. This, or a smaller spacing, is critical for subsequent water level determination via acoustical equipment.

(10) The outside only of the protective casing, hinges (if present), and covers/caps painted orange with a paint brush (not aerosol can). Painting required to be completed and dry prior to initially sampling that well. Any color deviations will be conveyed to the contractor by the COR.

(11) The painting of the well designation on the outside of the protective casing, using white paint and a brush. The identification shall be done after the casing is painted as described above. Painting required to be completed and dry prior to initially sampling that well.

(12) The erection of four steel pickets, each radially located 4 feet from each well, placed 2 to 3 feet below ground surface, having 3 feet minimally above ground surface with flagging in areas of high vegetation (see Figure 7). The pickets shall be painted orange, using a brush. Installation and painting shall be completed (and dry) prior to sampling the well.

III.C.8.c.

(13) The above pickets (III.C.8.c.(12)) shall be supplemented with three-strand barbed wire in livestock grazing areas. Installation required prior to sampling.

(14) The placement of an internal mortar collar within the well-protective casing annulus from ground surface to 1/2 foot above ground surface with a 1/4" diameter hole (drainage port) in the protective casing centered 1/8" above this level (see Figures 5 and 6). The mortar mix shall be (by weight) 1 part cement to 2 parts sand (the granular filter used around the well screen), with minimal water for placement. Placement required at least 48 consecutive hours prior to well development.

(15) The application of an approximately .5' thick coarse gravel (3/4" to 3" particle size) blanket extending 4' radially from the protective casing (see Figure 8 for layout and dimensions). Application required prior to development.

(16) Unique specifications for flood protection, if applicable, will be covered on a case-by-case basis.

9. Drilling Fluid Removal. When a borehole, made with or without the use of drilling fluid, contains an excessively thick, particulate-laden fluid which would preclude or practically hinder contractual well installation, the borehole fluid should be removed or displaced with approved water (section III.A.10.b.). This removal is intended to remove or dilute the thick fluid and thus allow the proper placement of casing, screen, granular filter, and seal. Fluid losses in this operation shall be initially recorded on the well diagram or boring log and later on the well development record (also see III.D.6., 11., and 14.). Any fluid removal prior to well placement is contingent upon the driller's and the geologist's evaluation of hole stability long enough for the desired well and seal placement.

10. Drilling Fluid Losses in Bedrock. For an option to remove drilling water from bedrock prior to well insertion, see paragraph III.D.11.

11. Schematic Well Construction. Figures 5 and 6 depict schematic well construction. Specific contract requirements described in the statement of work may alter some of the components and/or values shown.

12. Well Construction Diagrams.

a. Each installed well shall be depicted in a well diagram. This diagram shall be attached to the bore log for that installation and shall graphically denote, by depth from ground surface (unless otherwise specified):

(1) The bottom of the boring (that part of the boring most deeply penetrated by drilling and/or sampling) and boring diameter(s).

(2) Screen location.

(3) Joint locations.

(4) Granular filter pack.

(5) Seal.

(6) Grout.

(7) Cave-in.

(8) Centralizers.

(9) Height of riser without cap/plug above ground surface (stickup).

(10) Protective casing detail.

(a) Height of protective casing without cap/cover (above ground surface).

(b) Base of protective casing.

(c) Drainage port location and size.

(d) Internal mortar collar location.

(e) Gravel blanket height and extent.

(f) Picket configuration.

b. Describe on the diagram or on an attachment thereto:

(1) The actual quantity and composition of the grout, seals, and granular filter pack used for each well.

(2) The screen slot size (in inches), slot configuration, total open area per foot of screen, outside diameter, nominal inside diameter, schedule/thickness, composition, and manufacturer.

(3) The outside diameter, nominal inside diameter, schedule/thickness, composition, and manufacturer of the well casing.

(4) The joint design and composition.

(5) Centralizer design and composition.

(6) Protective casing composition and nominal inside diameter.

(7) The use of solvents, glues, and cleaners to include manufacturer and type (specification).

(8) Special problems and their resolutions; e.g., grout in wells, lost casing and/or screens, bridging, etc.

(9) Dates for the start and completion of well installation.

c. Each diagram shall be attached to the boring log and submitted from the field to the Contracting Officer's designated office within three working days after well installation. Do not delay this submission until all elements of well protection have been installed. Submit a supplemental diagram for well protection elements to the same designated office within three working days after all elements of well protection are installed.

d. Only the original well diagram and log shall be submitted to fulfill the above requirement. Carbon, typed, or reproduced copies shall not suffice. A legible copy of the well diagram may be used as a base for the supplemental protection diagram.

e. For abbreviations in the diagrams, see section III.B.5.v.

D. Well Development and Presample Purging.

1. Development: Definition and Purpose. As used herein, "well development" is that process by which one restores the aquifer's hydraulic conductivity and removes well drilling fluids, solids, and other mobile particulates from within and adjacent the newly installed well. "Development" can also refer to that process whereby one removes sediment or other built-up materials from a "clogged," older well. The resulting inflow should be as physically and chemically representative of the host aquifer as the following procedures allow for a newly installed well.

2. Timing and Record Submittal. The development of monitor wells shall be initiated not sooner than 48 consecutive hours after nor longer than 7 calendar days beyond internal mortar collar placement. The record of well development (see section III.D.14.) shall be submitted to the COR within three working days after development.

3. Pump and Bailer Usage. Development shall be accomplished with a pump and may be supplemented with a bottom discharge/filling bailer (for sediment removal) and surge block. A bottom discharge/filling bailer may be used in lieu of a pump in 2-inch wells. Bailers shall not be left inside the wells after development is completed.

4. Development Criteria. Development shall proceed in the manner described herein and continue until all the following are met:

a. The well water is clear to the unaided eye.

b. The sediment thickness remaining within the well is less than 1% of the screen length.

c. The conditions of paragraph III.D.5. (below) are met.

5. Volumetric Removal. In addition to minimally removing five times the standing water volume in the well (to include the well screen and casing plus saturated annulus, assuming 30% porosity), the following ap[illegible]:

a. For those wells where the boring was made by t[illegible] use of cable tool, auger, or air rotary methods and without the use of drill[illegible] fluid (mud and/or water), only the five volumes plus five times any water used in granular filter pack placement need be minimally removed. Should recharge be so slow that the required volume cannot be removed in 48 consecutive hours, the water remains discolored, or excess sediment remains after the five volume removal; contact the Contracting Officer's designated office for guidance.

b. For those wells where the boring was made or enlarged (totally or partially) with the use of drilling fluid (mud and/or water), remove five times the measured amount of total fluids lost while drilling plus five times the combined amount of standing water,annular water, and that used in filter pack placement as above. The same procedures apply here as above with respect to slow recharge, discoloration, and sediment thickness.

c. See sections III.C.9., III.D.6., and III.D.11. for optional procedures and the requirements if these options are used.

6. Water Additions and Wells with Thick Fluids. Water shall not be added to a well as part of development once the initial seal is placed. However, when a bore, made with or without the use of drilling fluid, contains an excessively thick, particulate-laden fluid which would preclude or practically hinder contractual well installation, the contractor should purge or dilute this fluid with clean water from the approved source (also see III.C.9.). A record of purging fluid losses shall be made on both the log or diagram and well development record (III.D.14.). Five times the volume of this loss shall be added to the other volumetric removal requirements for well development.

7. Agents and Additives. No dispersing agents, acids, disinfectants, or other additives shall be used during development or at any other time introduced to the well.

8. Development-Sampling Break. Well development shall be completed at least fourteen consecutive days before well sampling.

9. Pump/Bailer Movement. During development, water shall be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

10. Development Water Sample. For each well, a one-pint sample of the last water to be removed during development shall be obtained and given to the installation environmental coordinator (or USATHAMA-specified individual) for disposition, within three working days of developing that well. No preservation of these samples is required. However, the contractor shall ensure that these samples do not freeze while in his possession.

11. Partial Bedrock Development. If large drilling water losses occur in bedrock and if the hole is cased to bedrock, the contractor may remove at least five times this volumetric loss prior to well insertion. The intent here is to allow the placement of a larger pump in the borehole than otherwise possible in the well casing thereby reducing the development time and removing the lost water closer to the time of loss. Development of the completed well could then be reduced by a volume equal to that which was removed as above. However, the requirement shall still remain to remove at the time of well development at least five times the combination of standing water, water in the saturated annulus, plus that which was added during filter pack placement. Record the amount removed per above on the well diagram and in the well development record (III.D.14.).

12. Well Washing. Part of well development shall be the washing of the entire well cap and the interior of the well casing above the water table using only water from that well. The result of this operation shall be a well casing free of extraneous materials (grout, bentonite, sand, etc.) inside the riser, well cap, and blank casing between the top of the well casing and the water table. This washing shall be conducted before and/or during development, not after development.

13. Problems. If problems are encountered during development, contact the COR within 24 consecutive hours for guidance.

14. Well Development Record Requirements. The following data shall be recorded as part of development and submitted per section III.D.2.:

a. Well designation.

b. Date(s) of well installation.

c. Date(s) of well development.

d. Static water level from top of well casing before and 24 consecutive hours after development.

e. Quantity of mud/water:

(1) Lost during drilling.

(2) Removed prior to well insertion (III.D.11.).

(3) Lost during thick fluid displacement (III.C.9. and III.D.6.).

(4) Added during granular filter placement.

f. Quantity of fluid in well prior to development.

(1) Standing in well.

(2) Contained in saturated annulus (assume 30% porosity).

g. Field measurement of pH before, twice during, and after development using an electrometric device (EPA 150.1-Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020).

h. Field measurement of specific conductance (electrical conductivity) before, twice during, and after development using a conductivity meter (EPA 120.1-Methods for Chemical Analysis of Water and Wastes, EPA 600/4 - 79-020). Obtain conductance and pH readings concurrently.

i. Depth from top of well casing to bottom of well (from diagram).

j. Screen length (from diagram).

k. Depth from top of well casing to top of sediment inside well, before and after development.

l. Physical character of removed water, to include changes during development in clarity, color, particulates, and odor.

m. Type and size/capacity of pump and/or bailer used.

n. Description of surge technique, if used.

o. Height of well casing above ground surface.

p. Typical pumping rate.

q. Estimated recharge rate.

r. Quantity of fluid/water removed and time for removal (present both incremental and total values).

15. Presample Purging: Definition and Purpose. "Presample purging" refers to the removal of water from a well IMMEDIATELY prior to sample acquisition. This ensures a fresh and representative sample for analysis. In general, the USATHAMA Installation Restoration Program, Quality Assurance Program requires five times the calculated volume of water in the well and saturated well annulus to be removed immediately prior to sampling. Therefore, any water removed from a well as part of "development" shall not be counted toward the volumetric removal required in presample purging. Additional presample purging requirements are discussed in the current USATHAMA Quality Assurance Program.

E. Water Levels.

1. Measurement and Datum. The depth to groundwater shall be measured from the highest point on the rim of the well casing or riser (not protective casing). This same point on the well casing shall be surveyed for vertical control (see III.I.2). The depths to groundwater shall be converted to elevations for report usage. To enter the depths into the Data Management System, the well riser height above ground surface (stickup) must be subtracted from the above measured depth.

2. Contour Requirements. For contouring and reporting purposes, at least one complete set of static water level measurements shall be made over a single, consecutive 10-hour period for all wells (newly installed and specified) in the project. Static levels in borings not converted to wells shall be included if practical and technically appropriate.

3. Ground and Surface Water. Determine and report the elevations, to within $\pm$ 0.1 foot, of any streams, lakes, or open water bodies (natural and man-made), within 300 feet of monitor wells used in this contract or task. Use these data for the refinement of the groundwater contours in the vicinity of surface water if a hydrological connection is believed to exist.

F. Well and Boring Acceptance Criteria.

1. Well Criteria. Wells must be acceptable to the Contracting Officer. Well acceptance shall be on a case-by-case basis. The following criteria shall be used along with individual circumstances in the evaluation process.

a. The well and material placement shall meet the construction and placement specifications of these Geotechnical Requirements as modified, if at all, by the contract/task.

b. Wells/boreholes shall not contain portions of drill casing or augers unless they are contractually required as permanent casing.

c. All well casing and screen materials shall be free of any unsecured couplings, ruptures or other physical breakage/defects before and after installation.

d. The annular material (filter pack, bentonite, and grout) surrounding each installed well shall form a continuous and uniform structure, free of any fractures or cracks.

e. Any casing or screen deformation or bending shall be minimal to the point of allowing the insertion and retrieval of the pump and/or bailer optimally designed for that size casing (e.g., a 4-inch pump in a 4-inch schedule 40, PVC casing is optimal; a 2-inch pump in a 4-inch casing is not optimal).

f. All joints shall be constructed to provide a straight, nonconstricting, and water-tight fit.

g. Installed wells (fully or partially cased) shall be free of extraneous objects or materials (e.g., tools, pumps, bailers, packers, excessive sediment thickness, grout, etc.).

h. For those monitor wells where the screen depth was determined by the contractor, the well shall have sufficient free water at the time of water level measurement (III.E.2.) to obtain a representative groundwater level for that site. These same wells shall have sufficient free water, at the time of initial sampling, which is representative of the desired portion of the aquifer for the intended chemical analysis.

i. Data for all required geotechnical files in the Data Management System shall be acceptably entered and verified by the contractor.

2. Abandoned Borings and Wells. Borings not completed as wells shall be abandoned per section III.A.11. and the data therefrom acceptably entered and verified by the contractor into the Data Management System.

3. Well and Boring Rejection. Wells and borings not meeting these criteria are subject to rejection by the Contracting Officer.

G. Geophysics. The use of geophysical techniques, if required, will be specified in the RFP/RFQ. In the absence of this specification, the contractor should consider these techniques for site-specific applicability to enhance the technical acuity and cost-effectiveness of his efforts. Special applications may be useful in unexploded ordnance detection, disturbed area delineation, contaminant detection, depth to bedrock, buried drum detection, borehole and well logging, etc. When proposed for Contracting Officer approval, the contractor shall include the purpose, particular method(s) and equipment, selection rationale, methods and procedural assumptions, limitations (theoretical and site-specific), resolution, and accuracy. The contractor shall also address the safety aspects of geophysical applications in his proposal and Safety Plan, especially for those areas where induced electrical currents or seismic waves could detonate unexploded ordnance or other explosive materials. If geophysical techniques are used, the same topics shall be addressed in the geotechnical report.

H. Vadose Zone Monitoring. Data acquisition from the vadose (unsaturated) zone shall be addressed on a case-by-case basis. The use of lysimeters in a silica flour matrix, soil-gas monitors, and analysis of bulk soil samples are mechanisms which may be employed by the contractor. When proposed for Contracting Officer approval, the contractor shall include the purpose, particular method(s) and equipment, selection rationale, methods and procedural assumptions, limitations (theoretical and site-specific), and analytical variances from the current USATHAMA <u>Quality Assurance Program</u>.

I. Topographic Survey.

1. Horizontal Control. Each boring and/or well installed under this contract shall be topographically surveyed by a licensed surveyor to determine its map coordinates using a Universal Transverse Mercator (UTM) or State Planar grid to within ± 3' (± 1 meter).

2. Vertical Control. Elevations for the natural ground surface (not the top of the coarse gravel blanket) and the highest point on the rim of the uncapped well casing (not protective casing) for each bore/well site shall be surveyed by a licensed surveyor to within ± 0.05' (± 1.5 centimeters) using the National Geodetic Vertical Datum of 1929.

3. Field Data. The topographic survey shall be completed as near to the time of last well completion as possible, but no longer than five weeks after well installation. Survey field data (as corrected), to include loop closure for survey accuracy, shall be included within the geotechnical or final report. Closure shall be within the horizontal and vertical limits given above. These data shall clearly list the coordinates (and system) and elevation (ground surface, top of well, and protective casings) as appropriate, for all borings, wells, and reference marks. All permanent and semipermanent reference marks used for horizontal and vertical control (bench marks, caps, plates, chiseled cuts, rail spikes, etc.) shall be described in terms of their name, character, and physical location.

J. Data Management System.

1. Usage of the Data Management System (DMS) is a means to record and monitor contract performance; store, compare, and evaluate data; and provide cost-efficient, report quality tables and graphics. The System is thereby useful to both administrative and technical users.

2. The geotechnical data acceptably entered in the computer shall be regarded as having the technically best quality for evaluation and decision making. Any deviation from the field data shall be specified and discussed by the contractor in the geotechnical report (see III.B.5.c. and III.K.3.j.(6)).

3. To computerize all of the field-generated data would be neither useful nor cost-effective for most projects. Therefore, only those items specified in III.J.6. shall be acceptably entered on a routine basis by the contractor for each contract or task. These data shall be entered for new borings, wells, and other sampling points; e.g., existing wells, surface water, sediment, and soils, specified in the contract or task. If the contractor wishes to use additional geotechnical files or entries, the contractor shall first receive COR's approval.

4. The items selected for DMS entry shall be entered in one or more of four geotechnical files:

a. Map File (GMA).

b. Field Drilling File (GFD).

c. Well Construction File (GWC).

d. Groundwater Stabilized File (GGS).

5. These files, and others, along with data entry procedures are fully described in Sections 3 and 4 of the Installation Restoration Data Management User's Guide. Additional geotechnical files are available but are not routinely used. The contract or task will specify additional files to be completed, if required.

6. The following lists, arranged by file, denote those items which the contractor shall acceptably enter and verify. Consult the DMS User's Guide for specific coding.

a. Map File (GMA).

(1) Installation.

(2) Site Type.

(3) Site Identification/Site Number.

(4) Coordinates and Coordinate System.

(5) Ground Surface Elevation.

(6) Source and Accuracy of Mapping Data.

(7) Aquifer.

(8) Pointer Information (cross reference for each boring and associated well(s)).

(9) Source of Data (company and individual).

b. Field Drilling File (GFD).

(1) Installation.

(2) Site Type.

(3) Site Identification.

(4) Depth to First Encountered Water.

(5) Depth to Bedrock.

(6) Depth to Deepest Part of Boring.

(7) Unified Soil Classification System Symbol (expanded for bedrock lithologies).

(8) Lithologic Intervals (by depth and thickness).

(9) Source of Data (company and individual).

(10) Dates.

c. Well Construction File (GWC). The abbreviations in parentheses which follow are the "Action Measurements," as explained in the <u>User's Guide</u>.

(1) Installation.

(2) Site Type.

(3) Site Identification.

(4) Stickup (STKUP).

(5) Bentonite Seal Interval (BSEAL).

(6) Blank Well Casing Interval (CASE).

(7) Well Casing Diameter (CASED).

(8) Length of Overburden Casing (CSEAL).

(9) Overburden Casing Diameter (CASES).

(10) Total Depth of Boring (DPTOT).

(11) Filter Pack Interval (GFILT).

(12) Grout Interval (GROUT).

(13) Screen Interval (SCREN).

(14) Dates.

(15) Source of Data (company and individual).

d. Groundwater Stabilized File (GGS).

(1) Installation.

(2) Site Type.

(3) Site Identification.

(4) Depth to Water (from ground surface).

(5) Date(s) Measured.

(6) Source of Data (company and individual).

7. Figures 11 to 15 are provided as examples of completed DMS coding sheets for each of the above files using the example boring log and well diagram (Figures 4 and 6, respectively). Additional data required for coding but not shown on Figures 4 or 6 follow:

a. Abbreviations:

GP = General AAP
PALEO = Code used for aquifer at General AAP.

b. Field Data:

(1) Surveyed coordinates for boring in UTM system are:

X : 54321 centimeters
and Y : 99876 centimeters.

(2) Surveyed ground surface elevation for boring is 4321 centimeters, using National Geodetic Vertical Datum of 1929.

(3) Well 87-14 is located in the same hole made by boring 87-14.

(4) Cement grout proportioned per these Requirements (cement:bentonite = 20:1).

(5) Well screen: 4" PVC, Schedule 40, .01 inch slot.

(6) Well installed 8 Nov 87.

(7) Water levels recorded by Mr. Smith after development were as follows:

Date	Depth from Top of Riser (ft)
12 Nov 87	9.0

20 Dec 87	9.7
04 Jan 88	11.4

K. Geotechnical Reports.

1. General. Requirements of the geotechnical report are discussed herein along with required guidelines for the technical writing style. When a separate geotechnical report is not required per contract, the elements herein shall be incorporated into the final contract/task report(s).

2. Report Contents. The geotechnical report shall contain as a minimum:

a. Title page.

b. Disclaimer.

c. DD Form 1473.

d. Abstract.

e. Table of Contents.

f. Background.

g. Regional Geology.

h. Site Geology.

i. Methodology.

j. Significant Conclusions.

k. Geotechnical Analysis.

l. Recommendations.

m. References.

n. Bibliography.

o. Appendices.

(1) Boring Logs.

(2) Well Diagrams.

(3) Well Development.

(4) Water Levels.

(5) Special Problems and Resolution.

(6) Aquifer Testing and Hydraulic Parameters.

(7) Geophysical Data.

(8) Vadose Zone Monitoring data.

(9) Physical Analyses.

(10) Topographic Survey Data.

p. Distribution List.

3. Content Details. Details of the above items are listed below:

a. Title Page. The title page contains the following:

(1) Title.

(2) Author(s).

(3) Company (prime contractor).

(4) Report Date.

(5) Report/Contract Number (provided by USATHAMA).

(6) Distribution Statement (statement indicating the agency authorized to release the report, provided by USATHAMA).

(7) Organization(s) for which report was prepared (typically a Department of the Army installation and USATHAMA).

(8) USATHAMA Address.

b. Disclaimer. The following "DISCLAIMER" shall immediately follow the title page:

"DISCLAIMER"

"The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other documentation.

The use of trade names in this report does not constitute an official endorsement or approval of the use of such commercial products. This report may not be cited for purposes of advertisement."

c. Department of Defense (DD) Form 1473. This form shall be completed by the contractor. The data for blocks 1, 2, 3, 5, and 20 will be furnished by USATHAMA. A blank form is shown in Figure 9.

d. Abstract. The abstract is a summary of purpose, setting, and significant conclusions. This abstract should be more detailed than that given on the DD Form 1473.

e. Table of Contents. This item shall contain:

(1) Major Headings.

(2) Page Numbers.

(3) Figures, Tables, Plates (separately listed).

f. Background. Provide the objective of the geotechnical effort and a discussion of the contractor's corporate involvement within total survey.

g. Regional Geology. Include a discussion of the following topics for adjacent counties and states (as appropriate).

(1) Setting. Include maps and graphics for:

(a) Topography.

(b) Geomorphology.

(c) Physiography.

(d) Drainage.

(2) Stratigraphy. Include a complete, ideal sequence.

(3) Structure and Seismic Activity. Include cross sections.

(4) Hydrology. Include a discussion of surface and groundwater occurrences, drainage area, cross sections, and contour plots of potentiometric surfaces.

h. Site Geology. Discuss site specifics and how the site conforms and/or departs from the regional discussion based upon the knowledge gained from this study.

(1) Setting. Include local aspects of the regional setting.

(2) Stratigraphy. Discuss the sequence encountered.

(3) Structure and Seismic Activity. Include cross sections and local seismic history.

(4) Hydrology. Include hydrostratigraphic cross sections, contour plots, and a discussion of the relationship(s) between surface water and each aquifer encountered.

i. Methodology.

(1) Geotechnical Approach. Discuss literature and field considerations, provide boring and well placement rationale for each drilling site, note drilling locations on a detailed installation map and the largest scale U.S. Geological Survey topographic map depicting the installation.

(2) Drilling techniques. Specify the equipment, water source, procedures, and contractor.

(3) Borehole logging. Describe the procedures and specify the contractor.

(4) Well installation. Describe the materials (casing, screen, bentonite, cement, water, filter pack, etc. (see Table 1), construction procedures, and contractor.

(5) Well development. Specify the equipment, procedures, and contractor.

(6) Geophysical techniques. Provide the purpose, methods and equipment, selection rationale, method and procedural assumptions, limitations (theoretical and site-specific), resolution, accuracy, and contractor(s).

(7) Vadose Zone Monitoring. Provide the purpose, particular method(s) and equipment, selection rationale, method and procedural assumptions, limitations (theoretical and site-specific) and contractor(s).

(8) Topographic surveying. Specify the equipment, control systems, procedures, and contractor.

(9) Aquifer Tests. Specify the type of tests, literature reference, equipment, general procedure, and contractor.

(10) Physical Analyses. Provide the type of tests, literature references, and contractor.

j. Geotechnical Analysis.

(1) Provide indepth discussions of those geotechnical areas which were significant to the development of the report's conclusions. Describe any uncertainties or extrapolations of data and their relative importance to the conclusions drawn. Provide the data base, references, and actual calculations (in an appendix if over three pages) for quantitative discussions.

(2) Detail the integration of potential contaminant source locations, geologic, hydrologic, and available chemical data. Include how known or estimated groundwater velocities, directions, and chemical quality correspond to known or suspected up-, down-, and cross-gradient contaminant locations. For example, evaluate the occurrence of contaminants at a down-gradient well in terms of most likely up-gradient source, groundwater velocity and direction known or estimated in that area.

(3) Discuss each contaminant site in terms of the geologic, hydrologic, and (when available) chemical data generated by this study. Combine these individual site presentations into a total installation environmental discussion. Relate the installation environmental setting to the regional level. This site to regional development shall be done graphically with narratives to cover key and subtle points.

(4) Present and evaluate the results of any geophysical efforts in terms of design versus actual results, and actual results versus confirmatory/ground truth data; e.g., water levels, chemical analyses, borehole stratigraphy, etc.

(5) Discuss and evaluate the results of any vadose zone monitoring.

(6) Specify and discuss any soil classifications and any other geotechnical data which were changed from the original field descriptions (see III.B.5.c.).

k. Significant Conclusions. Provide summary discussions of those project results which bear upon the intended survey objectives and related areas. Avoid quantitative conclusions based upon qualitative data. Highlight the limitations imposed upon the extrapolation of quantitative conclusions.

l. Recommendations. In addition to any specific recommendations requested within the Statement of Work, the contractor shall recommend those actions (if any) to refine or fill key data gaps and areas of uncertainty relative to the project objective. Additional recommendations should be made for those areas where a change in technique, methodology, or approach could result in a technical or cost benefit in any future efforts at the installation. The COR will specify whether the recommendations shall be included as part of the geotechnical or final report or be provided under a separate cover.

m. References. List by author, title, publication, volume, date, etc., those sources specifically referenced within the geotechnical report.

n. Bibliography. List as above those sources which provided or could provide general project-related data.

o. Appendices. Include data too bulky to be presented within the main body of the report; e.g., extensive tables or figures, or groups of data covering more than three pages. Where these data are in the DMS, they shall be presented in tabular and/or graphic form by the contractor directly from this System. The contractor shall coordinate with the COR to accomplish this requirement.

(1) Boring Logs. Provide legible copies of the "as submitted" field logs, uncorrected by office review and any lab analyses.

(2) Well Diagrams. Provide a detailed graphical presentation for each well with data per contract, to include hole depth, locations of screen, joints, centralizers, top of riser, top of protective casing, cave-in, granular filter pack, bentonite, grout, etc. Include an adjacent staff with appropriate Unified Soil Classification Symbols/rock classification for the entire length of drilled hole. Also graphically detail the protective measures at the well head; protective casing, pickets, caps, locks, etc. Key these sketches to both ground surface (depths below/heights above) and elevation (National Geodetic Vertical Datum of 1929).

(3) Well Development. Provide contractual data in tabular form.

(4) Water Levels. Provide, in tabular form, a listing of water levels (depths and elevations) for each well to include: well number, ground surface elevation, riser height above ground surface (stickup), riser elevation, first encountered water, initial 24-hour level after development, and subsequent static levels measured during the course of the contract. Each level must be annotated as to date of measurement and point from which measured. At least one complete set of static level measurements must be made and included for all project wells over a ten-hour period.

(5) Special Problems and Resolution. Discuss any special geotechnical problems and their resolution. This topic may be addressed in a separate letter to the COR.

(6) Aquifer Testing and Hydraulic Parameters. For the procedures and parameters required by contract, provide a detailed discussion of methodology used, assumptions made, and accuracy measured. Discuss how field conditions varied from those assumed in the method used. Evaluate the values measured against values reported in similar environments and against the setting and manner in which the values of this study were measured. Include references, field data, graphs of field data (e.g., time vs. drawdown plots), sample calculations for each parameter, and a graphical sketch of the relation between field and equation parameters. Present results in tabular form.

(7) Geophysical Data. Provide the data obtained during the study and any lengthy discussions better suited for an Appendix rather than in the main text.

(8) Vadose Zone Monitoring. Provide the data from any monitoring and any detailed discussions more appropriate for Appendices.

(9) Physical Analyses. Provide the references for all tests run. Include the method and procedures for any permeameter tests. Present the results in tabular form. Also, include grain-size graphs. Provide a discussion of these analyses with respect to permeability, both alone and as a comparison with aquifer test results.

(10) Topographic Survey Data. Provide a corrected, legible copy of the field topographic data; and in tabular form, the corrected coordinates and elevation of each surveyed and key feature, including, bores and wells, bench marks, key control points, etc. For each well, include the elevations of the top of the well riser, protective casing, and ground surface. See paragraph III.I. for more guidance. Provide a statement of closure, indicating the amount of error (in feet) to be expected for each set of coordinates and elevations.

p. Distribution List. This list will be provided by the Contracting Officer.

4. Technical Writing Style.

a. Be quantitative. Use single, numerical values or ranges to convey magnitude, size, extent, etc. When ranges are used, denote the most probable value or a narrower, subrange of most probable occurrence. If qualitative terms must be used, define them within a numerical range.

b. Express confidence. Discuss the degree of confidence within the quantitative values generated. This confidence may be a function of field or lab conditions, technique, equipment, practice vs. theory, experience, personal bias, etc. Quantify the degree of confidence for key parameters such as elevations, velocities, permeabilities, porosities, gradients, etc. This shall be done through the use of (a) ranges with a most probable value, or (b) a single number with a plus-or-minus value attached.

c. For each point raised, provide a complete discussion. Do not leave the reader with unanswered questions which could have been naturally anticipated.

d. For maps, cross sections, boring staffs, well sketches, contour plots, etc., provide graphic scales (both vertical and horizontal) and a north arrow, as appropriate. Orient maps, contour plots, etc., with north toward the top of the page/sheet and orient the legend in the same manner as the map. Orient each graphic and its legend so that both can be easily read without rotating the graphic. Expand the graphics to cover the full paper size. Make all graphics fully and easily legible. Avoid any color coding on graphics. Provide vertical scales on both sides of each cross section and a horizontal scale along the base.

e. Adjust groundwater contours for topography (hills and valleys), streams (discharging, recharging), impermeable bedrock, and other obvious expressions of or alterations to the plotted groundwater contours.

f. Number all pages and denote those intentionally left blank.

g. Make sure separate graphics containing similar data agree. Make sure the field data, as corrected, agree with the graphical, tabular, and narrative presentations. Specify and discuss any changes made to the field data.

h. Address the four dimensional aspects of groundwater flow (X, Y, Z components and time) for each aquifer. The use of flow nets to supplement groundwater profiles and contours is desired.

i. Based on presurvey and survey data, provide hydrogeologic cross sections for the installation. These sections should include boring staffs with Unified Soil (and rock) Classification Symbols, summary well diagrams (with screen and seal locations noted), estimated stratigraphic correlation between borings, and estimated groundwater profiling.

j. USE TABULAR FORMATS WHEREVER PRACTICAL.

k. Provide literature/source credits for all data used or modified by the contractor. Credits shall appear in the text, on graphics, and in the list of references.

III.

L. Summary Lists.

1. Procedural and Material Summary. Table 2 denotes those geotechnical procedures and materials requiring specific USATHAMA-COR approval prior to their usage and the expected times for geotechnical evaluation and recommendations.

2. Document Submission Summary. In addition to those items to be submitted for approval per III.L.1., various documents and items discussed in these Geotechnical Requirements are to be submitted to the COR designated office (typically USATHAMA) after a particular action is completed. These materials and their submission times are summarized in Table 3.

M. FIGURES

BENTONITE APPROVAL REQUEST

Army Installation for Intended Use:

1. Bentonite Brand Name:

2. Bentonite Manufacturer:

3. Manufacturer's Address and Telephone Number:

4. Product Description (from package label or attach brochure):

5. Intended Use:

SUBMITTED BY:

Company:

Person:

Telephone:

Date:

USATHAMA APPROVAL/DISAPPROVAL:	(check one)	
Project Officer/Date:	A	D
Project Geologist/Date:	A	D

BENTONITE APPROVAL REQUEST
FIGURE 1

WATER APPROVAL REQUEST

Army Installation for Intended Use:

1. Water source:

   Owner:

   Address:

   Telephone Number:

2. Water tap location:

   Operator:

   Address:

3. Type of source:

   Aquifer:

   Well depth:

   Static water level from ground surface:

   Date measured:

4. Type of treatment prior to tap:

5. Type of access:

6. Cost per gallon charged by Owner/Operator:

WATER APPROVAL REQUEST
FIGURE 2

7. Attach results and dates of chemical analyses for past two years. Include name(s) and address(s) of analytical laboratory(s).

8. Attach results and dates of duplicate chemical analyses for project analytes by the laboratory certified by, or in the process of being certified by, USATHAMA for those analytes.

SUBMITTED BY:

Company:

Person:

Telephone Number:

Date:

USATHAMA APPROVAL/DISAPPROVAL:	(check one)	
Project Officer:	A	D
Project Geologist/Date:	A	D
Project Chemist/Date:	A	D

WATER APPROVAL REQUEST

FIGURE 2

GRANULAR FILTER PACK APPROVAL REQUEST

Army Installation for Intended Use:

1. Filter Material Brand Name:

2. Lithology:

3. Grain Size Distribution:

4. Source:

   Company that made product:

   Location of pit/quarry of origin:

5. Processing Method:

6. Slot Size of Intended Screen:

Submitted by:

Company:

Person:

Telephone:

Date:

USATHAMA APPROVAL/DISAPPROVAL:	(check one)	
Project Officer Name/Date:	A	D
Project Geologist Name/Date:	A	D

GRANULAR FILTER PACK APPROVAL REQUEST
FIGURE 3

BORING LOG GENERAL DATA

Project: GENERAL AAP Boring: 87-14 Page: 1 of 3

Driller & Company: JACK JONES OF ACME CO

Geologist/Logger & Company: J. SMITH OF ACE CO Signature: J Smith

Date Boring Started: 7 NOV 87 Completed: 8 NOV 87

Water Levels (from Ground Surface) Drilling Rig: ABC 20

First Encountered: 7.0' Date: 8 NOV 87

While Drilling: 7.0 Date: 8 NOV 87

At Boring Completion: NOT MEAS. Date: 8 NOV 87

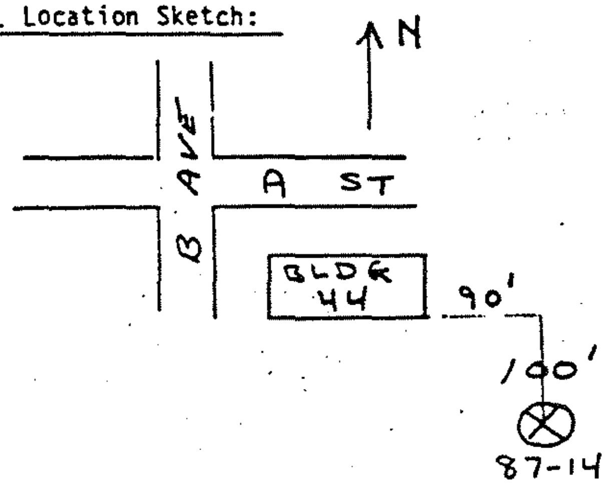
Drilling Shifts:

Date	Time		Depth of Drilling Per Shift		Date	Time		Depth of Drilling Per Shift	
1987	Start	End	Start	End		Start	End	Start	End
7 NOV	1500	1700	0	5					
8 NOV	0800	1700	5	18.5					

Abbreviations:

Abbr	Meaning
3x3 1/2 2x2 1/2	ID & OD OF SPL BBL SAMPLER
STD	1 3/8 X 2 STANDARD SAMPLER
R	RECOVERY
C/B	CORING INDUCED BREAK
NB	NATURAL BREAK
LC	LOST CORE
3X	3X3 1/2 SAMPLER
2X	2X2 1/2 SAMPLER

Location Sketch:



BORING LOG FORMAT

FIGURE 4

Project: GENERAL AAP	Boring: 87-14	Page: 2 of 3

Depth/ Elevation (FT)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		GROUND SURFACE	0		
0	OL	ORG CLAY, SANDY DK RED BRN 5YR 3/4 (MUNSELL) V MOIST, L PLAST ROOTMAT, TOPSOIL	S#1 .8	3x3½ 3	NOTES: 1. ALL SAMPLERS DRIVEN BY 140LB HAMMER, FALLING 30" 2. ALL DEPTHS & RECOVERIES IN FT 3. DEPTHS FROM GROUND SURFACE
.8 1	SM	TRANSITIONAL .8 - 1.5 SILTY SAND 20% FINES F-M SAND < 60% F, 20% M	1.5	2 R1.5 2x2½	
2		MOIST, LOOSE YEL BRN 10YR 5/4	S#2	4	NOTE 0' 1. DROVE 3X TO 1.5' 2. DROVE 2X TO 3.5' 3. DROVE STD TO 5'
3		FAINTLY BEDDED FLAT LYING & X-BEDDED <5% SILTY CLAY (CL) LAMINAE	3.0 3.5	6 R1.5 STD	4. SET HSA W/ PLUG TO 5', PULLED PLUG (HSA: 3¼" ID, 7" OD)
4		FLUVIAL SHARP	S#3 4.6	2 4	
.6 5	SP	SAND <5% FINES F-C SAND { 60% C, 10% M, 25% F	5.0 S#4	5 R1.5 3X 10	END 7 NOV 87 START 8 NOV NOTE 5' 1. HOLE DRY + OPEN TO 5'
6		V MOIST - SAT NO APPARENT BEDDING LOOSE LT RED BRN 5YR 6/4	6.0 6.5	5 R1.0 2X	2. DROVE 3X TO 6.5' 3. DROVE 2X TO 8.5' 4. FREE WATER ON SAMPLER & IN SAMPLE
7		V MOIST SAT FLUVIAL	S#5 7.5	8	5. MEAS. WATER AT 7.0 W/ ELEC TAPE. AFTER 5 MIN, STILL AT 7.0
8		SHARP		10	6. DROVE STD TO 10'
8	GP	SANDY GRAVEL 20% F-C SAND 80% F GRAVEL	8.5	R1.0 STD	7. SET HSA W/ PLUG TO 10', PULL PLUG
9		LT RED BRN 5YR 6/4 MED DENSE SAT, NO APP BED	S#6	2 4	
10		FLUVIAL	9.8	8	

BORING LOG FORMAT

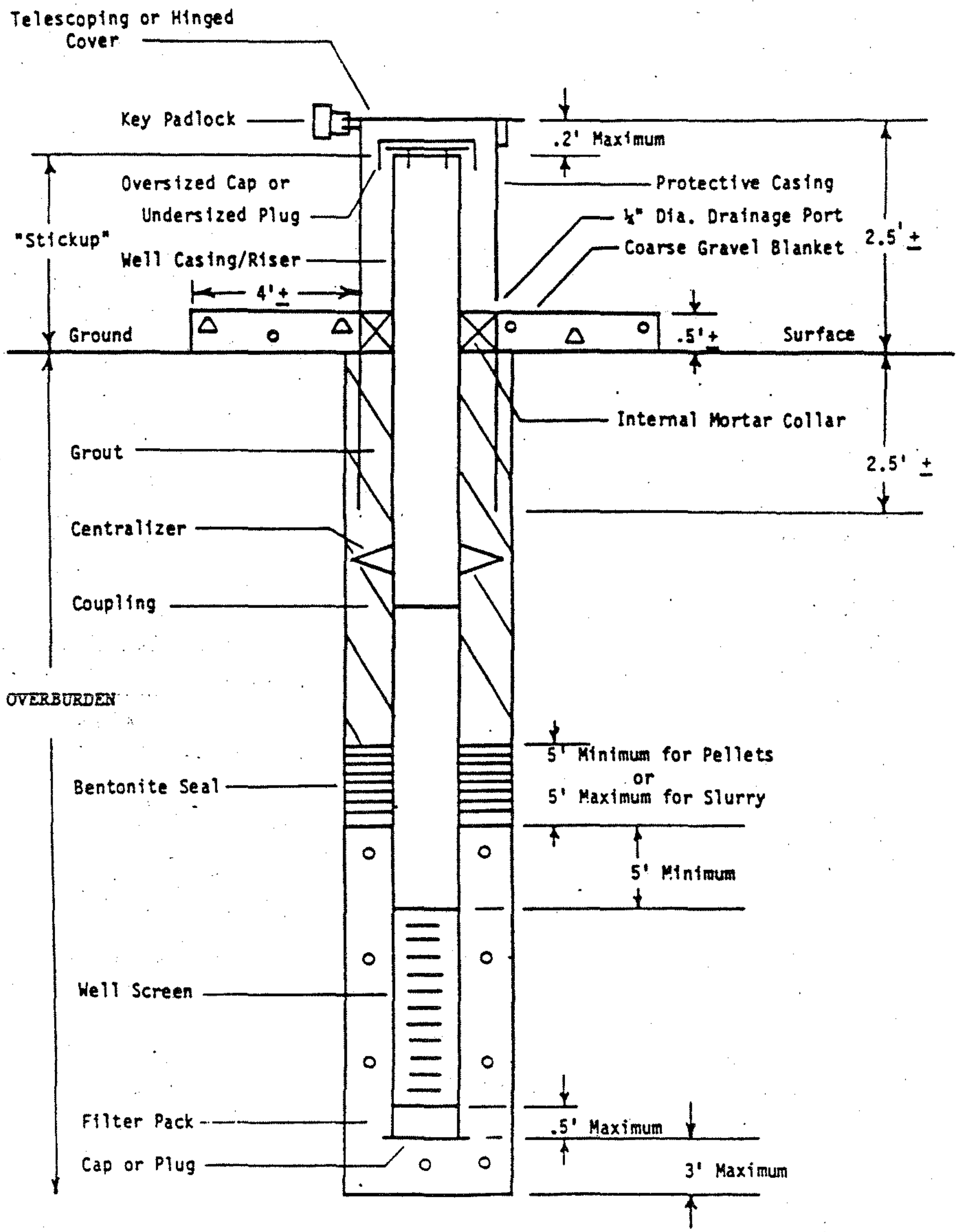
FIGURE 4

Project: GENERAL AAP	Boring: 87-14	Page: 3 of 3

Depth/ Elevation (FT)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
10	GP	SANDY GRAVEL (CONT'D)	10 S#7 10-6	10 3X 100 R=.5 10.9	NOTE 10' 1. DROVE 3X TO 10.9 (REFUSAL)
11 .9	L C	APPROXIMATE TOP OF WEATHERED ROCK LIMESTONE (LM) BASED ON CUTTINGS 1.1' LOST DUE TO DRILLING METHOD			2. PULLED ALL HSA SET 6" CSG TO 11.5'
12	L C	LM, .5 LOST DUE TO WEATHERING & FRACTURES	12.5	12-0	3. DRILLED W/ ROLLER BIT (6") TO 12.0, WATER LOSS 30 GAL 11.5'-12.0'
13	CIB	TOP OF SL. WEAT. ROCK LIMESTONE SANDY (SILICEOUS) FOSSILIFEROUS, NUMEROUS CORALS & GASTROPODS		RUN #1 R1.5	NOTE 12 1. START CORE RUN #1 AT 12' W/ 4" DOUBLE TUBE & DIAM. BOT. DISCH. BIT
14	CIB	THIN, HORIZONTAL BEDDING	BOX 1 OF 1	14.0	2. RUN #1 40 GAL LOST 12-12.5
15	NB	YEL BRN 10YR 5/4		RUN #2	
	NB	HARD WELL CEMENTED			
16	NB	DENSE - COARSE GRAINED SCAT (<5%) TIGHT 45° FRACTURES			0 LOST 12.5-14 SOUNDED HOLE 14.0'
17	CIB	NO STAINING SOLID, LOW PRIMARY & SECONDARY PERM. ST. GEORGE FM	18.0		NOTE 14 1. RUN #2, COMPLETE, WATER LOSS 18-18.5 (50 GAL), SH 18.5
18 .5	L C	.5' LOST LM BADLY FRACTURED	18.5	R4.5 18.5	NOTE 18.5 1. TOO FRACTURED TO CORE, USE GEAR BIT TO 30'.
		11.5' LOST, HIGHLY FRAC. LM (CUTTINGS) V. ROUGH DRILLING	S# 8		2. LOST 500 GALS 3. HOLE OPEN TO 30' 4. SET WELL, PULLED ALL CASING END 8 NOV 87
30		BOTTOM OF HOLE 30.0			

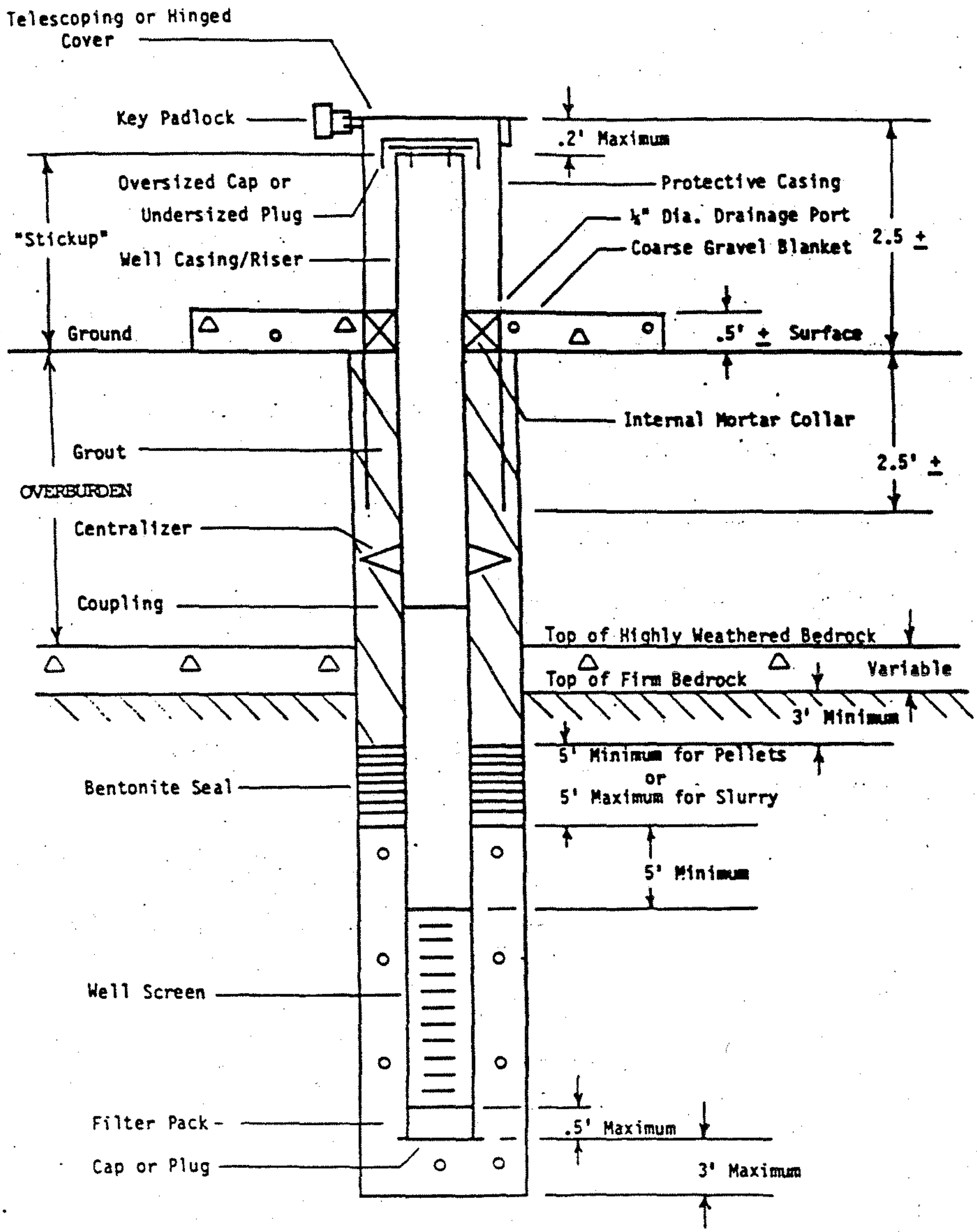
BORING LOG FORMAT

FIGURE 4



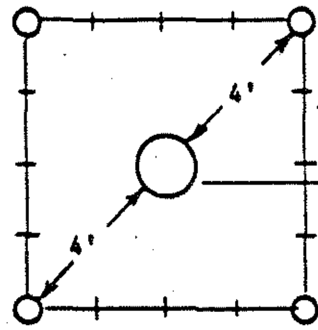
SCHEMATIC CONSTRUCTION OF OVERBURDEN WELL

FIGURE 5

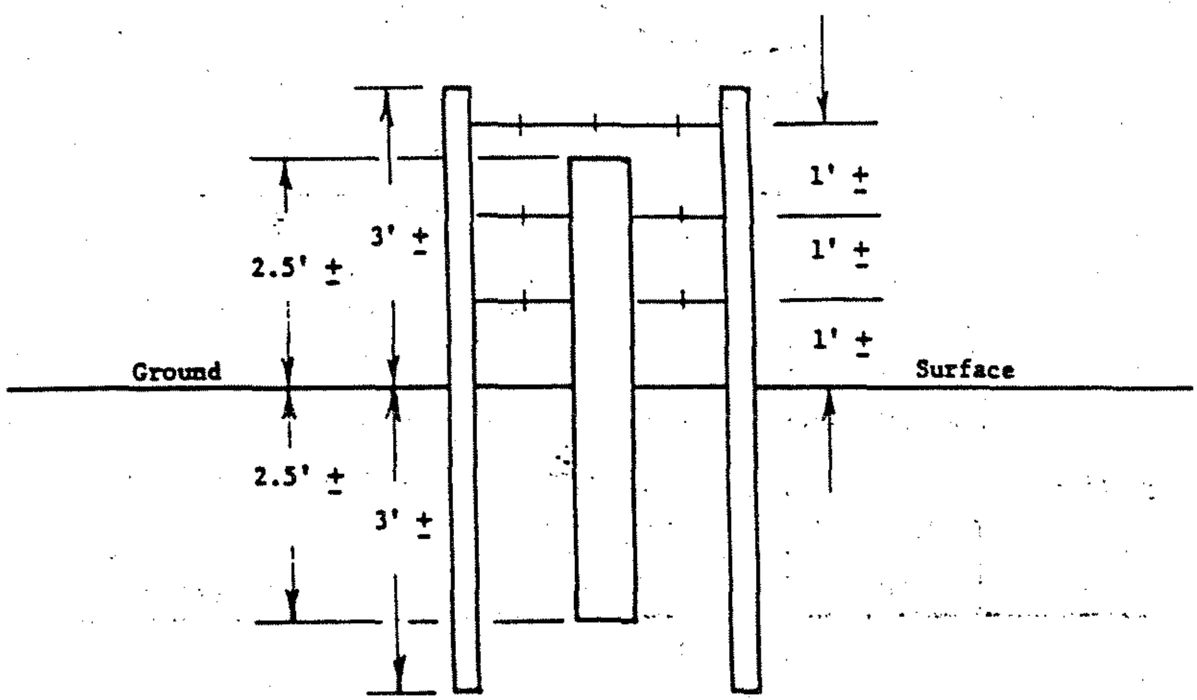


SCHEMATIC CONSTRUCTION OF
BEDROCK WELL

FIGURE 6

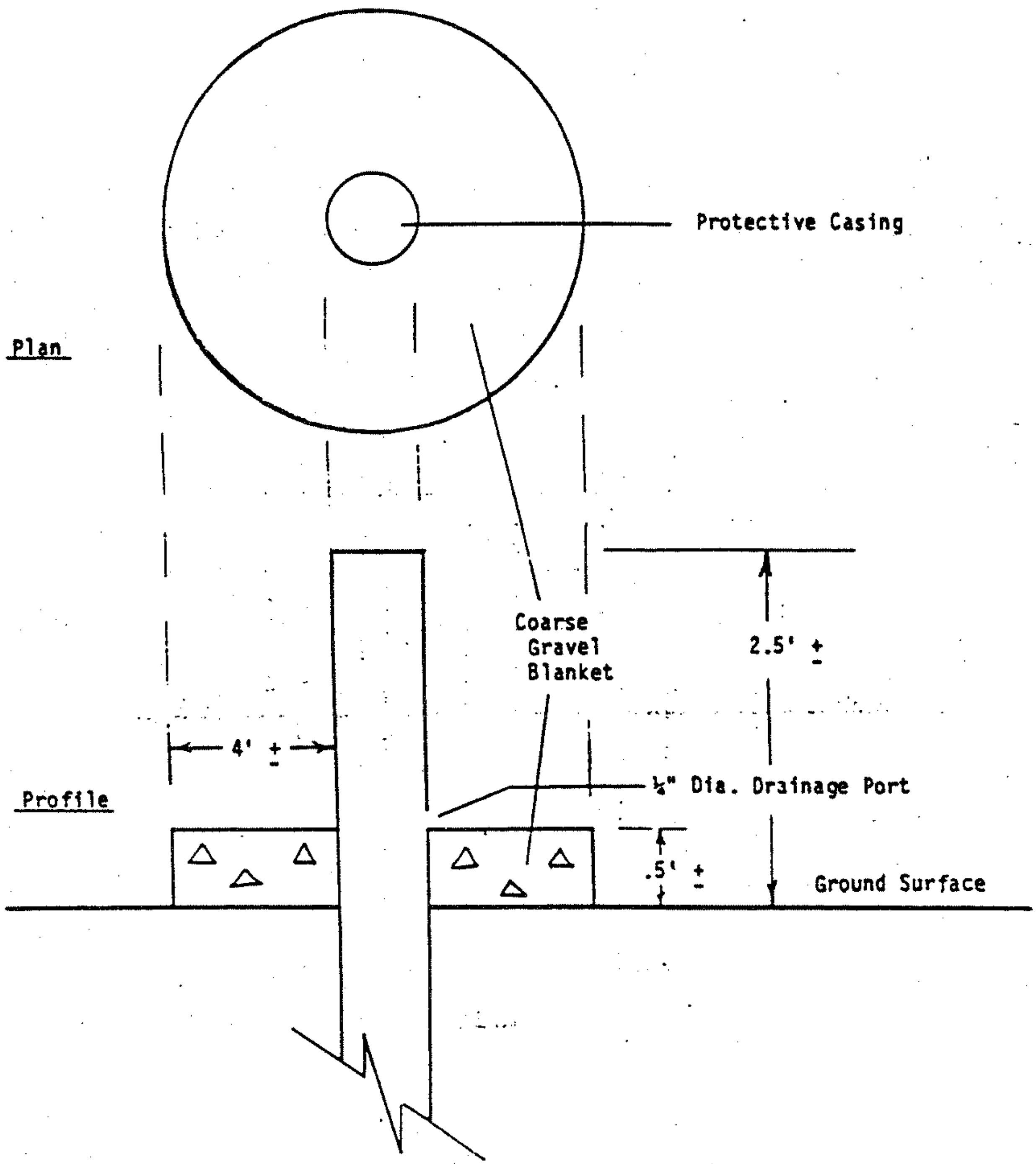


Plan



Profile

PICKET PLACEMENT AROUND WELLS
FIGURE 7



COARSE GRAVEL BLANKET LAYOUT

FIGURE 8

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION / 6b. OFFICE SYMBOL *(If applicable)*	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS *(City, State, and ZIP Code)*	7b. ADDRESS *(City, State, and ZIP Code)*
8a. NAME OF FUNDING / SPONSORING ORGANIZATION / 8b. OFFICE SYMBOL *(If applicable)*	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS *(City, State, and ZIP Code)*	10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.

11. TITLE *(Include Security Classification)*

12. PERSONAL AUTHOR(S)

13a. TYPE OF REPORT	13b. TIME COVERED FROM ____ TO ____	14. DATE OF REPORT *(Year, Month, Day)*	15. PAGE COUNT

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS *(Continue on reverse if necessary and identify by block number)*
FIELD	GROUP	SUB-GROUP	

19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

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FIGURE 9

Page 1 of 2

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE *(Include Area Code)* / 22c. OFFICE SYMBOL

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SECURITY CLASSIFICATION OF THIS PAGE

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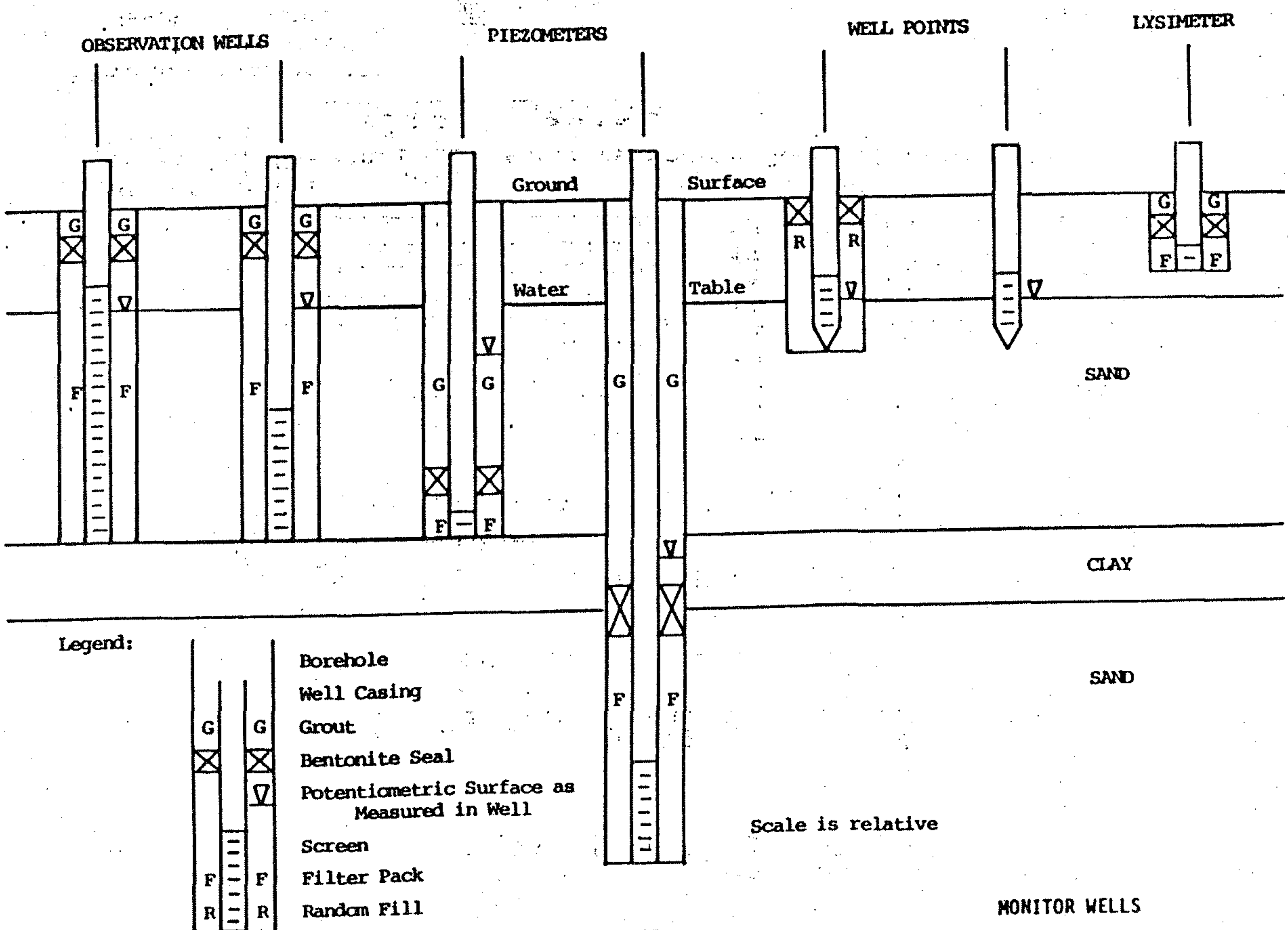
FIGURE 9

Page 2 of 2



MONITOR WELLS
FIGURE 10

MAP CODING FORM

Installation GP Site Type BORE Site Id 87-14

Description Information :

Pointer Information:
Pointer Site Type: WELL Pointer Site Id: 87-14
Aquifer id: PALEO
Area Information:
Coord Sys: Acc Source Code: Exp: No.Points:

Coordinate	X	Y		X	Y
1			10		
2			11		
3			12		
4			13		
5			14		
6			15		
7			16		
8			17		
9			18		

LSMP Information:
Coordinate System: UTM Accuracy Source Code: S Exponent: Ø
Coordinate — X 54321 Y 99876

Elevation Information:
Elevation Source: S
Elevation Accuracy: Ø
Elevation: 4321

MAP FILE CODING SHEET (BORE)

FIGURE 11

MAP CODING FORM

Installation GP Site Type WELL Site Id 87-14

Description Information :

Pointer Information:
Pointer Site Type: BORE Pointer Site Id: 87-14
Aquifer Id: PALEO
Area Information:
Coord Sys: Acc Source Code: Exp: No.Points:

Coordinate	X	Y		X	Y
1			10		
2			11		
3			12		
4			13		
5			14		
6			15		
7			16		
8			17		
9			18		

LSMP Information:
Coordinate System: UTM Accuracy Source Code: S Exponent: Ø
Coordinate — X 5V321 Y 99876

Elevation Information:
Elevation Source: S
Elevation Accuracy: Ø
Elevation: 4321

MAP FILE CODING SHEET (WELL)

FIGURE 12

GEOTECHNICAL DATA ENTRY CODING FORM

INST	FILE TYPE	LAB	INITIALS
GP	GFD	AC	JS

FIELD DRILLING AND WELL CONSTRUCTION

SITE TYPE	SITE ID
BORE	87-14

DATE	ACTION MEAS	METHOD	DEPTH	INTERVAL	VALUE	UNITS	ENTRY
11/08/87	GRDWT	01			7.0	FT	
11/08/87	DBRK	01			11.9	FT	
11/08/87	DPTOT	01			30.0	FT	
11/07/87	USCS	01	0.0	.8		FT	OL
11/07/87	USCS	01	0.8	3.8		FT	SM
11/08/87	USCS	01	4.6	3.4		FT	SP
11/08/87	USCS	01	8.0	3.9		FT	GP
11/08/87	USCS	01	11.9	18.1		FT	LMSN
/ /							

FIELD DRILLING FILE CODING SHEET

FIGURE 13

GEOTECHNICAL DATA ENTRY CODING FORM

INST	FILE TYPE	LAB	INITIALS
GP	GWC	AC	JS

FIELD DRILLING AND WELL CONSTRUCTION

SITE TYPE	SITE ID
WELL	87-14

DATE	ACTION MEAS	METHOD	DEPTH	INTERVAL	VALUE	UNITS	ENTRY
11/08/87	STKUP	01			2.3	FT	
11/08/87	BSEAL	01			5.0	FT	
/ /	CASE	01			25.0	FT	
/ /	CASED	01			.33	FT	
/ /	DPTOT	01			30.0	FT	
/ /	GFILT	01			10.0	FT	
/ /	GROUT	04			15.0	FT	
/ /	SCREN	02			5.0	FT	
/ /							

WELL CONSTRUCTION FILE
CODING SHEET
FIGURE 14

GEOTECHNICAL DATA ENTRY CODING FORM

INST	FILE TYPE	LAB	INITIALS
GP	GGS	AC	JS

UNITS
FT

GROUND WATER STABILIZED *

SITE TYPE	SITE ID	DATE	DEPTH
WELL	87-14	11/12/87	6.7
WELL	87-14	12/20/87	7.4
WELL	87-14	01/04/88	9.1
		/ /	
		/ /	
		/ /	
		/ /	
		/ /	
		/ /	
		/ /	
		/ /	
		/ /	

* - Depth measured from ground surface

GROUNDWATER STABILIZED FILE

CODING SHEET

FIGURE 15

N. TABLES

TABLE 1

WELL CONSTRUCTION MATERIALS

Material (Example Entries)	Brand/Description (Example Entries)	Source/Supplier (Example Entries)
PVC Casing	4.0" ID, Schedule 40, flush threaded; 2" ID, Schedule 40, flush threaded.	ABC Mfg; Aville, Minnesota
PVC Screen	.05" slot, 4.0" ID, Schedule 40, flush threaded, .02" slot, 2" ID, Schedule 40, flush threaded	ABC Mfg; Aville, Minnesota
Bentonite (drilling fluid and grout)	Tru-gel	A. O. Bentonite, Bville, Wyoming
Granular Bentonite (seal)	Gran-Bent	White Mud, Cville, Montana
Bentonite Pellets (seal)	(No brand name available)	PELBENT, Dville, Utah
Sand (filter pack)	8-12 silica sand	State Sand, Hville, Colorado; supplier: EFG Co. Eville, Utah
Cement (grout)	Portland Type II	A. Lumber Co., Eville, Utah
Drilling Water	St. Peter Sandstone	Production Well #1, Tap at well house General AAP
Drilling Rod Lubricant	Slick Turn	Oil Products Co., Fville, Texas
Air Compressor Oil	Oil #40	Oil Products Co., Fville, Texas

TABLE 2

PROCEDURAL AND MATERIAL APPROVAL SUMMARY

Items Requiring Approval	Reference Section	Time for Approval	Turn Around Time for Geotechnical Evaluation and Recommendation
Drilling Method	III.A.1.c.	Prior to contract/task award	During Proposal/ Bid Evaluation
Air Usage	III.A.2.	Prior to contract/task award	During Proposal/ Bid Evaluation
Bentonite	III.A.10.a.	Prior to drilling equipment arrival onsite	6 Working Days
Water	III.A.10.b.	Prior to drilling equipment arrival onsite	3 Calendar Weeks
Abandonment	III.A.11.	Prior to casing removal or backfilling	4 Consecutive Hours
Borehole Fluids, Cuttings, and Well Water Disposal	III.A.16.	Prior to technical plan acceptance	During Plan Evaluation
Time of Well Installation	III.C.1.	Prior to drilling	3 Working Days
Well Screen and Casing Materials	III.C.2.a.	Prior to contract/task award	During Proposal/ Bid Evaluation
Granular Filter Pack	III.C.5.a.	Prior to drilling	8 Working Hours
Protective Casing, Exceptions	III.C.8.a	Prior to drilling	6 Working Days
Geophysical Procedures	III.G.	Prior to use	Time not specified
Vadose Zone Monitoring	III.H.	Prior to use	Time not specified

TABLE 3

CONTRACTOR DOCUMENT/ITEM SUBMISSION SUMMARY

Document/Item	Reference Section	Submission Time	Submission To
Geotechnical Requirements (modified per contract)	II.A.	With Technical Plan (or equivalent document)	USATHAMA-COR
Licenses of Surveyor and Driller	III.A.5.	With Technical Plan (or equivelent document)	USATHAMA-COR
Submissions to State and/or local authorities	III.A.5.	As required	State and/or local offices coordinated through USATHAMA
Abandonment memorandum (written)	III.A.11.	Within 5 working days of telephonic request	Contracting Officer through USATHAMA
Abandoned boring and/or well record	III.A.11.	Within 3 working days of abandonment	USATHAMA-COR
Soil physical testing results	III.A.12.d.	Within 10 working days of final test	USATHAMA-COR
Rock core photography	III.A.13.	Within 2 weeks of last coring	USATHAMA-COR
Boring logs	III.B.2.	Within 3 working days after boring completion or instrumentation completely installed	USATHAMA-COR
Boring log abbreviations, general legend	III.B.5.v.	With first or last log, as appropriate	USATHAMA-COR
Two keys to padlocks	III.C.8.c.(8)	Upon completion of last well placement	Installation Representative and USATHAMA
Well diagram	III.C.12.c.	Within 3 working days of well/protective measure completion	USATHAMA-COR

TABLE 3 (Cont'd)

Document/Item	Reference Section	Submission Time	Submission To
Well development record	III.D.2.	Within 3 working days after development	USATHAMA-COR
Well development water sample	III.D.10.	Within 3 working days after developing that well	USATHAMA-designated individual
Geotechnical Report(s)	III.K.	As required per contract or task.	Contracting Officer through USATHAMA

APPENDIX K

FIELD METHODS:

DETECTION OF NITROAROMATICS AND NITROAMINES IN WATER AND SOIL AND METALS IN SOIL (X-RAY FLUORESENCE)

NITROAROMATICS AND NITRAMINES BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

1.0 SCOPE AND APPLICATION

1.1 Method 8330 is intended for the analysis of explosives residues. This method is limited to use by analysts experienced in handling and analyzing explosive materials. This method is used to determine the concentration of the following compounds in a water, soil or sediment matrix:

Compound	Abbrev	CAS No[a]
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	2691-41-0
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	121-82-4
1,3,5-Trinitrobenzene	TNB	99-35-4
1,3-Dinitrobenzene	DNB	99-65-0
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	479-45-8
Nitrobenzene	NB	98-95-3
2,4,6-Trinitrotoluene	TNT	118-96-7
2,4-Dinitrotoluene	24DNT	121-14-2
2,6-Dinitrotoluene	26DNT	606-20-2
o-Nitrotoluene	2NT	88-72-2
m-Nitrotoluene	3NT	99-08-1
p-Nitrotoluene	4NT	99-99-0

a Chemical Abstracts Service Registry number

1.2 All of these compounds are either used in the manufacture of explosives or are the degradation products of compounds used for that purpose. When making stock solutions for calibration, treat each compound as if it were extremely explosive.

1.3 The estimated quantitation limits (EQLs) of target analytes determined by Method 8330 in water and soil are presented in Table 1.

1.4 This method is restricted to use by or under the supervision of analysts experienced in the use of HPLC, skilled in the interpretation of chromatograms, and experienced in handling explosive materials. Each analyst must demonstrate the ability to generate acceptable results with this method.

2.0 SUMMARY OF METHOD

2.1 Aqueous samples are diluted 1/1 (v/v) with methanol, filtered, separated on a C-18 reverse phase column, determined at 254 nm, and confirmed on a CN reverse phase column.

2.2 Soil and sediment samples are extracted using acetonitrile in an ultrasonic bath, filtered, and chromatographed as in Section 2.1.

3.0 INTERFERENCES

3.1 2,4-DNT and 2,6-DNT elute at similar retention times (retention time difference of 0.2 minutes). A large concentration of one isomer may mask the response of the other isomer. If it is not apparent that both isomers are present (or are not detected), an isomeric mixture should be reported.

3.2 Tetryl decomposes rapidly in methanol/water solutions, as well as with heat. All aqueous samples expected to contain tetryl should be diluted with acetonitrile prior to filtration. All samples expected to contain tetryl should not be exposed to temperatures above room temperature.

3.3 Degradation products of tetryl appear as a shoulder on the TNT peak. Peak heights rather than peak areas should be used when tetryl is present in concentrations that are significant relative to the concentration of TNT.

4.0 APPARATUS AND MATERIALS

4.1 HPLC system

4.1.1 HPLC - equipped with a pump capable of achieving 4000 psi, a 100 μl loop injector and a 254 nm UV detector (Perkin Elmer Series 3, or equivalent).

4.1.2 Columns:

4.1.2.1 Primary column: C-18 Reverse phase HPLC column, 25 cm x 4.6 mm (5 μm), (Supelco LC-18, or equivalent).

4.1.2.2 Secondary column: CN Reverse phase HPLC column, 25 cm x 4.6 mm (5 μm), (Supelco LC-CN, or equivalent).

4.1.3 Strip chart recorder.

4.1.4 Digital integrator (optional).

4.1.5 Autosampler (optional).

4.2 Other Equipment

4.2.1 Temperature controlled ultrasonic bath.

4.2.2 Vortex mixer.

4.2.3 Balance ± 0.0001 g.

4.3 Materials

4.3.1 Injection syringe.

4.3.2 Filters - 0.5 μm Millex-SR, disposable, or equivalent.

4.3.3 Pipettes, volumetric, Class A, glass - 50 mL, 10 mL, 5 mL, 4 mL, 2 mL, 1 mL.

4.3.4 Vials, 20 mL, glass.

4.3.5 Vials, 15 mL, glass, Teflon lined screw cap or crimp top.

4.3.6 Syringes - 3 mL and 10 mL.

4.3.7 Volumetric flasks, Class A - 10 mL, 20 mL, 50 mL, 100 mL, 200 mL, 250 mL.

4.3.8 Mortar and pestle.

4.4 Preparation

4.4.1 Prepare all materials to be used as described in Chapter 4 for volatile organics.

5.0 REAGENTS

5.1 HPLC grade chemicals shall be used in all tests. It is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lowering the accuracy of the determination.

5.1.1 Acetonitrile, CH_3CN - HPLC grade.

5.1.2 Methanol, CH_3OH - HPLC grade.

5.1.3 Calcium Chloride, $CaCl_2$ - Reagent grade. Prepare an aqueous solution of 5 g/L.

5.2 Organic-free reagent water - All references to water in this method refer to organic-free reagent water, as defined in Chapter One.

5.3 Stock Standard Solutions

5.3.1 Analyte Standards

5.3.1.1 HMX - Standard Analytical Reference Material.

5.3.1.2 RDX - Standard Analytical Reference Material.

5.3.1.3 DNB - Standard Analytical Reference Material.

5.3.1.4 Tetryl - Standard Analytical Reference Material.

5.3.1.5 TNT - Standard Analytical Reference Material.

5.3.1.6 2,4-DNT - Standard Analytical Reference Material.

5.3.1.7 2,6-DNT - Standard Analytical Reference Material.

5.3.1.8 1,3,5-TNB - Standard Analytical Reference Material.

5.3.1.9 NB - Standard Analytical Reference Material.

5.3.1.10 2-NT - Reagent grade.

5.3.1.11 3-NT - Reagent grade.

5.3.1.12 4-NT - Reagent grade.

5.3.2 Dry each analyte standard to constant weight in a vacuum desiccator in the dark. Place about 0.100 g (weighed to 0.0001 g) of a single analyte into a 100 mL volumetric flask and dilute to volume with acetonitrile. Invert flask several times until dissolved. Store in refrigerator at 4°C in the dark. Calculate the concentration of the stock solution from the actual weight used (nominal concentration = 1,000 mg/L). Stock solutions may be used for up to one year.

5.4 Intermediate Standards Solutions

5.4.1 If both 2,4-DNT and 2,6-DNT are to be determined, prepare two separate intermediate stock solutions containing (1) HMX, RDX, 1,3,5-TNB, 1,3-DNB, NB, TNT, and 2,4-DNT and (2) Tetryl, 2,6-DNT, 2-NT, 3-NT, and 4-NT. Intermediate stock standard solutions should be prepared at 1,000 µg/L, in acetonitrile when analyzing soil samples, and in methanol when analyzing aqueous samples.

5.4.2 Dilute the two concentrated intermediate stock solutions, with the appropriate solvent, to prepare intermediate standard solutions that cover the range of 2.5 - 1,000 µg/L. These solutions should be refrigerated on preparation, and may be used for 30 days.

5.5 Working standards

5.5.1 Prepare working standards by diluting intermediate standards solutions by 50% (v/v) with (1) organic-free reagent water, when analyzing aqueous solutions, or (2) 5 g/L calcium chloride solution (Section 5.1.3), when analyzing soil and sediment samples. These solutions must be refrigerated, and may be used for 28 days after preparation.

5.6 Eluent

5.6.1 To prepare 1 liter of eluent, add 500 mL of methanol to 500 mL of organic-free reagent water.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 Grab samples must be collected and stored in glass containers. Follow conventional sampling procedures.

6.2 Samples must be kept below 4°C from the time of collection through analysis.

6.3 Soil and sediment samples should be air dried to constant weight at room temperature or colder after collection. While it is possible to analyze wet soil samples, it is much more difficult to obtain a homogeneous subsample on a wet sample. If wet soil samples are to be analyzed, a moisture determination must be made on a separate subsample.

7.0 PROCEDURE

7.1 Sample Preparation

7.1.1 Aqueous Samples

7.1.1.1 Sample Filtration: Place a 5 mL portion of each water sample in a scintillation vial, add 5 mL of methanol, shake thoroughly, and filter through a 0.5 µm filter. Discard the first 3 mL of filtrate, and retain the remainder for analysis.

7.1.2 Soil and Sediment Samples

7.1.2.1 Sample homogenization: Dry soil samples in air at room temperature or colder, being careful not to expose the samples to direct sunlight. Grind sample thoroughly in an acetonitrile rinsed mortar.

7.1.2.2 Sample extraction

7.1.2.2.1 Place a 2.0 g subsample of each soil sample in a 15 mL glass vial. Add 10.0 mL of acetonitrile, cap with teflon lined cap, vortex swirl for one minute, and place in ultrasonic bath for 18 hours. If tetryl is being analyzed, keep ultrasonic bath at room temperature or below.

7.1.2.2.2 After sonication, allow sample to settle for 30 minutes. Remove 5.0 mL of supernatant, and combine with 5.0 mL of calcium chloride solution (Section 5.1.3) in a 20 mL vial. Shake, and let stand for 15 minutes.

7.1.2.2.3 Place supernatant in syringe and filter through a 0.5 µm filter. Discard first 2 to 3 mL and retain remainder for analysis.

7.2 Chromatographic Conditions

Mobile Phase:	50/50 (v/v) methanol/organic-free reagent water
Flow rate:	1.5 mL/min
Injection volume:	100 μl
UV Detector:	254 nm

7.3 Calibration of HPLC

7.3.1 Analyze working standards in triplicate, using the chromatographic conditions given in Section 7.2. Prepare calibration curve using peak heights or peak areas, as appropriate. The calibration curve should be linear with zero intercept.

7.3.2 At the beginning of each analysis day, after the midpoint of a sample run, and after the last sample of the day, inject midpoint calibration standards. Compare mean peak heights obtained during the day with the peak heights obtained in the morning. If these values do not agree within 20%, reinject all solutions in triplicate and recalculate calibration curve.

7.4 Sample Analysis

7.4.1 Analyze the samples using the chromatographic conditions given in Section 7.2. Confirm each measurement by injecting onto the CN column.

7.4.2 Table 2 presents the retention times for the analytes on both the C18 and CN columns. Figure 1 presents typical chromatograms.

8.0 QUALITY CONTROL

8.1 Refer to Chapter One for specific quality control procedures.

8.2 Prior to preparation of stock solutions, acetonitrile, methanol, and water blanks should be run to determine possible interferences with analyte peaks. If the acetonitrile, methanol, or water blanks show contamination, a different batch should be used.

8.3 Method Blanks

8.3.1 Method blanks for the analysis of aqueous samples should be organic-free reagent water carried through all sample storage and handling procedures.

8.3.2 Method blanks for the analysis of soil samples should be uncontaminated soil carried through all sample storage, extraction, and handling procedures.

9.0 METHOD PERFORMANCE

9.1 Method 8330 was tested by six laboratories. The results of this testing indicate that the results presented in Tables 3 through 5 are to be expected.

10.0 REFERENCES

1. Bauer, C.F., S.M. Koza, and T.F. Jenkins, "Collaborative Test Results for a Liquid Chromatographic Method for the Determination of Explosives Residues in Soil," manuscript submitted to the Journal of the AOAC, April 1989.

2. Department of the Army, "Reversed-Phase HPLC Method for the Determination of Explosive Residues in Soil," Appendix B, provided by Dennis J. Wynne, Chief, Technology Division, U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland 21010-5401.

3. Department of the Army, "An Improved RP-HPLC Method for the Determination of Nitroaromatics and Nitramines in Water" Appendix B, provided by Dennis J. Wynne, Chief, Technology Division, U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland 21010-5401.

11.0 SAFETY

11.1 Standard precautionary measures used for handling other organic compounds should be sufficient for safe handling of the analytes targeted by Method 8330.

Figure 1

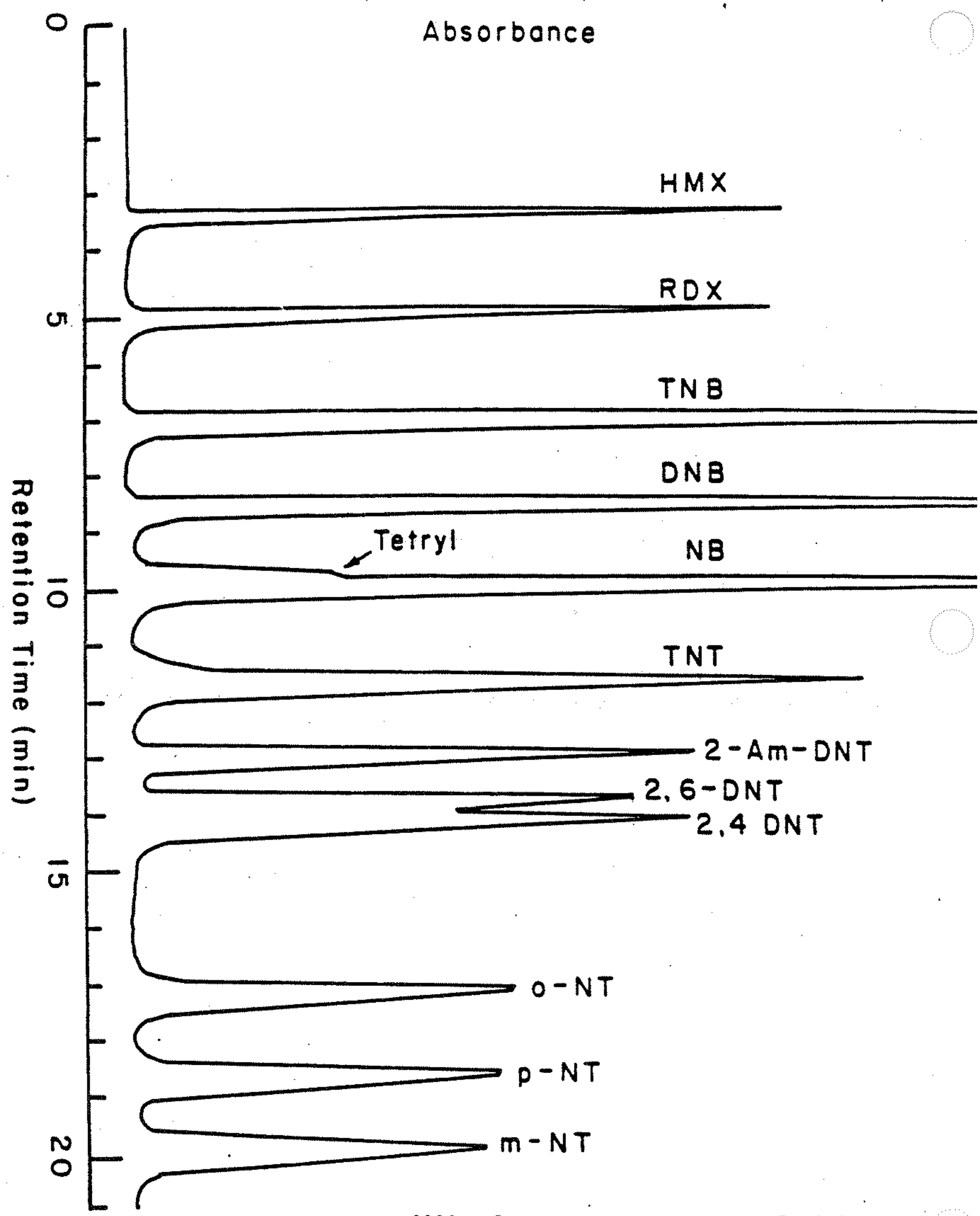

Absorbance
0
5
10
15
20
Retention Time (min)
HMX
RDX
TNB
DNB
Tetryl
NB
TNT
2-Am-DNT
2,6-DNT
2,4 DNT
o-NT
p-NT
m-NT

TABLE 1
ESTIMATED QUANTITATION LIMITS

Compound	Abbrev	Water (µg/L)	Soil (µg/g)
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	13.0	2.2
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	14.0	1.0
1,3,5-Trinitrobenzene	TNB	7.3	0.25
1,3-Dinitrobenzene	DNB	4.0	0.25
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	44.0	0.65
Nitrobenzene	NB	NA	0.26
2,4,6-Trinitrotoluene	TNT	6.9	0.25
2,4-Dinitrotoluene	24DNT	5.7	0.25
2,6-Dinitrotoluene	26DNT	9.4	0.26
o-Nitrotoluene	2NT	12.0	0.25
m-Nitrotoluene	3NT	7.9	0.25
p-Nitrotoluene	4NT	8.5	0.25

NA Not available

TABLE 2
RETENTION TIMES FOR ANALYTES ON C-18 AND CN COLUMNS

C-18		CN	
Analyte	Retention Time (min)	Analyte	Retention Time (min)
HMX	2.4	NB	3.8
RDX	3.7	TNB	4.1
TNB	5.1	DNB	4.2
DNB	6.2	2NT	4.4
Tetryl	6.9	4NT	4.4
NB	7.2	3NT	4.5
TNT	8.4	26DNT	4.6
26DNT	9.8	24DNT	4.9
24DNT	10.1	TNT	5.0
2NT	12.3	RDX	6.2
4NT	13.3	Tetryl	7.4
3NT	14.2	HMX	8.4

TABLE 3
INTRALABORATORY PRECISION OF METHOD FOR SOIL SAMPLES

	Spiked soils			Field-contaminated soils		
	Mean Concentration (μg/g)	SD	%rsd	Mean Concentration (μg/g)	SD	%rsd
HMX	46	1.7	3.7	14	1.8	12.8
				153	21.6	14.1
RDX	60	1.4	2.3	104	12	11.5
				877	29.6	3.4
TNB	8.6	0.4	4.6	2.8	0.2	7.1
	46	1.9	4.1	72	6.0	8.3
DNB	3.5	0.14	4.0	1.1	0.11	9.8
tetryl	17	3.1	17.9	2.3	0.41	18.0
TNT	40	1.4	3.5	7.0	0.61	9.0
				669	55	8.2
24DNT	5.0	0.17	3.4	1.0	0.44	42.3

TABLE 4
INTERLABORATORY ERROR OF METHOD FOR SOIL SAMPLES

	Spiked soils			Field contaminated soils		
	Mean Concentration (μg/g)	SD	%rsd	Mean Concentration (μg/g)	SD	%rsd
HMX	46	2.6	5.7	14	3.7	26.0
				153	37.3	24.0
RDX	60	2.6	4.4	104	17.4	17.0
				877	67.3	7.7
TNB	8.6	0.61	7.1	2.8	0.23	8.2
	46	2.97	6.5	72	8.8	12.2
DNB	3.5	0.24	6.9	1.1	0.16	14.5
tetryl	17	5.22	30.7	2.3	0.49	21.3
TNT	40	1.88	4.7	7.0	1.27	18.0
				669	63.4	9.5
24DNT	5.0	0.22	4.4	1.0	0.74	74.0

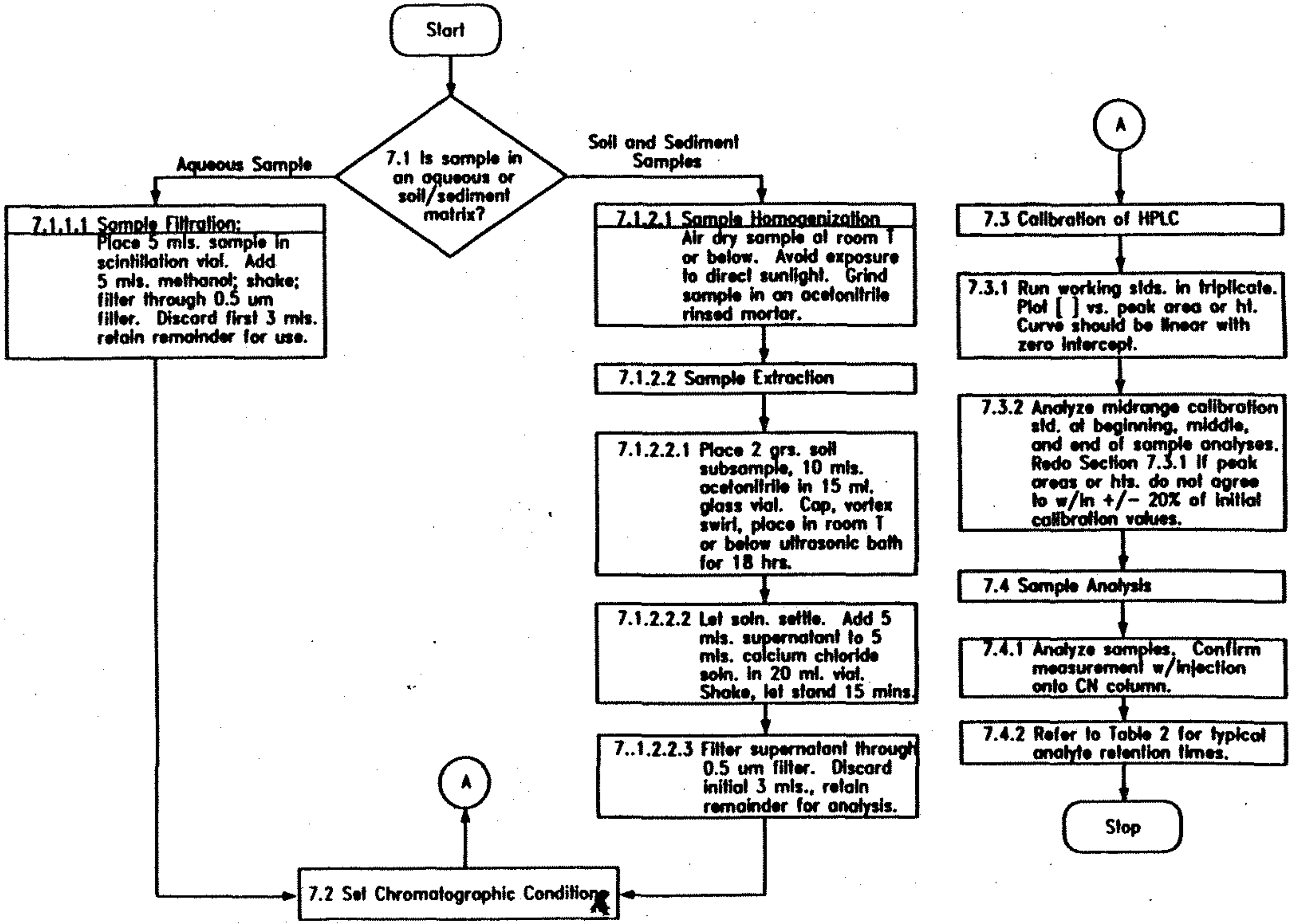
TABLE 5
INTERLABORATORY ERROR OF METHOD FOR WATER SAMPLES[a]

	Sample 1		Sample 2	
	mean conc. (μg/L)	%rsd	mean conc. (μg/L)	%rsd
HMX	nd	-	184[b]	8.4
RDX	431	22.9	2117	29.5
TNB	74.3	3.2	27.6[c]	4.2
TNT	10635	59.4	1746	26.8

[a] 10 replicate determinations, except where noted

[b] 6 replicate determinations

[c] 7 replicate determinations


Start
7.1 Is sample in an aqueous or soil/sediment matrix?
Aqueous Sample
Soil and Sediment Samples
7.1.1.1 Sample Filtration: Place 5 mls. sample in scintillation vial. Add 5 mls. methanol; shake; filter through 0.5 um filter. Discard first 3 mls. retain remainder for use.
7.1.2.1 Sample Homogenization Air dry sample at room T or below. Avoid exposure to direct sunlight. Grind sample in an acetonitrile rinsed mortar.
7.1.2.2 Sample Extraction
7.1.2.2.1 Place 2 grs. soil subsample, 10 mls. acetonitrile in 15 ml. glass vial. Cap, vortex swirl, place in room T or below ultrasonic bath for 18 hrs.
7.1.2.2.2 Let soln. settle. Add 5 mls. supernatant to 5 mls. calcium chloride soln. in 20 ml. vial. Shake, let stand 15 mins.
7..1.2.2.3 Filter supernatant through 0.5 um filter. Discard initial 3 mls., retain remainder for analysis.
7.2 Set Chromatographic Conditions
A
A
7.3 Calibration of HPLC
7.3.1 Run working stds. in triplicate. Plot [ ] vs. peak area or ht. Curve should be linear with zero intercept.
7.3.2 Analyze midrange calibration std. at beginning, middle, and end of sample analyses. Redo Section 7.3.1 if peak areas or hts. do not agree to w/in +/- 20% of initial calibration values.
7.4 Sample Analysis
7.4.1 Analyze samples. Confirm measurement w/injection onto CN column.
7.4.2 Refer to Table 2 for typical analyte retention times.
Stop

OPERATING PROCEDURE FOR XRF ANALYSIS OF SOILS WITH SPECTRACE MODEL TX-500 SPECTROMETER

This procedure discusses the use of the TX-5000 XRF (x-ray florescence) spectrometer for analysis of inorganic elements in solid samples.

1.0 EQUIPMENT

1. Spectrace Model TX-5000 XRF analyzer system.

2. Reference standards set, including both analytes and matrix elements.

3. Sample calibration standards, representative of the matrix and analyte specific.

4. Plastic sample cups, 32 mm OD.

5. Polypropylene film, 6.3 um.

6. Planetary Ball Mill with agate jars and balls for grinding samples to a powder.

7. Oven and aluminum pans for drying samples (105°C, 6 hours).

8. Plastic sample transfer spoons.

9. Plastic snap-cap vials (20 dram).

10. IBM PC compatible computer/printer.

2.0 SPECIFICATIONS

The Spectrace Model TX-5000 XRF analyzer system includes the following:

1. Si (Li) X-ray detector with 155 eV resolution, 30 mm^2 area, 0.5 mil Be window and 17 L liquid nitrogen (LN) dewar with level monitor.

2. 50 kV, 1.0 MA Rh target X-ray tube.

3. 16 position sample tray (autosampler).

4. Computer control of sample position, filter selection, excitation parameters and sample environment.

5. Five transmission filters with holders, one blank holder and one direct access.

   - 0.05 mm Pb
   - 0.125 mm Pb

- 0.13 mm Al
- 0.63 mm Cu
- Thin cellulose

6. Bias supply with FET protection.

7. High resolution pulse process with time variant filtering, pulse pileup rejector and live time correction.

8. Microprocessor controlled analog to digital convertor.

9. Radiation shielding and safety interlocks.

10. Menu driven analysis software including:

    - Linear
    - Quadratic
    - Intensity matrix correction
    - Concentration matrix correction
    - Sort
    - Fundamental parameters

3.0 <u>SAMPLE PREPARATION</u>

This procedure describes the method of preparing both samples and calibration standards for analysis with the TX-5000.

3.1 DRYING

In order to minimize analytical uncertainty due to moisture content (a matrix effect) and to facilitate sample grinding, all samples must be dried in a consistent manner.

3.1.1 Spread bulk samples evenly in the aluminum pan.

3.1.2 Place pan with sample in oven at 105°C for six hours, or until moisture is removed. Alternatively, samples may be air-dried for 2-7 days.

3.2 SIEVING

Following drying, the samples are sieved through a Standard U.S. No. 10 mesh (2 mm) sieve. Sieving serves to homogenize the sample and facilitate grinding in the ball mill.

3.3 GRINDING

It is important that all samples are ground in a consistent manner. Analytical uncertainty due to differences in particle size can be significant.

3.3.1 Samples for XRF analysis are ground with the ball mill until of approximately equal particle size (100 mesh nominal).

3.3.2 Grinding jars are decontaminated between samples. Silica sand blanks are processed at a frequency of 1/20 samples as a QC control on decontamination efficiency.

3.4 USE OF SAMPLE CUPS

3.4.1 Place ground sample specimen in plastic cup using plastic spoon to approximately 3/4 full (~5 g).

3.4.2 Place square piece of polypropylene film over top of cups.

3.4.3 Hold film smooth over top of cup with small inner ring, then snap large outer ring down into position.

3.4.4 Check the film surface for tears or wrinkles. If damaged, repeat steps 3.4.2 to 3.4.3.

3.5 GROUND POWERS ARE SORTED IN LABELED PLASTIC VIALS

4.0 PREPARATION FOR OPERATION

This procedure must be followed prior to both calibration (Section 5.0) and/or measurement (Section 6.0), "Measurement".

4.1 POWER SUPPLY

The TX-5000 electronic unit must be connected to a suitable 115 VAC power supply.

4.2 COMPUTER CONNECTION

The TX-5000 electronic unit is connected to a control board installed in the PC via an RS-232 serial port/cable.

4.3 LN SUPPLY

The 17 L dewar must be filled with LN approximately 12 hours prior to operation. The 17 L dewar has about an eight day holding time and should be refilled every 4-5 days.

4.4 ELECTRICAL STABILIZATION

Switch the unit on and allow a minimum of three hours for electrical stabilization prior to operation.

5.0 CALIBRATION

The calibration procedure programs the TX-5000 for the desired application. The analyte and matrix elements are defined (fitted) by establishing spatial regions of interest (ROI) using pure element compounds as references. Spectra for calibration standards are then obtained under the same conditions as the pure elements, and ROI intensities determined. Mathematical models are used to relate intensities to analyte concentrations.

The software used to calibrate the TX-5000 is menu driven and described in detail in the operating manual (Spectrace 1990).

5.1 ENERGY CALIBRATION

Energy calibration is required to monitor/correct instrumental drift (gain control). Place the Cu disk in tray position #1 and operate the energy calibration. Alternatively, a Cu reference standard may be used. Record GAIN DAC in operator's log book. Repeat this procedure at the beginning of each 16 sample run or a minimum of twice per day during sample analysis.

5.2 REFERENCE STANDARDS

The set of reference standards to be used should include both the analytes of interest and primary matrix elements. This determination should be made by a qualified XRF analyst based on quantitive and/or qualitative analysis of site-specific samples.

5.3 ACQUISITION CONDITIONS

Conditions under which spectra are to be acquired are established by the analyst and are based on optimizing the calibration for the analytes of interest.

5.4 CALIBRATION MODEL

The TX-5000 software is capable of utilizing a variety of calibration models (see Section 2.0) depending on the particular application and the types of standards available. Calibration using site-specific samples (i.e., empirical techniques)has been proven effective for soil analysis in cases where matrix representative soil samples are available.

5.5 CALIBRATION DATA MANAGEMENT

All calibration data obtained are stored in files on the computer hard disk and on backup disks, including spectra, standards concentrations and intensities. These data may be updated (e.g., by adding standards or concentrations upon further analysis of samples) and/or the model changed to reflect improved analyses. Samples may then be reprocessed under a new calibration if desired.

6.0 MEASUREMENT

6.1 Place samples to be measured in the 16 position autosampler tray.

6.2 Sample ID numbers are logged into the XRF operator's log book and also entered via the computer keyboard.

6.3 Press the "RUN" key to begin measurement.

6.4 ANALYTICAL DATA MANAGEMENT

All analytical data obtained are stored in files on the computer hard disk and on backup disks. In addition, hard copy results are output via the printer.

7.0 QA/QC

Quality control samples (blanks, calibration control checks, replicates, etc.) are analyzed along with the regular samples as described in Section 6.0, "Measurement."

8.0 REFERENCES

Spectrace Instruments, Inc. 1990. Spectrace 5000 Operators Manual. November.

Background Soil Metals Concentrations,
Evaluation Levels, and XRF Detection Limits

Metal	USATHAMA Analyte Code	Average Background Concentration in Soil (mg/kg)	Background Range in Soil (mg/kg)	Highest Background Level (mg/kg) (Evaluation Level)	Estimated XRF DL
Antimony	Sb	<19.6	<19.6	19.6	5
Arsenic	As	5.80	3.79-8.34	8.34	10
Barium	Ba	298	191-549	549	10
Beryllium	Be	0.825	0.663-1.14	1.14	(*)
Cadmium	Cd	0.669	0.534-0.805	0.805	5
Chromium (tot)	Cn	19.2	16-29.2	29.2	10
Copper	Cu	17.1	12.6-30.1	30.1	10
Lead	Pb	20.6	14-27	27	10
Mercury	Hg	0.21	0.062-0.495	0.495	5
Nickel	Ni	23.6	12.8-49.6	49.6	10
Selenium	Se	<0.449	<0.449	0.449	10
Silver	Ag	<0.803	<0.803	0.803	5
Zinc	Zn	62.7	50-84.7	84.7	10

Notes: Average concentrations are arithmetic means for all samples in which the indicated metal was detected.

(*) Cannot be analyzed with XRF.

APPENDIX L

OXIDATION REDUCTION POTENTIALS WITH METALLIC ELECTRODES

Oxidation- Reduction Potentials with

Introduction

Oxidation-reduction potential (ORP) measurements are useful for monitoring chemical reactions, quantitative determination of ions or determining the oxidizing or reducing properties of solutions. While ORP measurements are somewhat similar to those of pH, the potential value must be interpreted carefully for meaningful results. This report discusses the principles and electrode types involved, how measurements are made, and typical applications.

An ORP measurement is made using the millivolt mode of a pH meter. Thus by substituting a metallic electrode for the pH glass electrode, many other ions besides the hydrogen ion can be detected with the same pH meter.

Principles of Redox Measurements

• Definitions

In many chemical reactions, electrons are transferred from one substance to another. By definition a substance gains electrons in a reduction reaction; a substance loses electrons in an oxidation reaction. Oxidation and reduction reactions occur together. The available electrons from an oxidized substance are taken up by the reduced substance until an equilibrium condition is reached.

The relative tendency of different substances to gain electrons (relative reduction potentials) varies depending on the number of electrons in the outer shell and on the size of the atom or ion. Accordingly, these substances can be tabulated in descending order with those substances which gain electrons most easily at the top.

• Standard Potentials.

Since it is impossible to measure absolute potentials, an arbitrary standard, the hydrogen electrode, is chosen. Oxidation-reduction potentials are defined relative to this standard. The electrode reaction

$$2H^{+} + 2e^{-} = H_2$$

is assigned a potential of 0.00 volts when the hydrogen ion activity is 1.0 M and the partial pressure of hydrogen gas is one atmosphere.

Table I
Standard Oxidation-Reduction Potentials

Electrode Reaction	E^0 Volts
$Na^{+} + e^{-} = Na$	−2.714
$CNO^{-} + H_2O + 2e^{-} = CN^{-} + 2OH^{-}$	−0.97
$Zn^{++} + 2e^{-} = Zn$	−0.763
$2H^{+} + 2e^{-} = H_2$	0.0
$SO_4^{=} + 4H^{+} + 2e^{-} = H_2SO_3 + H_2O$	+0.17
Ag/AgCl electrode, 4N KCl	+0.199
Calomel electrode, Sat KCl	+0.244
$Ag^{+} + e^{-} = Ag$	+0.8
$Cr_2O_7^{=} + 14H^{+} + 6e^{-} = 2Cr^{3+} + 7H_2O$	+1.33
$Cl_2 + 2e^{-} = 2Cl^{-}$	+1.35

When reactions are written as oxidations (e.g., $Na = Na^{+} + e^{-}$), potentials have the opposite polarity.

The standard potential, E^0 of any oxidation-reduction reaction is referenced to the standard hydrogen electrode and refers to conditions of the oxidation-reduction reaction where temperature is 25°C, ion activities are unity, and gases are at 1 atm pressure. Table I shows the standard potential, E^0 associated with various reactions.

The oxidation-reduction potential (ORP) is characteristic of reactions involving both oxidation and reduction. ORP varies as a function of: (a) the standard potential, E^0 associated with each reaction (b) relative ion concentrations, (c) temperature, and (d) the number of electrons transferred in the reactions.

• ORP Potential Values

Oxidation-reduction potentials are usually displayed as millivolts (mV). When measured with a pH meter (which is set to read in millivolts), this oxidation-reduction potential is generally the emf difference developed between the ORP metallic indicating electrode and a constant voltage reference electrode, (e.g., saturated calomel instead of a normal hydrogen electrode) that is immersed in the test solution. Any one of three different types of metallic electrodes may be used. The nature of the test solution and the method to be used will determine the choice of the electrode. This is discussed later.

Metallic Electrodes

Regardless of which of these electrodes is used, the potential can be expressed by a general form of the Nernst equation:

$$E_h = E^0 + \frac{59.2}{n} \log \frac{(\text{Oxidant})}{(\text{Reductant})} \text{ at } 25°C \qquad (1)$$

where

E_h = the voltage difference between the oxidation-reduction electrode and the normal hydrogen electrode, mV.

E^0 = a constant characteristic of the system in question, mV.

= Eh when the activities of the oxidant and the reductant are equal, (i.e., the ratio of (Ox)/(Red) = 1, and since the logarithm of 1 is equal to 0, E^0 must equal E_h).

n = the number of electrons reacting.

Since the normal hydrogen electrode is rarely used as the reference electrode in actual measurements, the measured potential (E) will not be equal to E_h. E_h can be calculated by adding algebraically the measured voltage, E, to the constant voltage, E′, of the constant voltage reference electrode used.

$$E_h = E + E' \qquad (2)$$

For example, if the saturated calomel electrode (SCE) is used as the reference electrode, and the measured voltage E is 400 mv, E_h = 400 + 244 = 644 mv at 25°C (voltage of saturated calomel electrode is 244.3 mv at 25°C). If the measured value E is −544 mV, the E_h = −544 + 244 = −300 mV at 25°C. It can be seen that the E_h of an oxidation-reduction system will always differ from the measured value E by the voltage difference between the reference electrode being used and a normal hydrogen electrode. Both the E_h value and the measured value E of any particular oxidation-reduction system will depend on the values of E^0, n (the number of electrons reacting), and the molar concentrations (activities to be strictly accurate) of the oxidant and the reductant. Therefore, the observed potential (ORP) can be expressed as a combination of equations (1) and (2):

$$E = E^0 - E' + \frac{59.2}{n} \log \frac{(\text{Oxidant})}{(\text{Reductant})} \text{ @ } 25°C \qquad (3)$$

ORP Measurements

• Electrode Types

There are three types of metallic electrodes used ii ORP measurements which differ in construction, bu all are based on the same principle that an oxidized and a reduced state must always be present.

The *first* type of metallic electrode to be considered consists of a metal in contact with a solution of its own ions. The metal electrode is in the reduced state and its ions are in the oxidized state.

When an electrode of the first type is used, the general form of the Nernst equation can be further simplified to:

$$E_h = E^0 + \frac{59.2}{n} \log M^{n+} \text{ at } 25°C$$

where

M^{n+} = the concentration (activity) of the cations corresponding to the metal electrode being used. In this case, the activity of the reductant (the pure metal electrode) is always 1 by definition, and therefore the reductant term drops out.

An example of this type is silver in a silver nitrate solution. It is used for the direct measurement and potentiometric titration of solutions of the cations of the particular metal electrode being used.

The *second* type fo metallic electrode which may be used consists of a metal coated with a sparingly soluble salt of this metal in contact with a solution of a soluble salt with the same anion, e.g., silver-silver chloride in a solution of potassium chloride. The half-cell reaction for this type of electrode can be written for the metal (M) and the anion (A) as follows:

$$M_xA_y + ne^- = x\,M^+ + y\,A^-$$

For an electrode of the second type, the general equation becomes:

$$E_h = E^0 - \frac{59.2}{6} \log (A^-)^y \text{ at } 25°C$$

where

A^- = the concentration (activity) of the anions being measured (must correspond to the anion of the sparingly soluble salt coating the metallic electrode). In this case, the activity of the oxidant (sparingly soluble salt) is 1 by definition. The term +log (Ox) / (Red) becomes +log 1 / $(A^-)^y$ which is −log $(A^-)^y$.

Electrodes of this type can be used for the direct determination of potentiometric titration of a solution containing the anions of the sparingly soluble salt forming the coating on the electrode

The *third* type of metallic electrode consists of an inert metal in contact with a solution containing both the oxidized and reduced states of an oxidation-reduction system.

Ideally, the inert metal electrode in a well-mixed oxidation-reduction system serves only to acquire the electrochemical potential of electrons, depending on the prevailing redox equilibrium in solution. The metal donates and accepts electrons and otherwise does not participate in the oxidation-reduction reaction. The particular metal used is relatively unimportant as long as it is sufficiently noble. Platinum and gold are the most common ORP electrodes.

An example would be platinum in contact with a solution of ferric-ferrous ions. Electrodes of this type are used for potentiometric oxidation-reduction titrations, and for the direct measurement of the oxidizing or reducing intensity of solutions.

- Equipment

Equipment for ORP measurement compares closely to that for pH measurement. The reference electrodes can be identical, but a noble-metal electrode replaces the glass pH electrode. The potential is measured in millivolts. Temperature compensation is not used. The signal from the ORP electrodes must be fed into an amplifier with high-input impedance.

The sleeve junction calomel reference electrode is recommended for many applications since it provides an easily cleaned junction with fast response.

If chloride ion interferes with the oxidation-reduction system, the quartz-junction calomel electrode with salt bridge and chloride-free filling solution should be used as the reference.

- Other Considerations

If one or both of the half-reactions involve hydrogen ions, then ORP measurement becomes *pH* dependent. Consider the following half-reaction which occurs in the reduction of hexavalent chromate.

$$Cr_2O_7^{=} + 14H^+ + 6e^- = 2Cr^{+++} + 7H_2O$$

The potential at any point in the reduction of hexavalent chromate is:

$$E_h = E^0 + \frac{59.2}{6}\log\frac{(Cr_2O_7^{=})(H^+)^{14}}{(Cr^{+++})^2},\ E_o = +1.33v$$

$$= E^0 + \frac{59.2}{6}\log\frac{(Cr_2O_7^{=})}{(Cr^{+++})^2} + \frac{59.2}{6}\log(H^+)^{14}$$

$$= E^0 + \frac{59.2}{6}\log\frac{(Cr_2O_7^{=})}{(Cr^{+++})^2} - \frac{59.2 \times 14}{6}\,pH$$

The last term in the above expression depends on solution pH. Potential changes measured by the ORP electrode will continue to vary with the redox ratio, but the absolute potential will also vary with pH.

In industrial plants ORP is rarely applied to nice clean reactions where the potentials can be estimated easily. In sewage and paper pulp, for instance, solutions contain a host of constituents that the reagent oxidizes and reduces simultaneously. ORP relates to the concentrations and activities of *all* participating *reactions*. It frequently becomes necessary to determine the control point experimentally.

Temperature compensation is not used because the compensation would be different for each reaction, depending on the number of electrons transferred and the temperature coefficient of E^0. Examine again the general equation for ORP potential with the symbols which comprised 59.2 @ 25°C

$$E_h = E^0 + \frac{2.3\,RT}{nF}\log\frac{(Oxidant)}{(Reductant)}$$

The terms 'R' and 'F' are constants, but the coefficient that multiplies the log term also depends on "T" and "n". When pH is measured, "n" is always one (electron transferred in the hydrogen half-reaction), so temperature compensation is possible. Many industrial ORP reactions, however, have a number of different reactions occurring simultaneously. Often each reaction has a different number of transferred electrons. Therefore, it would be impractical to devise a universal temperature compensator.

The temperature effect is small but it should be considered if the temperature is much above or below 25°C. The necessary correction will usually be less than 1 mv per degree centigrade. This value varies with the electrode being used, but it is fixed for any particular electrode.

Operation

• Preparation

If day-to-day relative potential values are to be compared, the pH meter must be standardized to the same starting point. This can be accomplished by shorting the meter glass and reference inputs and adjusting the STANDARDIZE control until zero millivolts is displayed, using the "absolute millivolt" mode or setting the potential to some arbitrary value when the electrodes are reading the potential in a repeatable standard solution.

Ideally, a noble-metal ORP electrode will respond rapidly to the electrochemical potential established by the redox equilibrium. The rate of electron transfer across the metal's surface, however, depends on the state of the surface. Some reports indicate that electrode poisoning can reduce the exchange to one percent of its maximum value.

The platinum surface may absorb organic compounds and can be poisoned to a degree by cyanides and sulfides. However, in most process control applications the setpoint is fixed to maintain an excess of oxidant to ensure destruction of these compounds. In any case, if poisoning is suspected, the electrode can be restored by following proper cleaning procedures. Recommended *cleaning* procedures include immersion in chromic acid, aqua regia, or nitric acid, or scrubbing with a fine cleansing powder.

• Checking the System

Since ORP is a characteristic measure of redox equilibrium, it should not require standardization or calibration. The measured potential is absolute in a sense. Yet, frequently, it is desirable to check systems for proper operation and electrode poisoning.

Solutions of known potential can be developed by saturating buffer solutions with quinhydrone. The reaction is such that the measured potential will vary only as the solution pH and temperature (see Table II). Procedure is as follows:

1. Saturate buffer with quinhydrone. Make up fresh for each test. Quinhydrone is not readily soluble, so a few crystals stirred into the buffer is sufficient. Solution will be amber colored.
2. Clean platinum electrode.
3. Place platinum and reference electrodes in quinhydrone buffer solution and measure potential and temperature. Measured potential will generally be well within ± 10 mv of theoretical value.

Table II
ORP of Quinhydrone Solutions, mV

	pH 4			pH 7		
Temp °C	20	25	30	20	25	30
Reference						
Ag/AgCl	+268	+263	+258	+92	+86	+79
Calomel	+233	+218	+213	+47	+41	+34

• Sample and Calculations

The actual sample potential measurement consists only of immersing the electrode tips into the sample and recording the potential versus the reference electrode (e.g., E vs. SCE).

In most industrial reactions the oxidation-reduction potential will be controlled at a point that ensures excess of one reactant. This, in turn, ensures that the reaction will go to completion. The ORP measured by an instrument can be estimated by the following rules.

1. Write out the reactions.
2. Determine the equivalence potential.
3. Subtract the reference potential.

The actual magnitude of the measured value (E) of any particular oxidation-reduction system will depend on all the constants of that system (E^0, n, E' the voltage of the reference electrode being used to complete the cell) and on the concentrations of the oxidant and the reductant. Therefore, in any reversible oxidation-reduction system, the measured value, E, or the calculated value, E_h, is a function of the concentrations of the oxidant and the reductant. Regardless of the initial magnitude of the measured oxidation-reduction potential, E, or the calculated potential, E_h, both E and E_h of a given system will become more positive when the concentration of the oxidant relative to the reductant increases (oxidizing intensity becomes greater). Conversely, the values of E and E_h will become more negative with the concentration of the reductant increases relative to the oxidant (reducing intensity becomes greater).

The actual potential measured is the difference between that of the noble-metal electrode and the reference electrode. Potentials referenced to the hydrogen electrode, are commonly designated E_h.

Instrument manfuacturers, however, normally supply the silver-silver chloride or calomel electrodes for ORP measurement (see Table I). Then the ORP potential, measured by the amplifier is

$$E\ (ORP) = E_h - E'\ (reference).$$

Instrument makers have traditionally used the European convention for polarity of oxidation-reduction potentials since this corresponds with the measured potentials. Thermodynamically, this means that the oxidation-reduction reaction is written as a reduction. For example, consider ORP measurement of a standard solution of chlorine in water, using Ag/AgCl reference electrode.

$$\begin{aligned} ORP &= E_n - E'\ (reference) \\ &= E^0\ (chlorine) - E'\ (reference) \\ &= +1.35v - (+0.199v) \end{aligned}$$

The ORP meter will read +1.151V.

Applications

- General

Use of an "electrode of the third type" (noble metal in oxidation-reduction system) is essential for the detection of the equivalence point in numerous potentiometric oxidation-reduction titrations. This method of analysis involves the determination of a reducing agent by *titration* with an oxidizing agent of known concentration or vice versa. This type of reaction is usually characterized by a large change in the E_h (or E) of the solution at the equivalence point. Because of this, potentiometric oxidation-reduction titrations are among the most accurate methods of chemical analyses. Some examples are: titration of iodine with thiosulfate, titration of manganous ions with permanganate, titration of cyanide ions with hypochlorite, and titration of ferrous ions with ceric solutions. Other important uses of this electrode are in the manufacture of bleach, treatment of industrial wastes and in studying biological systems.

- Titrations

Suppose ferrous iron (Fe^{2+}) is titrated with ceric ammonium nitrate solution.

$$Ce^{4+} + e^- = Ce^{3+} \qquad E_1^0 = 1.61V$$
$$Fe^{3+} + e^- = Fe^{2+} \qquad E_2^0 = 0.77V$$
$$Ce^{4+} + Fe^{2+} = Ce^{3+} + Fe^{3+} \qquad E_1^0 - E_2^0 = +0.84$$

At the start of the titration no ceric ions are in solution. The potential of a platinum sensing electrode (referenced to that of hydrogen at 25°C) is

$$E_{h2} = E_2^0 + 59.2 \log \frac{(Fe^{3+})}{(Fe^{2+})} \tag{6}$$

When ceric ions are added to the solution, the ratio of ferric to ferrous iron increases. Equation 6 indicates that the potential sensed by the electrode will increase by 59.2 millivolts at 25°C for every decade increase in redox ratio until the equivalence point is reached.

At this point, the titration involves both the ferrous-ferric ion equilibrium and the ceric-cerous ion equilibrium. The potential of the latter equilibrium is, at 25°C,

$$E_{h1} = E_1^0 + 59.2 \log \frac{(Ce^{4+})}{(Ce^{3+})} \tag{7}$$

At the equivalence point $E_{h1} = E_{h2} = E_{eq}$ and $(Ce^{3+}) = (Fe^{3+})$, $(Ce^{4+}) = (Fe^{2+})$.

Adding Equations 6 and 7

$$2E_{eq} = E_1^0 + E_2^0 + 59.2 \log \frac{(Fe^{3+})(Ce^{4+})}{(Fe^{2+})(Ce^{3+})}$$
$$E_{eq} = \frac{E_1^0 + E_2^0}{2}$$

This relationship shows that the equivalence potential is a function only of the E^0 values of the half-reactions involved. If the addition of ceric ion in the above example is continued, the potential will increase toward E_1^0, reaching it when the ratio $(Ce^{4+}) / (Ce^{3+})$ equals one. Near the equivalence point there is a large change in potential for small increments of added titrant; thus, an ORP titration curve is similar to an acid-base titration curve. Some examples of redox titrations are given in Table III.

- Specific Applications

Applications for ORP measurement are not as widespread as for pH, but several reasonably standard applications exist where ORP measurement and control can be very useful. Some of these applications, include:

- Oxidation of cyanide and chromate wastes
- Bleaching of pulp
- Manufacture of bleach
- Water pollution
- Reduction of chromate wastes

1. *Oxidation of cyanide wastes*

While metal-plating and metal-treating industries produce the largest amount of cyanide waste, other industries use cyanide compounds as intermediates. Oxidation converts the toxic cyanides to harmless compounds. Typically, chlorine gas is the oxidant.

The process is usually carried out in two steps:

- Oxidation to cyanate ion OCN^-
- Further oxidation to carbon dioxide and nitrogen.

In the first step caustic or lime is added to make the cyanide-bearing waste alkaline to a pH of 9 to 10. An acid solution would release deadly cyanide gas. Therefore, the system generally incorporates pH control. The first stage reactions are:

$$Cl_2 + 2e^- = 2Cl^- \qquad E_1^0 = 1.35V$$

Minus

$$OCN^- + H_2O + 2e^- = CN^- + 2OH^- \quad E_2^0 = - \frac{(-0.97V)}{2.32}$$

Net Reaction

$$Cl_2 + CN^- + 2OH^- = 2Cl^- + OCN^- + H_2O$$

The ORP at the equivalence point, using a silver-silver chloride reference electrode, would be represented by:

$$E_{eq} = \frac{E_1^0 + E_2^0}{2} - E' = \frac{1.35 - 0.97}{2} - (0.199)$$
$$= -0.009 \text{ V vs Ag/AgCl}$$

Table III
Titrations with Metal Electrodes

Substance Determined	Titrant	Metal Elect.	Supporting Electrolyte Procedure or Remarks	End Point (E vs. SCE)
Ag^+	I^-	Ag	0.01 M HNO_3	+ 0.102V
AsO_4^{3-}	Ag^+	Ag	Maintain at pH 9	—
Au^{3+}	Ascorbic Acid	Pt	pH 1.6 – 3, 50°C	ΔE Max
Br^-	Ag^+	Ag	0.01M HNO_3	+ 0.195V
Cl^-	Ag^+	Ag	0.01M HNO_3	+ 0.270V
$Cr_2O_7^=$	As^{3+}	Pt	20% H_2SO_4	ΔE Max
Cu^{2+}	Cr^{2+}	Hg-(Ag Tipped in Hg)	5M HCl, deaerate w/CO_2	– 0.1V
Fe^{2+}	MnO_4^-	Pt	0.2 – 1M H_2SO_4	+ 1.09V
	$Cr_2O_7^=$	Pt	0.5M H_2SO_4	ΔE Max
Fe $(CN)_6^{4-}$	$Cr_2O_7^=$	Pt	7% HCl, 50°C	ΔE Max
Halide Mix.	Ag^+	Ag	0.01M HNO_3; contg 5% w/v Ba $(NO_3)_2$	—
H_2SO_3, SO_2	MnO_4^-	Pt	0.5M H_2SO_4, Add excess std MnO_4^-, then excess I^- and Back-Titrate	ΔE Max
I^-	Ag^+	Ag	0.01M HNO_3	+ 0.102V
	MnO_4^-	Pt	0.1-0.25M H_2SO_4	+ 1.0V
Mercaptans	Alc 0.01M Ag^+	Ag	Solv: 13.7g NaOAc·$3H_2O$ + 6 ml glacial HOAC + 500 ml MeOH dil to one liter with C_6H_6 Deaerate with N_2	S = 1st break (Not accurate) Mercaptan 2nd break
Mn^{2+}	MnO_4^-	Pt	Add acid soln of sample to 250 ml fresh sat'd $Na_4P_2O_7$ soln. Adjust to pH 5-7 and titrate	+ 0.53V
$S^=$	Ag^+	Ag		
Sb^{5+}	BrO_3^-	Pt	To sample in 5% HCl add excess Ti^{3+}, then immed. 3 dps 3% $CuSO_4$ Stir + Titrate	+ 0.3 to 0.5V
SCN^-	Ag^+	Ag	0.01 M HNO_3 Contg Ba $(NO_3)_2$	+ 0.21V
Ti^{4+}	Cr^{2+}	Hg-(Ag Tipped in Hg)	2M H_2SO_4 deaerate w/CO_2	– 0.30V
V	MnO_4^-	Pt	1M H_2SO_4 in Jones Reductor	+ 0.05V (V^{2+} – V^{3+}) + 0.44V (V^{3+} – V^{5+}) + 1.1V (V^{4+} – V^{5+})
Zn^{2+}	$K_4Fe(CN)_6$	Pt	pH 2-3, Add 3-4 drops 1% $K_3Fe(CN)_6$	

The second step in cyanide oxidation takes place at a controlled pH in the 7-8 range. The reactions are:

$$Cl_2 + 2e^- = 2Cl^-$$

$$2CO_2 + N_2 + 2H_2O + 6e^- = 2CNO^- + 4OH^-$$

The net reaction is:

$$3CL_2 + 20CN^- + 4OH^- = 6CL^- + 2CO_2 + N_2 + 2H_2O$$

2. *Reduction of chromate waste*

Metal-plating and treating industries are also one of the largest producers of chromate bearing wastes. Chromate reduction, like cyanide oxidation, requires pH control. In the first step the pH is lowered and controlled at about 2 to 2.5. Sulphur dioxide is commonly used as the reductant. The reactions are:

$$Cr_2O_7^= + 14H^+ + 6e^- = 2Cr^{3+} + 7H_2O$$

$$SO_4^= + 4H^+ + 2e^- = H_2SO_3 + H_2O$$

The overall reaction is:

$$Cr_2O_7^= + 2H^+ + 3H_2SO_3 = 2Cr^{3+} + 3SO_4^= + 4H_2O$$

In the second part of the process the waste liquors are neutralized to a pH level of 7 to 8. At this pH the chromic ion precipitates as a sludge, and is sent to clarifiers for ultimate disposal or recovery.

3. *Bleaching pulp*

The pulp and paper industry uses a number of oxidizing agents, usually based on chlorine, for bleaching pulp. Many of these applications also incorporate pH control. Since a variety of organic compounds are oxidized, it is not possible to write exact equations for the pulp-bleaching process.

However, excess reagent is often used to ensure completion of the reaction. Therefore, the ORP will again tend toward the standard potential of the added reactant. Again, the solution pH affects the absolute ORP value.

4. *pH of hydrogen fluoride solutions*

Fluoride concentrations, greater than 10^{-6}M in acid solutions, will attack the glass electrode. The greater the concentration, the greater the severity of the attack. One method of determining pH in hydrogen fluoride acidic solutions is by indirect measurement with a metallic electrode.

The oxidation-reduction potential (ORP) of a solution containing quinhydrone is pH-dependent. Therefore, if no interfering substances, such as strong oxidants or reductants are present, the pH of the test solution can be measured by first saturating it with quinhydrone then measuring the pH with a metallic electrode and a reference electrode. The Beckman gold thimble and the HF resistant calomel electrodes, in phenolic resin bodies, are specifically designed for this and are not attacked by HF.

These HF-resistant electrodes cannot be used directly to measure pH, but rather, quinhydrone must first be added to the solution to establish a reversible and measurable redox couple.

To make a measurement of pH, the solution is saturated, or nearly so, with quinhydrone. This establishes an equimolar mixture of quinone and hydroquinone and the potential of this redox couple is expressed in mV by:

$$E_h = 699.4 - 59.16 \text{ pH (at } 25°\text{C)}$$

The potential of this half-cell is measured by dipping a clean gold electrode into the solution which has been saturated with quinhydrone. The voltage, in millivolts at all temperatures and including the reference electrode potential, will be given by

$$E = E^0 - E' - 0.1984T \text{ pH}$$

where E is the observed potential in millivolts

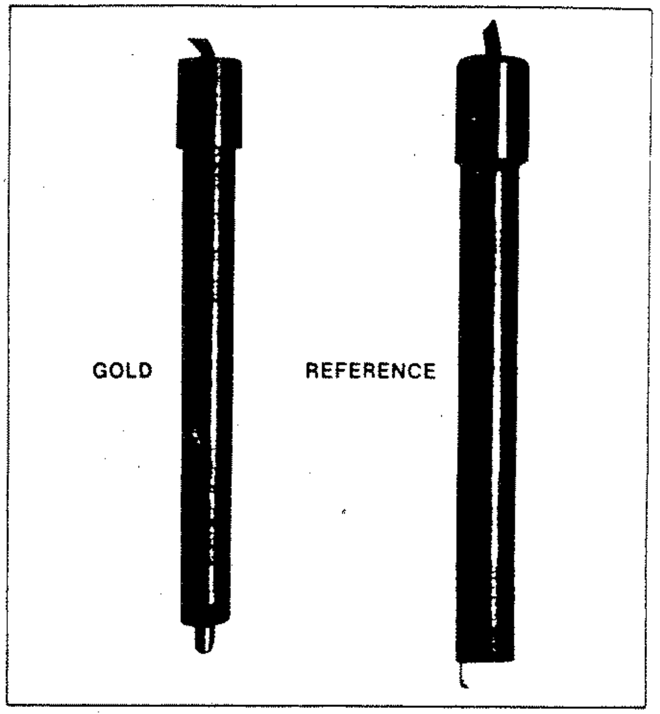
$E^0 - E'$ is the standard voltage of the whole system and is approximately 453 millivolts if a calomel reference is used.

T is the absolute temperature (T°C + 273.16)

A buffer saturated with quinhydrone may be used to calibrate the system. If a buffer close to the pH of the sample is used, the salt effect in this system is minimized (see Table II).

The quinhydrone system is not usable above pH 8.5 due to the dissociation of hydroquinone. It is also not necessary at high pH since HF is dissociated and the F+ ions do not strongly attack glass.

The presence of strong oxidants or reductants will interfere. For best results, samples should be held at constant temperature. Solutions of high salt or acid content can also cause errors.



Conclusion

In order to interpret the results of an ORP measurement correctly, a thorough understanding of the principles is required. In some cases the ORP value may be fairly specific and in other cases the net reaction value does not provide conclusive results as to the dominant reaction.

The use of metallic electrodes does provide expanded use of the pH meter for this important tool of an analysis. Direct measurements indicates quantitative determination of ions and the oxidizing or reducing strength while titrations also provide indirect analyses and increased accuracy.

ORP measurements are widely used for many different applications and this report has discussed only a general approach.

References:

Beckman Handbook of Applied Electrochemistry, Second Edition, 1982.

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LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AMCCOM	Army Armament, Munitions, and Chemical Command
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
CGI/02	Combustible Gas Indicator/Oxygen Meter
CWP	Contaminated Waste Processor
dB	Decibel
DOT	Department of Transportation
EDA	Explosive Disposal Area
EPA	Environmental Protection Agency
ERT	Emergency Response Team
FID	Flame-ionization Detector
HASP	Health and Safety Plan
HSO	Health and Safety Officer
IAAP	Iowa Army Ammunition Plant
IDLH	Immediately Dangerous to Life and Health
LAP	Load, Assemble, and Pack
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollution Discharge Elimination System
OERR	Office of Emergency and Remedial Response (EPA)
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PID	Photoionization Detector
PVC	Polyvinyl Chloride
REM	Roentgen Equivalent, Man
RCRA	Resource Conservation and Recovery Act
SCBA	Self-Contained Breathing Apparatus
SWMU	Solid Waste Management Unit
TLV	Threshold Limit Value
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USCG	U.S. Coast Guard
UV	Ultraviolet

SECTION 3.0

EMERGENCY RESPONSE/CONTINGENCY PLAN

SECTION 3.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the site. This plan is compatible with local, state, and federal disaster and emergency management plans as appropriate.

3.1 PREEMERGENCY PLANNING

During the site briefings held periodically, all employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and routes to the IAAP Health Clinic and Burlington Medical Center. Table 3-1 identifies the hazardous conditions associated with specific site activities.

TABLE 3-1 EMERGENCY RECOGNITION/CONTROL MEASURES

Hazard	Specific Condition/Location	Prevention/Control
Injury	SWMU Sampling Location	Described at Table 5-2
Fire/Explosion	Generator or van electrical fire	Fire extinguisher
Spill	Purge or decontamination water is spilled	Sorbent materials, berms, or dikes
Air Release	Volatiles escape from wellhead	Back off upwind and allow the well to vent

3.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The field Project Manager has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve calling for ambulance transport of injured personnel to the IAAP Health Clinic or to the Burlington Medical Center. He is additionally responsible for ensuring that appropriate security authorities have been notified, and follow-up reports completed. The HSO may be called upon to act on the behalf of the FTM, and will direct responses to any medical emergency.

3.3 EMERGENCY RECOGNITION/PREVENTION

Table 5-2 provides a listing of chemical and physical hazards by site. Hazards as a direct result of site activities are discussed in Section 5.3 and listed in Table 3-1 as are prevention and control techniques/mechanisms. Personnel will be familiar with techniques of hazard recognition from preassignment training and site specific briefings. The HSO is responsible for ensuring that prevention devices or equipment are available to personnel.

3.4 EVACUATION ROUTES/PROCEDURES

In the event of an emergency that necessitates an evacuation of an exclusion zone, the following procedure will be implemented.

Personnel will be expected to withdraw to a safe distance (100 ft.) until re-entry is allowable or an authorized individual, either the FTM or HSO, provides further instructions.

3.5 EMERGENCY EQUIPMENT

The following emergency equipment will be immediately available on each field team's truck:

- First aid kit;
- Fire extinguisher (A, B, and C);
- Eye wash;
- Sorbent material; and,
- Shovel.

3.6 EMERGENCY CONTACT/NOTIFICATION SYSTEM

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization. In the event of a fire or spill, the site supervisor will notify the appropriate IAAP organization. Site work will normally be conducted during IAAP duty hours. However, if work is to be performed during non-duty hours or on weekends, the HSO will make special arrangements with the IAAP emergency organizations to accommodate this situation. Team leaders will be briefed on these arrangements.

Organization	Telephone No. or Extension No.
In-plant ambulance	17
In-plant police	7414 or 7912
In-plant fire	17
Burlington Medical Center	(319) 753-3011
IAAP Health Clinic	7222 or 7830
USATHAMA-SES Branch (Mr. William Hansen)	(301) 671-4811
Health & Safety Advisor (Chris Marlowe)	(703) 968-0900

3.7 EMERGENCY MEDICAL TREATMENT PROCEDURES

Any person who becomes ill or injured must be provided medical treatment as quickly as possible. The buddy system will be used at all times and three-person teams are planned for all sample events. The uninjured team members are responsible for using their first-aid training to assist the injured person(s). If the injury or illness is minor, first aid should be administered prior to transport. If the patient's condition is serious, first aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must be reported to the Project Manager as soon as possible.

Patient(s) being transported to a clinic or hospital for treatment should be escorted by a team member who is able to give information on the chemical(s) to which the patient may have been exposed.

3.8 FIRE OR EXPLOSION

In the event of a fire or explosion, the base security and fire department should be summoned immediately. Upon their arrival, the Field Team Manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site.

If safe to do so, site personnel may:

- Use fire extinguishing equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

3.9 SPILLS OR LEAKS

In the event of a spill or leak, site personnel will:

- Inform the Project Manager immediately;
- Locate the source of the spillage and stop the flow if it can be done safely;
- Notify the IAAP security office; and,
- Begin containment and recovery of the spilled materials if it can be done safely.

SECTION 4.0

SPILL CONTAINMENT PROGRAM

SECTION 4.0 SPILL CONTAINMENT PROGRAM

The procedures defined in this section comprise the spill containment program in place for activities at the IAAP.

- Notify IAAP Security, Safety and Environmental Offices.
- All drums and containers used during the clean-up shall meet the appropriate DOT, OSHA, and EPA regulations for the waste that they will contain.
- Drums and containers containing purge water and sampling soil shall be inspected and their integrity assured prior to being moved. Drum movement will be performed by a subcontractor, hired specifically for this task, who is responsible for providing the proper equipment and trained operators.
- Operations on site will be organized so as to minimize the amount of drum or container movement.
- The drum movement contractor will be responsible for containing any spill during drum movement. The contractor will provide containment equipment (absorbent, pillows, etc.) to contain and isolate the volume of an entire drum.
- Fire extinguishing equipment that complies with 29 CFR Part 1910-Subpart 1 shall be available and ready for use to control fires.

SECTION 5.0

WORK AREAS

SECTION 5.0 WORK AREAS

5.1 HISTORICAL OVERVIEW OF IAAP

IAAP is a Government-Owned Contractor-Operated (GOCO) installation under the command of the U.S. Army Armament, Munitions, and Chemical Command (AMCCOM), Rock Island, Illinois. The current operating contractor, since 1951, is Mason and Hanger/Silas Mason Company. From 1942 to 1946, the operating contractor was Day and Zimmerman and from 1946 to 1951, the facility was government operated.

IAAP is located in Middletown, Iowa, approximately 10 miles west of Burlington, Iowa, and is comprised of approximately 19,000 acres (Figure 5-1). Prior to acquisition by the U.S. Government in 1940, the area consisted of farmland and small settlements. Construction of the Iowa Ordnance Plant began in 1941 and was completed in 1942. The installation has remained in operation, with varying degrees of activity, since 1941. The name of the installation was changed to IAAP in 1963.

The principal mission of IAAP is Load, Assemble, and Pack (LAP) operations dealing with a variety of conventional ammunition and fusing systems. LAP lines were operated at high production rates during the periods of 1941 to 1945, and 1949 to 1952. Varying rates of munitions production have occurred from 1952 to the present. A portion of the installation, Line 1, was modified and operated by the U.S. Atomic Energy Commission (AEC) from 1947 to 1975. No radioactivity was detected on Line 1 during the initial field visit, however readings above normal background were detected at Site 30 and Site 3.

Munitions production and renovation operations at IAAP have resulted in the discharge of wastewaters containing explosives and explosives by-products to surface water systems, including holding ponds and impoundments. Other potential contamination sources resulted from disposal operations, to include explosives burning and detonation, and plating waste landfilling. Potential contaminants in groundwater, surface water, soil, and sediment matrices consists primarily of 2,4,6-trinitrotoluene (246TNT), cyclotrimethylenetrinitramine (RDX), and related compounds used as precursors during the manufacturing process or resulting from degradation of primary explosives.

Forty-three separate sites at IAAP were originally looked at during the SI stage. These sites are briefly described below. Figure 5-2 notes the approximate locations of these sites.

Specific sampling locations are found in maps in the Field Sampling Plan. All sampling locations for this RI/FS are located outside buildings. No confined spaces will be entered during this investigation.

FIGURE 5-1 AREA LOCATION OF IAAP

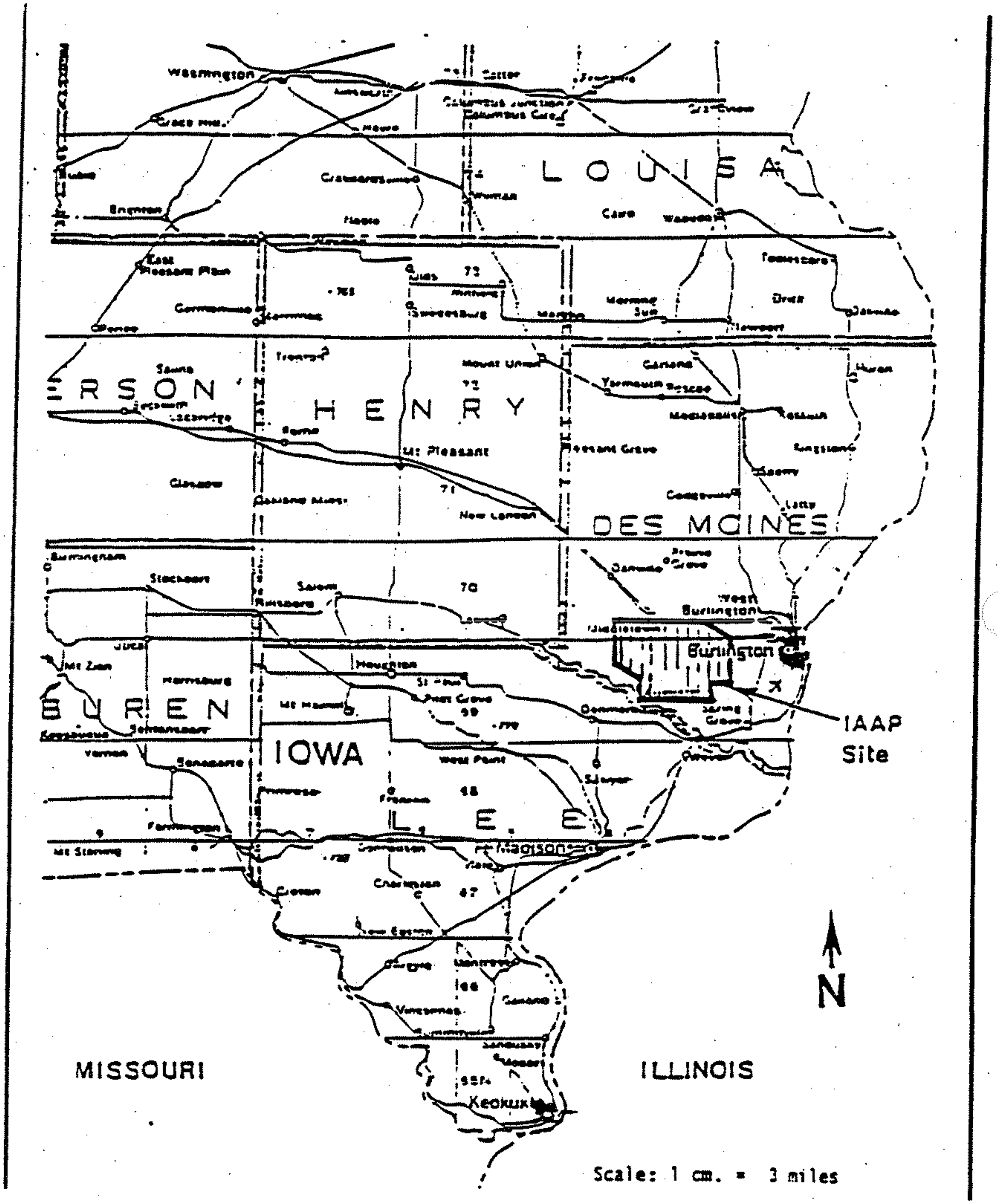
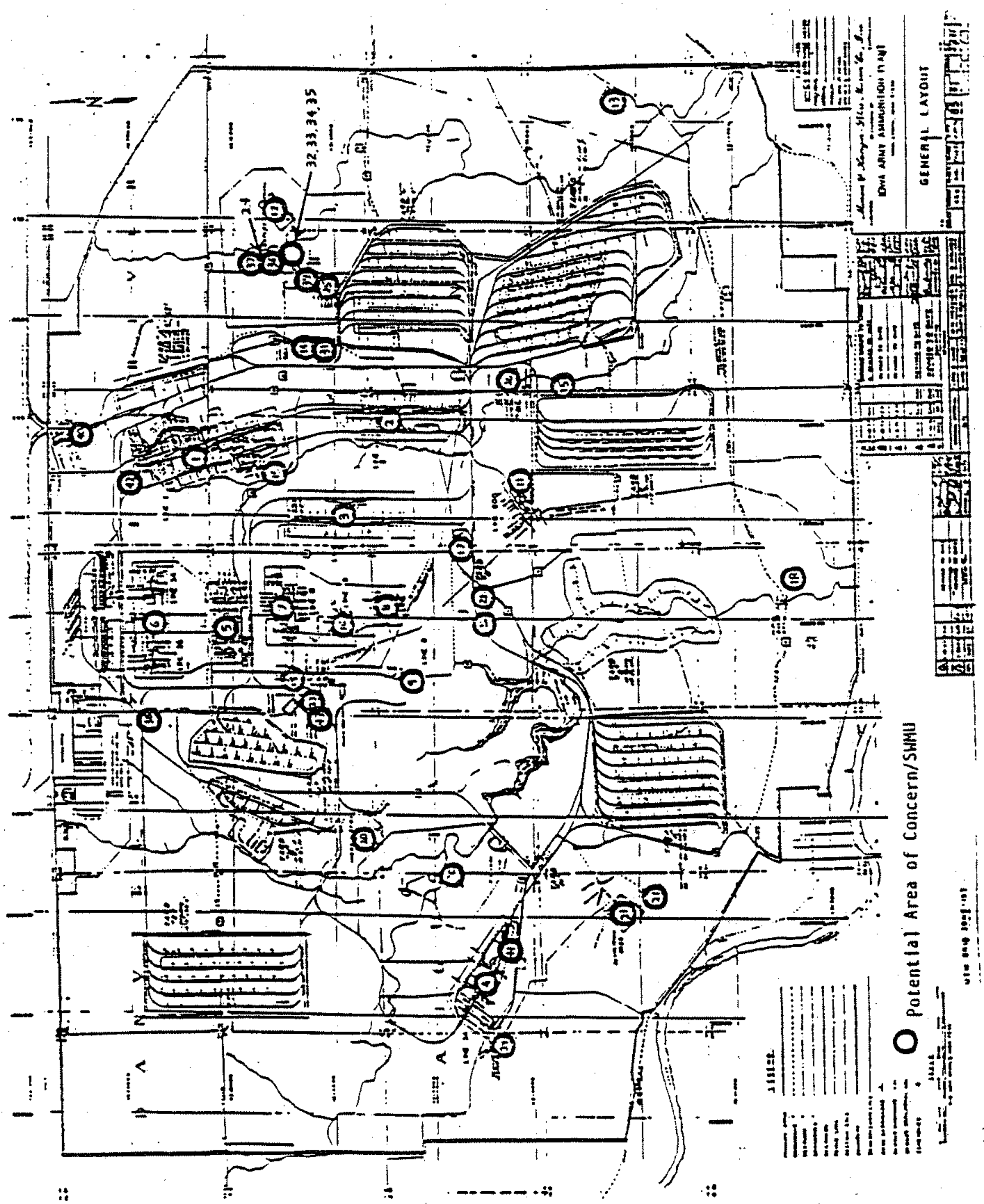


FIGURE 5-2 APPROXIMATE SITE LOCATIONS



LINE 1 (IAAP-1)

The Line 1 production facility is approximately 1700 feet by 4900 feet encompassing an area of approximately 914 acres, situated in the northeast portion if IAAP. This facility was constructed in 1941 and was in operation from late 1941 until September 1945.

From 1948 to June 1975, this line was operated by the Atomic Energy Commission as the Burlington AEC/ERDA Plant. During this period, boratol and boracitol were used. This line is currently a missile warhead, cartridge and grenade load, assemble and pack (LAP) facility. The principal feedstocks are TNT, composition B, PBX and RDX. Additional wastes include LX-14, octal, sump scrap, explosive contaminated carbon, acetone, xylene, explosive contaminated solvents, 1,1,1-trichloroethane, stoddard solvent, methyl ethyl ketone and toluene.

LINE 2 (IAAP-2)

Line 2 is a production line located in the central part of IAAP. It is in an area of approximately 141 acres encompassed by a security fence. Line 2 was constructed in 1941 and was in operation from late 1941 until 1947. The site was dormant from 1947 until 1949. Currently it is used as a conventional LAP facility for heavy artillery projectiles and shaped charges. TNT, composition B and RDX are the principal explosives used. Additional wastes include sump scrap, explosive contaminated carbon, toluene, acetone and xylene.

LINE 3 (IAAP-3)

Line 3 is a production line located in central IAAP. Its dimensions are approximately 1550 feet by 4180 feet encompassing an area of 149 acres. It is surrounded by a security fence. Line 3 was constructed in 1941 and operated until 1945. It was dormant from 1945 to 1949. Presently it is a conventional LAP facility for heavy artillery projectiles and also a metal (brass) treatment facility. Metal plating may have occurred on this line in the past. Wastes generated at this site include TNT, RDX, composition B, sump scrap, and explosive contaminated carbon.

LINE 3A (IAAP-4)

Line 3A is a production line located in western IAAP. It is a trapezoidal shaped area of approximately 119 acres encompassed by a security fence. The production facility was constructed in 1941 and operated from 1943 to 1945, and again from 1949 to present. Line 3A is a LAP facility for artillery ammunition. TNT, RDX, and composition B are used to fill 155mm artillery rounds. Additional wastes have included sump scrap and explosive contaminated carbon.

LINE 4A AND 4B (IAAP-5)

Lines 4A and 4B are situated in north-central IAAP. Both lines are included in a larger area encompassed by a security fence. Line 4A dimensions are approximately 900 feet by 1000 feet covering an approximate area of 21 acres. Line 4B dimensions are approximately 700 feet by 1000 feet covering an area of approximately 16 acres. Both lines were constructed in 1941 as component assembly facilities. Line 4A operated from 1942 to 1945 and again from 1982 to present. Line 4B operated from 1941 to 1945 and again from 1962 to present.

Line 4A is currently a detonator production area. The primary materials related to production of detonators include the following: lead azide, lead styphnate, tetracent, RDX, barium nitrate, and antimony sulfide.

Materials introduced during the treatment process of wastewater include: acetic acid, sodium sulfate, sodium nitrite, and sodium hydroxide.

Wastewaters are treated in tanks at Line 4A which are addressed in the RCRA Part B Permit Application as a hazardous waste treatment unit.

Line 4B is still an active assembly facility of components manufactured elsewhere. In the late 1960s, Line 4B was leased to Missile Command for missile assembly with warheads loaded on Line 2. Hazardous wastes included TNT, RDX, composition B, and lacquer thinner.

LINE 5A AND 5B (IAAP-6)

Lines 5A and 5B are situated in north-central IAAP. Both lines are included in a larger area encompassed by a security fence. Line 5A dimensions are approximately 1200 feet by 1200 feet encompassing an area of approximately 33 acres. Line 5B dimensions are 1200 feet by 1500 feet occupying an area of approximately 141 acres. Both lines were constructed in 1941, operated from 1942-1945 and again from 1949-present. Both lines currently are component lines for the pelletizing and assembly of explosive components. TNT and RDX are the principal explosives used on these lines. Other wastes include acetone and stoddard solvent.

LINE 6 (IAAP-7)

Line 6 is an approximately 30-acre site located near the center of IAAP. Dimensions of the facility are approximately 800 feet by 1600 feet. Line 6 was constructed in 1941. The facility has been used on a limited basis to produce detonators, but has not been in operation since 1981. Materials related to the production of detonators includes: lead azide, lead styphnate, tetracene, RDX, barium nitrate, and antimony sulfide.

Prior to 1981, wastewaters were treated in unlined, gravel-filled pits for pH adjustment prior to discharge to the surface drainage system. Use of these pits has been discontinued.

LINE 7 (IAAP-8)

Line 7 is an approximate 9-acre site located in the central part of IAAP. Its dimensions are approximately 500 feet by 800 feet. It is situated within a larger area encompassed by a security fence. The facility was constructed in 1941 and became inactive in 1970. Formerly, Line 7 was a fuse and blank LAP facility. TNT, RDX, and composition B were the primary materials used.

LINE 8 (IAAP-9)

Past activities at Line 8 encompassed an area of approximately 1200 feet by 2500 feet in central IAAP. This line was constructed in 1941. It was used during World War II to produce Amatol (NH_4 NO_3/TNT). Under government contract after World War II, the Emergency Export Company used the ammonium nitrate crystallization equipment to produce fertilizer for the Marshal Plan. Crystallized material was transferred to Line 3 for blending with bentonite clay.

Subsequent activities were fuse and rocket igniter LAP operations. This line is no longer used and has been partially dismantled.

LINE 9 (IAAP-10)

Line 9, situated in central IAAP, encompasses an area approximately 500 feet by 800 feet. It was built in 1941. Line 9 was a component production facility during World War II. During the Vietnam era, the line produced mines and mine fuses. Currently, the line is an ammunition LAP facility. The principal explosives used are Composition B and PBX. Additional wastes include sump scrap, acetone, xylene, lacquer thinner, and 1,1,1-trichloroethane.

LINE 800 (IAAP-11)

Line 800, located in central IAAP, measures approximately 450 feet by 1700 feet. It is encompassed by security fence. Built in 1941, this line is used as an ammunition renovation and metal treatment facility. Explosive filler is washed from projectiles and blank salute ammunition is loaded. Composition B, TNT, and black powder are the principal components used on this line. Additional wastes include sump scrap, contaminated carbon, acetone, xylene, and 1,1,1-trichloroethane.

Adjacent to Line 800 is a five-acre lagoon identified as the Line 800 Pink Water Lagoon. The lagoon was dug in 1943 and used by Day and Zimmerman until 1945. It was reopened in 1951 by the present contractor. The lagoon received effluent wastewaters from Line 800 explosive and metal cleaning operations. It also received sludges contaminated with heavy metals including hexavalent chromium. Use of the lagoon ceased in 1970. There is no known discharge from the lagoon to the creek. Dames and Moore completed an RI/FS in 1989, which is presently undergoing review and comment.

EXPLOSIVE DISPOSAL AREA (IAAP-12)

The explosive disposal area (EDA) is located in the northeast part of IAAP approximately one mile from the installation boundary. It is a secure area approximately 12 acres in size and measuring 500 feet by 1000 feet. Open burning of explosive contaminated materials and flashing of explosive contaminated metals takes place at the EDA in eight raised earthen burning pads. Each pad is bermed on three sides to restrict the horizontal movement of metal projectiles. Propellant, explosive and pyrotechnic (PEP) contaminated materials are burned or flashed at the EDA. This unit is a RCRA regulated unit and is addressed in the RCRA Part B Permit Application as a treatment unit. A complete list of wastes treated is given in that document. For the purposes of this study, IAAP-12 will be used to refer to IAAP's easternmost burning pad.

INCENDIARY DISPOSAL AREA (IAAP-13)

Based upon the recollection of a former installation employee, incendiary material was possibly buried in a small area east of Yard D during the mid 1940's and some demolition was done. The former employee, now a consultant to IAAP, stated that the area was fenced and warning signs were placed on the fence. The size of the area, which is believed to be small, cannot be determined. Remains of the fence that was placed around the area were located and numerous pits similar to other demolition pits were located in the area. A single length of fence consisting of wood posts and several strands of barb wire exists in the vicinity near the possible area. Based upon the recollection of a former installation employee, the operations were performed once or perhaps several times in the mid 1940's and some demolition was done. The wastes the allegedly buried incendiary material are unknown, but may be similar to those found for IAAP-12 above.

BOXCAR UNLOADING AREA (IAAP-14)

Dunnage lumber from boxcars transporting materials on to the installation are unloaded at this location. The boxcars at times transported boxes of explosives. Minute amounts of explosives may have come into contact with the dunnage. The boxcar unloading area is located east of Yard B. The area is approximately 300 feet by 3000 feet. It was operated from the 1940's to present (although in recent years explosives have been transported primarily by trucks). Possible minute amounts of TNT, RDX, and Composition B may have come into contact with the soil in this area.

OLD FLY ASH WASTE PILE (IAAP-15)

The fly ash waste generated by the Main Heating Plant and the 1-62 Heating Plant from the 1940's until 1976 was placed in this area. The old fly ash waste pile is located between Yards E and D on the west side of Brush Creek measuring approximately 1000 feet by 2000 feet. The fly ash probably contains copper, iron, zinc, sulfur and minute amounts of other metals.

FORMER WASTEWATER IMPOUNDMENT OF BRUSH CREEK (IAAP 16)

Upper Brush Creek near Line 1 was used as an impoundment for process wastewater since 1948. A concrete dam had been constructed containing the impoundment. The impoundment area under conditions of normal precipitation measured approximately 250 feet wide by 700 feet in length. This impoundment received untreated contaminated wash waters from operations at Line 1. Considerable amounts of particulate material, much of which was explosives, were deposited in the impoundment. This treatment method was discontinued and the dam and its accumulated sediment were removed in 1957. Consequently, the stream eroded a channel through the remaining sediments to a depth approximating its previous gradient. However, significant quantities of explosives may remain in the sediments deposited during the operation of the dam, and these sediments are subject to erosion and scour during periods of high stream flow. Explosive wastes including TNT, composition B, cyclotol, PBX, barium, and other materials were discharged to this impoundment. Dames and Moore completed an RI/FS for this area in 1989, which is currently undergoing review and comment.

PESTICIDE PIT (IAAP-17)

This pit is situated in central IAAP, located west of Building 500-30-6. It was for treatment and disposal of residual amounts of pesticides and herbicides from 1968 to 1974. Dimensions of the pit are 8 feet square by 2-3 feet deep. It is lined with plastic and filled with crushed limestone. Lindane, heptachlor, DDT, strychine and 2,4,5-T were among the materials disposed of in the pit.

POSSIBLE DEMOLITION SITE (South of Yard G) (IAAP-18)

The demolition of ammunition items apparently was performed at this site during the 1940's and possibly into the early 1950's. There are no records to confirm this activity or the items treated by demolition. The demolition area was apparently located south of Plant Road K directly across the road from the Pistol Range. The dimensions are unknown. Specification of wastes is unknown.

CONTAMINATED CLOTHING LAUNDRY (IAAP-19)

The installation laundry washes coveralls, underwear, and towels used by production and maintenance workers. A minute amount of explosives may be present on coveralls worn by workers in areas where explosives are present. The laundry is in Building No. 500-125 which is located north of the Main Heating Plant, Building No. 500-139 and west of Line 6 on Plant Road A. Laundry operations have occurred from the 1940's through the present. Building No. 500-125 measures 51 feet by 82 feet. The laundry wash water is discharged into the main sewage treatment plant sanitary sewer system and may contain minute amounts of TNT, RDX, Composition B, black powder and PBX-0280.

INERT DISPOSAL AREA (IAAP-20)

The inert disposal area is comprised of the sanitary landfill, a metal salvage operation and a storage area for blue sludge removed during the clean-up of a waste treatment lagoon. The inert disposal area is located near the center of IAAP on an approximately 10-acre site.

The inert landfill has been used as a sanitary landfill since the installation opened in 1941 receiving materials such as plastic, tin cans, scrap lumber, waxed cardboard, and installation-generated household and cafeteria garbage. The average annual quantity of materials placed in the landfill has been estimated at 3,170 tons. From November 1980 until October 1983, a portion of Trench 5 also received other wastes such as ash from the incineration of open burning of explosives and explosive contaminated waste, the contaminated waste, the contaminated waste processor, and the explosive waste incinerator. Trench 5 was filled and closed in accordance with IAAP standard procedures for closure of a sanitary landfill. Subsequently, a closure plan and post-closure plan for that portion of trench 5 used from November 1980 until October 1983, containing the ash, has been prepared, approved and implemented in accordance with RCRA standards.

Adjoining the landfill is a scrap metal storage area. This area stores scrap metal until sufficient quantities are available for rail shipment. All metals are flashed in one of the on-site incinerators or in the open burning area at the EDA to remove explosive residues prior to storage.

DEMOLITION AREA (IAAP-21)

The Demolition Area, where open detonation is conducted, is located on approximately 10 acres of land in the southwest portion of the installation. The area consists of an open field with 12 shallow craters.

Open detonation of ammunition reject items is required for items that cannot be processed or disposed of safely in any other manner. These are larger caliber ammunition items that cannot be safely dismantled or disassembled for the removal of the explosive filler. In addition, there is no containment vessel available for the detonation of large caliber ammunition items. They cannot be safely treated by incineration. All metals and collectable residues remaining after a detonation episode will be collected and treated in the contaminated waste processor to remove any remaining explosive contamination. The metals will be sold as salvage material. This unit is a RCRA regulated unit and is addressed in the RCRA Part B Permit Application as a treatment unit. [On disk] - See Attachment 9 for a list of wastes treated.

UNIDENTIFIED SUBSTANCE (OIL-BASED) WASTE SITE (IAAP-22)

An unidentified oil-base substance thought to be road surfacing oil was discovered on 16 July 1986. The substance covers an area 20 feet by 20 feet at a depth of less than 12 inches. The site is located northwest of Yard O along the south side of the railroad running track approximately 150 yards west of Plant Road 1.

DEACTIVATION FURNACE (IAAP-23)

The deactivation furnace (DF) is located near the demolition area in the southwestern portion of the plant. The facility has been in use since 1971; however, the DF facility is used only when required, and recent requirements have been limited. Dimensions of the DF are 98 feet by 26 feet. The adjoining air pollution control system measures 20 feet by 27 feet. The deactivation furnace is used to demilitarize small explosive loaded components such as detonators, primers, and fuses. These materials are generated from non-specific plant production lines and include excess and off-specification components. The principle of operation of the deactivation furnace is to feed material to the furnace where it is thermally treated and transported by means of spiral flights within the retort. The metal residue is ejected from the furnace discharge assembly and salvaged. This unit is a RCRA regulated unit and is addressed in the RCRA Part B Permit Application as a treatment unit. A complete list of wastes treated is given in Appendix J. [On disk - Attachment 9].

CONTAMINATED WASTE PROCESSOR (IAAP-24)

The contaminated waste processor (CWP) is located in the explosive disposal area in the northeast part of IAAP, approximately one mile from the installation boundary. The CWP is in Building GB-199-2 whose dimensions are approximately 40 feet by 100 feet. The CWP will be used to flash or burn materials which have come in contact with TNT or other energetic substances. Such materials will include equipment, pipe, steel, empty cartridge cases, empty projectiles, lumber, shipping cartons, wrapping paper, etc. The CWP has been used from 1982 through the present. On 4 October 1983, EPA exempted the CWP from RCRA requirements. However, ash from the CWP may be TLCP toxic and must be managed as a hazardous waste. Metal items are made available for sale as salvageable metals after flashing by fire.

EXPLOSIVE WASTE INCINERATOR (IAAP-25)

The explosive waste incinerator (EWI) is an incineration system designated to thermally treat bulk propellant and explosive wastes generated during the process of manufacture and assembly. The EWI is located in the northeast part of IAAP at the explosive disposal area in Building BG-199-1. Dimensions of the EWI are 28 feet by 110 feet. The adjoining air pollution control system measures 32 feet by 47 feet. Waste fed to the furnace moves toward a flame by means of spiral flights within the retort. Detonation or free-burning, depending on waste characteristics, is initiated by the furnace flame.

The EWI treats explosive wastes, explosive contaminated carbon, sump scrap, and explosive contaminated waste solvents. The resultant ash is collected and managed as a hazardous waste. The EWI was operated on a trial basis from November 1981 to April 1982. This unit is a RCRA regulated unit and is addressed in the RCRA Part B Permit Application as a treatment unit. [On disk - A complete list of wastes treated is given in that document.]

SEWAGE TREATMENT PLANT/SLUDGE DRYING BEDS (IAAP-26)

This unit is located to east-central IAAP. The wastewater influent consists of facility domestic wastes, car wash rack wastes and X-ray film processing wastes, boiler blowdown waste from the steam generating plant near Process Line 1, and blowdown from the oil fired heating plant near Line 2 (when in use). The treatment facility consists of an imhoff tank, a trickling filter, two secondary clarifiers, a chlorine contact chamber, and sludge drying beds. These facilities are contained in an area approximately one acre in size. The discharge is monitored immediately following the final treatment unit at Building No. 500-216-1 for NPDES compliance. Discharge is to Brush Creek. Dried sludge is taken to the old Fly Ash Waste Pile (IAAP-15).

FLY ASH LANDFILL (IAAP-27)

This 9.5 acre landfill, located in west-central IAAP northwest of Building No. 400-139, is approximately 590 feet by 708 feet. The landfill accepts only fly ash from the coal-fired heating plants and as such may contain TCLP toxic materials. This landfill has operated from 1985 through the present. It is part of a group of sites which includes the runoff pond for the coal storage pile located adjacent to the Main Heating Plant, Building No. 500-139.

CONSTRUCTION DEBRIS LANDFILL (IAAP-28)

This three-acre landfill in central IAAP is located in a ravine northwest of Yard O between Plant Road I and the south railroad running track. Wastes placed in the landfill include brick, stone, and concrete. It has operated from the 1940's through the present.

SEWAGE TREATMENT PLANT/SLUDGE DRYING BED - LINE 3A (IAAP-29)

This unit is located in western IAAP. The wastewater influent consists of domestic wastes from the Process Line 3A and blowdown water from the steam generating plant near Line 3A (Building No. 3A-02). The treatment facility consists of an imhoff tank, a trickling filter, a secondary clarifier, a chlorine contact chamber, and a sludge drying bed. These facilities are contained in an area approximately one-half acre in size. It has operated from 1943 to 1945 and again from 1949 through the present. The discharge shall be monitored immediately following the final treatment unit at Building No. 500-216-2 for NPDES compliance. Discharge is to an unnamed tributary of the Skunk River. Dried sludge is taken to the old Fly Ash Waste Pile (IAAP-15).

TEST FIRE (FS) AREA (IAAP 30)

The test fire (FS) area is used on a routine basis to perform static testing of warheads produced at the IAAP. The test fire area has been in operation since the 1940s and was used for atomic energy commission activities from 1948 until 1974. The test fire area measures approximately 4000 feet by 5000 feet and is characterized by hilly terrain which acts to prevent the horizontal movement of sound waves. The nearest installation boundary is approximately one mile away and the land adjoining the installation on the east side is agricultural. The test fire sites are primarily grouped into three areas: the north test fire site consists of F.S.-9, F.S.-10, F.S.-11 and F.S.-12; the south test fire site consists of F.S.-6 and F.S.-15; and the third area consists of F.S.-3, F.S.-4, and F.S.-5. F.S.-14 is counted independently of the other areas and F.S.-1 and F.S.-2 are used for offices. In May, 1991, visits to this area resulted in readings up to 80 micro rem/hour at the ground surface. Background readings were 8 micro rem/hour.

YARD B AMMUNITION BOX CHIPPER DISPOSAL PIT (IAAP-31)

The disposal pit is approximately 120 feet by 40 feet by 8 feet and is situated in the northeast portion of IAAP just west of the EDA. The pit was used over a continuous three-month period sometime between January 1972 and January 1975. During this period, residue from wooden ammunition boxes, primarily 90-millimeter cartridge boxes, was placed in the disposal pit after shredding through the box chipper. The remains of the former disposal pit could not be located during an August 1990 site inspection; however, weathered remains of approximately two dozen ammunition boxes were observed on the ground in the vicinity of the site. The specific wastes disposed in the pit included shredded ammunition boxes that were treated with the wood preservative and fungicide pentachlorophenol (PCP).

BURN CAGES (IAAP-32)

There are three burn cages located in the northeast portion of IAAP each of which is approximately 60 feet by 30 feet. They were used between 9 January 1949 and 9 January 1982 for the burning of inert and explosives contaminated packaging waste. In addition, metal parts flashing was also performed. The cages have since been removed. The inert and explosive contaminated combustible packing materials were disposed of in the adjacent Burn Cage Ash Landfill (IAAP-33). The flashed metal parts apparently were all salvaged.

BURN CAGE ASH DISPOSAL LANDFILL (IAAP-33)

This landfill is approximately 350 feet by 1250 feet and is situated in the northeast area of IAAP in the EDA. The landfill was used from 9 January 1949 to 9 January 1982 and it accepted residual ash generated from the Burn Cages (IAAP-32). The site has been covered with soil and no vegetative stress was observed during an August 1990 visual site inspection. The residual ash generated from the Burn Cage operations may contain trace amounts of heavy metals; however, explosives other than minute residues should not be present due to thermal destruction.

WEST BURN PADS (IAAP-34)

There are two burn pads with approximate individual dimensions of 50 feet by 15 feet located in the northeast sector of IAAP in the EDA. These burn pads were used between 9 January 1949 and 9 January 1982 to flash explosives contaminated metal parts. These pads have been since abandoned, although some metal parts, munition casings, and residual explosives staining on the ground surface was observed during August 1990 visual site inspection. Based on the operations performed at the burn pads, there may be some explosive residues and heavy metals present.

WEST BURN PADS LANDFILL (IAAP-35)

This landfill is approximately 300 feet by 200 feet and is also located in the northeast section of IAAP in the EDA. It was in use from 1950 to 1975 and received residues from the West Burn Pads (IAAP-34). This landfill was closed and covered; however, exposed bricks on the east site were observed during the August 1990 visual site inspection. The specific wastes disposed in this landfill included: sanitary and industrial refuse comprised of cafeteria waste, paper, wood, metal cans, and aerosol cans, including residues from burning operations at the West Burn Pads (IAAP-34). In addition, spent carbon and diatomaceous earth from the explosives wastewater treatment process, previously burned at the Explosives Disposal Area (IAAP-12) was also disposed in this landfill. Leachate generated in this landfill could potentially migrate into groundwater and a nearby stream. Potential wastes that may be encountered here include heavy metals, explosive residues and various hydrocarbons.

NORTH BURN PADS (IAAP-36)

These two burn pads with approximate individual dimensions of 50 feet by 20 feet are located adjacent to the contaminated waste processor (IAAP-24) in the northeast section of IAAP. These pads were used from 1968 to 1972 to burn lead azide and black powder from Line 9 (IAAP-10). During an August 1990 visual site inspection, the pads were observed to be covered with soil except for a 20-foot portion nearest the road. The southern pad is currently being used as a refueling station with an above ground 275-gallon diesel fuel tank. The wastes which were disposed in this area may include small amounts of residual lead. It is believed that with the possible exception of some slight explosive residues, that all explosive materials were thermally destroyed.

NORTH BURN PADS LANDFILL (IAAP-37)

This landfill is approximately 250 feet by 125 feet and is situated in the EDA disposal area in the northeast section of IAAP. The landfill was used from 1968 to 1972 and received residues from the North Burn Pads (IAAP-36). Presently, this site is closed and revegetated; however, small areas and strips of sparse vegetation were observed during an August 1990 visual site inspection. The waste disposed of in this landfill included detonator cups and paper or wood ash which were flashed at the North Burn Pads (IAAP-36). Leachate generated in this landfill may migrate to the groundwater.

BUILDING 600-86 SEPTIC SYSTEM (IAAP-38)

The septic tank and associated drain field were in use from 1941 to 1953. It is located in the north central portion of IAAP, west of Lines 5A and 5B (IAAP-6). Standard drinking and waste water analyses were performed in this building as well as titrations of primer mixes of lead azide which were killed with ceric ammonium nitrate. The waste titration solutions were transferred to the Explosive Disposal Area (IAAP-12). Primarily, sanitary waste water went to the septic tank and was subsequently discharged to the subsurface drain field.

FIRE TRAINING PIT (IAAP-39)

The Fire Training Pit was a burn pit used for fire-fighter training from 9 January 1981 to 9 January 1987. It was approximately 40 feet by 16 feet by 2 feet deep and was located in the northeast area of IAAP in the EDA. Fire fighter training was accomplished by placing 55-gallon drums of solvent or fuel in the pit, setting them ablaze, and then extinguishing the fire by the trainees. Generally, waste solvents were used until 1984, and fuels were used until 1987. Currently, based on an August 1990 visual site inspection, there are dark brown stained bare areas and a petroleum odor in the unlined pit. As a result of past practices, the potential contaminants of concern include various petroleum hydrocarbons and aromatics that could rapidly migrate in the subsurface soil and impact on the groundwater.

ROUNDHOUSE TRANSFORMER STORAGE AREA (IAAP-40)

During the early years of use, transformers were stored at the west side of Yard A in an area approximately 200 feet by 40 feet. Presently, the site is at the center of the yard, and its size is approximately 60 feet by 40 feet. This area has been in use since 1940. Transformers containing pentachlorobiphenyls (PCBs) are stored on the site awaiting reuse or disposal. During the August 1990 visual sight inspection, approximately 47 transformers were found at the site. Two relatively minor spills, totalling less than approximately four ounces, were also noted. All transformers stored in the area were labeled with green tags identifying dielectric fluid as containing less than 50 parts per million (ppm) of PCBs. Even though no wastes were disposed of in this area, there is the potential for soil contamination by PCBs.

LINE 3A POND (IAAP-41)

A man-made lagoon, partially above ground, and approximately 60 feet by 30 feet by 8 feet deep is located in the western area of IAAP just east of Line 3A (IAAP-4). It was used for a continuous six-month increment during the early 1950s. Casings for 500-pound bombs were processed by submersion into a sulfuric-hydrochloric acid bath that was then followed by a chromic acid bath for a final rinse. It is believed that approximately 15,000 gallons of spent sulfuric and hydrochloric acid was disposed in the pond and treated with sodium hydroxide. The chromic acid rinse was not taken to the pond when the operation was completed. Based on these past operational practices, it is expected that neutralized salts containing sulfates and chlorides, which are very mobile in soil, may be found in high concentrations in this area. During the August 1990 visual site inspection, no remains or evidence of the lagoon could be located; the suspected lagoon location is covered with natural vegetation. During the May 1991 visual inspection, a former employee confirmed the approximate location of the acid bath and estimated the location where the treated acid would have flowed through a road culvert to reach the pond. No evidence of the pond was found.

ABANDONED COAL STORAGE YARD (IAAP-42)

The abandoned coal storage yard is approximately 3 acres and is located in the north central area of IAAP, north of Line 1 (IAAP-1). From 1950 to 1968 the site was actively used to store coal for the Line 1 heating plant. In 1968 when coal was no longer used, the remaining coal in storage was abandoned in place. This coal has since become unusable, and the site has been abandoned. Vegetative stress adjacent to the yard was observed during the August 1990 visual site inspection. The specific waste to be found is weathered coal, and this implies potentially elevated solid concentrations of iron, sulfates, and various acids which can be released to the soil, groundwater, and nearby surface water.

FLY ASH DISPOSAL AREA IAAP (IAAP-43)

The fly ash disposal area is approximately 5 acres in size and is centrally located in IAAP west of Line 6 (IAAP-7) and Line 9 (IAAP-10). It was used in the 1940s to early 1950s for waste fly ash disposal. The abandoned waste site is presently covered by natural vegetation, and no vegetative stress was observed during the August 1990 visual site inspection. It is expected that the disposed material should be stable with low levels of heavy metal contaminants and little potential for migration to groundwater.

5.2 HAZARD RISK ANALYSIS

The evaluation of hazards is based upon a knowledge of the site's background presented in Section 5.1, and anticipated risks posed by the specific operations. The following subsections describe each task/operation in terms of the specific hazards associated with it and the specific sites to which they apply. In addition, the protective measures to be implemented during completion of those operations are also identified.

Table 5.1, Hazard Risk Index, provides a matrix of the categories of hazard severity versus the probability of encountering that hazard. This is a reference table which is used to rank site specific hazard risks, and forms the basis for the following tables. Table 5-2, Physical Hazards of Concern, provides a list of physical hazards and shows to which SWMUs these hazards are applicable. Physical examination of the SWMUs indicates that most hazards are present at all SWMUs, with SWMUs 4, 7, 21, 23, and 27 presenting additional electrical and exposure hazards. Table 5.3, Ranking of IAAP Hazard Risk Index, is a matrix where each potential hazard is placed in a hazard severity category and the correct probability range is assigned. Table 5-3 also lists the appropriate hazard risk index numbers taken from Table 5-1.

Prevention

- Back strain can be prevented by employing proper lifting and bailing techniques. Heavy equipment, such as pumps and generators, should by only lifted with the legs, preferably using two personnel (Appendix N).

- Slipping on wet surfaces can be reduced by placing all purged water in drums for removal. Also, boots with good tread must be worn and personnel be alert to the areas where they are walking to decrease the chance of slipping.

- Ground fault interrupters will be used in the absence of properly grounded circuitry or when pumps are used around wet conditions. Electrical extension cords will be protected or guarded from damage (e.g., cuts from other machinery) and be maintained in good condition. More detailed guidance may be found in Appendix M.

- Heat stress will be minimized by making coolers of drinking water available in each van and by insuring work crews take frequent rest breaks to cool themselves down. Team leaders will be responsible for insuring crew members take their temperature frequently with a disposable paper thermometer and taking them to the clinic if their temperature is above normal, 98.6° F. The HSO will instruct workers to recognize the symptoms of heat stress. See Appendix N for more detailed information.

- Tick bites and the potential for Lyme disease will be minimized by using full length clothing and tick repellent. Detailed procedures that will be followed are in Appendix J.

- Snake bites will be reduced by wearing steel-toed boots and being careful to watch your step in potential snake areas. If bitten, the crew member will be kept calm and immobile while the other team members transport him to the clinic that will provide ambulance transport to the Burlington Medical Center where anti-venom is available.

- Eye and face protection will be worn as appropriate to prevent water splashing into eyes.

- To minimize exposure to volatiles when the well head is initially opened, an organic vapor analyzer (OVA) will be placed near the opening to monitor organic levels. The breathing zone will also be monitored. The action levels on the instruments will be chosen before site work begins, and are outlined in this HASP in Section 9.3. To prevent contact with contaminated groundwater, or product material, adequate protective equipment will be provided.

Table 5-3 is applicable to work on all 43 SWMUs. Whenever the tasks are performed, the hazard severity and probability have been evaluated as relatively within the guidelines of Figure 5-1, Hazard Risk Index. The tasks covered by this table include all the sampling tasks and all the work during the time frame of this plan.

5.3 DRILLING AND UXO SAFETY

Phase I of the RI/FS will include no monitoring well installations. Phase II of the RI/FS may include monitoring well installations depending on the results of the Phase I sampling and screening.

Phase I work will, however, include the use of a Geoprobe (RECON Multimedia Sampling System) to do subsurface soil sampling, soil/gas surveying, and piezometer installation.

Specific Health and Safety issues pertaining to the Geoprobe can be found in the subcontractor's Health and Safety plan which is appended to this plan (Appendix S). JAYCOR's HASP for the Iowa site will have precedence over any conflicting supplemental information provided by the Geoprobe HASP. SOPs for Geoprobe subsurface sampling, soil/gas surveying, and piezometer installation may be found in the QAPjP in Appendix G.

Included within this section is preliminary information (See Appendix Q, Drilling Safety, and Appendix R, UXO Safety) discussing UXO and drilling concerns associated with Boring/Monitoring well installation.

Further information will be provided as attachments to this document and the QAPjP from drilling and UXO subcontractors before beginning Phase II field work if any well installation is warranted. As of this date USATHAMA's UXO technical support group will provide UXO support to JAYCOR's efforts at IAAP during the RI/FS.

Table 5-1 Summary of Hazard Risk Index

HAZARD SEVERITY		POTENTIAL CONSEQUENCES		PROBABILITY				
				A	B	C	D	E
Category	Descriptive Word	Personnel Injury/Illness	Building Unusable	Frequent	Reasonably Probable	Occasional	Remote	Improbable
I	Catastrophic	Death Long-Term Disability	Death Long-Term Disability	IA (1)	IB (2)	IC (4)	ID (8)	IE (12)
II	Critical	Severe Injury or Occupational Illness	Severe Injury or Occupational Illness	IIA (3)	IIB (5)	IIC (6)	IID (10)	IIE (15)
III	Marginal	Minor Injury or Minor Occupational Illness	Minor Injury or Minor Occupational Illness	IIIA (7)	IIIB (9)	IIIC (11)	IIID (14)	IIIE (17)
IV	Negligible	No Injury or Illness	No Injury or Illness	IVA (13)	IVB (16)	IVC (18)	IVD (19)	IVE (20)

Unacceptable
Undesirable
Acceptable when prevention/monitoring measures are taken
Acceptable without review

Table 5-2 Physical Hazards of Concern

HAZARD	DESCRIPTION	PREVENTION/MONITORING TECHNIQUES	APPLICABLE SWMUS
Back Pain	Lifting Samples or Pumps	Use Proper Lifting Techniques	All
Slips/Falls	Slipping on Wet Surfaces	Wear Boots With Good Tread	All
Electrical	Using Pumps or Generators in Wet Environments	Use Properly-Grounded Equipment	4, 7, 21, 23, & 27
Heat Stress	Hot Weather Causes Abnormal Stress	Take Frequent Breaks Monitor Body Temperature	All
Lyme Disease	Tick Bites Can Be Infectious	Addressed in Appendix J	All
Snake Bite	Poison Snakes May Be Encountered	Wear Boots (Section 10.3 for Emergency Medical Care)	All
Exposure to vapors	May Occur When Well Head is Initially Opened	Use OVA Meter - Back off & Allow to Vent	4, 7, 21, 23, & 27
Water splashing in eyes	May Occur During Sampling	Use Face Shields	4, 7, 21, 23, & 27

Table 5-3 Ranking of IAAP Hazard Risk Index

HAZARD	CATEGORY	PROBABILITY	HAZARD RISK INDEX
Back Pain	III	D	14
Slips/Falls	III	D	14
Heat Stress	III	C	11
Lyme Disease	III	C	11
Snake Bite	III	D	14
Electrical*	III	D	14
Exposure to vapors when well head initially opened	III	C	11
Water splashing in eyes during sampling	III	C	11

* Applicable only to sites 4,7,21,23, and 27 where generators will be used to purge monitoring wells.

5.4 CHEMICAL HAZARDS

The following is a brief description of the typical chemical contaminants that may be encountered on site, which includes a description of the chemical, its health hazards, fire and explosion hazards, first aid requirements, and recommended protective clothing. Appendix I contains MSDSs or equivalents for sampling and monitoring support materials, such as preservatives that are brought onto the site.

Arsenic

Description:	Silver-gray or tin-white, brittle, odorless solid.
Health Hazards:	Ulcerations of nasal septum. Respiratory and dermal irritation.
First Aid:	Flush or wash contaminated skin or eyes immediately. If large amounts of the material is inhaled, move victim to fresh air. Get medical attention immediately.
Fire/Explosion Hazard:	Non-combustible solid in bulk form, but a slight explosive hazard in the form of dust when exposed to flame.
Recommended Protective Clothing:	Butyl, Neoprene

Barium

Description:	An alkaline earth metal, yellowish-white, slightly lustrous lumps, somewhat malleable, very easily oxidized.
Health Hazards:	Inhalation may be harmful (contact may cause burns to skin and eyes). Fire may produce irritating or poisonous gases.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	May ignite itself if exposed to air, or moisture and may re-ignite after fire is extinguished. Cylinders may explode in heat of fire.
Recommended Protective Clothing:	CPE, PVA

Cadmium Compound

Description:	Silver-white, blue-tinged, lustrous metal, easily cut with a knife. Slowly oxidized by moist air, insoluble in water, does not react with alkalies. Cadmium and its salts are highly toxic.
Health Hazards:	Poisonous if swallowed or dust is inhaled. Fire may produce irritating or poisonous gases.
First Aid:	Flush eyes with water, wash skin with soap and water. If large amounts of cadmium compounds are inhaled, move victim to fresh air. Perform artificial respiration if breathing has stopped. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Some of these materials may burn, but none ignite readily.
Recommended Protective Clothing:	Butyl, Neoprene, PVC, Rubber, Nitrite/PVC, Nitrile, CPE

Chromium

Description:	Steel-gray, lustrous metal, takes a high polish, attacked by caustic alkalies, not oxidized by air.
Health Hazards:	Skin and lung irritant, oral ingestion may cause severe irritation of the gastrointestinal tract, circulatory shock, and renal damage.
First Aid:	Flush contaminated eyes with copious amounts of water, wash skin with soap and water. If large amounts of chromium are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Dust is a moderate fire hazard.
Recommended Protective Clothing:	Neoprene

Copper Nitrate Solution

Description:	A blue crystalline solid dissolved in water, used in medium and as an insecticide. Toxic oxides of nitrogen are produced in fires involving this material.
Health Hazards:	May cause burns to skin or eyes, vapors or dust may be irritating, fire may produce irritating or poisonous gases.

First Aid:	Flush skin or eyes with running water for at least 15 minutes, remove contaminated clothing. Move victim to fresh air. Get medical attention immediately.
Fire/Explosion Hazard:	May ignite other combustible materials. Reaction with fuels may be violent.
Recommended Protective Clothing:	PVC, Neoprene

DDT

Description:	A colorless to white crystalline solid, wettable powder, or water emulsifiable liquid, used as a pesticide.
Health Hazards:	Irritating to skin and eyes, if swallowed will cause nausea, vomiting, headache, or loss of consciousness.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Combustible, poisonous gases are produced in fire. Toxic and irritating gases may be generated. Melts and burns.
Recommended Protective Clothing:	Viton, Butyl

2,4-DNT and 2,6-DNT

Description:	Yellow to red solid or yellow heated liquid, liquid solidifies, solid and liquid sink in water.
Health Hazards:	Poisonous if swallowed or if skin is exposed, will burn skin and eyes, if swallowed will cause nausea, vomiting, or loss of consciousness.
First Aid:	Flush eyes with copious amounts of water, wash skin with soap and water. Get medical help immediately. If inhaled, move victim to fresh air and get medical attention for methemoglobinemia.
Fire/Explosion Hazard:	Combustible, fire may produce poisonous gases, containers may explode in fire.
Recommended Protective Clothing:	CPE, PVA

Heptachlor

Description:	A white to light tan waxy looking solid, used as an insecticide, non-combustible, insoluble in water.
Health Hazards:	Poisonous if swallowed or inhaled, irritating to skin or eves, will cause nausea and vomiting if swallowed and headache or loss of consciousness if inhaled.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Not flammable. Irritating gases may be produced when heated, hydrogen chloride fumes may form in fire.
Recommended Protective Clothing:	Viton, Butyl

Lead

Description:	Bluish-white, silvery, gray metal, highly lustrous when freshly cut, very soft and malleable, easily melted, attacked by pure water, resistant to tap water.
Health Hazards:	Poisonous if swallowed or inhaled, fire may produce irritating or poisonous gases.
First Aid:	Remove contaminated clothing at site, flush eyes with running water, move victim to fresh air, get medical attention immediately.
Recommended Protective Clothing:	Butyl, Neoprene, Nitrite, Nitrite/PVC, PVC, Rubber

Lindane

Description:	A white to yellow liquid dissolved in a liquid carrier, a water emulsifiable liquid, used as a pesticide.
Health Hazards:	Poisonous, may be fatal if inhaled, swallowed or absorbed through skin, may burn skin and eyes, fire may produce irritating or poisonous gases.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move

victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.

Fire/Explosion Hazard: These materials may burn but do not ignite readily. Cylinders may explode in heat of fire.

Recommended Protective Clothing: Viton

Mercury

Description: Silver-white, heavy, odorless liquid.

Health Hazards: Cough, chest pains, fatigue, weakness, eye and dermal irritation.

First Aid: Flush or wash contaminated skin or eyes immediately. Seek immediate help if inhaled or ingested.

Fire/Explosion Hazard: Non-combustible liquid.

Recommended Protective Clothing: Butyl, Neoprene

Methyl Ethyl Ketone (MEK)

Description: A colorless, fairly volatile liquid, with a pleasant, pungent odor, used as a solvent and for production of wax, moderately soluble in water.

Health Hazards: Vapor is irritating to eyes, nose and throat, if inhaled will cause nausea, vomiting, dizziness, difficult breathing, or loss of consciousness; liquid will burn eyes.

First Aid: Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.

Fire/Explosion Hazard: Flammable, flashback along vapor trail may occur, vapor may explode if ignited in an enclosed area.

Recommended Protective Clothing: Butyl

Pentachlorophenol

Description:	A white crystalline solid, slightly soluble in water, used as a fungicide and wood preservative.
Health Hazards:	Poisonous if swallowed or inhaled. Very toxic, causes lung, liver, and kidney damage and contact dermatitis, acute poisoning due to inhalation, visual damage.
First Aid:	Move victim to fresh air, remove and isolate contaminated clothing, flush skin or eyes with running water, wash skin and hair with soap and shampoo. Systemic poisoning: reduce elevated body temperature by physical means.
Fire/Explosion Hazard:	Liquid must be moderately heated before ignition will occur, contact with strong oxidizers may cause fires or explosions. Hydrogen chloride, chlorinated phenols, and carbon monoxide may be released upon decomposition.
Recommended Protective Clothing:	Nitrile, PVC

RDX

Description:	A Class A high explosive, detonation occurs almost instantaneously and is violent.
Health Hazard:	Does not appear markedly toxic.
First Aid:	Flush eyes with copious amounts of water, wash skin with soap and water. Get medical help immediately. If inhaled, move victim to fresh air and get medical attention for methemoglobinemia.
Fire/Explosion Hazard:	Dangerously explosive, do not fight fires in cargo areas, evacuate area-let burn.
Recommended Protective Clothing:	CPE, PVA

Selenium

Description:	Colorless to red, odorless, crystalline solid.
Health Hazards:	Vomiting, nausea, convulsions, abdominal pain, eye and dermal irritation.

First Aid:	Flush or wash contaminated skin or eyes with copious amounts of water. Seek immediate medical attention if inhaled or ingested.
Fire/Explosion Hazard:	Combustible solid.
Recommended Protective Clothing:	Neoprene, PVC

Silver

Description:	White, lustrous solid.
Health Hazards:	Nasal, throat, and skin irritation; ulcerations.
First Aid:	Flush or wash contaminated area with water. Seek medical attention immediately, especially if ingested or inhaled.
Fire/Explosion Hazard:	Non-combustible solid, but flammable in the form of a dust or powder.
Recommended Protective Clothing:	Viton, Butyl

Strychnine Salt

Description:	Usually a white crystalline solid, soluble in water, toxic by ingestion, will burn but not easily ignited, fire may produce irritating or poisonous gases.
Health Hazards:	Poisonous if swallowed, or inhalation of dust. Fire may produce toxic oxides of nitrogen.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Some of these materials may burn but none of them ignite readily.
Recommended Protective Clothing:	CPE, PVC

2,4,5 - T

Description:	A light tan solid, insoluble in water, used as a herbicide, defoliant, and plant growth regulator.
Health Hazards:	Poisonous if swallowed, irritating to skin and eyes. Poisonous gases may be produced in fire.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Combustible, toxic hydrogen chloride, and phosgene gases may be formed during combustion.
Recommended Protective Clothing:	Butyl, Neoprene, Nitrite, Viton, PVC

Toluene

Description:	A clear colorless liquid with a characteristic aromatic odor, lighter than water and insoluble in water, vapor is heavier than air, used in aviation and automotive fuels and as a solvent.
Health Hazards:	Vapor is irritating to eyes, nose and throat, causes nausea, vomiting, headache, dizziness, difficult breathing, or loss of consciousness. Liquid is irritating to skin and eyes, if swallowed will cause nausea, vomiting or loss of consciousness.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Flammable, flashback may occur along vapor trail, vapor may explode if ignited in an enclosed area, vapor is heavier than air and may travel a considerable distance to a source of ignition and flashback.
Recommended Protective Clothing:	NBR, Viton, Viton/NEO

1,1,1-Trichloroethane (TCEA)

Description:	A colorless liquid with a sweet-like odor, used as a solvent for fats, oils, waxes, resins, etc.
Health Hazards:	Vapor is irritating to eyes nose and throat, causes dizziness or difficult breathing, and may have a narcotic effect. Liquid is irritating to skin and eyes and may cause nausea if swallowed.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Moderately flammable at high temperatures, poisonous gases produced in fire.
Recommended Protective Clothing:	Viton, PVA

Trinitrotoluene (TNT)

Description:	A Class A explosive, detonates almost instantaneously, detonation is violent and may be initiated by sudden shock, high temperature or combination of the two.
Health Hazards:	Contact may cause burns to skin and eyes, fire may produce poisonous gases.
First Aid:	Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.
Fire/Explosion Hazard:	Dangerously explosive, do not fight fires in cargo areas, evacuate area and let burn.
Recommended Protective Clothing:	Nitrile/PVC, PVC

Xylene

Description:	A clear colorless liquid with a characteristic aromatic odor, lighter than water, insoluble in water, vapor is heavier than air, used as a solvent for paints and adhesives and to make other chemicals.

Health Hazards: May be poisonous if inhaled or absorbed through skin, vapor may cause dizziness or suffocation, liquid may irritate or burn skin and eyes, fire may produce irritating or poisonous gases.

First Aid: Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.

Fire/Explosion Hazard: Flammable/combustible material, may be ignited by heat, sparks, or flames, vapors may travel to a source of ignition and flashback, container may explode in heat of fire. Vapor explosion hazard indoors, outdoors, or in sewers.

Recommended Protective Clothing: Viton, PVA, NBR

Zinc

Description: Bluish-white, lustrous metal, stable in dry air, becomes covered with a white coating of basic carbonate when exposed to moist air.

Health Hazards: Exhalation of fumes may cause nausea and vomiting, contact may cause irritation and burns to skin and eyes, fire may produce irritating or poisonous gases.

First Aid: Flush contaminated skin or eyes with copious amounts of water. Remove contaminated clothing. If large amounts of this material are inhaled, move victim to fresh air. If breathing has stopped, perform artificial respiration. Keep victim warm and quiet. Get medical attention immediately.

Fire/Explosion Hazard: Flammable/combustible material, may be ignited by heat, sparks, or flames, may burn rapidly with flare-burning effect.

Appendix L, Occupational Exposure Limit Values, contains a list of threshold limit values (TLV) and concentrations immediately dangerous to life or health (IDLH). These are listed by SWMU for easy reference by workers.

5.5 SITE HAZARD EVALUATIONS

Site hazard evaluations were done for each individual SWMU site at IAAP. Information for each site includes site/waste characteristics, action levels, field activities, contaminants of concern, and monitoring equipment to be used.

OVERALL HAZARD EVALUATION

Several tasks will be conducted during the RI program, these are as follows:

1. Water level measurements
2. Groundwater sampling
3. Surface soil sampling
4. Sediment sampling
5. Soil gas monitoring/survey
6. Surface water sampling
7. Borehole drilling/subsurface sampling
8. Monitoring well installation/piezometer installation
9. Geoprobe subsurface soil sampling
10. Geoprobe groundwater sampling
11. Metals screening
12. Explosives screening
13. Fish tissue sampling

COMMENTS:

Analytical results from samples from the 1989 investigation indicated fairly widespread but low concentrations of contaminants found the IAAP SWMU sites. As such, the overall hazard evaluation for the above tasks proposed at IAAP is considered low. Level D protection will be the primary level of protection for all tasks at the RI sites. Upgrade to Level C will be done as site conditions require it. PPE requirements for each task at each site can be found in columns 3 and 4 on the following pages.

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________ .
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R1
LINE 1

HEALTH AND SAFETY PLAN FORM		PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)		TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3	Soil samples will be collected from locations selected based on visual evidence (e.g. stressed vegetation, sumps, etc.). Samples will be analyzed for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 & 6	Sediment and surface water samples will be collected from the drainage pathway to the Brush Creek watershed.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11	Surface and subsurface screening for metals will be conducted on samples from the sump behind Melt Building 1-05-1.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
10	Groundwater screening using Geoprobe along the western perimeter of the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12	Surface and subsurface screening for explosives will be conducted behind Melt Building 1-05-01.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R1
LINE 1

HEALTH AND SAFETY PLAN FORM	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
5 Soil gas surveys will be done at eight areas (solvent storage areas and at UST areas).	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
1 & 2 Groundwater sample at one location.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R1
LINE 1

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	12,000 (s)	0.5 mg/m^3	1100 mg/m^3	NE	Upper respiratory irritation, muscle spasm; slow pulse, extrasystoles, hypokalcuia, eye irritation, skin burns	NE
Lead	400 (s)	.15 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia weight loss, anemia, limp wrist, abdominal pain, hypotension	NE
Chromium	140 (s)	0.5 mg/m^3	NE	NE	Histologic fibrosis of lungs	NA
Copper	74 (s)	1 mg/m^3	NA	NE	Eye irritation, nausea, fever, weakness	NE
Zinc	804 (s)	1 mg/m^3	NE	NE	Nose/throat irritation, chest pain	NE
2,4,6-TNT	3.9 (s)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine, muscle pain	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R1
LINE 1

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
RDX	78 (s)	1.5 mg/m^3	NA		Central nervous system dysfunctiuon including convulsions and coma	NE
HMX	160 (s)				Skin irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R1
LINE 1

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL $21.0\%O_2$ $<21.0\%O_2$ $<19.5\%O_2$	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector ( ) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) _______ev Type __HNU__	1, 2, 3, 4, 5, 10, 11, & 12	*Specify:* HNU	HNU readings above 5ppm will require site evacuation	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		(X) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[ ]
Noise	[ ]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > ___0.5___ mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ______________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ______________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______________ mg/m^3, other ______________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
3 Collect surface soil samples to be analyzed for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives at SI location 02-SS-05 area.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface soil screening for metals at three areas.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 Soil gas survey will be done at solvent storage area.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 & 6 Surface water and sediment sampling done at six locations.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R2
LINE 2

HEALTH AND SAFETY PLAN FORM — PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Lead	170 kg/mg (s)	.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Mercury	1.41 mg/kg (s)	.05 mg/m^3	28 mg/m^3		Cough, chest pain, dyspnea, insomnia, irritability, headache, fatigue, weakness	NE
Zinc	216 mg/kg (s)	5 mg/m^3	NA	NE	Nose, throat irritation, chest pain	NE
RDX	.63 mg/kg (s)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
HMX	1.8 mg/kg (s)				Skin irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN | **PROJECT DOCUMENT #00012659.91**

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type _HNU_____	3, 4, 5, 6, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > ___0.5___ mg/m^3, other__________________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ________________________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ________________________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______________________ mg/m^3, other ________________________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN **TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION** (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11 Subsurface and surface soil will be screened in the vicinity of Buildings 3-70-1 and 3-70-2 for metal contamination.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
1, 8, & 10 Groundwater screening using Geoprobe at 6 points at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil samples will obtained at southern end of Building 3-10 to verify metal, explosive, and pesticide contaminants.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 Soil gas survey at solvent storage area.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives done around melt building.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R3
LINE 3

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	73.7 mg/kg (sw)	0.5 mg/m^3	NE	NA	Upper respiratory irritation, muscle spasm; slow pulse, extrasystoles; hypokalenia, eye irritation; skin burns	NE
Chromium	244 mg/kg (s)	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NE
Copper	2000 mg/kg (s)	1 mg/m^3	NA		Eye irritation, nausea, fever, weakness	NE
Mercury	10 mg/kg (s)	.05 mg/m^3	28 mg/m^3		Cough, chest pain, dyspnea, insomnia, irritability, headache, fatigue, weakness	NE
Zinc	5600 mg/kg (s)	5 mg/m^3	NE		Nose, throat irritation, chest pain	NE
2,4,6-TNT	2600 mg/kg (s)	.5 mg/m^3			Respiratory irritation, skin irritation, gastroentestinal distress, deep red colored urine	

NA = Not Available NE = None Established U = Unknown

S = Soil	SW = Surface Water	T = Tailings	F = Flyash	TK = Tanks	SD = Sediment
A = Air	GW = Groundwater	SL = Sludge	D = Drums	L = Lagoon	

SITE IAAP-R3
LINE 3

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
HMX	21 mg/kg (s)	1.5 mg/m^3	NE		Central nervous system dysfunction including convulsions and coma	
RDX	58 mg/kg (s)				Skin irritation	

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R3
LINE 3

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 $<$21.0%O_2 $<$19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ________ ev Type ___HNU_______	1, 3, 5, 8, 10, 11, 12	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ____________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ____________ Type ____________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ____________ Type ____________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [X] Solid [X] Sludge [ ] Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ] Volatile [ ] Corrosive [X] Acutely Toxic [ ]

Explosive [X] Reactive [ ] Carcinogen [X] Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ] Confined* Space [ ] Below Grade [X] Trip/Fall [X]

Puncture [X] Burn [X] Cut [X] Splash [X]

Noise [X] Other: ______________________________

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)		TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
6	Collect surface water samples from ditch near Building 3A-70-01 and within a sump. Samples will be analyzed for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11	Surface and subsurface screening for metals in soils will be conducted on the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12	Surface and subsurface screening for explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5	Soil gas survey will be done at two solvent storage areas.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3	Surface soil sampling will be done for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
PERSONNEL NAME	FIRM	RESPONSIBILITIES			ON SITE

SITE IAAP-R4
LINE 3A

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Cadmium	8.42 mg/kg (s)	0.2 mg/m^3	50 mg/m^3	NA	Dyspnea, cough, tight chest, headache, chills, muscle ache, diarrhea, vomit	NA
Chromium	71.4 mg/kg (s)	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NE
Copper	133 mg/kg (s)	1 mg/m^3	NA		Eye irritation, nausea, fever, weakness	NE
Lead	400 mg/kg (s)	.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia weight loss, anemia, limp wrist, abdominal pain, hypotension	NE
Zinc	332 mg/kg (s)	5 mg/m^3	NE		Nose, throat irritation, chest pain	NE
TNT	6600 mg/kg (s)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep colored urine	10.5% v

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
DNT	6.9 mg/kg (s)	1.5 mg/m^3	200 mg/m^3		Anorexia, cyanosis, anemia, jaundice	U
RDX	210 mg/kg (s)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
HMX	650 mg/kg (s)				Skin irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R4
LINE 3A

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ________ ev Type HNU	3, 5, 6, 11, & 12	*Specify:* HNU	HNU reading above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ] Solid [X] Sludge [ ] Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ] Volatile [ ] Corrosive [ ] Acutely Toxic [ ]

Explosive [ ] Reactive [ ] Carcinogen [X] Radioactive* [ ]

Other: __________

Physical Hazards:

Overhead [ ] Confined* Space [ ] Below Grade [X] Trip/Fall [X]

Puncture [X] Burn [ ] Cut [X] Splash [ ]

Noise [ ] Other: __________

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m³, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m³, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m³, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ________ mg/m³, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R5
LINES 4A & 4B

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN **TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION** **(attach additional sheets as necessary)**	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
11 Surface and subsurface soil screening for metals along drainage ditch and sump areas.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives along drainage ditch and at sump areas.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 Soil gas surveys done at two solvent storage areas.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
1 & 2 Groundwater sample of one existing well on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 & 6 Surface water and sediment samples taken at two locations.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R5
LINES 4A & 4B

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Lead	300 mg/kg (s)	0.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdonimal pain, hypotension	NE
Mercury	.75 mg/kg (s)	.1 mg/m^3	28 mg/m^3		Cough, chest pain, dyspnea, insomnia, irritibility, headache, fatigue, weakness	NE
RDX	9.3 µg/L (sw)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
HMX	91 µg/L (sw)				Skin irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL $21.0\%O_2$ $<21.0\%O_2$ $<19.5\%O_2$	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	1, 2, 4, 5, 6, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ]	Solid [X]	Sludge [ ]	Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [ ]	Corrosive [X]	Acutely Toxic [ ]
Explosive [X]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [X]	Trip/Fall [X]
Puncture [X]	Burn [X]	Cut [X]	Splash [ ]
Noise [ ]	Other: ______________________________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ____________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3 Collect surface soil samples to be analyzed for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface screening for explosives in soil at 6 areas on the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface screening for metals in soils at 8 areas on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R6
LINES 5A & 5B

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Beryllium	2.6 mg/kg (s)	.0005 mg/m^3	10 mg/m^3		Respiratory symptoms, weakness, fatigue, weight loss	NA
Cadium	32 mg/kg (s)	.2 mg/m^3	50 mg/m^3	NA	Dyspnea, cough, chest tight, headaches, chills, muscle aches, nausea	NA
Copper	65.7 mg/kg (s)	1 mg/m^3	NA		Eye irritation, nausea, fever, weakness	NE
Lead	370 mg/kg (s)	.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Mercury	.75 mg/kg (s)	.1 mg/m^3	28 mg/m^3	NE	Cough, chest pain, dyspnea, insomnia, irritibility, headache, fatigue, weakness	NA
Zinc	1360 mg/kg (s)	1 mg/m^3	NE	NE	Nose/throat irritation, chest pain.	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
DNB	.35 mg/kg (s)	1 mg/m^3	200 mg/m^3		Cyanosis, anemia, dizziness, and fatigue	10:50
DNT	1.7 mg/kg (s)	1.5 mg/m^3	200 mg/m^3		Anoxia, cyanosis, anemia, jaundice	U
HMX	120 mg/kg (s)				Skin irritation	NA
RDX	4.8 mg/kg (s)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NA
TNB	1.5 mg/kg (s)					
TNT	2500 mg/kg (s)	.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastroentestinal distress, deep red colored urine	10:59

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	3, 11, & 12	*Specify:* HNU	HNU reading above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ____________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ____________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11 Surface and subsurface screening for metals in soil at 5 areas on the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
1 & 2 Groundwater samples will be obtained from 18 monitor wells.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil confirmation sampling for metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	1600 mg/kg (s)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalenia, eye irritation, skin burns	NE
Chromium	466 mg/kg (s)	0.5 mg/m^3	NE		Histologic fibrosis of lungs	NE
Lead	820 mg/kg (s)	.15 mg/m^3	Variable		Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Nickel	328 mg/kg (s)	.015 mg/m^3	NE		Headaches, vertigo, nausea, vomiting, epigastric pain, cough, hyperpnea, cyanosis, weakness, delirium, convulsions	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ______ ev Type HNU	1, 2, 3, & 11	*Specify:* HNU	HNU reading above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R8
LINE 7

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
12 Surface and subsurface screening for explosives in soils in 1 location on site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Collect soil samples for PCB analysis outside of a transformer pad fence and confirmation samples for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Collect a surface water sample from excavated sump, if available.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface screening for metals in soils at four areas on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R8
LINE 7

HEALTH AND SAFETY PLAN FORM						PROJECT DOCUMENT #00012659.91
KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
PCB 1260	2.06 mg/kg (s)	.001 mg/m^3	5 mg/m^3		Eye and skin irritation, acne from dermatitis	U
Tetryl	8.8 μg/L (sw)	1.5 mg/m^3	NE		Sensitization dermatitis, itching, edema on nasal folds, cheeks, and neck; anemia, cough, headaches, insomia, nausea	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	3, 6, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[ ]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ______ mg/m^3, other ______.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ______ mg/m^3, other ______.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______ mg/m^3, other ______.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R9
LINE 8

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)		TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
3	Surface and subsurface soil sampling of Tank Farm and buildings.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 & 6	Surface water and sediment sampling of a creek.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
9	Subsurface soil sampling will be done with the Geoprobe.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11	Surface and subsurface screening for metals will be done at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12	Surface and subsurface screening for explosives will be done at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Cadmium	5.19 mg/kg (s)	.2 mg/m^3	50 mg/m^3	NA	Upper respiratory irritation, muscle spasm, skin burn	NA
Copper	58.7 mg/kg (s)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NE
Lead	570 mg/kg (s)	.15 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Mercury	1.3 mg/kg (s)	0.5 mg/m^3	28 mg/m^3	NE	Cough, chest pain, dyspnea, insomnia, irritibility, headache, fatigue, weakness	NE
Zinc	568 mg/kg (s)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NE
DNT	.6 μg/L (sw)	1.5 mg/m^3	200 mg/m^3		Anoxia, cyanosis, anemia, jaundice	

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	3, 4, 6, 9, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type OVA	3	*Specify:*		( ) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m³, other __________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m³, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m³, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m³, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3 Collect soil samples from locations around site for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 & 6 Collect surface water and sediment samples from excavated sump pits, if available.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface screening in soils for explosives will be done at four areas within the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface screening in soils for metals will be done within the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 Soil gas surveys will be done at two areas at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R10
LINE 9

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Beryllium	101 mg/kg (s)	.0005 mg/m^3	10 mg/m^3		Respiratory symptoms, weakness, fatigue, weight loss	NA
Chromium	227 µg/L (sw)	0.5 mg/m^3	NE		Histologic fibrosis of lungs	
Copper	106 mg/kg (s)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NA
Lead	660 µg/L (sw)	.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypotension	NA
Mercury	10 mg/kg (s)	.1 mg/m^3	28 mg/m^3	NE	Cough, chest pain, dyspnea, insomnia, irritability, headaches, fatigue, weakness	NA
HMX	6.8 µg/L (sw)				Skin irritation	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R10
LINE 9

HEALTH AND SAFETY PLAN FORM **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
RDX	63 µg/L (sw)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NA
TNB	1.7 µg/L (sw)					

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL $21.0\%O_2$ $<21.0\%O_2$ $<19.5\%O_2$	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ________ ev Type HNU		*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ____________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[ ]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ____________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other __________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11 Subsurface and surface soil screening for metals will occur on site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 & 8 Surface and subsurface soil samples will be obtained around transformer pad to be analyzed for PCBs and pesticides.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Subsurface and surface soil screening for explosives will occur on site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil confirmation samples will be obtained to analyze for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 A soil gas survey will be done at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Chromium	91.4 mg/kg (S)	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NA
Copper	178 mg/kg (S)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NA
Lead	140 mg/kg (S)	.1 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Zinc	1200 mg/kg (S)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NE
HMX	7.4 mg/kg (S)				Skin irritation	NE
RDX	6.4 mg/kg (S)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

SITE IAAP-R11
LINE 800

HEALTH AND SAFETY PLAN FORM **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
1,1,1-TCE	.83 mg/kg (S)	1 ppm	150 ppm		Nausea, vomiting, abdominal pain, enlarged tender liver, kidney damage	11.1 ev
di-n-butylphthalate	6.2 mg/kg (S)					
PCB 1260	.112 mg/kg (S)	.5 mg/m^3	5 mg/m^3		Irritated eyes and skin, dermatitis	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL $21.0\%O_2$ $<21.0\%O_2$ $<19.5\%O_2$	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	3, 5, 8, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type OVA	5	*Specify:*		( ) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ______________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R12
EDA EAST BURN PADS

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)		TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
10	Groundwater samples will be collected using a Geoprobe at 4 locations.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11	Surface and subsurface soil screening for metals on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12	Surface and subsurface soil screening for explosives on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3	Surface soil confirmation samples analyzing metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
9	Subsurface soil samples will be collected using the Geoprobe at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R12
EDA EAST BURN PADS

HEALTH AND SAFETY PLAN FORM **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	8300 mg/kg (s)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalenia, eye irritation, skin burns	NA
Chromium	89.9 mg/kg (s)	0.5 mg/m^3	NE		Histologic fibrosis of lungs	NA
Copper	53.9 mg/kg (s)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NA
Zinc	513 µg/L (gw)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NA
DNT	5.4 µg/L (gw)	1.5 mg/m^3	200 mg/m^3		Anoxia, cyanosis, anemia, jaundice	U
HMX	3700 mg/kg (s)				Skin irritation	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R12
EDA EAST BURN PADS

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
RDX	7700 mg/kg (s)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
TNT	6000 mg/kg (s)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

HEALTH AND SAFETY PLAN **PROJECT DOCUMENT #00012659.91**

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	3, 9, 10, 11, & 12	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ______________________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ______________________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______________________ mg/m^3, other ______________________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R13
PESTICIDE PIT

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
10 Groundwater samples will be obtained from 3 locations on site using a Geoprobe. Samples will be analyzed for pesticides.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
9 Subsurface soil samples will be collected with the Geoprobe on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil samples will be collected for analysis of pesticides and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface soil screening for metals will be done at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R13
PESTICIDE PIT

HEALTH AND SAFETY PLAN FORM **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	1120 mg/kg (s)	.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, eye irritation, skin burns	NA
Chromium	58.9 mg/kg (s)	.5 mg/m^3	NE	NA	Histologic fibrosis of the lungs	NA
DDT	.007 mg/kg (s)	.5 mg/m^3	NE	NA	Dizziness, confusion, vomiting, irritation of eyes and skin	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: ***Specify by task. Indicate type as necessary. Attach additional sheets as necessary.***

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector ( ) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ________ ev Type ____________		*Specify:*		(X) Not Needed
Flame Ionization Detector Type OVA	3, 9, 10, & 11	*Specify:*	OVA will be used to monitor Geoprobe area while installation and sampling is done.	( ) Not Needed
Detector Tubes/Monitor Type ____________ Type ____________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ____________ Type ____________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R14
INERT DISPOSAL AREA

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
7 Collect depth composite soil samples from 3 locations on site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 & 4 Collect sediment samples with corresponding surface water samples from drainage pathways.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface screening for explosives in soil.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface screening for metals in soil.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Chromium	502 mg/kg (S)	.5 mg/m^3	NE		Histologic fibrosis of the lungs	NA
Copper	4700 mg/kg (S)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NA
Lead	7600 mg/kg (S)	.10 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NE
Zinc	3360 µg/L (SW)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NE
DNT	1.1 µg/L (SW)	1.5 mg/m^3	200 mg/m^3		Anoxia, cyanosis, anemia, jaundice	U
HMX					Skin irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R14
INERT DISPOSAL AREA

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	7, 3, 4, 11, & 12	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ________ mg/m^3, other ________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R15
DEMOLITION AREA AND DEACTIVATION FURNACE

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
2 Groundwater wells will be sampled and analyzed for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
7 Soil samples will be collected using an auger and analyzed for metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 & 11 Surface and subsurface screening for explosives and metals in soil.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
10 Geoprobe may be used for additional sampling, if warranted.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	5100 mg/kg (s)	0.5 mg/m³	1100 mg/m³	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Cadmium	180 mg/kg (s)	0.2 mg/m³	50 mg/m³	NA	Dyspnea, cough, tight chest, headaches, chills, muscle aches, nausea, diarrhea	NA
Chromium	613 mg/kg (s)	0.5 mg/m³	NE		Histologic fibrosis of the lungs	NA
Copper	613 mg/kg (s)	1 mg/m³	NE		Eye irritation, nausea, fever, weakness	NA
Lead	6400 mg/kg (s)	.10 mg/m³	700 mg/m³	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
Mercury	.719 mg/kg (s)	0.5 mg/m³	28 mg/m³	NE	Cough, chest pain, dyspnea, insomnia, irritability, headaches, fatigue, weakness	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R15
DEMOLITION AREA AND DEACTIVATION FURNACE

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Zinc	14000 mg/kg (s)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NA
DNB	25 mg/kg (s)	1.0 mg/m^3	200 mg/m^3		Cyanosis, anemia, dizziness, fatigue	10.7 ev
DNT	5.5 μg/L (gw)	1.5 mg/m^3	200 mg/m^3		Anoxia, cyanosis, anemia, jaundice	U
RDX	7 μg/L (gw)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL $21.0\%O_2$ $<21.0\%O_2$ $<19.5\%O_2$	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ______ ev Type HNU	2, 7, 10, 11, & 12	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ]	Solid [X]	Sludge [ ]	Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [ ]	Corrosive [X]	Acutely Toxic [ ]
Explosive [X]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [X]	Trip/Fall [X]
Puncture [X]	Burn [X]	Cut [X]	Splash [ ]
Noise [X]	Other: ______________________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ________________________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ________________________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________________ mg/m^3, other ________________________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R16
CONTAMINATED WASTE PROCESSOR

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11 Surface and subsurface screening for metals will occur on 2 areas of the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives will be done on the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
1 & 2 Groundwater sample taken at one well on the site. Analyses will be done for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water sample in a sump will be taken. Analyses will be done for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil confirmation samples will be taken for explosives and metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R16
CONTAMINATED WASTE PROCESSOR

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Copper	93.5 mg/kg (s)	1 mg/m^3	NE		Eye irritation, nausea, fever, weakness	NA
Lead	160 mg/kg (s)	.15 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
HMX	12 µg/L (sw)				Skin irritation	NA
RDX	34 µg/L (sw)	1.5 mg/m^3	NE		Central nervous system dysfunction including convulsions and coma	NE
TNT	16 µg/L (sw)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: ***Specify by task. Indicate type as necessary. Attach additional sheets as necessary.***

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )_______ ev Type HNU	1, 2, 3, 6, 11, & 12	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type _______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type _______ Type _______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type _______ Type _______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[ ]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[X]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[ ]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[ ]
Noise	[ ]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ______ mg/m^3, other ________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ______ mg/m^3, other ________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______ mg/m^3, other ________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
5 Soil gas survey will be performed at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 Surface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R17
EXPLOSIVE WASTE INCINERATOR

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Chromium	31.3 mg/kg	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NE
Zinc	98.0 mg/kg	5 mg/m^3	NE		Nose and throat irritation, chest pain	NE
1,1,2,2-tetrachloroethane (TCLEA)	0.264 mg/kg	7 mg/m^3	150 ppm		Nausea, vomiting, abdominal pain, jaundice, enlarged tender liver, dermatitis, kidney damage	11.10 ev

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN — **PROJECT DOCUMENT #00012659.91**

MONITORING EQUIPMENT: ***Specify by task. Indicate type as necessary. Attach additional sheets as necessary.***

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector ( ) 11.7 ev (X) 10.2 ev ( ) 9.8 ev ( ) ____ ev Type HNU	3, 5	*Specify:* HNU	HNU reading above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ____		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ____ Type ____		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ____ Type ____		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		(X) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[X]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[ ]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other ______________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ______________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other ______________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R18
STP/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3 & 7 Surface and subsurface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water sample will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R18
STP/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m³ (*specify*)	IDLH ppm or mg/m³ (*specify*)	WARNING CONCENTRATION ppm or mg/m³ (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	92.6 µg/L (SW)	0.5 mg/m³	1100 mg/m³	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Chromium	33.9 mg/kg (S)	0.5 mg/m³	NE		Histologic fibrosis of the lungs	NA
Mercury	5.6 mg/kg (S)	0.5 mg/m³	28 mg/m³	NE	Cough, chest pain, dyspnea, insomnia, irritability, headaches, fatigue, weakness	NA
Silver	139 mg/kg (S)	0.01 mg/m³	NE		Blue-gray eyes, nasal septum, throat, and skin irritation	NA
Zinc	486 µg/L (SW)	5 mg/m³	NE		Nose and throat irritation, chest pain	NA

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

SITE IAAP-R18
STP/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
2,4,6-TNT	12 µg/L (SW)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U
HMX	4.2 µg/L (SW)				Skin irritation	NE
RDX	6.7 µg/L (SW)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
Tetryl	0.66 µg/L	1.5 mg/m^3	NE		Sensitive dermatitis, erythemia, edema on nasal folds, cheeks, and neck; sneezing, anemia, fatigue, cough, insomnia, headaches	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	3, 6, & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ____________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[ ]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ____________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ____________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ____________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R19
FLY ASH LANDFILL

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
2 Groundwater monitoring wells will be sampled.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R19
FLY ASH LANDFILL

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Arsenic	99 mg/kg (S)	.01 mg/m^3	100 mg/m^3		Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, respiratory irritation	NA
Barium	986 μg/L (GW)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Beryllium	5.6 mg/kg (S)	.0005 mg/m^3	10 mg/m^3		Respiratory symptoms, weakness, fatigue, weight loss	NA
Chromium	29.9 mg/kg (S)	0.5 mg/m^3	NE		Histologic fibrosis of the lungs	NA
Lead	97.0 mg/kg (S)	0.10 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
Selenium	13.5 mg/kg (S)	0.2 mg/m^3	U		Irritated eyes, nose, and throat; headaches, chills, fever, metallic taste, garlic breath, gastrointestinal disturbances, dermatitis	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R19
FLY ASH LANDFILL

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Zinc	688 µg/L (GW)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NA
TNT	1.7 µg/L (GW)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U
HMX	1.5 µg/L (GW)				Skin irritation	NE
Tetryl	4.9 µg/L (GW)	1.5 mg/m^3	NE		Sensitive dermatitis, erythmea, edema on nasal folds, cheeks, and neck; sneezing, anemia, fatigue, cough, insomnia, headaches	U

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	2	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other __________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R20
CONSTRUCTION DEBRIS LANDFILL

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3 and 7 Collect soil samples from locations using auger; samples will be analyzed for PCB/pesticides.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 and 6 Collect sediment and corresponding surface water samples from intermittent stream coming off-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives will be performed.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
9 & 10 Geoprobe groundwater and subsurface sampling.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R20
CONSTRUCTION DEBRIS LANDFILL

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
HMX	.75 mg/kg (S)				Skin irritation	NE
DNB	.97 mg/kg (S)	1 mg/m^3	200 mg/m^3		Anoxia, cyanosis, burning mouth, dry throat, thirst, anemia	10.71 ev
PCB-1260	.75 mg/kg (S)	0.5	5 mg/m^3		Irritated eyes and skin, dermatitus	U
Dieldrin	.061 (S)	.25 mg/m^3	450 mg/m^3		Headaches, dizziness, nausea, vomiting, mailase, convulsions, coma	U
2;2-bis(p-chlorophenyl) -1,1-dichtoroethane	.057 mg/kg (S)	400 mg/m^3	16400 mg/m^3	120 ppm	Skin irritation, liver and kidney damage	11.12
2,2-bis(p-chlorophenyl) -1,1-dichloroethene	.032 mg/kg (S)					

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R20
CONSTRUCTION DEBRIS LANDFILL

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
2,2-bis(p-chlorophyl) -1,1-trichorocthene	.063 mg/kg (S)					

NA = Not Available NE = None Established U = Unknown

S = Soil
A = Air
SW = Surface Water
GW = Groundwater
T = Tailings
SL = Sludge
F = Flyash
D = Drums
TK = Tanks
L = Lagoon
SD = Sediment

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ______ ev Type HNU	3, 4, 6, 7, 9, 10, & 12	*Specify:*		( ) Not Needed
Flame Ionization Detector Type OVA		*Specify:*		( ) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[X]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other __________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R21
LINE 3A SEWAGE TREATMENT PLANT/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
3 & 17 Surface and subsurface soil samples will be obtained.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R21
LINE 3A SEWAGE TREATMENT PLANT/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN FORM — PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	97.4 µg/L (SW)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Silver	15.5 mg/kg (SL)	0.01 mg/m^3	NE		Blue-gray eyes; nasal septum, throat, and skin irritation	NA
Lead	36 mg/kg (S)	0.10 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
Zinc	119 µg/L (SW)	5 mg/m^3	NE		Nose and throat irritation, chest pain	NA
HMX	23 µg/L (SW)				Skin irritation	NE

NA = Not Available　NE = None Established　U = Unknown

S = Soil　SW = Surface Water　T = Tailings　F = Flyash　TK = Tanks　SD = Sediment
A = Air　GW = Groundwater　SL = Sludge　D = Drums　L = Lagoon

SITE IAAP-R21
LINE 3A SEWAGE TREATMENT PLANT/SLUDGE DRYING BEDS

HEALTH AND SAFETY PLAN FORM — PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
RDX	200 µg/L (SW)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE
Tetryl	0.66 µg/L (SW)	1.5 mg/m^3	NE		Sensitive dermatitis, erythema, edema on nasal folds, cheeks, and neck; sneezing, anemia, fatigue, cough, insomnia, headaches	U

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: ***Specify by task. Indicate type as necessary. Attach additional sheets as necessary.***

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	3, 6, & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[X]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R22
FIRING SITE AREA

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	LEVEL OF PROTECTION Contingency	SCHEDULE
11 Surface and subsurface soil screening for metals will occur on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12 Surface and subsurface soil screening for explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 & 7 Surface and subsurface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
10 A Geoprobe piezometer will be installed.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
2 A groundwater sample will be obtained from an available well on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R22
FIRING SITE AREA

HEALTH AND SAFETY PLAN FORM | **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Arsenic	21.3 mg/kg (s)	.01 mg/m^3	100 mg/m^3	NA	Ulceration of nasal septum, dermatitis, respiratory irritation	NE
Barium	77.8 µg/L (sw)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Cadmium	332 mg/kg (s)	0.2 mg/m^3	50 mg/m^3	NE	Pulminary edema, dyspnea, cough, tight chest, headaches, chills, muscle aches, nausea, vomiting, diarrhea	NE
Chromium	2800 mg/kg (s)	0.5 mg/m^3	NE		Histologic fibrosis of the lungs	NA
Copper	8200 mg/kg (s)	1 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	NA
Nickel	1900 mg/kg (s)	.015 mg/m^3	NE	NE	Headaches, vertigo, nausea, vomiting, cough, cyanosis, weakness, delirium, convulsions	NE

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

SITE IAAP-R22
FIRING SITE AREA

HEALTH AND SAFETY PLAN FORM **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Zinc	3900 mg/kg (s)	5 mg/m^3	NE	NE	Nose and throat irritation, chest pain	NE
DNB	.98 mg/kg (s)	1 mg/m^3	200 mg/m^3		Cyanosis, anemia, dizziness, fatigue	10.71 ev
HMX	2.2 mg/kg (s)				Skin irritation	NE
RDX	16 mg/kg (s)	1.5 mg/m^3	NA		Central nervous system dysfunction including convulsions and coma	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R22
FIRING SITE AREA

HEALTH AND SAFETY PLAN			PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*			
INSTRUMENT	TASK	ACTION GUIDELINES	COMMENTS
Combustible Gas Indicator		0-10% LEL — No explosion hazard 10-25% LEL — Potential explosion hazard; notify SHSC >25% LEL — Explosion hazard; interrupt task/evacuate 21.0%O_2 — Oxygen normal <21.0%O_2 — Oxygen deficient; notify SHSC <19.5%O_2 — Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: Notify HSM >2mR/hr: Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	2, 3, 7, 10, 11, & 12	*Specify:* HNU — HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*	(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*	(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling	(X) Not Needed
Other *Specify:*		*Specify:*	( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[ ]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R23
AMMUNITION BOX CHIPPER DISPOSAL PIT

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
9 Geoprobe subsurface sampling will be performed.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
10 Geoprobe piezometers will be used to collect groundwater samples.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R23
AMMUNITION BOX CHIPPER DISPOSAL PIT

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Pentachloraphenol (PCP)		0.5 mg/m^3	150 mg/m^3		Irritated eyes, nose and throat; sneezing, cough, weakness, headaches, dizziness, nausea, chest pain, high fever, dermatitis	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R23
AMMUNITION BOX CHIPPER DISPOSAL PIT

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ________ ev Type HNU	9 & 10	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[X]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[X]	Cut	[X]	Splash	[X]
Noise	[X]	Other:					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ______________ mg/m^3, other ______________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ______________ mg/m^3, other ______________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______________ mg/m^3, other ______________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R24
BURN CAGES, BURN CAGES LANDFILL,
W. BURN PADS, & W. BURN PADS LANDFILL

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)		TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11	Surface and subsurface soil screening for metals will occur on-site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6	Surface water samples will be collected from a drainage ditch.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4	Sediment samples will be collected from drainage ditch and analyzed for metals and explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
12	Surface and subsurface soil screening for explosives.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11	Surface and subsurface soil screening for metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R24
BURN CAGES, BURN CAGES LANDFILL, W. BURN PADS, & W. BURN PADS LANDFILL

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Barium	3200 mg/kg (S)	0.5 mg/m^3	1100 mg/m^3	NA	Upper respiratory irritation, muscle spasm, slow pulse, extrasystoles, hypokalemia, eye irritation, skin burns	NA
Chromium	213 mg/kg (S)	0.5 mg/m^3	NE	NA	Histologic fibrosis of the lungs	NA
Copper	213 mg/kg (S)	1 mg/m^3	NE	NE	Eye irritation, nausea, fever, weakness	NA
Lead	1800 mg/kg (S)	.10 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
Zinc	18000 mg/kg (S)	5 mg/m^3	NE	NE	Nose and throat irritation	NE

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R24
BURN CAGES, BURN CAGES LANDFILL,
W. BURN PADS, & W. BURN PADS LANDFILL

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
HMX	230 mg/kg (S)				Skin irritation	NE
RDX	460 mg/kg (S)	1.5 mg/m^3	NA		Central nervous system dysfunction, including convulsions and coma	NE
TNB	38 mg/kg (S)					
TNT	49 mg/kg (S)	.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U
di-n-butyl-phthalate	3.01 mg/kg					

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	4, 6, 11, & 12	*Specify:* HNU	 HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ]	Solid [X]	Sludge [ ]	Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [ ]	Corrosive [ ]	Acutely Toxic [ ]
Explosive [X]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [X]	Trip/Fall [X]
Puncture [X]	Burn [X]	Cut [X]	Splash [ ]
Noise [ ]	Other: ______________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ______________ mg/m^3, other ______________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ______________ mg/m^3, other ______________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ______________ mg/m^3, other ______________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
11 Surface and subsurface soil screening for metals will occur at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R25
NORTH BURN PADS

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Chromium	304 mg/kg (s)	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NA
Copper	17000 mg/kg (s)	1 mg/m^3	NE	NE	Eye irritation, nausea, fever, weakness	NA
Lead	760 mg/kg (s)	.10 mg/m^3	700 mg/m^3	NE	Weakness, insomnia, anorexia weight loss, anemia, limp wrist, abdominal pain, hypertension	NA
Zinc	10,000 mg/kg (s)	5 mg/m^3	NE	NE	Nose and throat irritation	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN

PROJECT DOCUMENT #00012659.91

MONITORING EQUIPMENT: ***Specify by task. Indicate type as necessary. Attach additional sheets as necessary.***

INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	11	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [ ]	Solid [X]	Sludge [ ]	Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [ ]	Corrosive [ ]	Acutely Toxic [ ]
Explosive [ ]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ____________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [X]	Trip/Fall [X]
Puncture [X]	Burn [ ]	Cut [X]	Splash [ ]
Noise [ ]	Other: ____________________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R26
BUILDING 600-86 SEPTIC SYSTEM

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
7 Surface and subsurface soil samples will be collected and analyzed for metals, volatiles, and semivolatiles.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water samples will be obtained, if available.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R26
BUILDING 600-86 SEPTIC SYSTEM

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Cadmium	6.46 mg/kg (S)	0.02 mg/m^3	50 mg/m^3	NE	Pulminary edema, dyspnea, cough, tight chest, headaches, chills, muscle aches, nausea vomiting, diahrrea	NA
Chromium	88.4 mg/kg (S)	0.5 mg/m^3	NE	NA	Histologic fibrosis of lungs	NA
Mercury	4.8 mg/kg (S)	.05 mg/m^3	28 mg/m^3		Cough, chest pain, dyspnea, insomnia, irritability, headaches, fatigue, weakness, irritated skin and eyes	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	6 & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [X]	Solid [X]	Sludge [ ]	Gas/Vapor [X]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [X]	Corrosive [ ]	Acutely Toxic [ ]
Explosive [X]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ____________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [X]	Trip/Fall [X]
Puncture [X]	Burn [X]	Cut [X]	Splash [X]
Noise [X]	Other: __________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R27
FIRE TRAINING PIT

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
3 & 7 Samples will be obtained for headspace readings for volatiles and semivolatiles.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
10 Geoprobe will be used to obtain groundwater samples for volatiles and explosives analysis.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
11 Surface and subsurface soil screening for metals.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
5 Soil gas survey will be performed at the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R27
FIRE TRAINING PIT

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Cadmium	62 mg/kg (s)	.02 mg/m^3	50 mg/m^3	NE	Pulminary edema, dyspnea, cough, chest tightness, headaches, chills, muscle aches, nausea, vomiting, diahrrea	NA
Chromium	358 mg/kg (s)	0.5 mg/m^3	500 mg/m^3	NA	Histologic fibrosis of lungs	NA
Copper	1150 mg/kg (s)	1 mg/m^3	NA	NE	Eye irritation, skin irritation, gastrointestinal distress, deep red colored urine	NA
Lead	3300 mg/kg (s)	.10 mg/m^3	700 mg/m^3	NA	Weakness, insomnia, anorexia, weight loss, anemia, limp wrist, abdominal pain, hypotension	NA
2-methylnaphtalene	7.92 mg/kg (s)	200 ppm	3000 ppm			7.53 ev
Ethybenzene	62 mg/kg (s)	100 ppm	2000 ppm	0.25-200 ppm	Irritated eyes and mucus membranes, headaches, dermatitis, coma	8.76 ev

NA = Not Available   NE = None Established   U = Unknown

S = Soil   SW = Surface Water   T = Tailings   F = Flyash   TK = Tanks   SD = Sediment
A = Air   GW = Groundwater   SL = Sludge   D = Drums   L = Lagoon

SITE IAAP-R27
FIRE TRAINING PIT

HEALTH AND SAFETY PLAN FORM | **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m³ *(specify)*	IDLH ppm or mg/m³ *(specify)*	WARNING CONCENTRATION ppm or mg/m³ *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
1,1-Trichloroethane	10 mg/kg (s)	350 ppm	1000 ppm	6.76 ppm		10.4 ev
1,1-Dichloroethane	8.91 mg/kg (s)	10 ppm	500 ppm	1.06-40 ppm	Irritated eyes, central nervous system depression, liver and kidney damage	11.12 ev
Toluene	10 mg/kg (s)	100 ppm	2000 ppm	0.17 ppm	Fatigue, weakness, dizziness, headaches, muscle fatigue, insomnia, dermititis	8.82
Xylene	12.2 mg/kg (s)	100 ppm	10,000 ppm	0.08 ppm	Dizziness, excitement, drowsiness, irritated eyes, nose, and throat; nausea, vomiting, abdominal pain, dermatitis	8.56

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R27
FIRE TRAINING PIT

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type ___HNU___	3, 5, 7, 10, & 11	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[ ]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[X]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[ ]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[X]	Trip/Fall	[X]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________________					

<u>Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions</u>:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ______________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other ______________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other ______________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other ______________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R28
ROUNDHOUSE TRANSFORMER STORAGE YARD

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
7 Collect soil samples using an auger to be analyzed for pesticides/PCBs.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Collect surface water samples, if possible.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R28
ROUNDHOUSE TRANSFORMER STORAGE YARD

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
PCB-1260	.13 µg/L	0.5 mg/m^3	5 mg/m^3		Irritated eyes and skin; dermititus	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R28
ROUNDHOUSE TRANSFORMER STORAGE YARD

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type HNU	6 & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:* This will be required during drilling		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [X] Solid [X] Sludge [ ] Gas/Vapor [ ]

Characteristic(s):

Flammable/ Ignitable [ ] Volatile [ ] Corrosive [ ] Acutely Toxic [ ]

Explosive [ ] Reactive [ ] Carcinogen [ ] Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ] Confined* Space [ ] Below Grade [X] Trip/Fall [X]

Puncture [X] Burn [ ] Cut [X] Splash [X]

Noise [ ] Other: ______________________________

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R29
LINE 3A POND

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE- STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
3 & 7 Surface and subsurface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
4 Sediment samples will be obtained.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
2 Downgradient groundwater samples will be obtained.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water samples will be obtained, if available.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R29
LINE 3A POND

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Chromium	32.2 mg/kg (S)	0.5 mg/m^3	NE		Histologic fibrosis of lungs	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R29
LINE 3A POND

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0% O_2 <21.0% O_2 <19.5% O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type __HNU__	2, 3, 4, 6, & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [X]	Solid [X]	Sludge [ ]	Gas/Vapor [ ]

Characteristic(s):

Flammable/ Ignitable [ ]	Volatile [ ]	Corrosive [X]	Acutely Toxic [ ]
Explosive [ ]	Reactive [ ]	Carcinogen [X]	Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ]	Confined* Space [ ]	Below Grade [ ]	Trip/Fall [ ]
Puncture [X]	Burn [X]	Cut [ ]	Splash [X]
Noise [X]	Other: ______________		

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other ____________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > ________ mg/m^3, other ____________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > ________ mg/m^3, other ____________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > ____________ mg/m^3, other ____________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-R30
FLY ASH DISPOSAL AREA

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	 Contingency	SCHEDULE
6 Surface water samples will be collected from streams around the site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-R30
FLY ASH DISPOSAL AREA

HEALTH AND SAFETY PLAN FORM

PROJECT DOCUMENT #00012659.91

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Beryllium	2.96 mg/kg (S)	.0005 mg/m^3	10 mg/m^3		Respiratory symptoms, weakness, fatigue, weight loss	NA

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-R30
FLY ASH DISPOSAL AREA

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( ) ______ ev Type HNU	6	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid	[X]	Solid	[X]	Sludge	[ ]	Gas/Vapor	[ ]

Characteristic(s):

Flammable/ Ignitable	[ ]	Volatile	[ ]	Corrosive	[ ]	Acutely Toxic	[ ]
Explosive	[X]	Reactive	[ ]	Carcinogen	[X]	Radioactive*	[ ]

Other: ______________________________

Physical Hazards:

Overhead	[ ]	Confined* Space	[ ]	Below Grade	[ ]	Trip/Fall	[ ]
Puncture	[X]	Burn	[ ]	Cut	[X]	Splash	[X]
Noise	[ ]	Other: ______________________________					

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-16
FORMER LINE 1 IMPOUNDMENT

HEALTH AND SAFETY PLAN		PROJECT DOCUMENT #00012659.91		
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	LEVEL OF PROTECTION Contingency	SCHEDULE
2 Groundwater samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 & 4 Sediment and surface soil samples will be obtained.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water samples will be obtained from Brush Creek.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
7 Subsurface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-16
FORMER LINE 1 IMPOUNDMENT

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *(specify units and media)*	PEL/TLV ppm or mg/m^3 *(specify)*	IDLH ppm or mg/m^3 *(specify)*	WARNING CONCENTRATION ppm or mg/m^3 *(specify)*	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
HMX	400 mg/kg (S)				Skin irritation	NE
DNB		1 mg/m^3	200 mg/m^3		Anoxia, cyanosis, visual disturbance, central scotomas, bad taste, burning mouth, dry throat, thirst, yellowing hair	
DNT		1.5 mg/m^3	U		Anoxia, cyanosis, anemia, jaundice	U
RDX	61 mg/kg (S)	1.5 mg/g^3	NA		Central nervous system dysfunction including convulsions and coma	U
TNT		0.5 mg/m^3	NE	-	Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-16
FORMER LINE 1 IMPOUNDMENT

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )________ ev Type HNU	2, 3, 4, 6, & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ________		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ________ Type ________		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid [X]   Solid [X]   Sludge [ ]   Gas/Vapor [ ]

Characteristic(s):

Flammable/ Ignitable [ ]   Volatile [ ]   Corrosive [ ]   Acutely Toxic [ ]

Explosive [X]   Reactive [ ]   Carcinogen [X]   Radioactive* [ ]

Other: ______________________________

Physical Hazards:

Overhead [ ]   Confined* Space [ ]   Below Grade [ ]   Trip/Fall [X]

Puncture [X]   Burn [ ]   Cut [X]   Splash [X]

Noise [ ]   Other: ______________________________

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates > 0.5 mg/m^3, other__________.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >5 ppm, particulates > __________ mg/m^3, other __________.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates > __________ mg/m^3, other __________.
- Level A: O_2<19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates > __________ mg/m^3, other __________.

*Requires completion of additional form and special approval from the Corporate Health Safety Group.

SITE IAAP-44
LINE 800 PINK WATER LAGOON

HEALTH AND SAFETY PLAN	PROJECT DOCUMENT #00012659.91			
FIELD ACTIVITIES COVERED UNDER THIS PLAN TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION (attach additional sheets as necessary)	TYPE	LEVEL OF PROTECTION Primary	Contingency	SCHEDULE
2 Groundwater sampling will occur at site.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
3 & 4 Sediment and surface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
6 Surface water sampling will occur.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
7 Subsurface soil samples will be collected.	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	TBD
	Intrusive Non-Intrusive	A B C D Modified	A B C D Modified	

PERSONNEL NAME	FIRM	RESPONSIBILITIES	ON SITE

SITE IAAP-44
LINE 800 PINK WATER LAGOON

HEALTH AND SAFETY PLAN FORM — **PROJECT DOCUMENT #00012659.91**

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (*specify units and media*)	PEL/TLV ppm or mg/m^3 (*specify*)	IDLH ppm or mg/m^3 (*specify*)	WARNING CONCENTRATION ppm or mg/m^3 (*specify*)	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Copper	172 mg/kg (S)	1 mg/g^3	NE		Eye irritation, nausea, fever, weakness	NA
DNT	20 µg/L (SW)	1.5 mg/m^3	U		Anoxia, cyanosis, anemia, jaundice	U
HMX	110 mg/kg (S)				Skin irritation	U
RDX	36,000 µg/L (GW)	1.5 mg/g^3	NA		Central nervous system dysfunction, including convulsions and coma	U
TNT	2000 mg/kg (S)	0.5 mg/m^3	NE		Respiratory irritation, skin irritation, gastrointestinal distress, deep red colored urine	U

NA = Not Available NE = None Established U = Unknown

S = Soil SW = Surface Water T = Tailings F = Flyash TK = Tanks SD = Sediment
A = Air GW = Groundwater SL = Sludge D = Drums L = Lagoon

SITE IAAP-44
LINE 800 PINK WATER LAGOON

HEALTH AND SAFETY PLAN				PROJECT DOCUMENT #00012659.91
MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets as necessary.*				
INSTRUMENT	TASK	ACTION GUIDELINES		COMMENTS
Combustible Gas Indicator		0-10% LEL 10-25% LEL >25% LEL 21.0%O_2 <21.0%O_2 <19.5%O_2	No explosion hazard Potential explosion hazard; notify SHSC Explosion hazard; interrupt task/evacuate Oxygen normal Oxygen deficient; notify SHSC Interrupt task/evacuate	(X) Not Needed
Radiation Survey Meter		3 x Background: >2mR/hr:	Notify HSM Establish REZ	(X) Not Needed
Photoionization Detector (X) 11.7 ev ( ) 10.2 ev ( ) 9.8 ev ( )______ ev Type __HNU__	2, 3, 4, 6, & 7	*Specify:* HNU	HNU readings above 5 ppm will require site evacuation.	( ) Not Needed
Flame Ionization Detector Type ______		*Specify:*		(X) Not Needed
Detector Tubes/Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Respirable Dust Monitor Type ______ Type ______		*Specify:*		(X) Not Needed
Other *Specify:*		*Specify:*		( ) Not Needed

5.6 NOISE HAZARD AND CONTROL

Protection against the effects of noise exposure shall be provided for all team personnel whenever the sound level exceeds 85 dB(A) continuously or 140 regardless of the duration of exposure (USACE Safety and Health Requirements Manual). The following are permitted exposure times and sound levels:

Duration/ Day (hours)	Sound Level dB(A)	Duration/ Day (hours)	Sound Level dB(A)
8	90	6	92
4	95	3	97
2	100	1½	102
1	105	1½	110
¼	115		

Generators will be used to purge monitoring wells at sites. The site HSO will monitor noise levels during generator operation to ensure that limits are not exceeded or proper hearing protection is used.

Noise hazard areas will be marked with caution signs indicating both the presence of hazardous noise levels, and the need for hearing protection. Hearing protectors that meet or exceed the ANSI Z 24.22 standard will be used. Ear plugs may be used when determined and fitted individually by a competent person. Plain cotton will not be used.

5.7 RADIATION SAFETY

As noted in Section 5. 1, radioactivity levels above normal background were detected at IAAP Sites 3 and 30. The site HSO is responsible for ensuring that radiological monitoring is conducted and that proper protective procedures are carried out by field team personnel while working at those two sites. Specifically, the site HSO will:

- Provide radiation dosimeters of the proper range for all personnel.
- Train field team personnel in the use of dosimeters.
- Ensure that dosimeters are worn at all times while working at these sites.
- Record dosimeter readings daily.
- Maintain exposure log for each person noting date/time of reading, dose since last reading, and accumulated dose. Records will be maintained at the JAYCOR site office and at the Environmental Services Division of JAYCOR.
- Whole-body radiation exposure is limited by OSHA to 1.25 rem per calendar quarter. Should any person's dose exceed 10 millirems in one day or 50 millirems in a one-week period, the site HSO will notify the Project Manager, IAAP health

and safety authorities, and the USATHAMA SES Branch. Work may be resumed after the situation has been evaluated and proper precautions implemented.

- No employee under 18 years of age may be permitted to receive in any calendar quarter a dose in excess of 10% of the specified whole-body limit discussed above.

- As necessary, establish special decontamination procedures for radioactive materials.

SECTION 6.0

PERSONNEL TRAINING REQUIREMENTS

SECTION 6.0 PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA's 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel are required to be trained in accordance with the standard. At a minimum, all personnel are required to be trained to recognize the hazards on-site, the provisions of this HASP, and the responsible personnel.

6.1 PREASSIGNMENT AND ANNUAL REFRESHER TRAINING

The HSO is responsible for certifying that all employees, prior to arrival on site, meet the requirements of preassignment training. Consistent with OSHA 29 CFR 1910.120 Paragraph (e)(3), each employee shall provide to the HSO, a document certifying dates of 40 hours of training. Personnel must also receive and document, as needed, eight hours of annual refresher training. Certificates of training will be maintained on file at the JAYCOR site office and will be available for reference and inspection at any time.

6.2 SITE SUPERVISORS TRAINING

Consistent with OSHA 29 CFR 1910.120 Paragraph (e)(8), individuals will be designated as site supervisors only when an additional eight hours of training is certified.

The following individuals are identified as having the training necessary to be site supervisors:

Alan Amor	Aaron Frantz	Sharon Schaeffer	Fred Mayes
Hope Eiseman	Andy Hopton	David Schroeder	David Rosa
Scott Flickinger	David Hrebenach	Mary Robertson	

Certificates of training will be maintained at the JAYCOR site office.

6.3 TRAINING AND BRIEFING TOPICS

The following items will be discussed by a qualified individual, i.e., the HSO or FTM, at the site pre-entry briefing(s), as well as at daily morning safety briefings. Health and safety briefings will be held each morning, and all in attendance will sign the Health and Safety logbook, not the HSP, at the conclusion of each briefing. The Health and Safety Officer (HSO) will visit the field sampling teams to conduct oversight of their activities with respect the health and safety concerns.

Topics	Frequency
Site Characterization and Analysis	Weekly
Chemical and Personnel Hazards	Daily
Site Control	Daily
Personnel Protective Equipment	Weekly
Sampling Equipment	Weekly
Decontamination	Daily
Procedures for Handling Site Emergencies	Weekly

6.4 MOTOR VEHICLE SAFETY

The contractor/subcontractor will emphasize compliance with state, local, and installation motor vehicle laws and regulations as part of each daily briefing. Additionally, any special considerations pertaining to motor vehicle safety, i.e., current or hazardous road conditions, etc., will be addressed at the daily site briefings.

SECTION 7.0

PERSONAL PROTECTIVE EQUIPMENT TO BE USED

SECTION 7.0 PERSONAL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA-designated levels of protection and the specific levels of protection required for the various tasks at IAAP.

7.1 LEVELS OF PROTECTION

Personnel wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full facepiece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and their necessary components have been divided into four categories according to the degrees of protection afforded:

1. Level A should be worn when the highest level of respiratory, skin, and eye protection is needed.

2. Level B should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

3. Level C should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

4. Level D should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact.

The level of protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity;

- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done; and,

- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified.

After consultation with USATHAMA and IAAP personnel to identify chemical and physical hazards that can be reasonably expected to occur at IAAP, the Field Team Manager and the HSO have determined that the potential for exposure is low, and that Level D protection is adequate for on-site work. This determination is consistent with the USATHAMA contract. Should any employee feel that a higher level of protection is required, that employee must immediately back off and inform the Project Manager and the HSO. The Field Team Manager and the HSO will evaluate the circumstances to determine the level of threat present and the possible necessity for a higher level of PPE. Work activities at that site will be temporarily suspended if there is an imminent danger to life/health. If circumstances warrant a PPE upgrade, it shall be noted in the field logbook, and the Project Manager will notify USATHAMA COR, the IAAP Environmental Office, and the USATHAMA Project Manager. Significant changes in potential exposures and PPE requirements may necessitate modification to this plan.

7.2 LEVEL D PERSONNEL PROTECTIVE EQUIPMENT

- Coveralls/outer garment - cotton;
- Gloves - butyl;
- Boots/shoes - leather or chemical-resistant, with steel toe;
- Head gear - hard hat;
- Facial protection - face shield, chemical splash goggles, or safety glasses; and,
- Respiratory protection (as required).*

7.3 REASSESSMENT OF PROTECTION PROGRAM

One respiratory upgrade will always be taken to the field, should an upgrade be required, based on current site conditions. The HSO for the site should be allowed to upgrade the level of protection at his or her discretion; the HSO will never downgrade the level of respiratory protection without approval of the corporate Health and Safety Director. The site HSO will make all decisions regarding health and safety concerns at the site. Anyone on the site has the right to question, without fear of reprimand, health and safety issues if they believe these issues are being compromised. The corporate Health and Safety Director ultimately will have the authority to resolve any issues that cannot be resolved satisfactorily in the field.

The level of protection provided by PPE selection shall be upgraded based upon a change in site conditions or findings of investigations. This may require a modification to this plan.

When a significant change in procedures occurs, the hazards should be reviewed. Some indicators of the need for reassessment are:

* Many contaminants will not be detected by a FID or a PID. For example, cadmium, lead PCBs, etc., are respiratory hazards if dust is present or generated. Where appropriate, respiratory protection may be required when performing operations where these types of contaminants may become airborne.

- Commencement of a new work phase, such as moving from soil sampling to sampling of monitoring wells;

- Change in job tasks during a work phase;

- Change of weather, such as a thunderstorm;

- When hot temperatures demand rest, water, shade, and air conditioning;

- Contaminants other than those previously identified are encountered; and,

- Change in ambient levels of contaminants.

7.4 WORK MISSION DURATION

Before the workers actually begin work, the anticipated duration of the work mission should be established. Several factors limit mission length, including:

- Ambient temperature and humid conditions; and,

- Difficulty in climbing hills or wading through tall vegetation.

The work duration will be adjusted by the Field Supervisor or HSO, based on these factors.

SECTION 8.0

MEDICAL SURVEILLANCE REQUIREMENTS

SECTION 8.0 MEDICAL SURVEILLANCE REQUIREMENTS

Medical monitoring programs are designed to track the physical condition of employees on a regular basis as well as survey preemployment or baseline conditions prior to potential exposures. The medical surveillance program is a part of the health and safety program.

8.1 BASELINE OR PREASSIGNMENT MONITORING

Prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials, each employee will receive a preassignment or baseline physical. The contents of the physical is to be determined by the employer's medical consultant. As suggested by NIOSH/OSHA/USCG/EPA's Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities, the minimum medical monitoring requirements for work at the Site is as follows:

- Complete medical and work histories;
- Physical examination;
- Pulmonary function tests (FVC and FEV1);
- Chest X-ray (every 2 years);
- EKG;
- Eye examination and visual acuity;
- Audiometry;
- Urinalysis; and,
- Blood chemistry, including hematology, serum analyses, and heavy metals toxicology.

The preassignment physical will categorize employees as fit-for-duty and able to wear respiratory protection.

8.2 PERIODIC MONITORING

In addition to a baseline physical, all employees require a periodic physical within the last 12 months unless the advising physician believes a shorter interval is appropriate. The employer's medical consultant will prescribe an adequate medical monitoring program that fulfills OSHA 29 CFR 1910.120 requirements. The preassignment medical monitoring program outlined above may be applicable.

All personnel working in contaminated or potentially contaminated areas at the site will verify currency (within 12 months) with respect to medical monitoring. This is done by providing a copy of the medical examination certification form from the examining physician to the HSO who will inspect them and keep them on file at the site. An example medical examination certification form is shown at Appendix B.

8.3 EXPOSURE/INJURY/MEDICAL SUPPORT

As a follow-up to an injury or possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it may be critical to perform follow-up testing within 24-48 hours. It will be up to the employer's medical consultant to advise the type of test required to accurately monitor for exposure effects. An accident/incident report worksheet is shown in Appendix C. Accidents resulting in a fatality, lost-time injury or illness, hospitalization of five or more personnel, or property damage to government or contractor property (which occurred during the performance of the contract_ equal to or exceeding $2,000.00 must be telephonically reported to USATHAMA, CETHA-TS-S, (301) 671-4811, as soon as possible, but not later than two hours after occurrence, and reported in writing within five days of occurrence on ENG Form 3394 (Appendix C). All other accidents/incidents must be telephonically reported to USATHAMA, CETHA-TS-S, (301) 671-4811, within eight hours of occurrence.

8.4 EXIT PHYSICAL

At termination of employment or reassignment to an activity or location that does not represent a risk of exposure to hazardous materials, an employee shall require an exit physical. If the latest physical was within the last six months, the advising medical consultant has the right to determine adequacy and necessity of an exit exam.

SECTION 9.0

FREQUENCY AND TYPES OF PERSONAL AIR MONITORING/SAMPLING

SECTION 9.0
FREQUENCY AND TYPES OF PERSONAL AIR MONITORING/SAMPLING

This section explains the general concepts of an air monitoring program and specifies the surveillance activities that will take place during project completion at the site.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to verify and determine the level of worker protection needed. Initial screening for identification is often qualitative (i.e., the contaminant or the class to which it belongs is demonstrated to be present), but the determination of its concentration (quantification) must await subsequent testing. Two principal approaches are available for identifying and/or quantifying airborne contaminants:

1. The on-site use of direct-reading instruments; and,

2. Laboratory analysis of air samples obtained by gas sampling bag, collection media (i.e., filter and sorbent), and/or wet-contaminant collection methods.

9.1 DIRECT-READING MONITORING INSTRUMENTS

Unlike air sampling devices, which are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision making. Data obtained from the real-time monitors are used to assure proper selection of PPE, engineering controls, and work practices. Overall, the instruments provide the user with the capability to determine if site personnel are being exposed to concentrations that exceed exposure limits or action levels for specific hazardous materials.

Of significant importance, especially during initial entries, is the potential for IDLH conditions or oxygen-deficient atmospheres. Real-time monitors can be useful in identifying any IDLH conditions, toxic levels of airborne contaminants, flammable atmospheres, or radioactive hazards. Periodic monitoring of conditions is critical, especially if exposures may have increased since initial monitoring or if new site activities have commenced.

Table 9- 1, excerpted from Occupational Safety and Health Guidelines for Hazardous Waste Site Activities, provides an overview of the monitoring instruments that will be used at the IAAP.

9.2 PERSONAL MONITORING SAMPLING

After site activities have commenced, the selective monitoring of high-risk workers, i.e., those who are closest to the source of contaminant generation, is essential. Personal monitoring shall be completed in the breathing zone.

Those employees working closest with the source have the highest likelihood of exposure to concentrations that exceed established limits. Representative sampling approaches emphasizing worst-case conditions or employees with the greatest risk of exposure are acceptable; however, the sampling strategy may change if the operation or tasks change on site or if exposures were potentially increased.

Table 9-1. Monitoring Instruments to be Used at IAAP

Instrument	Hazard Monitored	Application	Detection Method	General Care and Maintenance	Typical Operating Times
Combustible Gas Indicator (CGI)	Combustible gases and vapors.	Measures the concentration of a combustible gas or vapor.	A filament, usually made of platinum, is heated by burning the combustible gas or vapor. The increase in heat is measured.	Recharge or replace battery. Calibrate immediately before using.	Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.
Flame Ionization Detector (FID) with Gas Chromatography Option Example: Foxboro OVA	Many organic gases and vapors.	In survey mode, detects the total concentration of many organic gases and vapors. In gas chromatography (GC) mode identifies and measures specific compounds. In survey mode, all the organic compounds are ionized and detected at the same time. In GC mode, volatile species are separated.	Gases and vapors are ionized in a flame. A current is produced in proportion to the number of carbon atoms present.	Recharge or replace battery. Monitor fuel and/or combustion air supply gauges. Perform routine maintenance as described in the manual. Check for leaks.	8 hours; 3 hours with strip chart recorder.
Gamma Radiation Survey Instrument	Gamma Radiation	Environmental radiation monitor.	Scintillation detector.	Must be calibrated annually at a specialized facility.	Can be used for as long as the battery lasts, or for the recommended interval between calibrations, whichever is less.
Ultraviolet (UV) Photoionization Detector (PID) Example: HNU	Many organic and some inorganic gases and vapors	Detects total concentrations of many organic and some inorganic gases and vapors. Some identification of compounds is possible if more than one probe is used.	Ionizes molecules using UV radiation; produces a current that is proportional to the number of ions.	Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories.	10 hours; 5 hours with strip chart recorder.
Direct-Reading Colorimetric Indicator Tube	Specific gas and vapors	Measures concentrations of specific gases and vapors.	The compound reacts with the indicator chemical in the tube, producing a stain whose length of color change is proportional to the compound's concentration.	Do not use a previously opened tube even if the indicator chemical is not stained. Check pump for leaks before and after use. Refrigerate prior to use to maintain shelf life about two years. Check expiration date of tubes. Calibrate pump volume at least quarterly. Avoid rough handling which may cause channeling.	
Oxygen Meter	Oxygen	Measures the percentage of oxygen in air.	Users and electro-chemical sensor to measure the partial pressure of oxygen in the air and converts that reading to oxygen concentration.	Replace detector cell according to manufacturer's recommendations. Recharge or replace batteries prior to expiration of the specified interval. If the ambient air is more than 0.5% oxygen, replace or detector cell frequently.	8-12 hours.

9.3 SPECIFIC CONTAMINANTS TO BE MONITORED AT THE SITE

The following provides a summary of the contaminants to be monitored and the frequency/schedule of monitoring. Data from these measurements will be entered into the field log book. Appendices D, E, and F provide information on the use and calibration of the Combustible Gas Indicator/Oxygen Meter and Organic Vapor Analyzer (FID), and the Photoionization Detector (HNU).

9.3.1 Site Air Monitoring Instruments, Frequencies, and Locations

- Combustible Gas Indicator Oxygen Meter ($CGI/0_2$)
  - Frequency - Once at each monitoring well sampling location, unless elevated readings are encountered.
  - Location - At the wellhead.
- Organic Vapor Analyzer (FID) or Photoionization Detector (PID)
  - Frequency - Once at each sampling location, unless elevated readings are encountered.
  - Location - At the wellhead.
- Radiation Meter
  - Frequency - At initial site entry.
  - Location - Across the entire site for SWMU 30.

9.3.2 Action Levels

EXPLOSIVE ATMOSPHERE

LEVEL	ACTION
<10% LEL	Continue investigation.
10%*-25% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
>25% LEL	Explosion hazard. Withdraw from area immediately and contact IAAP Security.

OXYGEN

LEVEL	ACTION
<19.5%	Withdraw from area immediately and contact IAAP Security. NOTE: Combustible gas readings are not valid in atmospheres with <19.5% oxygen.
19.5%-25%	Continue investigation. Deviation from normal level may be due to presence of other substances.
>25%	Fire hazard potential. Discontinue investigation and withdraw from area. Contact IAAP Security and consult a fire safety specialist.

ORGANIC VAPORS

LEVEL	ACTION
0-4 ppm above background in the breathing zone or <½TLV if the contaminant is known and the instrument is directly calibrated.	Continue investigation/monitoring background, Level D.
5-10 ppm above background in the breathing zone or <10X TLV if the contaminant is known.	Back off from area and if readings continue, contact IAAP Security and evaluate an upgrade to Level C.
10-500 ppm above background in the breathing zone or <100X the TLV if the contaminant is known.	Back off from area and if readings continue, contact IAAP Security and evaluate an upgrade to Level B.
>500 ppm above background in the breathing zone protection.	Excavate work area, contact IAAP Security, and evaluate the need for Level A.

SECTION 10.0

SITE CONTROL MEASURES

SECTION 10.0 SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

10.1 BUDDY SYSTEM

When conditions present a real or potential risk to personnel, the implementation of a buddy system is mandatory. A buddy system requires at least two people to work as a team; each looking out for each other. All site and sampling activities at IAAP will be done under the buddy system.

10.2 SITE COMMUNICATIONS PLAN

Successful communications between field teams and contact with personnel in the support zone is essential. For all Level D activities normal verbal communication shall be used.

10.3 WORK ZONE DEFINITION

The three general work zones established at any site are (1) the Exclusion Zone; (2) the Contamination Reduction Zone; and, (3) the Support Zone.

The Exclusion Zone is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel.

The Contamination Reduction Zone is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Activities to be conducted in this zone will require personal protection as defined in the decontamination plan.

The Support Zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

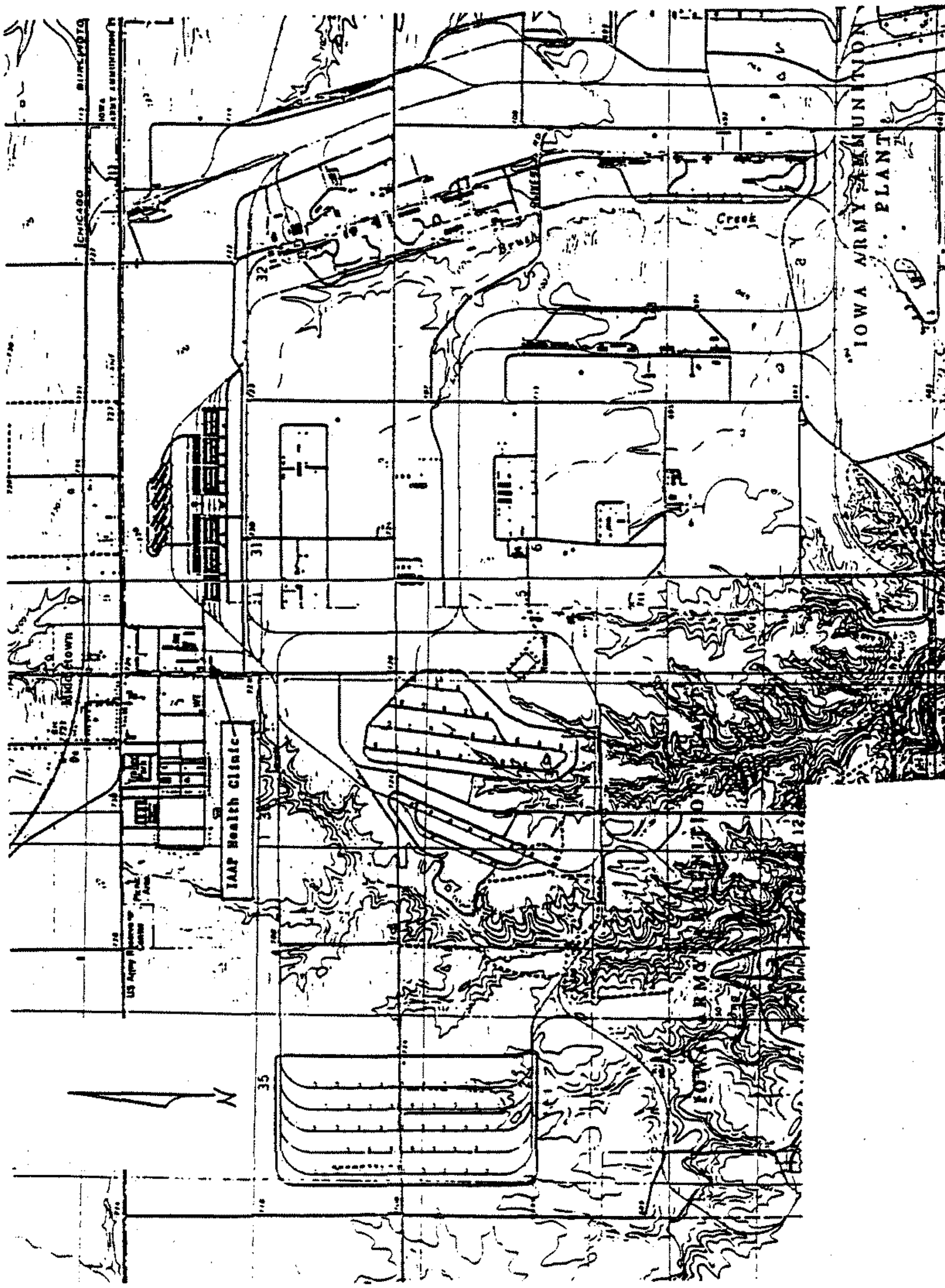
These zones will be established as required at each SWMU under the direction of the HSO or FTM. Visual delineation of zones with flagging tape will be accomplished if there is any potential for persons other than team members to enter the zones. In remote sampling locations, the extent of zone demarkation will be decided by the team leader.

10.4 NEAREST MEDICAL ASSISTANCE

Figure 10-1 provides a map locating the IAAP Health Clinic for emergency care to individuals who may experience an injury or exposure on-site. The route to the base health clinic will be verified by the HSO and should be familiar to all site personnel. For injuries or exposures requiring off-site medical attention, the Burlington Medical Center (located at 602 North 3rd Street) shall be used. A map to this facility is shown at Figure 10-2. Each team member will drive to this facility to become familiar with the route so they can assist in a possible emergency.

The recommended route to the Burlington Medical Center is as follows:

Figure 10-1 Location of the IAAP Health Clinic



- Proceed north on Texas Avenue, past the Administration Area and through Gate #4;
- Turn right (east) on Route 34;
- Follow Route 34 into Burlington;
- Turn right (south) on N. Main Street for four blocks;
- Turn right (west) onto Washington Street, follow for one block;
- Turn right again (north) onto N. 3rd Street; the Medical Center is on the right;
- Proceed to the Emergency entrance.

10.5 SAFE WORK PRACTICES

The standing orders during sampling and any other site activities are:

- Comply with IAAP Procedures for entry into production lines and other fenced areas;
- No smoking, eating, or drinking inside the exclusion zone;
- No horse play on site;
- Wear the appropriate level of protection; and,
- Drive carefully and safely.

10.6 EMERGENCY COMMUNICATIONS

If an emergency occurs, the nearest security guard position has a telephone or if a guard is available in a nearby vehicle, he can radio for an ambulance.

Mobile phones will be provided for teams working in remote areas. Call 7414 or 7912 for assistance.

Figure 10-2 Location of the Burlington Medical Center

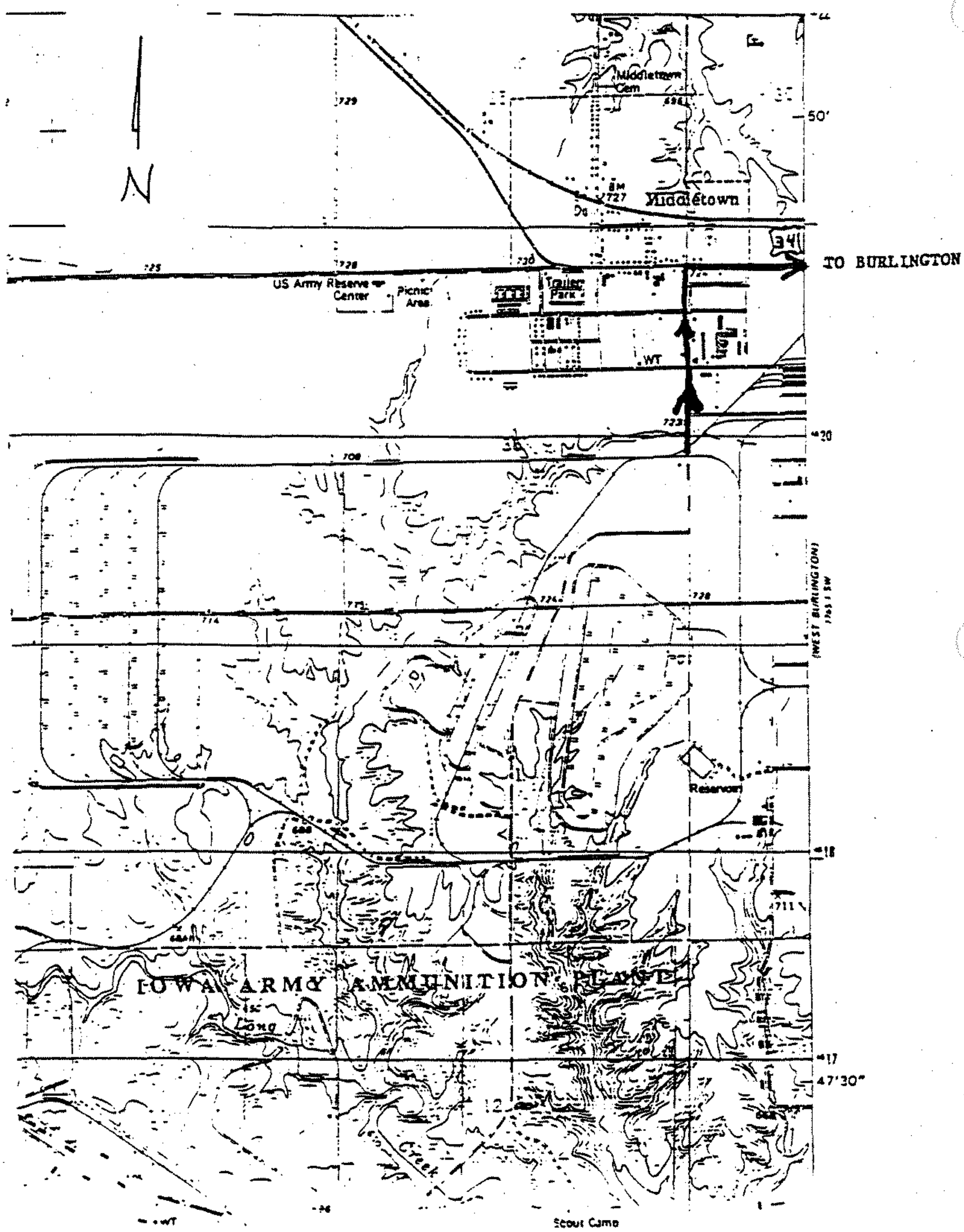
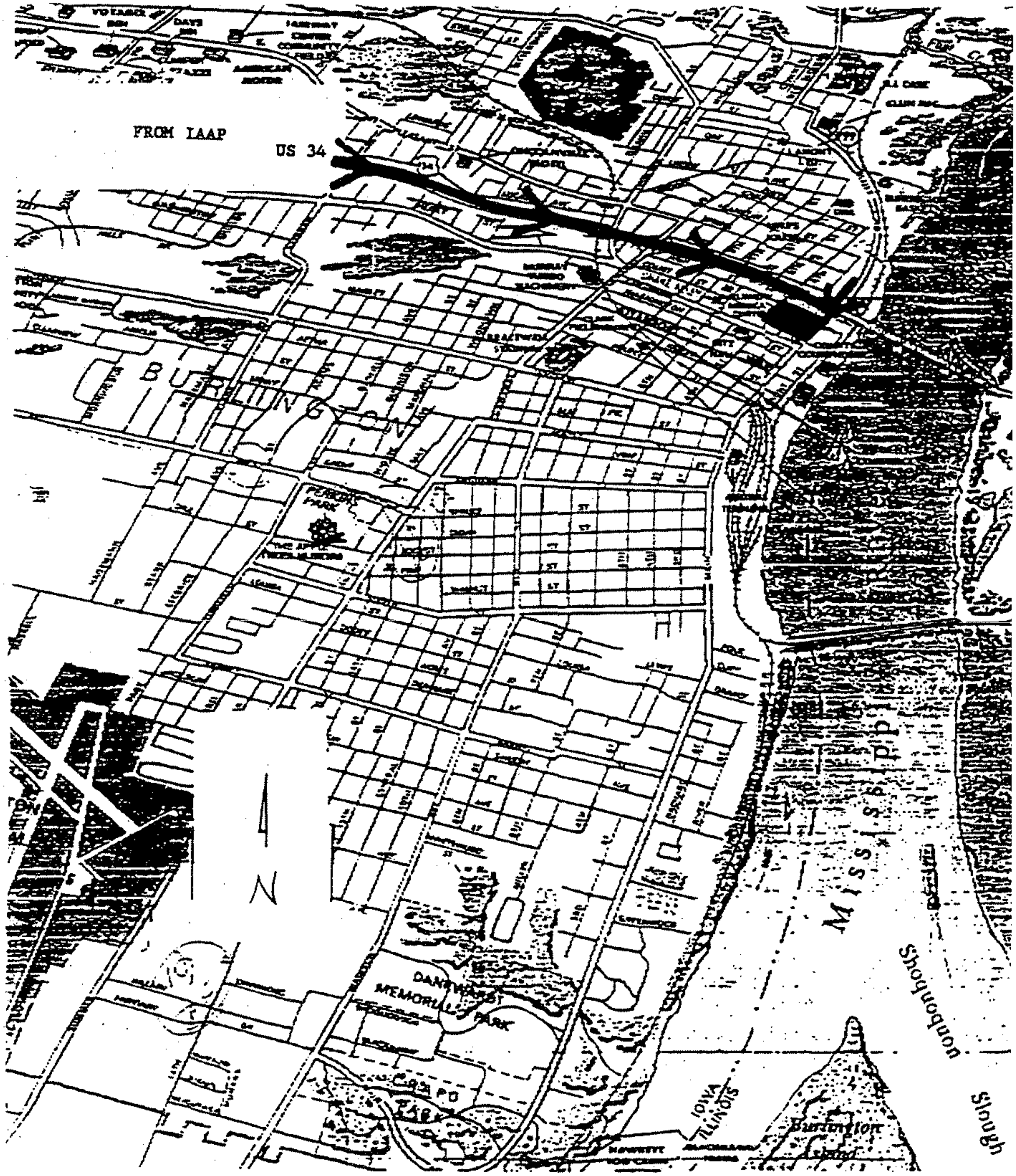


Figure 10-2 Location of the Burlington Medical Center (Cont'd)



SECTION 11.0

DECONTAMINATION PLAN

SECTION 11.0 DECONTAMINATION PLAN

Sections 7.1 and 7.2 list the specific level of protection and components required. Consistent with this level of protection, decontamination will be performed in a level of protection at least equal to the level of protection required for sampling.

11.1 STANDARD OPERATING PROCEDURES

Decontamination involves the orderly and controlled removal of contaminants. Standard decontamination sequences are presented in Table 11-1 for Level D. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination.

Table 11-1 Level D Decontamination

Step 1 - Gross wash;
Step 2 - Alconox wash;
Step 3 - Detailed scrub;
Step 4 - Gross rinse with approved nonchlorinated water;
Step 5 - First rinse with distilled water;
Step 6 - Final rinse with distilled water; and,
Step 7 - Air dry.

11.2 LEVELS OF DECONTAMINATION PROTECTION REQUIRED

The level of protection required for personnel assisting with decontamination will be Level D. The HSO is responsible for monitoring decontamination procedures and determining their effectiveness.

11.3 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated after each sample is taken. Table 11-1 provided the sequence of decontamination steps required for equipment that will be decontaminated after each sampling event. Site personnel will wear splash protection while decontaminating equipment (Tyvek, eye protection, and nitrile gloves). Personnel will stand up-wind of decontamination area while decontaminating equipment in order to minimize exposure to overspray. Plastic sheeting will be laid down to cover all of the decontamination area. A thorough wash and rinse of equipment will be done, but wash and rinse water will be limited as much as possible in order to minimize the amount of decontamination water to be contained in drums.

11.4 DISPOSITION OF DECONTAMINATION WASTES

Contamination must be expected at each SWMU sampling location. All wash and decontamination waters will be contained in drums that will be transported to each SWMU. All disposable sampling equipment; i.e., bailers, rope, etc., will be treated as hazardous solid waste and disposed of accordingly. The specific provisions for disposing of all Investigation Derived Waste (IDW) are detailed in Appendix B (Section B.5) of the QAPjP.

APPENDIX A

SITE SAFETY PLAN COMPLIANCE ACKNOWLEDGEMENT FORM

SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

By my signature below, I certify that I have been informed of, understand, and will abide by the procedures set forth in the Health and Safety Plan for the Iowa Army Ammunition Plant.

SIGNATURE	PRINTED NAME	DATE

APPENDIX B

MEDICAL CERTIFICATION FORM

MEDICAL MONITORING EXAMINATION
EMPLOYER NOTIFICATION

Employee JOHN LABADIE Date 6-26-91

Employer JAYCOR

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☑ is/☐ is not) complete. (Tests not performed: ____________________)
(____________________)

Please check all sections that are applicable to this examination:

Applicable / Not Applicable

☐ ☑ **Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☑ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☑ qualified/☐ not qualified) to use a respirator.

☑ ☑ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☑ passed/☑ not passed) a qualitative fit test.

☑ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

☑ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.

☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.

☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)
Corrective lenses required

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) Robert Subotnik (Signature) [signature]

Date 7-2-91

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

00012659.91

APPENDIX C

ACCIDENT/INCIDENT REPORT WORKSHEET

(Eng. Form 3394 USA COE Accident Investigation Report)

ACCIDENT REPORT WORKSHEET

(USATHAMA Requires Form 3394 Within Seven Days of Accident)*

Injured Employee: ____________________

Date of Injury: ____________________ Time of Injury: ____________________

Place of Injury: ____________________

Description of Occurrence: ____________________

____

____

Nature and Extent of Injury: ____________________

____

Treatment given by (if hospital/clinic - give name, address, and attending physician): __________

____

____

Future treatment if advised/taken: ____________________

____

____

Corrective Actions Recommended/Taken: ____________________

____

____

Reported by (print name): ____________________

Signature: ____________________

Date: ____________________

cc: GM, HRD, PM, HSO

* Call Vivian Graham at (301) 671-4811.

(For Safety Staff only)	REPORT NO.	EROC CODE	UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT (For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)	REQUIREMENT CONTROL SYMBO CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

	(1) INJURY/ILLNESS/FATAL	(2) PROPERTY DAMAGE	(3) MOTOR VEHICLE INVOLVED	(4) DIVINC
a. GOVERNMENT ☐ CIVILIAN ☐ MILITARY →	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
b. CONTRACTOR →	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
c. PUBLIC →	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

a. NAME (Last,First,MI)

b. AGE

c. SEX ☐ MALE ☐ FEMALE

[redacted]

f. JOB SERIES/TITLE

g. DUTY STATUS AT TIME OF ACCIDENT (1) ☐ ON DUTY (2) ☐ TDY (3) ☐ OFF DUTY

3. GENERAL INFORMATION

a. DATE OF ACCIDENT (month/day/year) / /

b. TIME OF ACCIDENT (Military time) / /

c. EXACT LOCATION OF ACCIDENT

d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER # ☐ CIVIL WORKS ☐ MILITARY ☐ OTHER

f. TYPE OF CONTRACT ☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER (Specify)

g. HAZARDOUS/TOXIC WASTE ACTIVITY ☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER (Specify)

4. CONSTRUCTION ACTIVITIES ONLY (Fill in line and corresponding code number in box from list - see instructions)

a. CONSTRUCTION ACTIVITY (CODE) #

b. TYPE OF CONSTRUCTION EQUIPMENT (CODE #

5. INJURY/ILLNESS INFORMATION (Include name on line and corresponding code number in box for items e, f & g - see instructions)

a. SEVERITY OF INJURY ☐ FATAL (2) ☐ LOST- TIME (3) ☐ NON LOST -TIME (4) ☐ FIRST AID

b. ESTIMATED DAYS LOST

c. ESTIMATED DAYS HOSPIT-ALIZED

d. ESTIMATED DAYS RESTRICTED DUT

e. BODY PART AFFECTED PRIMARY (CODE) # SECONDARY (CODE) #

f. NATURE OF INJURY (CODE) #

g. TYPE AND SOURCE OF INJURY TYPE (CODE # SOURCE (CODE #

6. PUBLIC FATALITY (Fill in line and corresponding code number in box - see instructions)

a. ACTIVITY AT TIME OF ACCIDENT (CODE) #

b. PERSONAL FLOATATION DEVICE USED? ☐ YES ☐ NO ☐ NA

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE ☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER (Specify)

b. TYPE OF COLLISION ☐ HEAD ON ☐ REAR END ☐ BACKING ☐ BROADSIDE ☐ SIDE SWIPE ☐ ROLL OVER ☐ OTHER

c. SEAT BELTS	USED	NOT USED	NOT AVAILAB
(1) FRONT SEAT			
(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT (Fill in line and corresponding code number in box from list - see instructions)

a. TYPE OF VESSEL/FLOATING PLANT (CODE) #

b. TYPE OF COLLISON/MISHAP (CODE #

10. ACCIDENT DESCRIPTION (Use additional paper, if necessary)

11. CAUSAL FACTOR(S) *(Read Instruction Before Completing)*

a *(Explain YES answers in item 13)*

	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a *(CONTINUED)*

	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident?	☐	☐

b WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. TRAINING

a WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? ☐ YES ☐ NO

b. TYPE OF TRAINING: ☐ CLASSROOM ☐ ON JOB ☐ NONE

c. DATE OF MOST RECENT FORMAL TRAINING: / / *(Month) (Day) (Year)*

13 FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a DIRECT CAUSE

b INDIRECT CAUSE(S)

14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).

DESCRIBE FULLY:

15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.

a BEGINNING *(Month/Day/Year)* / /

b. ANTICIPATED COMPLETION *(Month/Day/Year)* / /

c SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT

CORPS ____________

CONTRACTOR ____________

d DATE *(Mo/Da/Yr)* ___ / ___ / ___ ; ___ / ___ / ___

e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)*

f. OFFICE SYMB

16. MANAGEMENT REVIEW *(1st)*.

a ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. MANAGEMENT REVIEW *(2nd - Chief Operations, Construction, Engineering, etc.)*

a ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. ☐ CONCUR b ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS.

SIGNATURE	TITLE	DATE

19. COMMAND APPROVAL

COMMENTS

COMMANDER SIGNATURE	DATE

GENERAL. Complete a separate report for each person who was *injured, caused,* or *contributed* to the accident (excluding uninjured personnel and witnesses). Use of this form for reporting USACE employee first-aid type injuries *NOT* to be submitted to the Department of Labor (DOL), Office of Workers' Compensation Programs (OWCP) shall be at the discretion of the FOA Commander. Please type or print legibly. Appropriate items shall be marked with an "X" in the box(es). If additional space is needed, provide the information on a separate sheet and attach to the completed form. Ensure that these instructions are forwarded with the completed report to the designated management reviewers indicated in sections 16. and 17.

INSTRUCTIONS FOR SECTION 1 — ACCIDENT CLASSIFICATION. *(Mark All Boxes That Are Applicable.)*

a. GOVERNMENT. Mark "CIVILIAN" box if accident involved government civilian employee; mark "MILITARY" box if accident involved U.S. military personnel.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in any government civilian employee injury, illness, or fatality that requires the submission of Office of Workers Compensation Programs (OWCP) Forms CA-1 (injury), CA-2 (illness), or CA-6 (fatality), to the Department of Labor OWCP, or military personnel lost-time or fatal injury.

(2) PROPERTY DAMAGE — Mark the appropriate box if accident resulted in any damage of $1000 or more to government property (including motor vehicles).

(3) VEHICLE INVOLVED — Mark if accident involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY — Mark if the accident involved an in-house USACE diving activity.

b. CONTRACTOR.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in any contractor lost-time injury/illness or fatality.

(2) PROPERTY DAMAGE — Mark the appropriate box if accident resulted in any damage of $1000 or more to contractor property (including motor vehicles).

(3) VEHICLE INVOLVED — Mark if accident involved a motor vehicle, regardless of whether "INJURY/ILLNESS" or "PROPERTY DAMAGE" are marked.

(4) DIVING ACTIVITY — Mark if the accident involved a USACE Contractor diving activity.

c. PUBLIC.

(1) INJURY/ILLNESS/FATALITY — Mark if accident resulted in public fatality. (The "OTHER" box will be marked when requested by the FOA to report an unusual non-fatal public accident that could result in claims against the government or as otherwise directed by the FOA Commander).

(2) VOID SPACE — Make no entry.

(3) VEHICLE INVOLVED — Mark if accident resulted in a fatality to a member of the public and involved a motor vehicle, *regardless* of whether "INJURY/ILLNESS" is marked.

(4) VOID SPACE — Make no entry.

INSTRUCTIONS FOR SECTION 2 — PERSONAL DATA

a. NAME — (MANDATORY FOR GOVERNMENT ACCIDENTS. OPTIONAL AT THE DISCRETION OF THE FOA COMMANDER FOR CONTRACTOR AND PUBLIC ACCIDENTS). Enter last name, first name, middle initial of person involved.

b. AGE — Enter age.

c. SEX — Mark appropriate box.

d. SOCIAL SECURITY NUMBER — (FOR GOVERNMENT PERSONNEL ONLY) Enter the social security number (or other personal identification number if no social security number issued).

e. GRADE — (FOR GOVERNMENT PERSONNEL ONLY) Enter pay grade. Example: O-6; E-7; WG-8; WS-12; GS-11; etc.

f. JOB SERIES/TITLE — For *government civilian employees* enter the pay plan, full series number, and job title, e.g. GS-0810/Civil Engineer. For *military personnel* enter the primary military occupational specialty (PMOS), e.g., 15A30 or 11G50. For *contractor employees* enter the job title assigned to the injured person, e.g. carpenter, laborer, surveyor, etc.,

g. DUTY STATUS — Mark the appropriate box.

(1) ON DUTY — Person was at duty station during duty hours or person was away from duty station during duty hours but on official business at time of the accident.

(2) TDY — person was on official business, away from the duty station and with travel orders, at time of accident.

(3) OFF DUTY — person was not on official business at time of accident.

h. EMPLOYMENT STATUS — (FOR GOVERNMENT PERSONNEL ONLY) Mark the most appropriate box. If "OTHER" is marked, specify the employment status of the person.

INSTRUCTION FOR SECTION 3 — GENERAL INFORMATION

a. DATE OF ACCIDENT — Enter the month, day, and year of accident.

b. TIME OF ACCIDENT — Enter the local time of accident in military time. Example: 1430 hrs (not 2:30 p.m.).

c. EXACT LOCATION OF ACCIDENT — Enter facts needed to locate the accident scene. (installation/project name, building number, street, direction and distance from closest landmark, etc..).

d. CONTRACTOR NAME

(1) PRIME — Enter the exact name (title of firm) of the prime contractor.

(2) SUBCONTRACTOR — Enter the name of any subcontractor involved in the accident.

e. CONTRACT NUMBER — Mark the appropriate box to identif[y] contract is civil works, military, or other: if "OTHER" is marke[d], specify contract appropriation on line provided. Enter complete contract number of prime contract, e.g., DACW 09-85-C-0100.

f. TYPE OF CONTRACT — Mark appropriate box. A/E means architect/engineer. If "OTHER" is marked, specify type of contract on line provided.

g. HAZARDOUS/TOXIC WASTE ACTIVITY (HTW) — Mark the box to identify the HTW activity being performed at the time of the accident. For Superfund, DERP, and Installation Restoration Program (IRP) HTW activities include accidents that occurred during inventory, predesign, design, and construction. For the purpose of accident reporting, DERP Formerly Used DoD Site (FUDS) activities and IRP activities will be treated separately. For Civil Works O&M HTW activities mark the "OTHER" box.

INSTRUCTIONS FOR SECTION 4 — CONSTRUCTION ACTIVITIES

a. CONSTRUCTION ACTIVITY — Select the *most appropriate* construction activity being performed at time of accident from the list below. Enter the activity name and place the corresponding code number identified in the box.

CONSTRUCTION ACTIVITY LIST

1. MOBILIZATION	14. ELECTRICAL
2. SITE PREPARATION	15. SCAFFOLDING/ACCESS
3. EXCAVATION/TRENCHING	16. MECHANICAL
4. GRADING (EARTHWORK)	17. PAINTING
5. PIPING/UTILITIES	18. EQUIPMENT/MAINTENANCE
6. FOUNDATION	19. TUNNELING
7. FORMING	20. WAREHOUSING/STORAG[E]
8. CONCRETE PLACEMENT	21. PAVING
9. STEEL ERECTION	22. FENCING
10. ROOFING	23. SIGNING
11. FRAMING	24. LANDSCAPING/IRRIGATION
12. MASONRY	25. INSULATION
13. CARPENTRY	26. DEMOLITION

b. TYPE OF CONSTRUCTION EQUIPMENT—Select the equipment involved in the accident from the list below. Enter the name and place the corresponding code number identified in the box. If equipment is not included below, use code 24, "OTHER", and write in specific type of equipment.

CONSTRUCTION EQUIPMENT

1. GRADER	13. DUMP TRUCK (OFF HIGHWAY)
2. DRAGLINE	14. TRUCK (OTHER)
3. CRANE (ON VESSEL/BARGE)	15. FORKLIFT
4. CRANE (TRACKED)	16. BACKHOE
5. CRANE (RUBBER TIRE)	17. FRONT-END LOADER
6. CRANE (VEHICLE MOUNTED)	18. PILE DRIVER
7. CRANE (TOWER)	19. TRACTOR (UTILITY)
8. SHOVEL	20. MANLIFT
9. SCRAPER	21. DOZER
10. PUMP TRUCK (CONCRETE)	22. DRILL RIG
11. TRUCK (CONCRETE/TRANSIT MIXER)	23. COMPACTOR/VIBRATORY ROLLER
12. DUMP TRUCK (HIGHWAY)	24. OTHER

INSTRUCTIONS FOR SECTION 5—INJURY/ILLNESS INFORMATION

a. SEVERITY OF INJURY—Mark the appropriate box

(1) FATAL—injured person died or is missing and presumed dead.

(2) LOST TIME—a non-fatal injury that causes any loss of time from work beyond the day or shift in which it occurred or a non-fatal illness/disease that causes disability at any time.

(3) NO LOST TIME—a non-fatal, traumatic injury that does not cause loss of time from work beyond the day or shift in which it occurred.

(4) FIRST AID—One time treatment (and/or one follow visit for observation) for minor scratches, cuts and similar injuries that do not ordinarily require medical attention.

b. ESTIMATED DAYS LOST—Enter the estimated number of workdays the person will lose from work.

c. ESTIMATED DAYS HOSPITALIZED—Enter the estimated number of workdays the person will be hospitalized.

d. ESTIMATED DAYS RESTRICTED DUTY—Enter the estimated number of workdays the person, as a result of the accident, will not be able to perform all of their regular duties.

e. BODY PART AFFECTED—Select the most appropriate primary and when applicable, secondary body part affected from the list below. Enter body part name on line and place the corresponding code letters identifying that body part in the box.

GENERAL BODY AREA	CODE	BODY PART NAME
ARM/WRIST	AB	ARM AND WRIST
	AS	ARM OR WRIST
TRUNK, EXTERNAL MUSCULATURE	B1	SINGLE BREAST
	B2	BOTH BREASTS
	B3	SINGLE TESTICLE
	B4	BOTH TESTICLES
	BA	ABDOMEN
	BC	CHEST
	BL	LOWER BACK
	BP	PENIS
	BS	SIDE
	BU	UPPER BACK
	BW	WAIST
	BZ	TRUNK OTHER
HEAD, INTERNAL	C1	SINGLE EAR INTERNAL
	C2	BOTH EARS INTERNAL
	C3	SINGLE EYE INTERNAL
	C4	BOTH EYES INTERNAL
	CB	BRAIN
	CC	CRANIAL BONES
	CD	TEETH
	CJ	JAW
	CL	THROAT, LARYNX
	CM	MOUTH
	CN	NOSE
	CR	THROAT, OTHER
	CT	TONGUE
	CZ	HEAD OTHER INTERNAL
ELBOW	EB	BOTH ELBOWS
	ES	SINGLE ELBOW
FINGER	F1	FIRST FINGER
	F2	BOTH FIRST FINGERS
	F3	SECOND FINGER
	F4	BOTH SECOND FINGERS
	F5	THIRD FINGER
	F6	BOTH THIRD FINGERS
	F7	FOURTH FINGER
	F8	BOTH FOURTH FINGERS
TOE	G1	GREAT TOE
	G2	BOTH GREAT TOES
	G3	TOE OTHER
	G4	TOES OTHER
HEAD, EXTERNAL	H1	EYE EXTERNAL
	H2	BOTH EYES EXTERNAL
	H3	EAR EXTERNAL
	H4	BOTH EARS EXTERNAL
	HC	CHIN
	HF	FACE
	HK	NECK/THROAT
	HM	MOUTH/LIPS
	HN	NOSE
	HS	SCALP
KNEE	KB	BOTH KNEES
	KS	KNEE
LEG, HIP, ANKLE, BUTTOCK	LB	BOTH LEGS/HIPS/ ANKLES/BUTTOCKS
	LS	SINGLE LEG/HIP ANKLE/BUTTOCK
HAND	MB	BOTH HANDS
	MS	SINGLE HAND
FOOT	PB	BOTH FEET
	PS	SINGLE FOOT
TRUNK, BONES	R1	SINGLE COLLAR BONE
	R2	BOTH COLLAR BONES
	R3	SHOULDER BLADE
	R4	BOTH SHOULDER BLADES
	RB	RIB
	RS	STERNUM (BREAST BONE)
	RV	VERTEBRAE (SPINE; DISC)
	RZ	TRUNK BONES OTHER
SHOULDER	SB	BOTH SHOULDERS
	SS	SINGLE SHOULDER
THUMB	TB	BOTH THUMBS
	TS	SINGLE THUMB
TRUNK, INTERNAL ORGANS	V1	LUNG, SINGLE
	V2	LUNGS, BOTH
	V3	KIDNEY, SINGLE
	V4	KIDNEYS, BOTH
	VH	HEART
	VL	LIVER
	VR	REPRODUCTIVE ORGANS
	VS	STOMACH
	VV	INTESTINES
	VZ	TRUNK, INTERNAL; OTHER

f. NATURE OF INJURY—Select the most appropriate nature of injury from the list below. This nature of injury shall correspond the *primary body part* selected in 5.e. above. Enter the nature (injury name on the line and place the corresponding CODE lett identifying the nature of injury in the box provided.

* The injury or condition selected below must be caused by a specific incident or event which occurred during a single work day or shift.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
*TRAUMATIC INJURY OR DISABILITY	TA	AMPUTATION
	TB	BACK STRAIN
	TC	CONTUSION: BRUISE; ABRASION
	TD	DISLOCATION
	TF	FRACTURE
	TH	HERNIA
	TK	CONCUSSION
	TL	LACERATION, CUT
	TP	PUNCTURE
	TS	STRAIN, MULTIPLE
	TU	BURN, SCALD, SUNBURN
	TI	TRAUMATIC SKIN DISEASES/ CONDITIONS INCLUDING DERMATITIS
	TR	TRAUMATIC RESPIRATORY DISEASE
	TQ	TRAUMATIC FOOD POISONING
	TW	TRAUMATIC TUBERCULOSIS
	TX	TRAUMATIC VIROLOGICAL/ INFECTIVE/PARASITIC DISEASE
	T1	TRAUMATIC CEREBRAL VASCULAR CONDITION/STROKE
	T2	TRAUMATIC HEARING LOSS
	T3	TRAUMATIC HEART CONDITION
	T4	TRAUMATIC MENTAL DISORDER; STRESS; NERVOUS CONDITION
	T8	TRAUMATIC INJURY — OTHER (EXCEPT DISEASE, ILLNESS)

** A nontraumatic physiological harm or loss of capacity produced by systemic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a long period of time. For practical purposes, an occupational illness/disease or disability is any reported condition which doses not meet the definition of traumatic injury or disability as described above.

GENERAL NATURE CATEGORY	CODE	NATURE OF INJURY NAME
**NON-TRAUMATIC ILLNESS/DISEASE OR DISABILITY		
RESPIRATORY DISEASE	RA	ASBESTOSIS
	RB	BRONCHITIS
	RE	EMPHYSEMA
	RP	PNEUMOCONIOSIS
	RS	SILICOSIS
	R9	RESPIRATORY DISEASE, OTHER
VIROLOGICAL, INFECTIVE & PARASITIC DISEASES	VB	BRUCELLOSIS
	VC	COCCIDIOMYCOSIS
	VF	FOOD POISONING
	VH	HEPATITIS
	VM	MALARIA
	VS	STAPHYLOCOCCUS
	VT	TUBERCULOSIS
	V9	VIROLOGICAL/INFECTIVE/ PARASITIC — OTHER
DISABILITY, OCCUPATIONAL	DA	ARTHRITIS, BURSITIS
	DB	BACK STRAIN, BACK SPRAIN
	DC	CEREBRAL VASCULAR CONDITION; STROKE
	DD	ENDEMIC DISEASE (OTHER THAN CODE TYPES R&S)
	DE	EFFECT OF ENVIRONMENTAL CONDITION
	DH	HEARING LOSS
	DK	HEART CONDITION
	DM	MENTAL DISORDER, EMOTIONAL STRESS NERVOUS CONDITION
	DR	RADIATION
	DS	STRAIN, MULTIPLE
	DU	ULCER
	DV	OTHER VASCULAR CONDITIONS
	D9	DISABILITY, OTHER

GENERAL NATURE CATEGORY	CODE	NATURE OF INJUR.. NAME
SKIN DISEASE OR CONDITION	SB	BIOLOGICAL
	SC	CHEMICAL
	S9	DERMATITIS, UNCLASSIFIED

g. TYPE AND SOURCE OF INJURY (CAUSE) — Type and S Codes are used to describe what caused the incident. The Code stands for an ACTION and the Source Code for an OBJE(or SUBSTANCE. Together, they form a brief description of how t incident occurred. Where there are two different sources, code t *initiating* source of the incident (see example 1, below). Example

(1) An employee tripped on carpet and struck his head on a desk.
TYPE: 210 (Fell on Same Level) SOURCE: 0110 (walking/ working surface)

NOTE: This example would NOT be coded 120 (struck against) and 0140 (furnitur

(2) A Park Ranger contracted dermatitis from contact with poison n oak.
TYPE: 510 (contact) SOURCE: 0920 (plant)

(3) A lock and dam mechanic punctured his finger with a metal sliv while grinding a turbine blade.
TYPE: 410 (punctured by) SOURCE: 0830 (metal)

(4) An employee was driving a government vehicle when it was struck by another vehicle.
TYPE: 800 (traveling in) SOURCE: 0421 (government owne vehicle, as driver)

NOTE. The Type Code 800, "Traveling In" is different from the other type codes in that its function is not to identify factors contributing to the injury or fatality, but rath to collect data on the type of vehicle the employee was operating or traveling in at the time of the incident.

Select the most appropriate TYPE and SOURCE identifier from the l below and enter the name on the line and the corresponding code i the appropriate box.

CODE	TYPE OF INJURY NAME
	STRUCK
0110	STRUCK BY
0111	STRUCK BY FALLING OBJECT
0120	STRUCK AGAINST
	FELL, SLIPPED, TRIPPED
0210	FELL ON SAME LEVEL
0220	FELL ON DIFFERENT LEVEL
0230	SLIPPED, TRIPPED (NO FALL)
	CAUGHT
0310	CAUGHT ON
0320	CAUGHT IN
0330	CAUGHT BETWEEN
	PUNCTURED, LACERATED
0410	PUNCTURED BY
0420	CUT BY
0430	STUNG BY
0440	BITTEN BY
	CONTACTED
0510	CONTACTED WITH (INJURED PERSON MOVING)
0520	CONTACTED BY (OBJECT WAS MOVING)
	EXERTED
0610	LIFTED, STRAINED BY (SINGLE ACTION)
0620	STRESSED BY (REPEATED ACTION)
	EXPOSED
0710	INHALED
0720	INGESTED
0730	ABSORBED
0740	EXPOSED TO
0800	TRAVELING IN

CODE	SOURCE OF INJURY NAME
0100	BUILDING OR WORKING AREA
0110	WALKING/WORKING SURFACE (FLOOR, STREET, SIDEWALKS, ETC)
0120	STAIRS, STEPS
0130	LADDER
0140	FURNITURE, FURNISHINGS, OFFICE EQUIPMENT
0150	BOILER, PRESSURE VESSEL
0160	EQUIPMENT LAYOUT (ERGONOMIC)
0170	WINDOWS, DOORS
0180	ELECTRICITY

CODE	SOURCE OF INJURY NAME
0200	ENVIRONMENTAL CONDITION
0210	TEMPERATURE EXTREME (INDOOR)
0220	WEATHER (ICE, RAIN, HEAT, ETC.)
0230	FIRE, FLAME, SMOKE (NOT TOBACCO)
0240	NOISE
0250	RADIATION
0260	LIGHT
0270	VENTILATION
0271	TOBACCO SMOKE
0280	STRESS (EMOTIONAL)
0290	CONFINED SPACE
0300	MACHINE OR TOOL
0310	HAND TOOL (POWERED: SAW, GRINDER, ETC.)
0320	HAND TOOL (NONPOWERED)
0330	MECHANICAL POWER TRANSMISSION APPARATUS
0340	GUARD, SHIELD (FIXED, MOVEABLE, INTERLOCK)
0350	VIDEO DISPLAY TERMINAL
0360	PUMP, COMPRESSOR, AIR PRESSURE TOOL
0370	HEATING EQUIPMENT
0380	WELDING EQUIPMENT
0400	VEHICLE
0411	AS DRIVER OF PRIVATELY OWNED/RENTAL VEHICLE
0412	AS PASSENGER OF PRIVATELY OWNED/RENTAL VEHICLE
0421	DRIVER OF GOVERNMENT VEHICLE
0422	PASSENGER OF GOVERNMENT VEHICLE
0430	COMMON CARRIER (AIRLINE, BUS, ETC.)
0440	AIRCRAFT (NOT COMMERCIAL)
0450	BOAT, SHIP, BARGE
0500	MATERIAL HANDLING EQUIPMENT
0510	EARTHMOVER (TRACTOR, BACKHOE, ETC.)
0520	CONVEYOR (FOR MATERIAL AND EQUIPMENT)
0530	ELEVATOR, ESCALATOR, PERSONNEL HOIST
0540	HOIST, SLING CHAIN, JACK
0550	CRANE
0551	FORKLIFT
0560	HANDTRUCK, DOLLY
0600	DUST, VAPOR, ETC.
0610	DUST (SILICA, COAL, ETC.)
0620	FIBERS
0621	ASBESTOS
0630	GASES
0631	CARBON MONOXIDE
0640	MIST, STEAM, VAPOR, FUME
0641	WELDING FUMES
0650	PARTICLES (UNIDENTIFIED)
0700	CHEMICAL, PLASTIC, ETC.
0711	DRY CHEMICAL—CORROSIVE
0712	DRY CHEMICAL—TOXIC
0713	DRY CHEMICAL—EXPLOSIVE
0714	DRY CHEMICAL—FLAMMABLE
0721	LIQUID CHEMICAL—CORROSIVE
0722	LIQUID CHEMICAL—TOXIC
0723	LIQUID CHEMICAL—EXPLOSIVE
0724	LIQUID CHEMICAL—FLAMMABLE
0730	PLASTIC
0740	WATER
0750	MEDICINE
0800	INANIMATE OBJECT
0810	BOX, BARREL, ETC.
0820	PAPER
0830	METAL ITEM, MINERAL
0831	NEEDLE
0840	GLASS
0850	SCRAP, TRASH
0860	WOOD
0870	FOOD
0880	CLOTHING, APPAREL, SHOES
0900	ANIMATE OBJECT
0911	DOG
0912	OTHER ANIMAL
0920	PLANT
0930	INSECT
0940	HUMAN (VIOLENCE)
0950	HUMAN (COMMUNICABLE DISEASE)
0960	BACTERIA, VIRUS (NOT HUMAN CONTACT)

CODE	SOURCE OF INJURY NAME
1000	PERSONAL PROTECTIVE EQUIPMENT
1010	PROTECTIVE CLOTHING, SHOES, GLASSES, GOGGLES
1020	RESPIRATOR, MASK
1021	DIVING EQUIPMENT
1030	SAFETY BELT, HARNESS
1040	PARACHUTE

INSTRUCTIONS FOR SECTION 6 — PUBLIC FATALITY

a. ACTIVITY AT TIME OF ACCIDENT—Select the activity being performed at the time of the accident from the list below. Enter the activity name on the line and the corresponding number in the box. If the activity performed is not identified on the list, select from the *most* appropriate primary activity area (water related, non-water related or other activity), the code number for "Other", and write in the activity being performed at the time of the accident.

WATER RELATED RECREATION

1. Sailing
2. Boating—powered
3. Boating—unpowered
4. Water skiing
5. Fishing from boat
6. Fishing from bank dock or pier
7. Fishing while wading
8. Swimming/supervised area
9. Swimming/designated area
10. Swimming/other area
11. Underwater activities (skin diving, scuba, etc.)
12. Wading
13. Attempted rescue
14. Hunting from boat
15. Other

NON-WATER RELATED RECREATION

16. Hiking and walking
17. Climbing (general)
18. Camping/picnicking authorized area
19. Camping/picnicking unauthorized area
20. Guided tours
21. Hunting
22. Playground equipment
23. Sports/summer (baseball, football, etc.)
24. Sports/winter (skiing, sledding, snowmobiling etc.)
25. Cycling (bicycle, motorcycle, scooter)
26. Gliding
27. Parachuting
28. Other non-water related

OTHER ACTIVITIES

29. Unlawful acts (fights, riots, vandalism, etc.)
30. Food preparation/serving
31. Food consumption
32. Housekeeping
33. Sleeping
34. Pedestrian struck by vehicle
35. Pedestrian other acts
36. Suicide
37. "Other" activities

b. PERSONAL FLOTATION DEVICE USED—If fatality was water-related was the victim wearing a person flotation device? Mark the appropriate box.

INSTRUCTIONS FOR SECTION 7—MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE—Mark appropriate box for each vehicle involved. If more than one vehicle of the same type is involved, mark both halves of the appropriate box. USACE vehicle(s) involved shall be marked in left half of appropriate box.

b. TYPE OF COLLISION—Mark appropriate box.

c. SEAT BELT—Mark appropriate box.

INSTRUCTIONS FOR SECTION 8—PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM—Describe all property involved in accident. Property/material involved means material which is damaged or whose use or misuse contributed to the accident. Include the name, type, model; also include the National Stock Number (NSN) whenever applicable.

b. OWNERSHIP—Enter ownership for each item listed. (Enter one of the following: *USACE; OTHER GOVERNMENT; CONTRACTOR; PRIVATE)*

c. $ AMOUNT OF DAMAGE—Enter the total estimated dollar amount of damage (parts and labor), if any.

INSTRUCTIONS FOR SECTION 9 — VESSEL/ FLOATING PLANT ACCIDENT

a. TYPE OF VESSEL/FLOATING PLANT — Select the most appropriate vessel/floating plant from list below. Enter name and place corresponding number in box. If item is not listed below, enter item number for "OTHER" and write in specific type of vessel/ floating plant.

VESSEL/FLOATING PLANTS

1. ROW BOAT	7. DREDGE/DIPPER
2. SAIL BOAT	8. DREDGE/CLAMSHELL BUCKET
3. MOTOR BOAT	9. DREDGE/PIPE LINE
4. BARGE	10. DREDGE/DUST PAN
5. DREDGE/HOPPER	11. TUG BOAT
6. DREDGE/SIDE CASTING	12. OTHER

b. COLLISION/MISHAP — Select from the list below the object(s) that contributed to the accident or were damaged in the accident.

COLLISION/MISHAP

1. COLLISION W/OTHER VESSEL	7. HAULAGE UNIT
2. UPPER GUIDE WALL	8. BREAKING TOW
3. UPPER LOCK GATES	9. TOW BREAKING UP
4. LOCK WALL	10. SWEPT DOWN ON DAM
5. LOWER LOCK GATES	11. BUOY/DOLPHIN/CELL
6. LOWER GUIDE WALL	12. WHARF OR DOCK
	13. OTHER

INSTRUCTIONS FOR SECTION 10 — ACCIDENT DESCRIPTION

DESCRIBE ACCIDENT — Fully describe the accident. Give the sequence of events that describe what happened leading up to and including the accident. Fully identify personnel and equipment involved and their role(s) in the accident. Ensure that relationships between personnel and equipment are clearly specified. Continue on blank sheets if necessary and attach to this report.

STRUCTIONS FOR SECTION 11 — CAUSAL rACTORS

a. Review thoroughly. Answer each question by marking the appropriate block. If any answer is yes, explain in item 13 below. Consider, as a minimum, the following:

(1) DESIGN — Did inadequacies associated with the building or work site play a role? Would an improved design or layout of the equipment or facilities reduce the likelihood of similar accidents? Were the tools or other equipment designed and intended for the task at hand?

(2) INSPECTION/MAINTENANCE — Did inadequately or improperly maintained equipment, tools, workplace, etc. create or worsen any hazards that contributed to the accident? Would better equipment, facility, work site or work activity inspections have helped avoid the accident?

(3) PERSON'S PHYSICAL CONDITION — Do you feel that the accident would probably not have occurred if the employee was in "good" physical condition? If the person involved in the accident had been in better physical condition, would the accident have been less severe or avoided altogether? Was over exertion a factor?

(4) OPERATING PROCEDURES — Did a lack of or inadequacy within established operating procedures contribute to the accident? Did any aspect of the procedures introduce any hazard to, or increase the risk associated with the work process? Would establishment or improvement of operating procedures reduce the likelihood of similar accidents?

(5) JOB PRACTICES — Were any of the provisions of the Safety and Health Requirements Manual (EM 385-1-1) violated? Was the task being accomplished in a manner which was not in compliance with an established job hazard analysis or activity hazard analysis? Did any established job practice (including EM 385-1-1) fail to adequately address the task or work process? Would better job practices improve the safety of the task?

(6) HUMAN FACTORS — Was the person under undue stress (either internal or external to the job)? Did the task tend toward overloading the capabilities of the person; i.e., did the job require tracking and reacting to many external inputs such as displays, alarms, or signals? Did the arrangement of the workplace tend to interfere with efficient task performance? Did the task require reach, strength, endurance, agility, etc., at or beyond the capabilities of the employee? Was the work environment ill-adapted to the person? Did the person need more training, experience, or practice in doing the task? Was the person inadequately rested to perform safely?

(7) ENVIRONMENTAL FACTORS — Did any factors such as moisture, humidity, rain, snow, sleet, hail, ice, fog, cold, heat, sun, temperature changes, wind, tides, floods, currents, dust, mud, glare, pressure changes, lightning, etc., play a part in the accident?

(8) CHEMICAL AND PHYSICAL AGENT FACTORS — Did exposure to chemical agents (either single shift exposure or long-term exposure) such as dusts, fibers (asbestos, etc.), silica, gases (carbon monoxide, chlorine, etc.), mists, steam, vapors, fumes, smoke, other particulates, liquid or dry chemicals that are corrosive, toxic, explosive or flammable, by-products of combustion or physical agents such as noise, ionizing radiation, non-ionizing radiation (UV radiation created during welding, etc.) contribute to the accident/incident?

(9) OFFICE FACTORS — Did the fact that the accident occurred in an office setting or to an office worker have a bearing on its cause? For example, office workers tend to have less experience and training in performing tasks such as lifting office furniture. Did physical hazards within the office environment contribute to the hazard?

(10) SUPPORT FACTORS — Was the person using an improper tool for the job? Was inadequate time available or utilized to safely accomplish the task? Were less than adequate personnel resources (in terms of employee skills, number of workers, and adequate supervision) available to get the job done properly? Was funding available, utilized, and adequate to provide proper tools, equipment, personnel, site preparation, etc?

(11) PERSONAL PROTECTIVE EQUIPMENT — Did the person to use appropriate personal protective equipment (gloves, protection, hard-toed shoes, respirator, etc.) for the task or environment? Did protective equipment provided or worn fail to provide adequate protection from the hazard(s)? Did lack of or inadequate maintenance of protective gear contribute to the accident?

(12) DRUGS/ALCOHOL — Is there any reason to believe the person's mental or physical capabilities, judgement, etc., were impaired or altered by the use of drugs or alcohol? Consider the effects of prescription medicine and over the counter medications as well as illicit drug use. Consider the effect of drug or alcohol induced "hangovers".

b. WRITTEN JOB/ACTIVITY HAZARD ANALYSIS — Was a written Job/Activity Hazard Analysis completed for the task being performed at the time of the accident? Mark the appropriate box. *If one was performed, attach a copy of the analysis to the report.*

INSTRUCTIONS FOR SECTION 12 — TRAINING

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK? — For the purpose of this section "trained" means the person has been provided the necessary information (either formal and/or on-the-job (OJT) training) to competently perform the activity/task in a safe and healthful manner.

b. TYPE OF TRAINING — Mark the appropriate box that best indicates the type of training; (classroom or on-the-job) that the injured person received before the accident happened.

c. DATE OF MOST RECENT TRAINING — Enter the month, day, year of the last *formal* training completed that covered the act task being performed at the time of the accident.

INSTRUCTIONS FOR SECTION 13—CAUSES

a. DIRECT CAUSES—The direct cause is that single factor which most directly lead to the accident. See examples below.

b. INDIRECT CAUSES—Indirect causes are those factors which contributed to but did not directly initiate the occurrence of the accident.

Examples for section 13:

a. Employee was dismantling scaffold and fell 12 feet from unguarded opening.
Direct cause: failure to provide fall protection at elevation.
Indirect causes: failure to enforce USACE safety requirements: improper training/motivation of employee (possibility that employee was not knowledgeable of USACE fall protection requirements or was lax in his attitude towards safety); failure to ensure provision of positive fall protection whenever elevated: failure to address fall protection during scaffold dismantling in phase hazard analysis.

b. Private citizen had stopped his vehicle at intersection for red light when vehicle was struck in rear by USACE vehicle. (note USACE vehicle was in proper/safe working condition).
Direct cause: failure of USACE driver to maintain control of and stop USACE vehicle within safe distance.
Indirect cause: Failure of employee to pay attention to driving (defensive driving).

INSTRUCTIONS FOR SECTION 14—ACTION TO ELIMINATE CAUSE(S)

DESCRIPTION—Fully describe all the actions taken, anticipated, and recommended to eliminate the cause(s) and prevent reoccurrence of similar accidents/illnesses. Continue on blank sheets of paper if necessary to fully explain and attach to the completed report form.

INSTRUCTIONS FOR SECTION 15—DATES FOR ACTION

a. BEGIN DATE—Enter the date when the corrective action(s) identified in Section 14 will begin.

b. COMPLETE DATE—Enter the date when the corrective action(s) identified in Section 14 will be completed.

c. TITLE AND SIGNATURE—Enter the title and signature of supervisor completing the accident report. For a GOVERNMENT employee accident/illness the immediate supervisor will complete and sign the report. For PUBLIC accidents the USACE Project Manager/Area Engineer responsible for the USACE property where the accident happened shall complete and sign the report. For CONTRACTOR accidents the Contractor's project manager shall complete and sign the report and provide to the USACE supervisor responsible for oversight of that contractor activity. This USACE Supervisor shall also sign the report. Upon entering the information required in 15.d, 15.e and 15.f below, the responsible USACE supervisor shall forward the report for management review as indicated in Section 16.

d. DATE SIGNED—Enter the month, day, and year that the report was signed by the responsible supervisor.

e. ORGANIZATION NAME—For GOVERNMENT employee accidents enter the USACE organization name (Division, Branch, Section, etc.) of the injured employee. For PUBLIC accidents enter the USACE organization name for the person identified in block 15.c. For CONTRACTOR accidents enter the USACE organization name for the USACE office responsible for providing contract administration oversight.

f. OFFICE SYMBOL—Enter the latest complete USACE Office Symbol for the USACE organization identified in block 15.e.

INSTRUCTIONS FOR SECTION 16—MANAGEMENT REVIEW (1st)

1ST REVIEW—Each USACE FOA shall determine who will provide 1st management review. The responsible USACE supervisor in section 15.c shall forward the completed report to the USACE office designated as the 1st Reviewer by the FOA. Upon receipt, the Chief of the Office shall review the completed report, mark the appropriate box, provide substantive comments, sign, date, and forward to the FOA Staff Chief (2nd review) for review and comment.

INSTRUCTIONS FOR SECTION 17—MANAGEMENT REVIEW (2nd)

2ND REVIEW—The FOA Staff Chief (i.e., FOA Chief of Construction, Operations, Engineering, Planning, etc.) shall mark the appropriate box, review the completed report, provide substantive comments, sign, date, and return to the FOA Safety and Occupational Health Office.

INSTRUCTIONS FOR SECTION 18—SAFETY AND OCCUPATIONAL HEALTH REVIEW

3RD REVIEW—The FOA Safety and Occupational Health Office shall review the completed report, mark the appropriate box, ensure that any inadequacies, discrepancies, etc. are rectified by the responsible supervisor and management reviewers, provide substantive comments, sign, date and forward to the FOA Commander for review, comment, and signature.

INSTRUCTION FOR SECTION 19—COMMAND APPROVAL

4TH REVIEW—The FOA Commander shall (to include the person designated Acting Commander in his absence) review the completed report, comment if required, sign, date, and forward the report to the FOA Safety and Occupational Health Office. Signature authority shall not be delegated.

APPENDIX D

USER'S MANUAL FOR THE EXPLOSIMETER

I. INTRODUCTION TO THE EXPLOSIMETER/C.G.I

The explosimeter or Combustible Gas Indicator (CGI), is an air monitoring device designed to indicate flammable/explosive atmospheres and the level of oxygen present. The CGI registers combustible gases/vapors in terms of their Lower Flammability (L.F.L.). The L.F.L. is synonymous with Lower Explosive Limit (L.E.L.). The L.F.L. is the lowest concentration at which a combustible gas may ignite/explode in normal atmospheric conditions.

The oxygen sensor measures the partial pressure of oxygen in the atmosphere sampled. The percent O_2 is indicated on the oxygen meter.

II. OPERATION OF OXYGEN SENSOR

The O_2 sensor consists of gold and silver electrodes enclosed by a teflon membrane assembly in a potassium chloride solution. Oxygen diffuses through the Teflon membrane and reacts with the KCL solution. The electrode reactions are:

Cathode: $O_2 + 2\ H_2O + 4e^- \longrightarrow 4\ OH^-$

Anode: $4\ Ag^+ + 4\ Cl^- \longrightarrow AgCl + 4e^-$

The current supplied by the cell is directly proportional to the oxygen percent in the sample. This current is amplified and displayed on the percent oxygen meter. The oxygen sensor measures the partial pressure of oxygen.

<u>Temperature Limits:</u> The operational temperature range is -10° to 180°F. Operation at temperatures between 28° to 59°F requires that the meter be recalibrated with the sensor at the ambient temperature. Use the following procedure:

1. Place the sensor in the atmosphere to be tested. Allow several minutes for temperature equalization.

2. Remove the sensor and quickly calibrate to 20.9% in good air.

3. Return the sensor to the atmosphere to be tested and read the percent oxygen on the percent oxygen meter.

The following gases will interfere when present in high concentrations: sulfur dioxide, fluorine, chlorine, bromine, iodine, and oxides of nitrogen.

The detector element is of the catalytic filament type. The filaments are arranged in a bridge circuit. When a combustible gas contacts the heated filament, the heat from the catalytic combustion causes a resistance (i.e., electrical current) change in the filament bridge circuit. This change is detected and displayed on the percent L.F.L. meter.

Temperature Limits: The operational temperature range is 0° to 120°F.

Prolonged exposure to tetraethyl lead (leaded gasoline vapors) or silicone vapors causes fouling or destruction of the filament.

Start Up/Control Panel Operations

1. Turn the power switch on (center knob). Both meters will indicate red, yellow, and green lights and audible alarms will activate briefly, indicating they are operable (refer to Figure 1).

2. Allow one minute for warm up. After one minute, the green light will come on to indicate that the unit is ready to be calibrated. DO NOT CALIBRATE OR ZERO UNTIL THE GREEN LIGHT COMES ON.

3. With the instrument in normal atmospheric air, calibrate the oxygen meter by rotating the CAL. OXYGEN control knob until the oxygen meter reads exactly 20.9% oxygen (ϕ symbol on meter).

4. With instrument in gas free air, zero the percent L.F.L. meter by rotating the ZERO L.F.L. control knob until the L.F.L meter reads exactly zero.

5. A short "beep" once every few seconds indicates the unit is functional. There is a control inside the unit to disable the security beep if it is not desired.

With C.G.I. instrument in hand and sequence 1-4 performed in an area representative of nonhazard, ambient air conditions, the meter is ready to enter the subject area.

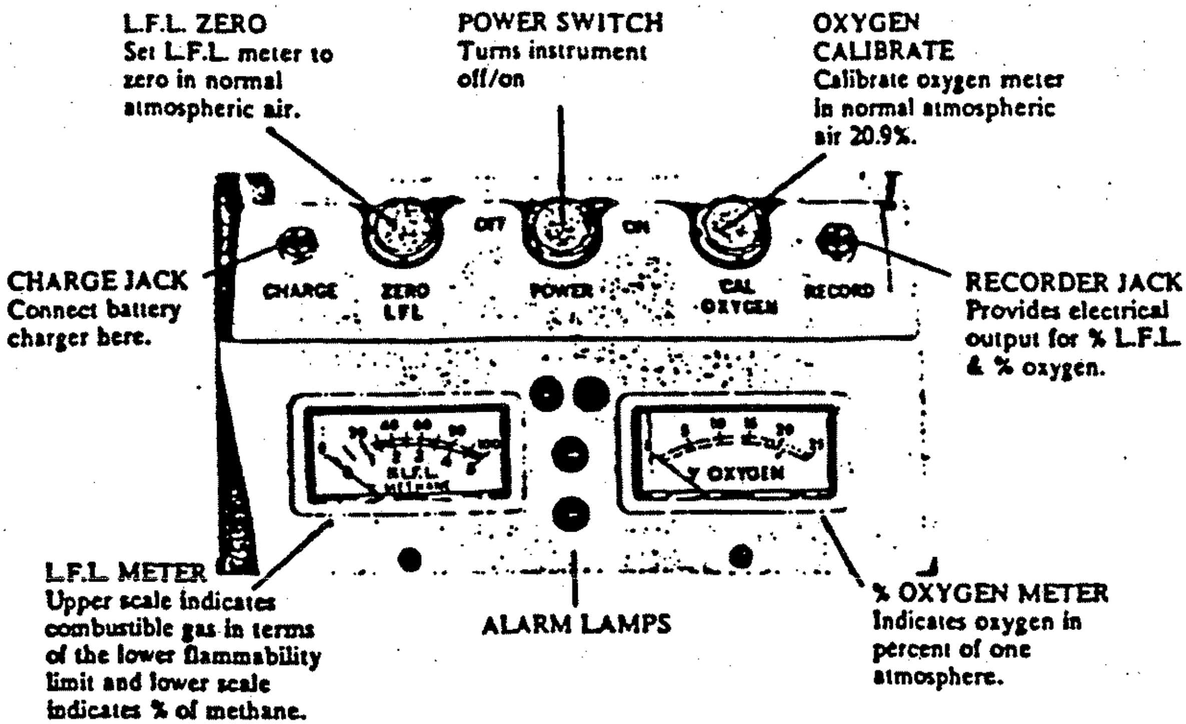
6. Place the probe assembly in the environment to be tested. If an alarm occurs (red light and wailing siren), personnel should leave the area.

7. If an instrument malfunction occurs (yellow light and sinking audible tone), personnel should leave the area until the problem is corrected (refer to troubleshooting section).

III. CALIBRATION/PERFORMANCE CHECK

Oxygen: The oxygen portion of this instrument is calibrated by the operator against good air to 20.9% as specified in Step 3 of the turn-on sequence. This calibration should be done once daily per use.

Figure D-1
Control Panel



Gas: The combustible gas detector is calibrated to methane at the factory to indicate directly percent L.F.L. of methane in air. The L.F.L. of methane is 5% by volume. That is, a concentration of 5% methane will indicate 100% L.F.L. for maximum accuracy, calibration curves for various gases should be used.

It is recommended that the gas detector be calibrated at least once every month, and whenever the detector filament is replaced. The calibration kit included with the CGI contains a calibration gas cylinder, a valve attachment to release the calibration gas, flexible tubing (delivery tube), and a cylinder to encapsulate the sensor probe.

RECALIBRATION INSTRUCTIONS

1. Disassemble case by removing the four retaining screws.

2. Allow the instrument to warm up for 15 minutes.

3. Assemble the calibration gas tank and delivery tube/cylinder.

4. Carefully open the valve on the gas tank to bathe the sensor with just enough gas to cause the needle on the L.F.L meter to move.

5. Adjust the L.F.L. CAL. control screw (refer to Figure 2) on circuit board until the percent L.F.L. meter indicates exactly the correct L.F.L. as indicated on the calibration gas cylinder.

Calibration in an atmosphere of combustible gases requires a source of methane test gas and a source of compressed air:

1. Using compressed air, bathe the gas sensor in a flow of air and adjust the ZERO L.F.L. control knob.

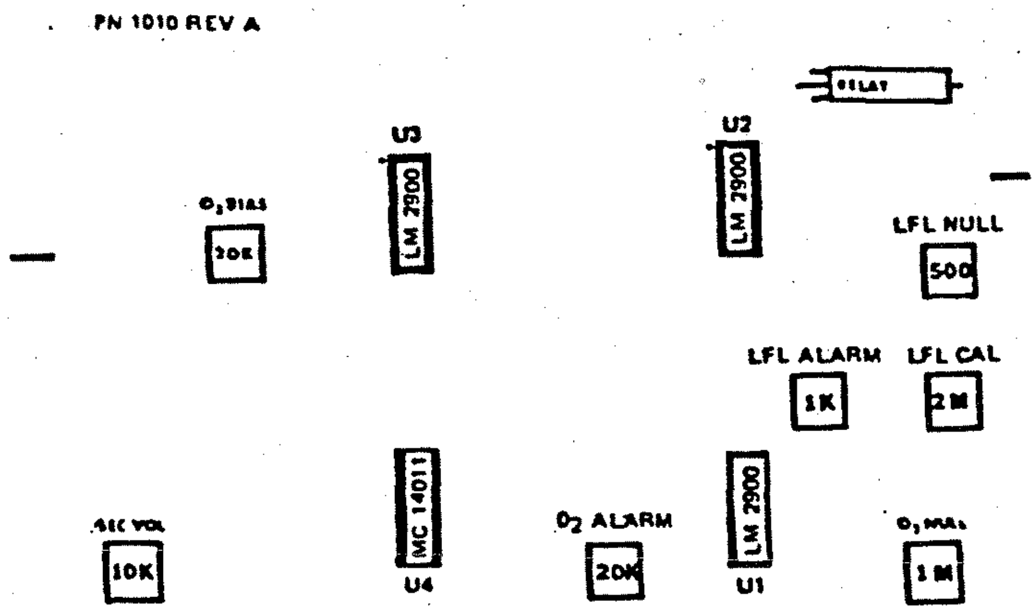
2. Calibrate the oxygen meter by rotating the CAL OXYGEN control knob until the oxygen meter indicates 20.9%.

3. Using the methane test gas, bathe the sensor in a flow of test gas and calibrate, if necessary, by adjusting the L.F.L. CAL control screw on circuit board (see Figure 2).

IV. READINGS/INTERPRETATIONS OF INSTRUMENT

Oxygen: The components of normal dry air are 780,900 ppm nitrogen, 209,400 ppm oxygen, 9,300 ppm argon, 315 ppm carbon dioxide, and trace amounts of neon, helium, methane, krypton, nitrous oxide, hydrogen, xenon, nitrogen dioxide and ozone. From this we observe the partial pressure exerted by the oxygen molecules in a representative sample of good air is 20.94% of the total volume of

Figure D-2
Circuit Board



the air sampled. If the oxygen sensor measures the partial pressure of oxygen at 19.5% or less, the alarm will sound and the red light closest to the oxygen meter will light up. This indicates an oxygen-deficient atmosphere and personnel should leave the area.

If the oxygen sensor measures that partial pressure of oxygen at 21% or greater, the alarm or light will activate. Personnel should be aware that they are in an oxygen-enriched atmosphere and should not sample or work under such conditions because a spark, arc, or flame could lead to fire or explosion.

<u>Gas:</u> As stated in the calibration section, the explosimeter measures percent L.F.L. relative to methane.

Since all combustible gases will not have the same L.F.L. as methane, a conversion factor is needed and is available in the manufacturer's literature. Divide the percent L.F.L. indicated on the meter by the conversion factor, the quotient is the percent L.E.L. If the gas you are detecting for. The choosing of a conversion factor assumes you know the gas you are sampling.

EXAMPLE: The atmosphere you are sampling is known to be a styrene-air mixture. The meter indicates 16% L.F.L. To determine the actual amount of styrene present, divide 16 by the conversion factor 0.31.

16% ÷ 0.31 = 51.6% of the L.F.L. of styrene. Personnel safety protocol requires personnel evacuate the area with atmospheric conditions at 20% L.F.L. With this in mind, in the previous example, personnel would have left the area they were sampling before the alarm went off.

The Safety Factor is an indication of how far the atmosphere being measured is from a hazardous condition (100% L.F.L.). A higher Safety Factor indicates a greater margin of safety.

EXAMPLE: styrene-air mixture at alarm level
20% L.E.L. ÷ 0.31 = 64.5% L.F.L. styrene
Safety Factor = 100% ÷ 64.5% = 1.6
*Less safe as methane at 20% L.F.L.
Safety Factor = 100% ÷ 20% = 5

COMBUSTIBLE GAS ALARM LATCH: When a high concentration of gas is present in concentrations greater than 90% L.F.L., the meter will latch up at full scale and stay there until reset. This latch shows the operator that a gas concentration near or exceeding the lower flammability limit has been sensed. On the latched conditions, the siren alarm is on and power to the gas detector filament is turned off. This prevents possible damage to the filament from exposure to high gas concentrations. Resetting is done by turning the instrument off and waiting 15 seconds. When the instrument is turned on again, it should go through its normal turn-on sequence.

V. CHARGING/RECHARGING AND MAINTENANCE

Before attempting to operate the unit, be sure the batteries have been charged for at least 12 hours. The battery charger is factory-set for 115 volts operation, and has an internal switch for conversion to 230 volts operation.

For 230 volt operation, disassemble your battery charger by removing the bottom cover plate and move the switch to the 230 volt position. NOTE: For 230 volt operation, a suitable line cord plug, or adapter, must be provided by the user. Remember to switch back the 115 volt operation when done since most outlets operate at this voltage.

BATTERY CHARGING/RECHARGING PROCEDURE:

1. Make sure the power switch is in the OFF position.

2. Connect the charger plug to the charger jack on the instrument.

3. Plug the Edmont Ni-Cad Battery charger into a suitable source of 115 V.A.C. (or 230 V.A.C.).

Charge the battery for 12-14 hours. This will generate full capacity and the unit will operate continuously for more than 10 hours.

The unit may be operated while connected to the charger; however, the batteries will charge at a reduced rate. NOTE: to prevent possible ignition of gases, always recharge in a nonhazardous location.

LOW BATTERY ALARM: There is no battery test switch on this instrument. The circuitry of the Edmont No. 60-400 continuously monitors the condition of the nickel cadmium batter pack. The CAUTION! alarm is triggered when batter voltage falls below 8.4 volts. The instrument may indicate the CAUTION! alarm condition for several hours without damage to the battery pack. However, if left on, the batter pack will eventually be damaged by deep discharge. The operator should turn the unit off within two to three hours and recharge the battery pack.

ACTIVATING/RECHARGING PROCEDURE FOR THE OXYGEN SENSOR

Normal charge life is 30-60 days. Oxygen readings which drift rapidly down 20.9% indicate the need to recharge the oxygen sensor. Recharging is accomplished with Edmont Recharge Kit #60-614.

OXYGEN SENSOR RECHARGING PROCEDURE:

1. Make sure the instrument is OFF.

2. Disassemble the probe assembly by sliding the shaft away from the body to uncover the oxygen sensor (see Figure 3).

3. Unscrew and discard the used cap.

4. Using the tissue from the kit, wipe away residual electrolyte.

5. Using the green scrubber, scour the silver electrode until bright as a new dime. Do not abrade plastic parts of tip.

6. Fill the new cap with electrolyte to vent holes.
7. Screw the cap on finger-tight. Excess electrolyte will exude through vent holes.

8. Wipe of excess electrolyte. Discard used materials. Allow two minutes to stabilize, then recalibrate.

REPLACING GAS DETECTOR FILAMENT (PART 60-402)

A CAUTION! alarm, accompanied by a steady yellow light, indicates that the gas sensor filament is burned out and must replaced. If the filament gives no response to methane test gas or its response is greatly reduced, the filament is probably poisoned and must also be replaced. The detector assembly should be replaced if ZERO cannot be set within range of the ZERO L.F.L. control, or if the percent L.F.L. meter cannot be calibrated using the L.F.L. CAL control knob (see Figure 1).

1. Make sure the instrument is OFF.

2. Disassemble the probe assembly by sliding the shaft away from body.

3. Remove three wires from the filament assembly and pull out the old filament assembly.

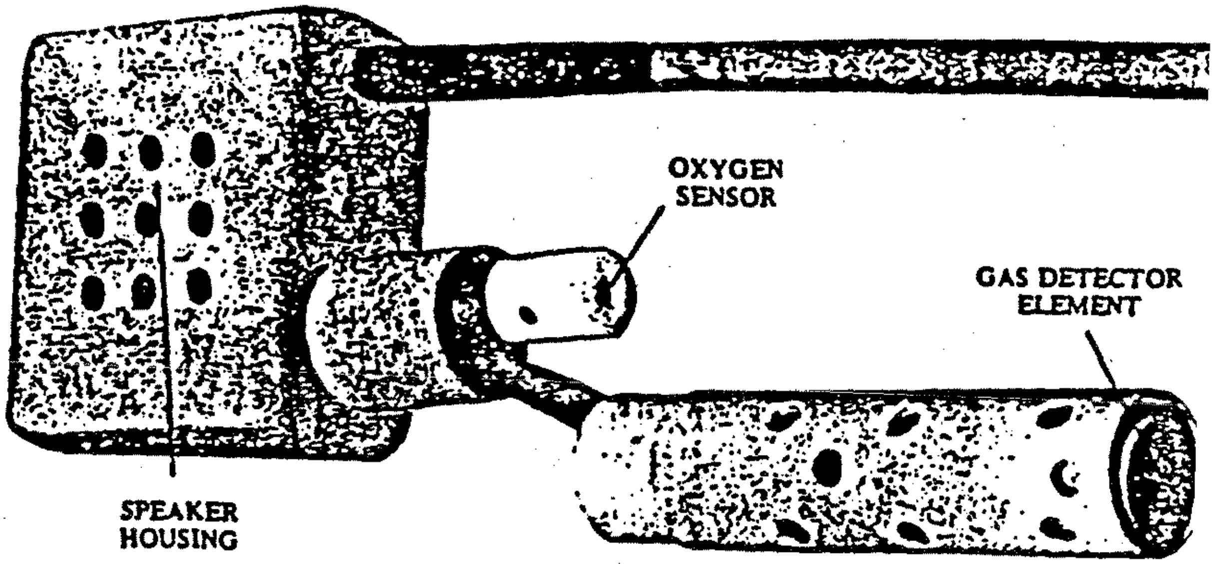
4. Install a new filament assembly 60-402.

5. Attach wires (black to black, white to white, blue to blue). Reassemble and recalibrate.

INTERNAL ADJUSTMENTS

The internal adjustments are made, preferably with a jeweler's screwdriver, via control screws on the circuit board of the instrument.
ADJUSTING OXYGEN ALARM: Set oxygen meter, using the CAL OXYGEN control knob to 19.5%. Adjust 0_2 Alarm Level control screw until

Figure D-3
Sensor Assembly



the alarm just comes on. Rotate the calibrate control knob above and below 19.5%. The alarm should just come on at 19.5%.
ADJUSTING GAS ALARM: The alarm point may adjust to any point the meter scale.

1. Turn the unit ON. Allow 15 minutes for warm-up period.
2. Adjust ZERO L.F.L. control knob until the L.F.L. meter indicates the desired alarm point (factory set at 20% L.F.L.).
3. Adjust the L.F.L. alarm level control screw until the alarm just comes on at 20% L.F.L. (or any desired alarm point).

SECURITY "BEEP": The security volume control screw adjusts the volume of the security beep from full off to maximum.

Set control screw for the desired volume.

VI. TROUBLESHOOTING

Basic troubleshooting procedures are given in the table below. If service is required beyond these basic procedures, refer the problem to qualified personnel.

Symptom	Cause	Remedy
No meter indication No alarms	Dead or defective battery	Recharge or replace batter
Constant oxygen alarm Unable to calibrate to 20.9%	Defective oxygen probe	Recharge oxygen probe
Does not operate for full 8 hours	Defective battery pack	Recharge or replace
CAUTION! alarm blinking yellow	Low battery	Recharge battery
CAUTION! alarm steady yellow	Burned out gas detector filament	Replace filament and recalibrate
Red and yellow lamps only	Improperly connected extension cable, or probe cable not connected.	Connect probe cable. Make sure extension cable connectors make good reconnections.
	Very low battery	Recharge

APPENDIX E

USER'S MANUAL FOR THE ORGANIC VAPOR ANALYZER

I. INTRODUCTION TO THE OVA

The Organic Vapor Analyzer (OVA) measures trace quantities of organic compounds in the air by using ionization as the detection method. The ionization is caused by a hydrogen flame within the flame ionization detector. As the compound is ionized, the ions pass through two charged plates whereby the conductivity is measured and this current is then displayed on an external meter. The OVA can operate in two modes:

1. Survey Mode

A sample of ambient air is routed through the OVA into the detector, allowing all organic species to be ionized and detected at the same time. The OVA analyzes total organic vapor concentrations on a continuous sampling basis and reports the results on the basis of sensitivity of the instrument to various compounds as compared to the calibration gas methane. When the OVA is calibrated to methane, the instrument is sensitive to .1 ppm.

2. Gas Chromatography Mode

When there is a mixture of organic vapors present or when qualitative and quantitative identification of a compound is necessary, then the OVA can be operated in the GC mode. The OVA can analyze air samples in the GC mode through general survey, syringe injection, or through the use of collector tubes.

The components to be separated are carried through a column packed with an inert solid. The different components of the sample migrate through the column at different rates (retention times) and can be identified by comparing their retention time to a known standard.

The OVA is more sensitive to hydrocarbons than to any other class of organics. Compounds containing oxygen, such as alcohols, ethers, aldehydes, phenols and esters, give a lower relative response as compared with hydrocarbons. The OVA gives the lowest response for materials containing no hydrocarbon and it is also limited in detecting compounds with high molecular weight. Listed below is a table indicating the relative response of compounds as compared to the calibration gas methane.

Compound	Relative Response
Methane	100
Ethane	90
Propane	64
n-Butane	61
n-Pentane	100
Ethylene	85
Acetylene	200
Benzene	150
Toluene	120
Acetone	100
Methyl ethyl ketone	80
Methyl isobutyl ketone	100
Methanol	15
Ethanol	25
Isopropyl alcohol	65
Carbon tetrachloride	10
Chloroform	70
Trichloroethylene	72
Vinyl chloride	35

II. OPERATION OF THE OVA

Turn-On Procedure

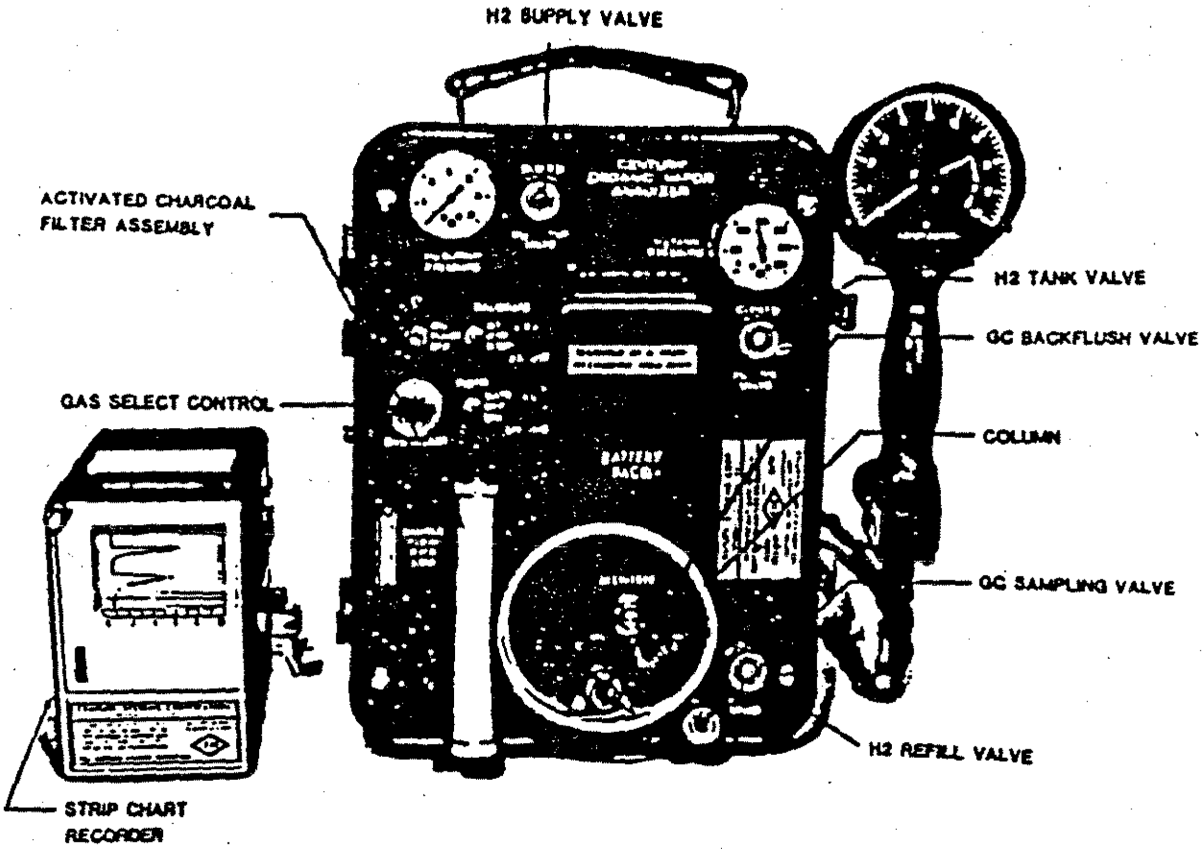
1. Move INSTR switch to ON and allow five minutes for warm up. See Figure 1 for illustration of instrument panel.

2. To set the audible alarm to a predetermined level, turn the PUMP switch to ON and adjust the meter pointer to the desired alarm level by using the CALIBRATE ADJUST (zero) knob. Turn the Alarm Level Adjust knob on the back of the Readout Assembly until the audible alarm just comes on. Adjust the speaker volume with the Volume knob. The instrument is then preset to activate the alarm when the level exceeds that of the setting.

3. Move the CALIBRATE switch to X10 and adjust the meter reading to zero with the CALIBRATE ADJUST knob.

4. Confirm the PUMP switch is on and observe the SAMPLE FLOW RATE indicator. Indication should be approximately 2 units.

Figure E-1
Portable Organic Vapor Analyzer



5. Open the H_2 TANK VALVE and the H_2 SUPPLY VALVE one turn each and observe the reading on the H_2 TANK PRESSURE indicator. Approximately 150 psi is needed for each hour of operation.

6. Open the H_2 supply valve one-half to one turn and observe the reading on the H_2 supply indicator. The pressure should be around 10 psi when operating.

   CAUTION: Do not leave the H_2 SUPPLY VALVE open when the pump is not running as this will allow hydrogen to accumulate in the detector chamber.

7. Confirm that the meter is still reading zero (re-adjust if required).

8. Depress igniter button. There will be a slight "pop" as the hydrogen ignites and the meter pointer will move upscale. Immediately after ignition, release the igniter button. Do not depress igniter button for more than 6 seconds at a time. If the burner does not ignite, let the instrument run for several minutes and try again. After ignition, the meter pointer will indicate the background concentration. Use the CALIBRATE ADJUST knob to zero meter again and null the background reading.

9. Move the instrument to an area where you think the cleanest air to be surveyed is present. Move the CALIBRATE switch to X1 and adjust the meter to read 1 ppm with the CALIBRATE ADJUST knob. This permits minor downward fluctuations in the normal background level without dropping below zero, which would actuate the flame-out alarm. It is important, therefore, to remember that 1 ppm must be subtracted from all readings, e.g., a reading of 1.8 ppm would actually be 0.8 ppm.

10. If the alarm level is to be set above the normal background detection level, turn the Alarm Level Adjust knob on the back of the Readout Assembly until it activates slightly above background. The instrument is now ready for use.

Operation Procedure for Survey Mode

When using the OVA in the Survey Mode, ensure that the SAMPLE INJECT VALVE is in the FULL OUT position and that the BACKFLUSH VALVE is in either FULL IN or FULL OUT position.

1. Set the CALIBRATE switch to the desired range. Using one hand operation, survey the areas of interest while observing the meter and/or listening for the audible alarm. For broad surveys outdoors, the pickup fixture should be positioned several feet above ground level. When making a quantitative reading or pinpointing a contaminant, the pickup fixture should be positioned at the point of interest.

2. When organic vapors are detected, the meter pointer will move upscale and the audible alarm will sound when the preset point is exceeded. The frequency of the audible alarm will increase as the detection level increases.

3. If the flame-out alarm is actuated, confirm that the pump is running; then, press the igniter button. Under normal conditions, flame-out results from sampling a gas mixture that is above the lower explosive level which causes the H_2 flame to extinguish. If this is the case, reignition is all that is required.

   Another possible cause for flame-out would be restriction of the sample flow line which would not allow sufficient air into the chamber to support combustion of the H_2 flame. The usual cause for such restriction would be a clogged particle filter or other restriction in the line. Remember that the chamber exhaust port is on the bottom and blocking it with the hand will cause fluctuations and/or flame-out.

Operating Procedures for GC Mode

To use the OVA in the GC (Gas Chromatograph) mode, place the Sample Inject Valve in the "in" position and turn on the unit as described in this section. Place the BACKFLUSH VALVE in the IN position and leave the hydrogen fuel and pump on for three to four minutes before attempting ignition to allow the hydrogen to purge the column.

A strip chart recorder, called a chromatogram, is usually used to record the output concentration from the OVA as a function of time. Figure 1 shows the GC option and strip chart recorder. The following procedures are for operation of the chromatograph:

1. Turn on the recorder and push the Sample Inject valve in with a fast, positive motion. This starts the GC analysis which is automatic until the unit is backflushed. To inject a sample, use an air-tight syringe to draw a predetermined amount of the sample gas into the syringe. Insert the syringe

into the column and inject the sample. Occasionally, the flame in the Flame Ionization Detector (FID) may go out, which would be indicated by a sharp and continued drop of the concentration level. If this occurs, simply re-ignite the flame and continue the analysis. A negative peak typically occurs shortly after sample injection and should not be confused as flame-out. The negative air peak and various positive compound peaks will be indicated on the OVA read-out meter and the strip chart recorder, which represents the chromatogram of the analysis.

2. After the analyses are complete, rapidly move the Backflush Valve to the out position. Leave the instrument in this position until the backflush peak printed on the recorder returns to baseline; then, return the backflush valve to the "in" position. The OVA is now ready for injection of another sample into the GC system.

Shut-Down Procedures

1. Close H_2 supply valve. Do not tighten the valves down too hard because the Teflon seats are very fragile.

2. Close H_2 tank valve and H_2 Supply valve.

3. Move INSTR switch to OFF.

4. Wait 5 seconds and move PUMP switch to OFF.

III. REFUELING THE OVA

The instrument should be completely shut down during hydrogen tank refilling operations. The tank should be refilled in a ventilated area. There should be no flame or other potential ignition source in the area.

If you are filling the instrument for the first time, or if the filling hose has been allowed to fill with air, THE FILLING HOSE SHOULD BE PURGED WITH N_2 OR H_2 PRIOR TO FILLING THE INSTRUMENT TANK. This purging is not required for subsequent fillings.

- To connect the supply tank to the instrument, first attach the filling hose assembly to the supply tank if it is not left on the tank between fillings. Ensure that the FILL/BLEED valve on the instrument end of the hose is in the OFF position. Connect the hose to the refill connection on the Side Pack Assembly.

BEFORE FILLING THE HYDROGEN TANK, BE SURE TO HAVE THE H_2 TANK VALVE AND H_2 SUPPLY VALVE CLOSED ON THE INSTRUMENT TO PREVENT DAMAGE TO THE PRESSURE REGULATORS.

- Open the hydrogen supply bottle valve slightly. Open the REFILL VALVE and the H_2 TANK VALVE on the instrument panel and turn the FILL/BLEED valve on the filling hose assembly to FILL. The pressure on the instrument tank will now be indicated on the H_2 TANK PRESSURE indicator.

- After the instrument tank is filled, shut off the REFILL VALVE on the panel, the FILL/BLEED valve on the filling hose assembly and the hydrogen supply bottle valve.

- Bleed the filling hose to atmospheric pressure by turning the FILL/BLEED valve on the filling hose assembly to the BLEED position. After the hose is bled to atmospheric pressure, turn the FILL/BLEED valve to the FILL position to allow the hydrogen that is trapped in the connection fittings to go into the hose assembly. Then, bleed the hose again.

- Turn the FILL/BLEED valve to OFF to keep the hydrogen at one atmosphere in the hose so that at the time of the next filling, there will be no air trapped in the filling line. If possible, leave the filling hose assembly attached to the supply tank.

- Close the H_2 TANK VALVE.

- With the H_2 TANK VALVE and the H_2 SUPPLY VALVE closed, a small amount of H_2 at high pressure will be present in the regulators and plumbing. As a leak check, observe the H_2 TANK PRESSURE indicator while the remainder of the system is shut down. If the pressure indicator decreases rapidly (greater than 350 PSIG/hr), there is a significant leak in the H_2 supply system.

IV. RECHARGING THE OVA

Never charge the OVA in a hazardous area or environment. Approximately one hour of charging time is required for each hour of operation, although an overnight charge is recommended. The charger can be left on indefinitely without damaging the batteries.

Recharging the Batteries

1. Plug charger BNC connector into connector on battery cover and insert AC plug into 115V AC wall outlet.

2. Switch on the battery charger switch. The light above the switch should illuminate.

3. Battery charge condition is indicated by the meter on the front panel of the charger. During charging, the meter will deflect to the right and when the battery is fully charged, the pointer will be in line with the "charged" marker above the scale.

4. When the battery is charged, switch off battery charger and unplug it from the Side Pack assembly.

If the battery has been allowed to completely discharge, the above procedures may not be sufficient to recharge the battery. When this happens, the following steps should be taken:

1. Remove the battery from the instrument case.

2. Connect the battery to any variable DC power supply.

3. Apply 50 volts at amp maximum.

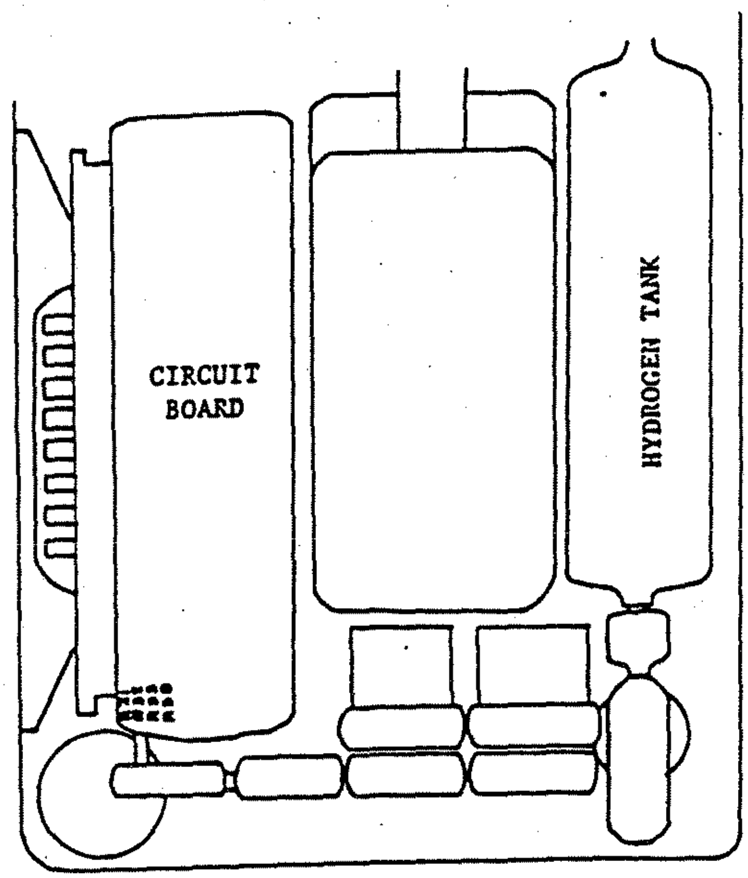
4. As soon as the meter on the power supply shows that the battery is drawing current, reduce the voltage on the power supply at a slow rate until the meter reads approximately 15 volts. The time required to reach the 15 volt reading will depend on the degree of discharge.

V. CALIBRATION OF THE OVA

The OVA is capable of detecting nearly all organic compounds. The instrument is factory-calibrated to a methane-in-air standard, but it can be easily calibrated to any of a variety of compounds for precise analyses.

A GAS SELECT control on the instrument panel is used to set the electronic gain to a particular organic compound. Internal electronic adjustments are provided to calibrate and align the electronic circuits (Figure 2). There are four adjustments on the electronics board, but one adjustment potentiometer, R-38, is used to set the power supply voltage and has a one-time factory adjustment. The other three adjustments, R-31, R-32, and R-33, are used for setting the electronic amplifier gain for each of the

Figure E-2
Location of Electronic Adjustments



three calibration ranges. The instrument must be removed from its case to access these adjustments.

To calibrate the OVA to methane, follow the procedures for Gain Adjustment and Bias Adjustment.

Gain Adjustment

1. Turn on instrument as described in Section B. Set CALIBRATE switch to X10 and GAS SELECT control to 300.

2. Use the CALIBRATE ADJUST knob to adjust the meter reading to zero.

3. Introduce a methane sample of a known concentration (near 100 ppm and adjust trimpot R-32 on the circuit board so that the meter reads the concentration as equivalent to that of the known sample. This sets the instrument gain for methane with the gain adjustment on the panel (GAS SELECT knob) set at a reference of 300.

4. Turn off the H_2 SUPPLY VALVE to put out the flame.

Bias Adjustments

5. Leave the CALIBRATE switch on X10 position and use the CALIBRATE ADJUST knob to adjust the meter reading to 4 ppm.

6. Turn the CALIBRATE switch to X1. Using trimpot R-31 on the circuit board, adjust the meter reading to 4ppm.

7. Set the CALIBRATE switch to X10 again and use the CALIBRATE ADJUST knob to set meter reading to 40 ppm.

8. Move the CALIBRATE switch to X100 position and use trimpot R-33 on the circuit board to adjust meter to 40 ppm.

9. Set the CALIBRATE switch to X10 position and use the CALIBRATE ADJUST knob to adjust meter to zero.

The unit is now balanced from range to range, calibrated to methane, and ready to use.

Calibration to Various Organic Vapors

Primary calibration of the OVA is accomplished by using a known mixture of a specific organic vapor compound. To calibrate for a specific gas, turn the instrument on as described in Section B, and use the following procedures:

1. Zero out the ambient background reading.

2. Draw a sample of the calibration gas into the instrument. Calibration gases of known concentrations can be obtained from local laboratories or prepared by injecting a known concentration of compound into a known volume of air.

3. Use the GAS SELECT knob to adjust the meter to correspond to the known concentration of the calibration gas mixture.

4. Read and record the setting on the digidial. This is the setting for that particular organic vapor compound.

The instrument is now calibrated for the specific gas mixture. This can be repeated for a large variety of compounds. When a particular compound is to be read, turn the GAS SELECT control to the setting that was recorded for that compound. Calibration on any one range automatically calibrates the other two ranges. Relative response data can be used to estimate concentrations of various vapors. With the instrument calibrated to methane, obtain the concentration reading for a calibration sample of the test vapor. The relative response, in percent, for that test vapor would then be:

(concentration read/concentration of calibrated sample) X 100.

VI. APPLICATIONS

Sample Screening

Priority Pollutant Analyses at hazardous waste sites can run $1,500 a sample. To initially screen samples before analysis to determine if any contaminant is found can be a very cost-effective method. In order to do this, duplicate samples should be collected in 40 ml VOA jars with Teflon-lined caps. Be sure to leave head space in each of the sample jars, for it is actually the head space that you will be analyzing.

Standards can be purchased or prepared specifically for the concentration and identity of the compound or compounds in question. The standard is injected with a gas-tight syringe as described in Part B and retention time and peak height are measured from the standard. Be sure to purge the gas-tight syringe before injecting a sample to prevent cross-contamination.

A known volume (100-1,000 ul) of head space is then injected into the column. Retention times and peak heights for the sample are then compared back to the standard to verify if the compound is present, and, if so, an approximate concentration can be determined. If the sample indicates a positive presence for a specific compound, then the duplicate sample could be sent to an analytical laboratory for quantitation.

General Surveying

The OVA instrument is a very good general survey instrument and is usually used in conjunction with a photo-ionization detector (PID) to verify accuracy of the general readings. The instrument can be used to detect methane whereby the PID is not sensitive to methane. Also, vapor levels can be assessed to diagnose hazards that exist on site and to determine proper levels of personnel protection.

Fugitive Air Emissions

Monitoring of fugitive air emissions at hazardous waste sites can be accomplished by placing one OVA upwind and one downwind of a site. The instruments are placed in general survey modes and hooked to a strip chart recorder to monitor daily vapor emissions. If properly charged and filled with hydrogen, the instruments will operate on a 8-10 hour basis unattended.

VII. TROUBLESHOOTING THE OVA

Table 1 presents a summary of recommended field troubleshooting procedures when using the instrument in the survey mode. If necessary, the instrument can be easily removed from the case by unlocking the four one-quarter turn fasteners on the panel face and removing the refill cap and exhaust port. The battery pack is removed by taking out the four screws on the panel and disconnecting the power connector at the battery pack.
Table 2 presents recommended field troubleshooting procedures which are peculiar to the GC system. These are in addition to what is presented in Table 1.

APPENDIX F

USER'S MANUAL TO THE PHOTOIONIZATION DETECTOR

I. INTRODUCTION TO THE HNU

The HNU is a portable trace gas analyzer that can be used to measure a wide variety of organic vapors including chlorinated hydrocarbons, heterocyclics and aromatics, aldehydes and ketones, as well as several inorganic gases including hydrogen sulfide and ammonia.

The HNU photoionizer employs the principal of photoionization for detection. Photoionization is initiated by the absorption of a photon of ultraviolet radiation energetic enough to ionize a molecule and produce an instrument response only if the ionization potential (IP) is equal to or slightly less than the ionizing energy supplied by the instrument's UV lamp (9.5 eV, 10.2 eV, 11.7 eV). Species that have a very high IP will display a poor instrument response or none at all. Employing the 11.7 eV lamp will ensure the total range of detectable species, but there will still be a number of undetectable sample components, such as cyanide or methane. so, whenever possible, it is recommended that the 11.7 eV probe be used in cases involving unknown species.

The 11.7 eV lamp is identified by the inscription "11.7 eV" near the lamp number on the glass envelope. A comparison of response to selected species of compounds utilizing the 9.5 eV, 10.2 eV and 11.7 eV lamps are listed in Table 1. The relative sensitivity of the 11.7 eV lamp is about one-tenth that of the 10.2 eV. The 11.7 eV lamp provides a more universal response than the 10.2 lamp which makes the 11.7 eV lamp more practical to our type of needs at Burns and Roe.

<u>CAUTION:</u> The HNU instrument is not intrinsically safe. Its use in a probable explosive environment should be attempted after the area in question has been metered by a explosimeter and deemed safe for the HNU instrument operation.

Table F-1
Selected List of Species Detected

Class species	Photoionization Response 9.5EV lamp	10.2eV lamp	11.7eV lamp
Paraffins and unsaturated hydrocarbons			
methane	NR	NR	NR
ethylene	NR	L	H
acetylene	NR	NR	H
1-butene	H	H	H
hexane	NR	L	H
Chlorinated hydrocarbons			
methyl chloride	NR	NR	H
carbon tetrachloride	NR	NR	H
chloroform	NR	NR	H
dichloroethane	NR	NR	H
vinylidene chloride	L	H	H
trichloroethylene	H	H	H
Heterocyclics & aromatics			
phenol	H	H	H
pyridine	H	H	H
benzene	H	H	H
toluene	H	H	H
xylene	H	H	H
styrene	H	H	H
aniline	H	H	H
chlorobenzene	H	H	H
nitrobenzene	NR	L	L
Nitrogen compounds			
formamide	NR	H	H
ammonia	NR	L	H
hydrazine	H	H	H
methyl amine	H	H	H
acetonitrile	NR	NR	NR
acrylonitrile	NR	NR	H

NR = No response.
H = High response.
L = Low response.

II. OPERATION

1. Before attaching the probe, check the function switch on the control panel to make sure it is in the "OFF" position. Figure 1.

2. Carefully match the alignment key in the probe connector to the 12 pin connector on the control panel, and then twist the probe connector until a distinct snap and lock is felt.

3. Turn the function switch to the battery check position. The needle on the meter should read within or above the green battery arc on the scale plate.

   If the needle is in the lower portion of the arc, recharge before use. If the LED comes on, recharge before use. (See Section D. Reacharging the HNU.)

4. Turn the function switch to "On." In this position, the UV light source should be on. If looking into the end of the probe reveals a purple glow, the UV light source is working.

5. Set the span to the desired gain.

6. Zero the instrument by turning the function switch to the stand-by position and rotate the zero potentiometer knob. Clockwise produces an up-scale deflection and counterclockwise yields a downscale deflection:

   NOTE: If the span adjustment setting is changed after the zero is set, the zero should be rechecked and adjusted, if necessary (Stand-by position).

The instrument is supplied calibrated to read directly in ppm (0-20, 0-200, 0-2000) of benzene with the span position set at 9.8. For additional sensitivity, the span potentiometer is turned counterclockwise (smaller numbers) to increase the gain. Changing the gain changes instrument sensitivity and specificity (if changed from 9.8, it will no longer be direct reading for benzene). By changing the span setting from 10.0 to 1.0, the sensitivity is increased approximately ten-fold. The 0.20, 0-200, and 0-2000 scales become 0-2, 0-20, and 0-200, respectively.

The span control can be utilized to calibrate nearly any compound, measured by photoionization, to be direct reading on the 0-20 ppm range. For example, gain settings of 4.5 or 8.9, respectively, will provide direct reading capability (0-2-, 0-200 ppm) for vinyl chloride and trichloroethylene, respectively. Table 2 is a listing of approximate gain setting values for some common compounds. Note that these settings are approximate until the meter is calibrated against the specific compound.

Figure F-1
Control Panel Functions

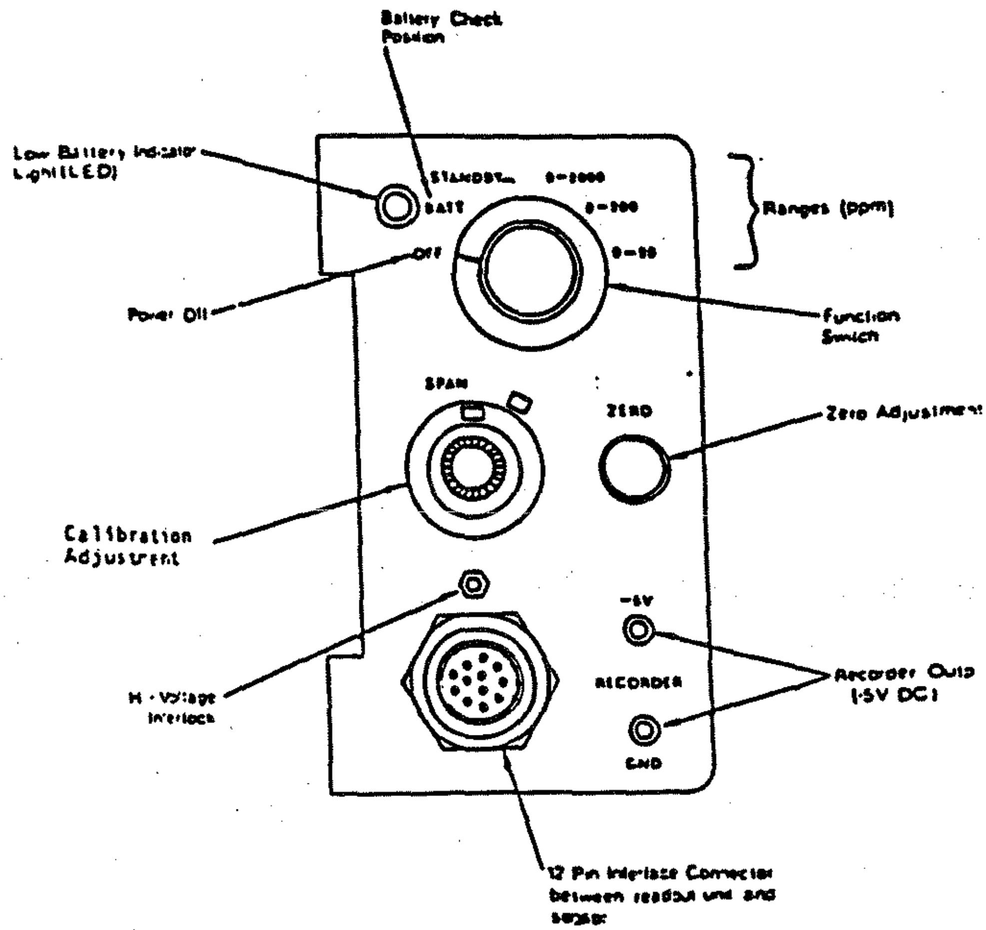


Table F-2
Relative Photoionization Sensitivities
for Various Gases

Grouping	Setting	Examples
Aromatic	9.8	Benzene, Toluene Styrene
Aliphatic Amine	9.8	Diethylamine
Chlorinated Unsaturated	5-9	Vinyl Chloride, Vinylidene Chloride, trichloroethylene
Carbonyl	5-7	MEK, MIBK, Acetone, Cyclohexene
Unsaturated	3-5	Acrolein, Propylene, Chclohexene, Allyl Alcohol
Sulfide	3-5	Hydrogen Sulfide, Methyl Mercaptan
Paraffin (C_5 -C_7)	1-3	Pentane, Heptane
Ammonia	0.3	--
Paraffin (C_1 -C_4)		Ethane, Propane, Butane

7. The instrument is now ready for calibration or measurement by switching the function switch to the proper measurement range, i.e., 0-20, 0-200, or 0-2000.

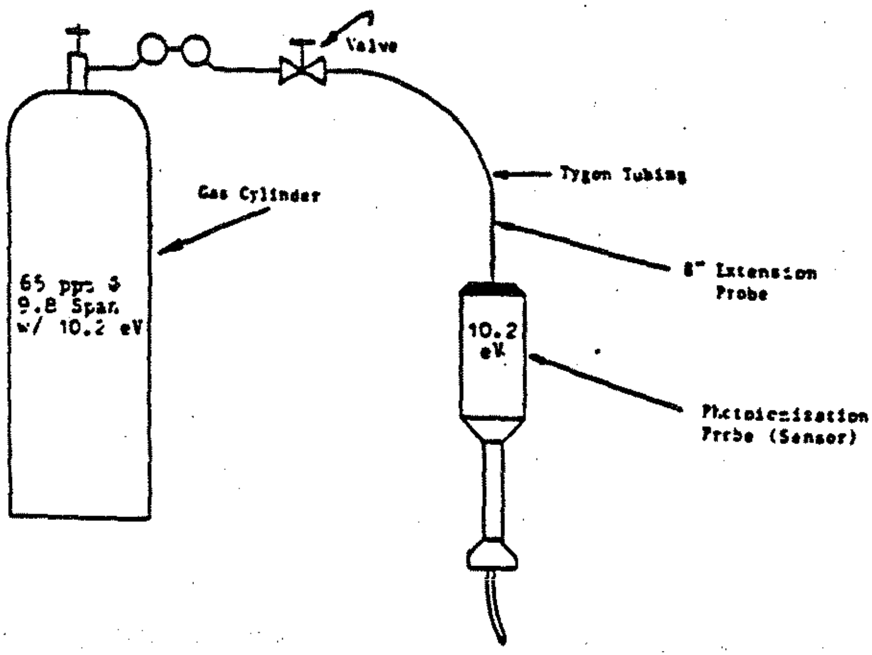
III CALIBRATION

The recommended and most accurate procedure for calibration of the HNU instrument is utilizing a pressurized gas cylinder containing a known ppm value at a specified span setting attached to a designated probe. The following procedure refers to Figure 2.

1. Follow steps 1-7 in OPERATION section.

2. Attach the tygon tubing to the 8" extension probe of the photoionization probe.

Figure F-2
Recommended Calibration Procedure



3. Crack the valve of the pressurized cylinder until a light flow of gas is being released from the cylinder.

   The instrument should read ±10% of the gas value; if not, one of two things can be done:

   a. Change span to get the gas value. NOTE: If span is changed more than ±10%, proceed to b.

   b. Clean lamp and IP chamber. A dirty lamp will yield low readings, and a dirty chamber will yield high readings.

   NOTE: If the instrument span setting is changed, the instrument should be turned back to the stand-by position and rezeroed, if necessary.

If using the 11.7 eV probe and the gas calibration cylinder showing a ppm value of 9.8 span with 10.2 eV probe, all steps above will be necessary. The final span setting using the 11.7 eV probe should be approximately the same value as indicated for the specific probe as noted in the instrument's calibration certificate.

The HNU instrument is now ready for field measurements.

IV RECHARGING THE HNU

To ensure no damage to the HNU instrument and to extend the life of the battery, the following steps should be followed when recharging the HNU.

1. Place the miniphone plug into the jack on the left side of the read-out unit.

2. Plug the charger into a 120 vac outlet.

3. Let stand overnight or for at least 14 hours.

NOTE: Overcharging is not a major problem with the HNU as it has a built-in solid-state battery voltage drops below approximately 11 volts. This circuit will automatically turn off power to the instrument. The prevents deep discharging of the batter.

It is, however, recommended that if the battery check shows ample power available, not to charge the unit.

4. When disconnecting the charger, remove the charger from the 120 vac before removing the miniphone plug.

   The instrument can be operated during the recharging cycle. This will only lengthen the time required to completely recharge the instrument battery.

V FALSE READINGS

Incorrect values may be detected by the HNU, outside mechanical failures within the unit. Some of the field situations which may be encountered are as follows:

1. High wind;
2. High humidity (>95%);
3. Probe too far from source;
4. High electrical areas;
5. Temperatures above 105° or below 32°F.

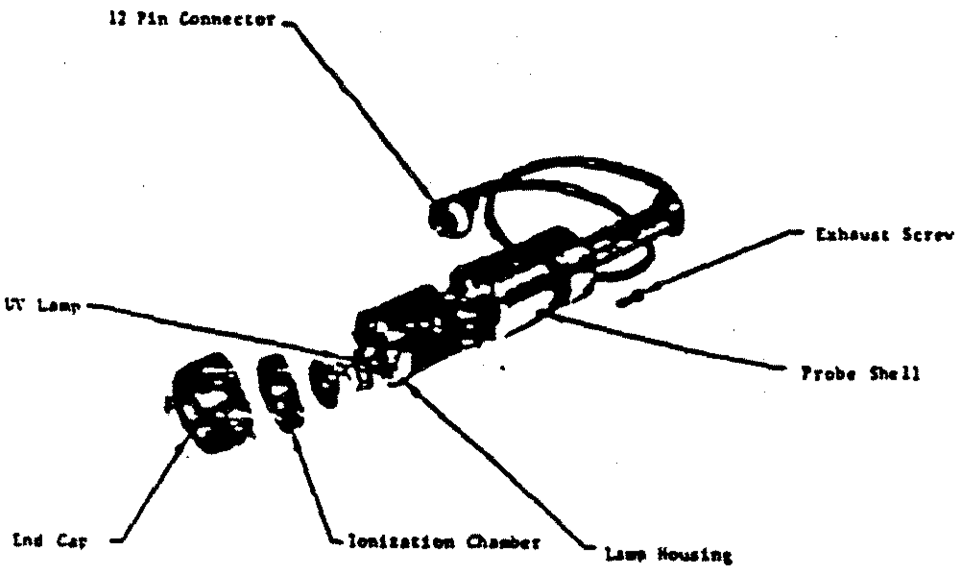
High wind and high humidity are two variables beyond control of the instrument operator. The probe being too far from the source is self-explanatory for correction. When working around high electrical areas, the following steps may be utilized to obtain relevant measurements.

1. Zero the instrument in an electrically quiet area in the stand-by position.
2. Move the instrument to the area in question. If AC pick-up is going to be a problem, the meter (in the stand-by position) will indicate the magnitude of error.
3. Subtract this difference, Step 2, from the indicated value to obtain the actual value.

The HNU should not be used in temperatures greater than 105°F, the unit should function properly as long as the probe extension and probe inlet are wiped dry after use. The probe extension should be wiped dry because when moving the unit from a warm area to a cold area and back to a warm area again, condensation will develop inside the extension probe causing erratic values. If moisture enters into the lamp area of the probe, the following steps should be taken to free the unit of moisture or dust particles, see also Figure 3.

1. Turn the function switch to the off position.
2. Disconnect the probe from read-out unit.
3. Remove the exhaust screw found near the base of the probe.
4. Grasp the end cap in one hand and the probe shell in the other; gently pull to separate the end cap and lamp housing from shell.

Figure F-3
Component Parts of Probe



5. Loosen the screws on the top of the end cap and separate the end cap and ion chamber from the lamp and lamp housing.

6. Turn the end cap over into your hand and tap on the top of it; the ion chamber should fall out into your hand.

7. Place one hand over the top of the lamp housing and tilt slightly; the light source will slide out into your hand.

8. Wipe dry all parts with a soft dry cloth, except for lamp and lamp window.

   CAUTION: If the window in lamp of the 11.7 eV lamp is dirty and needs to be cleaned, do not clean with water or an organic solvent miscible with water such as acetone or methanol. The window should be cleaned with a soft tissue dipped in an organic (nonwater miscible) solvent or freon. The cleaning compound for the 10.2 eV lamp should not be used under any circumstances on the 11.7 eV lamp.

VI TROUBLESHOOTING

Some of the basic problems which may occur and probable causes and solutions are as follows:

1. No meter response in any switch position (including BATT CHK)
   - A. Broken meter movement.
     - (1) Tip instrument rapidly from side to side. Meter needle should move freely and return to zero.
   - B. Electrical connection to meter is broken.
   - C. Battery is completely dead.
     - (1) Disconnect battery and check voltage with a volt-ohm meter.
   - D. Check 2 amp fuse.
   - E. If none of the above solves the problem, consult the factory.

2. Meter responds to BATT CHK position, but reads zero or near zero for all others.
   - A. Power supply defective.
     - (1) Check power supply voltages. If any voltage is out of specification, consult the factory.
   - B. Input transistor or amplifier has failed.

(1) Rotate zero control; meter should deflect up/down as control is turned.

(2) Open probe. Both transistors should be fully seated in sockets.

(3) Check all wires in read-out for solid connections.

3. Instrument response correctly in BATT CHK, and STBY, but not in measure mode.

A. Check to see that light source is on.

(1) Check high voltage power supply.

(2) Open end of probe; remove lamp and check high voltage and lamp contact ring.

(3) If high voltage is present at all above points, light source has most likely failed. Consult the factory.

4. Instrument responds correctly in all positions but signal is lower than expected.

A. Check span setting for correct value.

B. Clean window of light source.

C. Check power supply 180 V output.

D. Check for proper fan operation. Check fan voltage.

E. Rotate span setting. Response should change if span pot is working properly.

5. Instrument response in all switch positions, but is noisy (erratic meter movement).

A. Open circuit in feedback circuit. Consult the factory.

B. Open circuit in cable shield or probe shield. Consult the factory.

6. Instrument response is slow and/or irreproducible.

A. Fan operating improperly. Check fan voltage.

B. Check calibration and operation. See Sections B and C.

7. Low battery indicator.

A. Indicator comes on if battery charge is low.

B. Indicator also comes on if ionization voltage is too high.

APPENDIX G

USER'S MANUAL TO THE THYVAC III RADIATION DETECTOR & SIMILAR DETECTORS

I INTRODUCTION TO THE THYVAC III GEIGER COUNTER

The Model 490, Thyvac III, is a sensitive, portable pulse count ratemeter and power supply designated to be used with a variety of detector probes as an alpha, gamma, beta-gamma, or alpha-beta-gamma survey meter. This manual will discuss the use of two specific probes: 1) the model 489-110 "Pancake" GM probe used for large area detection of beta and gamma radiation; 2) the model 489-4, used for the detection of beta and gamma radiation. The instructions here are also applicable to other similar radiation detectors.

This instrument has the latest design in solid state circuitry and contains no vacuum tubes. This allows the unit to operate on only two D cell batteries for approximately 100 hours with continuous use, longer with intermittent use.

The weather-proof instrument case consists of die-cast aluminum and drawn steel bottom with two manually-operated pull catches for closure. Visual readout is provided by a rugged, military type, water-proof 3 1/2 inch controls; the function switch which has a batter test position and four range positions, and the response switch which adjusts the response time contrast of the meter to slow, medium, or fast.

The detector probes are connected by a weather-proof, high voltage, coaxial connector and may be conveniently clipped onto a probe clamp on the handle post. A low intensity beta check source is provided on the side of the case bottom for calibration verification. The two D cell batteries are contained in a high-impact resistant battery box. The battery contacts are easily replaceable without tools for cleaning or replacement.

II OPERATION OF THE THYVAC III GIEGER COUNTER

The model 490 should be stored with the batteries removed. In order to put the instrument into operation, the following procedure should be followed:

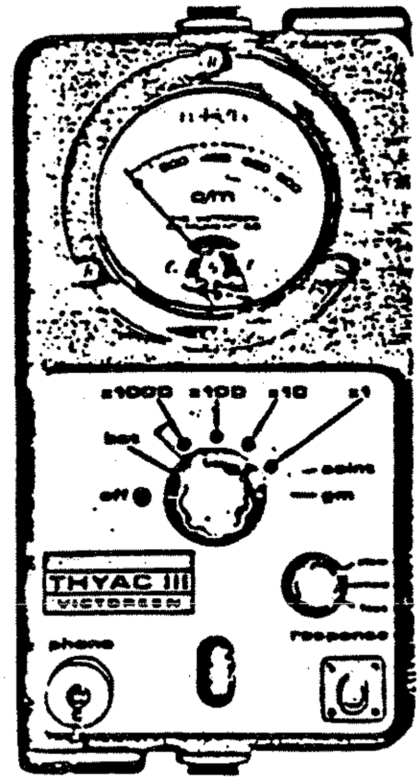
1. Access to the interior of the instrument is gained by snapping the pull catch at each end of the case and separating the case top from the base bottom. This will expose the battery box and battery retainer clip.

2. Remove the clip by squeezing its end until it can be pulled out of the slots in the battery box (Figure 1).

3. Insert the batteries into the battery box.

4. Replace the battery retainer clip.

Figure G-1
Model 490, Thyvac III
(View of Operating Controls)



5. Align the case top with the bottom and squeeze them together gently.

6. Snap the pull catches closed.

NOTE: It is recommended that the batteries be removed whenever the instrument is out of use for any considerable length of time. This eliminates the possibility of the batteries corroding and perhaps damaging the instrument.

II.1 Selecting the Range and Taking Readings

A. With the instrument in the OFF position, connect the detector probe by inserting the connector on the probe cable into the coaxial receptacle to the right of the handle post (Figure 2). Press down and turn clock-wise for about 1/4 turn and release to lock the bayonet catches on their mating connector pins.

B. Turn the instrument onto the batter check position, and see that the meter reads in the indicated zone.

C. Turn the switch to the highest usable range. For scintillation-type detectors, this is the X1000 range, while for the GM on pancake-type probe, this is the X10 range.

NOTE: This instrument cannot be used with a GM probe on the X1000 range. Any attempt to do so will result in a highly erroneous reading.

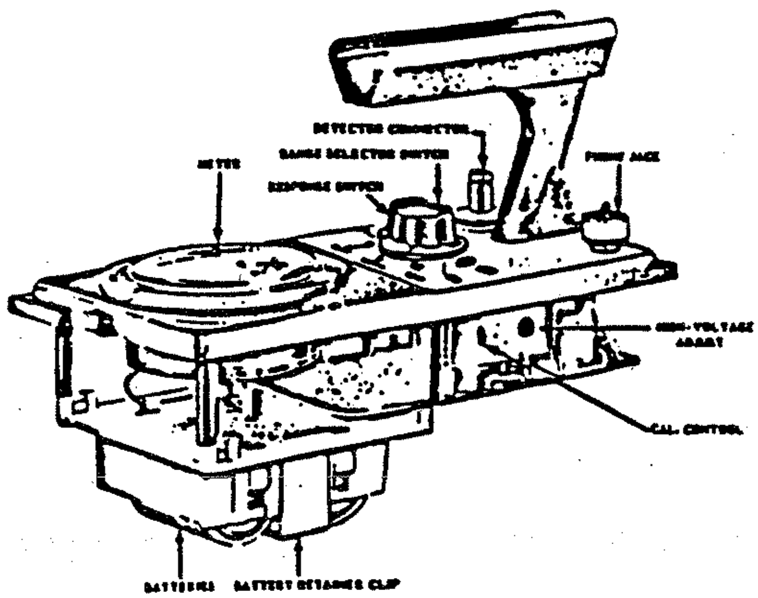
D. Place the probe in the location to be measured. If the meter reading is less than 10 percent of full scale, switch to the next lowest range. Continue this procedure until the meter reads above 10 percent of full scale.

E. Select an appropriate response speed.

II.2 Electing Response Time

The Model 490 offers three choices of meter response time that are designated slow, medium, and fast. These correspond to approximately 15 seconds, 5 seconds, and 1.5 seconds, and 4.5 seconds for 95 percent response. The desired response time is selected by the top-mounted with designated RESPONSE (Figure 2). The choice of response speed is dictated by the desired accuracy in reading (the slower the response, the more accurate the reading) and the range on which the reading is to be made. Generally, the slow response will be used on the two most sensitive ranges for a very accurate reading; the medium response will be used for the majority of readings; the fast response will be used on the X1000 range and when the radiation field may fluctuate rapidly, as in a survey-type measurement. The RESPONSE switch is shown in front of the instrument carrying handle in Figure 1.

Figure G-2
Cover of Model 490 Thyvac Survey Meter
(External Controls)



II.3 Verifying Calibration

A low-intensity uranium beta source, called an operational check source, is fastened to the side of the case bottom. This source may be used in conjunction with any of the beta sensitive probes connected to the instrument in order to verify operability and to check the constancy of calibration. Specifically, the Model 489-4 beta gamma probe. For the Model 489-4 beta gamma probe, the beta shield is retracted to expose the perforated Geiger tube guard. One of the square openings in the perforated guard near the center of the Geiger tube is then placed directly over the 3/8-inch diameter circle on the operational check source, under which the beta source is located. A reading of approximately 2000 counts-per-minute will result for a properly operating instrument. This check must be carried out without the presence of any additional appreciable radiation fields from other sources. If the counting rate obtained on a specific combination of probe and instrument is retained, a periodic repeat of this procedure will check the constance of calibration of the instrument and probe combination. The alpha and a gamma sensitive scintillation probes applicable to this instrument are not sensitive to the beta radiation emanating from the check source, and, therefore, cannot be checked with it.

III DETECTOR PROBES FOR THE THYVAC III

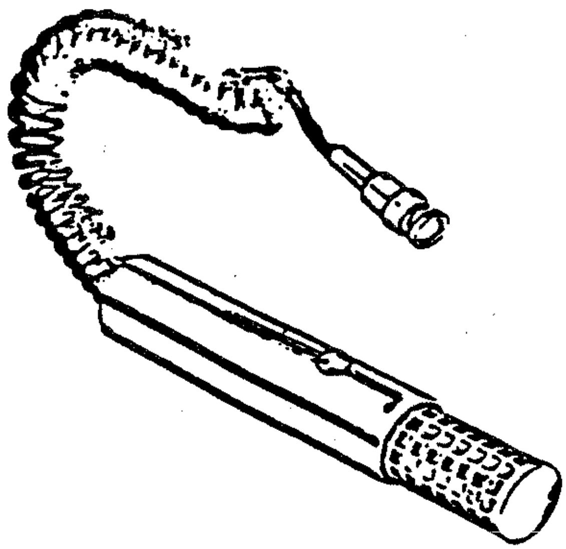
III.1 Model 489-4

This beta and gama sensitive detector probe uses the VICTOREEN 1BI5 Geiger tube which has a 30 mg/cm^2 wall thickness. This probe has a retractable beta shield and is connected to the Model 490 by a self-storing coil cord cable. This probe is shown in Figure 3. Since it is the most popular of the detector probes used with the Model 490, a secondary meter scale calibrated in milliroent-gens-per-hour on radium gammas is provided on the Model 490 to be used with the Model 489-4 probe. Calibration for this combination will be approximately correct for radium radiation filter by 0.5 mm of platinum, under which condition the ranges are 0-20, 0-2, 0-.2 mR/h for the X100, X10, and X1 ranges, respectively. The standard calibration of the Model 490 is in counts-per-minute; namely, 0-800,000, 0-80,000, 0-8,000,0-800.

If the shield is used closed to exclude beta particles in a combined beta-gamma field, the instrument reading should be multiplied by 1.15 to obtain a closer approximation of the gamma dose rate.

In order to perform beta measurements with this probe, make two measurements: One with the probe shield open (thus measuring total radiation--gamma and beta), and the other with the probe shield closed (thus measuring only gamma radiation--use the 1.15

Figure G-3
Model 489-4, Beta-Gamma Probe



factor to correct for shield adsorption as described above). The beta radiation will be the difference between the two readings.

III.2 489-110 "Pancake" Probe (Figure 4)

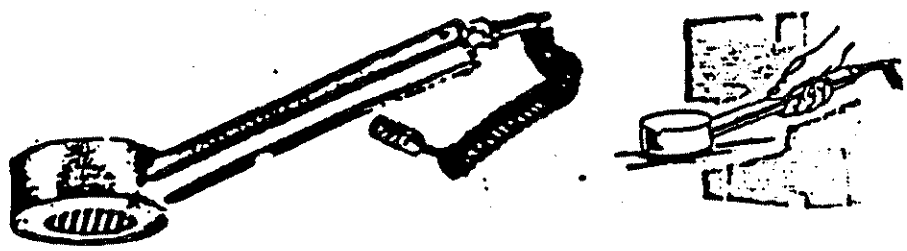
The 489-110 "Pancake" Probe is a handheld, thin-window, large area detector for beta, and gamma radiation measurements. It is designed for use in conjunction with a standard GM survey instrument, and is configured for operating convenience in table-top and floor surveys, as well as surveys of personnel and equipment contamination. For storage and carrying ease, the probe fits into the standard handle clip on the survey meter.

In use, the probe connector is attached to the probe input on the survey meter, and the window is placed in proximity to the surface to be surveyed. An aluminum screen protects the thin mica window, and three Teflon feet raise the screen slightly to facilitate rapid frisking of flat surfaces. Reasonable care should be exercised to avoid puncturing the window.

IV CALIBRATION OF THE THYVAC III

Calibration of the Thyvac III radiation detector cannot be conducted in the field. It must be sent to an authorized service/repair organization.

Figure G-4
Model 489-110, "Pancake" GM Beta and Gamma Probe



APPENDIX H

DECONTAMINATION PROCEDURES

LEVEL B DECONTAMINATION

I. EQUIPMENT WORN

The full decontamination procedure outlined is for wo wearing Level B protection (with taped joints between gloves, boot and suit) consisting of:

- One-piece, hooded, chemical-resistant splash suit.
- Self-contained breathing apparatus.
- Hard hat.
- Chemical-resistant, steel toe and shank boots.
- Boot covers.
- Inner and outer gloves.

II PROCEDURE FOR FULL DECONTAMINATION

<u>Station 1:</u> Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices ar containers, monitoring instruments, radios, clipboards, etc.) c plastic drop cloths or in different containers with plastic liners Each will be contaminated to a different degree. Segregation a the drop reduces the probability of cross contamination.

Equipment:
- various size containers
- plastic liners
- plastic drop cloths

<u>Station 2:</u> Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution (detergent/water.

Equipment:
- container (20-30 gallons)
- decon solution or
- detergent water
- 2-3 long-handle, soft-bristle scrub brushes

<u>Station 3:</u> Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amoun of water. Repeat as many times as necessary.

Equipment:
- container (30-50 gallons) or
- high-pressure spray unit
- water
- 2-3 long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots and gloves and deposit in container with plastic liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 5: Boot Cover Remover

Remove boot covers and deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- plastic liners
- bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 7: Suit/Safety Boot Wash

Thoroughly wash chemical-resistant splash suit, SCBA, gloves, and safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of decon solution or detergent/water. Wrap SCBA regulator (if belt-mounted type) with plastic to keep out water. Wash backpack assembly with sponges or cloths.

Equipment:
- container (30-50 gallons)
- decon solution or
- detergent/water
- 2-3 long-handle, soft-bristle scrub brushes
- small buckets
- sponges or cloths

Station 8: Suit/SCBA/Boot/Glove Rinse

Rinse off decon solution or detergent/water using copious amounts of water. Repeat as many times as necessary.

Equipment:
- container (30-50 gallons) or
- high-pressure spray unit
- water
- small buckets
- 2-3 long-handle, soft-bristle scrub brushes
- sponges or cloths

Station 9: Tank Change

If worker leaves Exclusion Zone to change air tank, this the last step in the decontamination procedure. Worker's air tank is exchanged, new outer gloves and boots covers donned, and joints taped. Worker returns to duty.

Equipment:
- air tanks
- tape
- boot covers
- gloves

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- plastic liners
- bench or stool
- boot jack

Station 11: SCBA Backpack Removal

While still wearing facepiece, remove backpack and place on table. Disconnect hose from regulatory valve and proceed to next station.

Equipment:
- table

Station 12: Splash Suit Removal

With assistance of helper, remove splash suit. Deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- plastic liners
- bench or stool

Station 13: Inner Glove Wash

Wash inner gloves with decon solution or detergent/water that will not harm skin. Repeat as many times as necessary.

Equipment:
- decon solution or
- detergent/water
- basin or bucket
- small table

Station 14: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment:
- water
- basin or bucket
- small table

Station 15: Facepiece Removal

Remove facepiece. Avoid touching face with gloves. Deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- plastic liners

Station 16: Inner Glove Removal

Remove inner gloves and deposit in container with plastic liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 17: Inner Clothing Removal

Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off-site since there is a possibility small amounts of contaminants might have been transferred in removing fully encapsulating suit.

Equipment:
- container (30-50 gallons)
- plastic liners

Station 18: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

Equipment:
- water
- soap
- small tables
- basins or buckets, or
- field showers

Station 19: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment: - tables
- chairs
- lockers
- clothes

III FULL DECONTAMINATION (SITUATION 1) AND THREE MODIFICATIONS SITUATION 2,3, AND 4

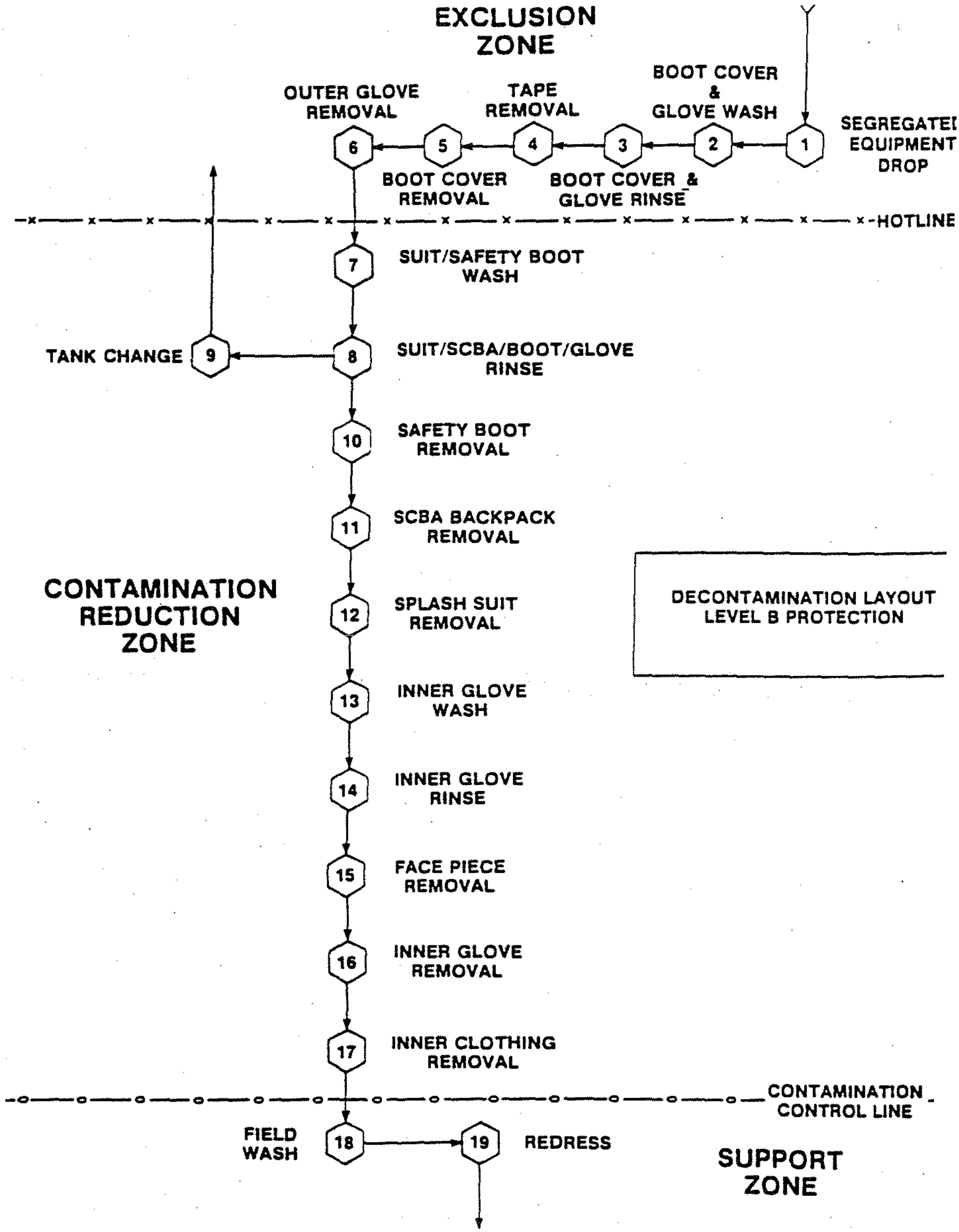
	STATION NUMBER																	
SIT.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X										
3	X						X	X		X	X	X			X	X	X	X	
4	X						X	X	X										

<u>Situation 1:</u> The individual entering the Contamination Reductic Corridor is observed to be grossly contaminated or extremely toxi substances are known or suspected to be present.

<u>Situation 2:</u> Same as Situation 1 except individual needs new ai tank and will return to Exclusion Zone.

<u>Situation 3:</u> Individual entering the CRC is expected to I minimally contaminated. Extremely toxic or skin-corrosi materials are not present. No outer gloves or boot covers a worn. Inner gloves are not contaminated.

<u>Situation 4:</u> Same as Situation 3 except individual needs new a tank and will return to Exclusion Zone.



DECONTAMINATION LAYOUT
LEVEL B PROTECTION

LEVEL C DECONTAMINATION

1.0 EQUIPMENT WORN

The full decontamination procedure outlined is for workers wearing Level C protection (with taped joints between gloves, boots, and suit) consisting of:

- One-piece, hooded, chemical-resistant splash suit.
- Canister equipped, full-face mask.
- Hard hat.
- Chemical-resistant, steel toe and shank boots.
- Boot covers.
- Inner and outer gloves.

II PROCEDURE FOR FULL DECONTAMINATION

Station 1: Segregated Equipment Drop

Deposit equipment used on site (tools, sampling devices, and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross contamination.

Equipment:
- various size containers
- plastic liners
- plastic drop cloths

Section 2: Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/water.

Equipment:
- container (20-30 gallons)
- decon solution or
- detergent water
- 2-3 long-handle, soft-bristle scrub brushes

Station 3: Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment:
- container (30-50 gallons) or
- high-pressure spray unit
- water
- 2-3 long-handle, soft bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots and gloves and deposit in containe with plastic liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit in container with plasti liner.

Equipment:
- container (30-50 gallons)
- plastic liners
- bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plasti liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 7: Suit/Safety Boot Wash

Thoroughly wash splash suit and safety boots. Scrub with lon handle, soft-bristle scrub brush and copious amounts of decc solution or detergent/water. Repeat as many times as necessary.

Equipment:
- container (30-50 gallons)
- decon solution or
- detergent/water
- 2-3 long-handle, soft-bristle scrub brushes

Station 8: Suit/Safety Boot Rinse

Rinse off decon solution or detergent/water using copiou amounts of water. Repeat as many times as necessary.

Equipment:
- container (30-50 gallons) or
- high-pressure spray unit water
- 2-3 long-handle, soft-bristle scrub brushes

Station 9: Canister of Mask Change

If worker leaves Exclusion Zone to change canister (or mask this is the last step in the decontamination procedure. Worker canister is exchanged, new outer gloves and boots covers donne and joints taped. Worker returns to duty.

Equipment:
- canister (or mask)
- tape
- boot covers
- gloves

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- plastic liners
- bench or stool
- boot jack

Station 11: Splash Suit Removal

With assistance of helper, remove spash suit. Deposit in container with plastic liner.

Equipment:
- container (30-50 gallons)
- bench or stool
- liner

Station 12: Inner Glove Wash

Wash inner gloves with decon solution or detergent/water that will not harm skin. Repeat as many times as necessary.

Equipment:
- decon solution or
- detergent/water
- basin or bucket

Station 13: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment:
- water
- basin or bucket
- small table

Station 14: Facepiece Removal

Remove facepiece. Avoid touching face with gloves. Deposit facepiece in container with plastic liner.

Equipment:
- container (20-30 gallons)
- plastic liners

Station 16: Inner Clothing Removal

Remove clothing soaked with perspiration. Place in conta with plastic liner. Do not wear inner clothing off site sinc there is a possibility small amounts of contaminants might hav been transferred in removing splash suite.

Equipment:
- container (30-50 gallons)
- plastic liners

Station 17: Field Wash

Shower if highly toxic, skin-corrosive or skin-absorbabl materials are known or suspected to be present. Wash hands an face if shower is not available.

Equipment:
- water
- soap
- tables
- wash basins/buckets, or
- field showers

Station 18: Redress

Put on clean clothes. A dressing trailer is needed i inclement weather.

Equipment:
- tables
- chairs
- lockers
- clothes

III FULL DECONTAMINATION (SITUATION 1) AND THREE MODIFICATIONS SITUATION 2,3, AND 4

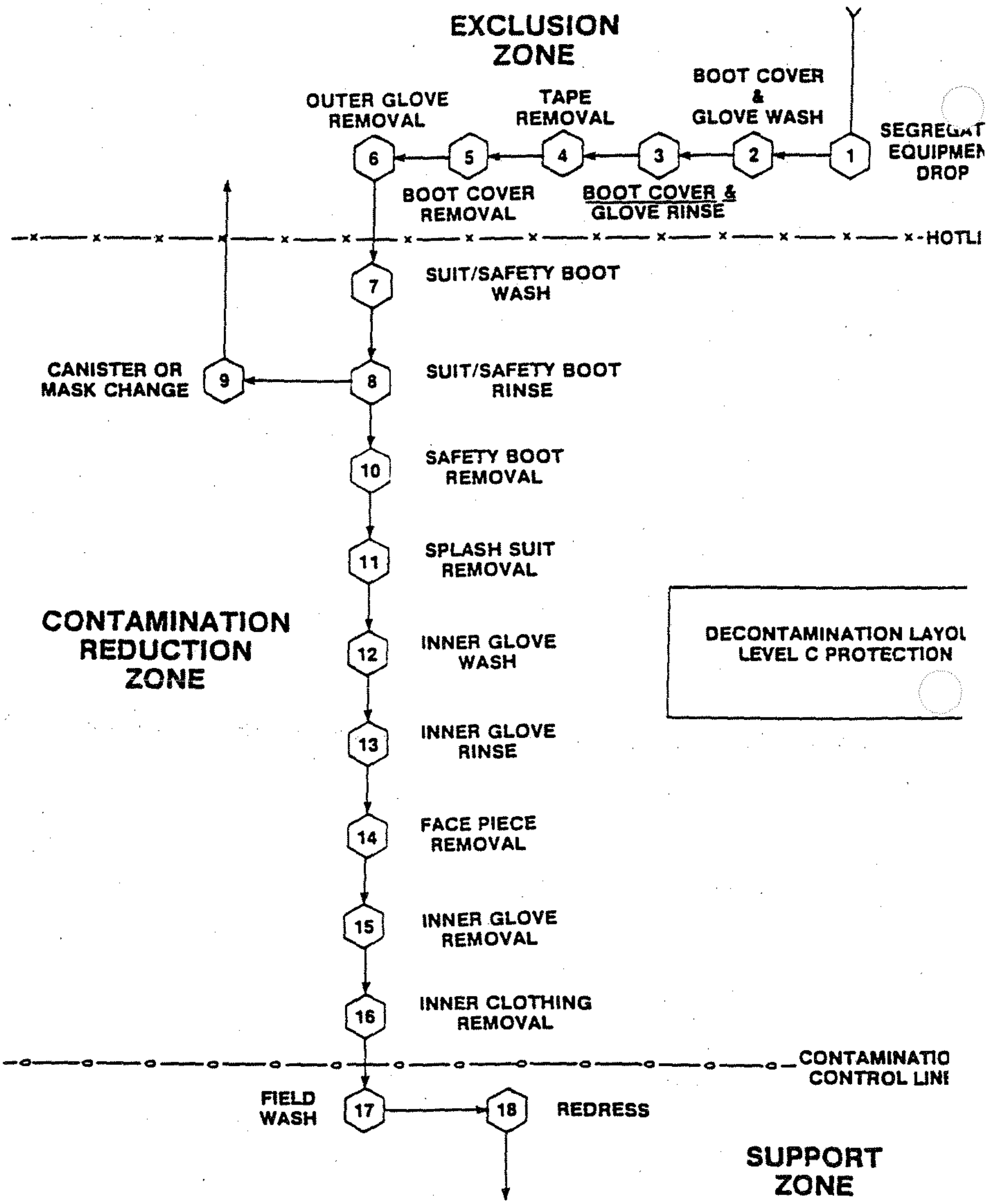
	STATION NUMBER																		
SIT.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X										
3	X						X	X		X	X	X			X	X	X	X	
4	X						X	X	X										

<u>Situation 1:</u> The individual entering the Contamination Reduction Corridor is observed to be grossly contaminated or extremely skin corrosive substances are known or suspected to be present.

<u>Situation 2:</u> Same as Situation 1 except individual needs new canister or mask and will return to Exclusion Zone.

<u>Situation 3:</u> Individual entering the CRC is expected to be minimally contaminated. Extremely skin-corrosive materials are not present. No outer gloves or boot covers are worn. Inner gloves are not contaminated.

<u>Situation 4:</u> Same as Situation 3 except individual needs new canister or mask and will return to Exclusion Zone.


EXCLUSION ZONE
BOOT COVER & GLOVE WASH
TAPE REMOVAL
OUTER GLOVE REMOVAL
SEGREGAT
EQUIPMEN
DROP
1
2
3
4
5
6
BOOT COVER & GLOVE RINSE
BOOT COVER REMOVAL
HOTLI
7
SUIT/SAFETY BOOT WASH
8
SUIT/SAFETY BOOT RINSE
9
CANISTER OR MASK CHANGE
10
SAFETY BOOT REMOVAL
11
SPLASH SUIT REMOVAL
CONTAMINATION REDUCTION ZONE
12
INNER GLOVE WASH
13
INNER GLOVE RINSE
14
FACE PIECE REMOVAL
15
INNER GLOVE REMOVAL
16
INNER CLOTHING REMOVAL
CONTAMINATIO
CONTROL LINI
17
FIELD WASH
18
REDRESS
SUPPORT ZONE
DECONTAMINATION LAYOU
LEVEL C PROTECTION

APPENDIX I

MATERIAL SAFETY DATA SHEETS

NAME:
SULFURIC ACID

S Registry Number: 7664939

Label: CORROSIVE MATERIAL UN/NA: 1830

NFPA Ratings : Health: 3 Flam: 0 React: 2 Spec: No water

GENERAL DESCRIPTION:

Sulfuric acid is a colorless oily liquid. It is used to make fertilizers and other chemicals, in petroleum refining, in iron and steel production, and for many other uses. It is soluble in water with release of heat. It is corrosiv to metals and tissue. It will char wood and most other organic matter on contact, but is unlikely to cause a fire. ((C)AAR, 1986)

FIRE & EXPLOSIVE HAZARD:

Not flammable. It is highly reactive and capable of igniting finely-divided combustible materials on contact. When heated, it emits highly toxic fumes. Can undergo violent chemical change at elevated temperatures and pressure. May react violently with water. Avoid contact with heat; water; and organic materials. Sulfuric acid is explosive or incompatible with an enormous array c substances. (EPA, 1986)

FIRE FIGHTING:

For small fires use dry chemical or carbon dioxide. Use water on combustibles burning in vicinity of this material. For large fires flood fire area with water from a distance. Do not get solid streams of water on material. Move container from area if you can do so without risk. Fight fire from safe distance or from protected location. Use care as water applied directly to thi acid results in evolution of heat and causes spattering. Cool containers that are exposed to flames with streams of water until fire is out. (EPA, 1986)

TECTIVE CLOTHING:

Extremely hazardous to health; areas may be entered with extreme care. Wear full protective clothing including self-contained breathing apparatus, coat, pants, gloves, boots, bands around arms, legs, and waist. No skin surface should be exposed. (EPA, 1986)

SUIT MATERIAL COMPATIBILITY (Based on ACGIH, 1985):

BUTYL	Good Resistance/Good Data.
CHLOROBUTYL	Good Resistance/Limited Data.
CHLOR RUB	
CPE	Good Resistance/Limited Data.
CR 39	
EVA/PE	
FEP OR TFE	
HYPALON	
NBR	Good Resistance/Limited Data.
NEOPRENE	Good Resistance/Limited Data.
NEO/RUB	
NEO/SBR	Poor Resistance/Limited Data.
NITRILE	Good Resistance/Limited Data.
NITRILE/PVC	Good Resistance/Limited Data.
PE	
POLYCARB	
PU	Poor Resistance/Limited Data.
PVA	
PVC	Good Resistance/Limited Data.
RUBBER	Poor Resistance/Good Data.
RUB/NEO/NBR	
RUB/NEO/SBR	
SARANEX	
SBR	Poor Resistance/Limited Data.
VITON	Good Resistance/Limited Data.
ON/NEO	

FIRE RESPONSE:

Keep material out of water sources and sewers. Build dikes to contain flow necessary. Neutralize spilled material with crushed limestone, soda ash, o lime. Land spill: Dig a pit, pond, lagoon, holding area to contain liquic solid material. Dike surface flow using soil, sand bags, foamed polyuretha or foamed concrete. Absorb bulk liquid with fly ash or cement powder. Neutralize with agricultural lime (slaked lime), crushed limestone, or sod bicarbonate. Water spill: Neutralize with agricultural lime (slaked lime crushed limestone, or sodium bicarbonate. Air spill: Apply water spray o to knock down vapors. Vapor knockdown water is corrosive or toxic and sh diked for containment. ((C)AAR, 1986)

HEALTH HAZARDS:

Corrosive to all body tissues. Inhalation of vapor may cause serious lung damage. Contact with eyes may result in total loss of vision. Skin contac produce severe necrosis. Fatal amount for adult: Between 1 teaspoonful ar one-half ounce of the concentrated chemical. Even a few drops may be fatal the acid gains access to the trachea. Chronic exposure may cause tracheobronchitis, stomatitis, conjunctivitis, and gastritis. Gastric perforation and peritonitis may occur and may be followed by circulatory collapse. Circulatory shock is often the immediate cause of death. Signs Symptoms of Exposure: Contact causes corrosion of mucous membranes of mouth throat, and esophagus with immediate pain and difficulty in swallowing. Da tissue is greyish white, soon to be black, shrunken and wrinkled; epigastri pain, nausea and vomiting, and gastric hemorrage also result. Vomit may co fresh blood; and victims complain of profound thirst. Clammy skin, weak ar rapid pulse, shallow respiration and scanty urine are caused by exposure. Medical Conditions Generally Aggravated by Exposure: Those with chronic respiratory, gastrointestinal, or nervous diseases and any eye and skin dis are at greater risk. (EPA, 1986)

FIRST AID:

Move victim to fresh air; call emergency medical care. If not breathing, g artificial respiration. If breathing is difficult, give oxygen. If contac with material occurs, flush skin or eyes with running water for at least 1 minutes. Remove and isolate contaminated clothing and shoes at the site. victim quiet and maintain normal body temperature. Effects may be delayed; victim under observation. (EPA, 1986)

FLASH POINT:
Not Applicable. Not flammable. (USCG, 1985)

LOWER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

UPPER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

AUTO IGNITION TEMPERATURE:
Not Applicable. Not flammable. (USCG, 1985)

MELTING POINT:
50.65 Deg F (EPA, 1986)

VAPOR PRESSURE:
1 mm Hg (EPA, 1986)

VAPOR DENSITY (AIR = 1):
3.4 (EPA, 1986)

SPECIFIC GRAVITY-LIQUID (H2O=1):
1.841 (EPA, 1986)

SPECIFIC GRAVITY-SOLID (H2O=1):

BOILING POINT:
554 Deg F (EPA, 1986)

MOLECULAR WEIGHT:
98.08 (EPA, 1986)

IDLH:
80 mg/m3 (NIOSH, 1987)

TLV - TIME WEIGHTED AVERAGE:
1 mg/m3 ((C)ACGIH, 1986)

TLV - SHORT TERM EXPOSURE LIMIT:

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES Isobutylene is flammable over a wide range in air.

PHYSICAL DATA

BOILING POINT 19.6°F (−6.9°C)	**LIQUID DENSITY AT BOILING POINT** 39.1 lb/ft^3 (626 kg/m^3)
VAPOR PRESSURE @ 70°F (21.1°C) = 39 psia (269 kPa)	**GAS DENSITY AT 70°F, 1 atm** 0.148 lb/ft^3 (2.37 kg/m^3)
SOLUBILITY IN WATER Insoluble	**FREEZING POINT** −220.6°F (−140.3°C)
APPEARANCE AND ODOR Colorless gas with an unpleasant odor similar to that which is emitted when burning anthracite coal.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) See last page.	**AUTO IGNITION TEMPERATURE** 869°F (465°C)	**FLAMMABLE LIMITS % BY VOLUME** **LEL** 1.8 **UEL** 9.6
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical		**ELECTRICAL CLASSIFICATION** Class 1, Group not specifie

SPECIAL FIRE FIGHTING PROCEDURES

Keep cylinder(s) cool with water spray from a distance. If possible without risk, move cylinder(s) away from fire area. If possible without risk, stop the flow of gas to a fire. Allow gas fire to burn itself out. (Continued on last page.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Isobutylene is denser than air and can travel considerable distances to an ignition source and flash back. Cyl der(s) may explode or vent when exposed to fire.

REACTIVITY DATA

STABILITY **Unstable**		**CONDITIONS TO AVOID**
Stable	X	
INCOMPATIBILITY (Materials to avoid) Oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION **May Occur**		**CONDITIONS TO AVOID**
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, b certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, call the "800" emergency phone number listed herein.

WASTE DISPOSAL METHOD

All Federal, State and Local regulations regarding health and pollution should be followed in waste disposal. tact Air Products for specific recommendations. Do not dispose of unused quantities.

(Continued on last page

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

VENTILATION	LOCAL EXHAUST	SPECIAL
Hood with forced ventilation	To prevent accumulation above the LEL	
	MECHANICAL (Gen.)	**OTHER**
	In accordance with electrical codes	

PROTECTIVE GLOVES
Plastic or rubber

EYE PROTECTION
Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT
Safety shoes, safety shower, eyewash "fountain."

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION
DOT Shipping Name: Liquified petroleum gas DOT Hazard Class: Flammable gas
DOT Shipping Label: Flammable gas ID No.: UN 1075

SPECIAL HANDLING RECOMMENDATIONS
Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (< 250 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional recommendations consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional recommendations consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL PACKAGING RECOMMENDATIONS
Isobutylene is noncorrosive and may be used with any common structural material.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Earth-ground and bond all lines and equipment associated with the isobutylene system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

Specialty Gas Department
Air Products and Chemicals, Inc.
Allentown, PA 18195
(215) 481-8257

AIR PRODUCTS

TIME WEIGHTED AVERAGE EXPOSURE LIMIT (Continued)

Isobutylene is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg. (ACGIH 1984–85)

FLASH POINT (Method Used) (Continued)

− 105°F (− 76°C) Closed Cup

SPECIAL FIRE FIGHTING PROCEDURES (Continued)

Ventilate low areas where flammable or explosive mixtures may form.

WASTE DISPOSAL METHOD (Continued)

Return the properly labeled shipping container to Air Products for disposal with valve(s) tightly closed, outlet seal(s) secured and valve protection cap in place. For emergency disposal assistance, call the "800" emergency phone number listed herein.

AIR PRODUCTS

Specialty Ga
Material Safet
Data Shee

EMERGENCY PHONE (800) 523-9374 **IN PENNSYLVANIA (800) 322-9092**	**PRODUCT NAME** METHANE	CAS NO.: 74-82-8
AIR PRODUCTS AND CHEMICALS, INC. **ALLENTOWN, PA 18195** **(215) 481-8257**	**TRADE NAME AND SYNONYMS** Methane, Methyl Hydride, Marsh Gas **CHEMICAL NAME AND SYNONYMS** Methane	
ISSUE DATE August 1977 **REVISION DATE** Feb. 1984, Jan. 1987	**FORMULA** CH_4	**CHEMICAL FAMILY** Aliphatic Hydrocarbon

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT
OSHA: None established ACGIH: Simple asphyxiant

SYMPTOMS OF EXPOSURE
Inhalation: High concentrations of methane so as to exclude an adequate supply of oxygen to the lungs cause dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

TOXICOLOGICAL PROPERTIES
Methane is inactive biologically and essentially nontoxic; therefore, the major hazard of overexposure is the exclusion of an adequate supply of oxygen to the lungs.

RECOMMENDED FIRST AID TREATMENT
PROMPT MEDICAL ATTENTION IS REQUIRED IN ALL CASES OF OVEREXPOSURE TO METHANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH APPROPRIATE PROTECTIVE EQUIPMENT (SELF-CONTAINED BREATHING APPARATUS, ETC.) TO PREVENT UNNECESSARY EXPOSURE AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES
Forms explosive or flammable mixtures with most oxidizers (oxygen, chlorine, fluorine, etc.), and is flammable over a wide range in

PHYSICAL DATA

BOILING POINT −258.6°F (−161.4°C)	**LIQUID DENSITY AT BOILING POINT** 26.4 lb/ft³ (424.7 kg/m³)
VAPOR PRESSURE @ 70°F (21.1°C) above the critical temp. of −116.17°F (−82.3°C)	**GAS DENSITY AT 70°F, 1 atm** 0.042 lb/ft³ (.673 kg/m³)
SOLUBILITY IN WATER Negligible	**FREEZING POINT** −296.45°F (−182.47°C)
APPEARANCE AND ODOR Colorless, odorless gas. Specific Gravity @ 70°F (Air = 1) = 0.555	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) −306°F (−188°C) C.C.	**AUTO IGNITION TEMPERATURE** 1076°F (580°C)	**FLAMMABLE LIMITS % BY VOLUME** LEL 5 UEL 15

EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical	**ELECTRICAL CLASSIFICATION** Class 1, Group D

SPECIAL FIRE FIGHTING PROCEDURES
If possible without risk, stop the flow of methane. From a safe distance use water spray to cool surrounding containers until well after fire is out. If possible without risk, move cylinders from fire area.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Should flame be extinguished and flow of gas continue, increase ventilation to prevent flammable or explosive mixture format Cylinders exposed to heat or flame may vent rapidly or explode.

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
Unstable		
Stable	X	None

INCOMPATIBILITY (Materials to avoid)
Oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		
Will Not Occur	X	None

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in cylinder or cylinder valve, call the "800" emergency phone number listed herein.

WASTE DISPOSAL METHOD
All Federal, State, and Local regulations regarding health and pollution should be followed in waste disposal. Contact Air Pro specific recommendations. Do not dispose of unused quantities.

Return the properly labeled shipping container to Air Products for disposal. For emergency disposal assistance, call the "800" emergency phone number listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

VENTILATION
Use hood with forced ventilation and/or local exhaust to prevent accumulation above the LEL in accordance with electrical codes.

PROTECTIVE GLOVES
Plastic or rubber

EYE PROTECTION
Safety goggles or glasses

OTHER PROTECTIVE EQUIPMENT
Safety shoes, safety shower, eyewash "fountain"

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION
DOT Shipping Name: Methane; DOT Hazard Class: Flammable gas; DOT Shipping Label: Flammable gas; I.D. No.: UN 1971

SPECIAL HANDLING RECOMMENDATIONS
Use only in well-ventilated areas. Valve protection caps must remain in place unless cylinder is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (< 3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the cylinder.

For additional handling recommendations consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily traveled areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional storage recommendations, consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL PACKAGING RECOMMENDATIONS
Methane is noncorrosive and may be used with any common structural material.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Earth-ground and bond all lines and equipment associated with the methane system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

Hydrogen Material Safety Data Sheet

Industrial Gas Division
Air Products and Chemicals, Inc.
Allentown, PA 18195
Tel. (215) 481-4911 · TWX 510-651-3686
Telecopy (215) 481-5900
CABLE-AIRPROD · TELEX 847416

AIR PRODUCTS

EMERGENCY PHONE: 800—523-9374	IN PENNSYLVANIA: 800—322-9092	
ISSUE DATE Issued: 13 April 1977	TRADE NAME AND SYNONYMS Hydrogen, or Liquid Hydrogen (in cryogenic liquid state.)	CHEMICAL NAME AND SYNONYMS Hydrogen
REVISIONS Rev: 30 June 1988	FORMULA H_2 MW: 2.016	CHEMICAL FAMILY Flammable Gas CAS#1333-74-0

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Hydrogen is a simple asphyxiant and has no threshold limit value (TLV). Hydrogen is not listed as a carcinogen by NTI or OSHA.

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED
Hydrogen is nontoxic and classified as a simple asphyxiant. Symptoms of anoxia occur only when gas concentrati within the flammable range and the mixture has not ignited. DO NOT ENTER AREAS WITHIN THE FLAMMABLE RAN TO THE IMMEDIATE FIRE AND EXPLOSION HAZARD. Contact of skin with liquid hydrogen or cold gas vapors ca cryogenic (extreme low temperature) burns and freeze tissues.

TOXICOLOGICAL PROPERTIES
Hydrogen is nontoxic and classified as a simple asphyxiant, but it is extremely flammable. The amount of hydro necessary to reduce oxygen concentrations below life support levels is well within the flammable range. Do not ent containing flammable mixtures due to the immediate fire and explosion hazard.

RECOMMENDED FIRST AID TREATMENT
If cryogenic liquid or cold boil-off gas contacts worker's skin or eyes, frozen tissues should be flooded or soaked wi water (105–115F; 41–46C~~). DO NOT USE HOT~~ WATER. Cryogenic burns which result in blistering or deeper tissue should be seen promptly by a physician. First degree burns (reddening only, as sunburn) or second degree burns which are the result of fire exposure and are localized to a portion of an extremity or other small area of the immersed in cool water for 10–20 minutes to relieve pain. Do NOT immerse the whole body in a cold bath. All the...al except the most minor and localized burns should be referred promptly for medical care. Burned areas should be with the cleanest available material, such as a clean sheet, prior to transport. Do NOT use burn ointments or greasy m on burns which show more than localized reddening. Persons suffering from lack of oxygen should be moved to are normal atmosphere. Assisted respiration and supplemental oxygen should be given if the victim is not breathing.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A (gas at normal temperatures)	932F (500C)	In air @ 1 atm	4.0%	74.

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION
Dry chemical, carbon dioxide, or Halon	GROUP Class I, Group E

SPECIAL FIRE FIGHTING PROCEDURES
Shut off source of hydrogen. When possible, allow fire to burn itself out. Spray water on adjoining equipment to kee

UNUSUAL FIRE AND EXPLOSION HAZARDS
Hydrogen can burn with almost an invisible flame of low thermal radiation. People have unknowingly walked into h flames. Easily ignited; minimum ignition energy is low (0.02MJ) and flammable range is wide. Flame propagates at ra Potential explosion hazard from reignition if fire is extinguished without shutting off hydrogen source. Hydrogen gas is and can accumulate in the upper sections of enclosed spaces.

PHYSICAL DATA

BOILING POINT (°F)		FREEZING POINT (°F)	
@ 1 atm −423.0F (−252.8C)		@ 1 atm −434.5F (−259.2C)	
VAPOR PRESSURE (psia) N/A		SOLUBILITY IN WATER @ 68F (20C), 1 atm 1.82% by volume	
VAPOR DENSITY (lb/cu ft) @ 68F (20C), 1 atm 0.005229	SPECIFIC GRAVITY (AIR = 1) @ 68F (20C), 1 atm 0.0696	LIQUID DENSITY (lb/cu ft) @ boiling point, 1 atm 4.432	SPECIFIC GRAVITY (H_2O = 1) @ boiling point, 1 at

APPEARANCE AND ODOR
Both liquid and gaseous hydrogen are colorless and odorless.

REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	Sources of ignition, sparks, flames, hot objects.

INCOMPATIBILITY (Materials to avoid)
…dizing materials. Some steels are susceptible to hydrogen attack or embrittlement at high temperature and pressure.

…RDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	None

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
DO NOT ENTER areas containing flammable mixtures of hydrogen in air. Avoid contact of skin with liquid hydrogen or cold boil-off gas. Ventilate enclosed areas to prevent formation of flammable or oxygen-deficient atmospheres. See "VENTILATION" below. Eliminate all potential sources of ignition. Move a leaking compressed gas cylinder out of doors if leak is small. Consult Air Products for additional assistance.

WASTE DISPOSAL METHOD
Do not attempt to dispose of residual gaseous hydrogen in cylinders. Return cylinders to Air Products with positive residual pressure, cylinder valves tightly closed, and valve cap in place. Do not dispose of liquid hydrogen — contact Air Products for assistance.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
Natural or mechanical where gas or vapor is present.	As necessary	Mechanical ventilation must meet National Electric Code (NEC) requirements for Class I, Group B
	MECHANICAL (General)	OTHER
	As necessary	Only as necessary

PROTECTIVE GLOVES
(Liquid) Loose-fitting of impermeable material such as leather. Leather work gloves are recommended when handling compressed gas cylinders

EYE PROTECTION
Safety glasses are recommended when handling compressed gas cylinders. Use safety glasses or goggles when handling liquid.

…ER PROTECTIVE EQUIPMENT
…e

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION
Hydrogen shipment must be in accordance with Department of Transportation (DOT) regulations using DOT "FLAMMABLE GAS" label. Consult DOT regulations for details on the shipment of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS
Prevent contact of liquid or cold gaseous hydrogen with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compressed gas cylinders contain hydrogen at extremely high pressure and should be handled with care. Use a pressure-reducing regulator when connecting to lower pressure piping systems. Secure cylinders when in use. Never use direct flame to heat a compressed gas cylinder. Use a check valve to prevent back flow into storage container. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
Store liquid containers and cylinders in well ventilated areas. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Avoid exposure to areas where salt or corrosive chemicals are present. Cylinder storage of hydrogen should be segregated from oxidizers such as oxygen, fluorine, etc. See Compressed Gas Association Pamphlet P-1 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS
Gaseous hydrogen containers meet DOT specifications or American Society of Mechanical Engineers (ASME) codes. Liquid hydrogen is stored in vacuum-insulated containers meeting DOT specifications or ASME codes.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Liquid hydrogen in exposed piping can actually cause air to condense and liquefy. The nitrogen in this liquid can evaporate more rapidly, leaving an oxygen enriched liquid behind. Utilize oxygen-compatible insulating materials and minimize exposed piping surface areas. Use only metals and materials compatible with extremely low temperatures. Avoid use of carbon steel and other metals which become brittle at low temperatures. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law. The atmosphere in areas in which hydrogen gas may be vented and collect should be tested with …portable or continuous flammable gas analyzer.

… Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which may not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

NAME:
SODIUM HYDROXIDE, DRY SOLID, FLAKE, BEAD

CAS Registry Number: 1310732

Label: CORROSIVE MATERIAL UN/NA: 1823

NFPA Ratings : Health: 3 Flam: 0 React: 1 Spec:

GENERAL DESCRIPTION:

Sodium hydroxide, dry is a white material. It is used in chemical manufacturing, petroleum refining, cleaning compounds, home drain openers, for many other uses. It is soluble in water with release of heat. It abs moisture from the air and dissolves in it. It is corrosive to metals and tissue. ((C)AAR, 1986)

FIRE & EXPLOSIVE HAZARD:

Not flammable. May cause fire on contact with combustibles. Flammable ga be produced on contact with metals. (USCG, 1985)

FIRE FIGHTING:

Extinguish fire using agent suitable for type of surrounding fire (materia itself does not burn or burns with difficulty). Use water in flooding quantities as fog. Apply water from as far a distance as possible. ((C)A 1986)

PROTECTIVE CLOTHING:

Avoid bodily contact with the material. Wear boots, protective gloves, an goggles. Do not handle broken packages without protective equipment. Was any material which may have contacted the body with copious amounts of wat soap and water. If contact with the material anticipated, wear full pr clothing. ((C)AAR, 1986)

SUIT MATERIAL COMPATIBILITY (Based on ACGIH, 1985):

BUTYL	Good Resistance/Limited Data.
CHLOROBUTYL	
CHLOR RUB	
CPE	Good Resistance/Limited Data.
CR 39	
EVA/PE	
FEP OR TFE	
HYPALON	
NBR	Good Resistance/Limited Data.
NEOPRENE	Good Resistance/Good Data.
NEO/RUB	
NEO/SBR	Good Resistance/Limited Data.
NITRILE	Good Resistance/Good Data.
NITRILE/PVC	Good Resistance/Good Data.
PE	Good Resistance/Limited Data.
POLYCARB	
PU	Good Resistance/Limited Data.
PVA	
PVC	Good Resistance/Limited Data.
RUBBER	Good Resistance/Good Data.
RUB/NEO/NBR	
RUB/NEO/SBR	
SARANEX	
SBR	Good Resistance/Limited Data.
VITON	Good Resistance/Limited Data.
VITON/NEO	

NONFIRE RESPONSE:

Keep material out of water sources and sewers. Land spill: Dig a pit, po lagoon, holding area to contain liquid or solid material. Cover solids plastic sheet to prevent dissolving in rain or fire fighting water. Wa spill: Neutralize with dilute acid or removable strong acid. ((C)AAR,

HEALTH HAZARDS:

DUST: Irritating to eyes, nose and throat. SOLID: Will burn skin and eyes. Harmful if swallowed. (USCG, 1985)

FIRST AID:

'f this chemical comes in contact with the eyes, immediately wash the eyes wi arge amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when workin with this chemical. If this chemical comes in contact with the skin, immediately flush the contaminated skin with water. If this chemical penetra the clothing, immediately remove the clothing and flush the skin with water. Get medical attention promptly. If a person breathes in large amounts of thi chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and a rest. Get medical attention as soon as possible. If this chemical has been swallowed, get medical attention immediately. (NIOSH, 1987)

FLASH POINT:
Not Applicable. Not flammable. (USCG, 1985)

LOWER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

UPPER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

AUTO IGNITION TEMPERATURE:
Not Applicable. Not flammable. (USCG, 1985)

MELTING POINT:
604 Deg F (USCG, 1985)

VAPOR PRESSURE:
Not Applicable. (USCG, 1985)

VAPOR DENSITY (AIR = 1):
Not Applicable. (USCG, 1985)

PECIFIC GRAVITY-LIQUID (H2O=1):

SPECIFIC GRAVITY-SOLID (H2O=1):
2.13 @ 68 Deg F (USCG, 1985)

BOILING POINT:
Very high. (USCG, 1985)

MOLECULAR WEIGHT:
40 (USCG, 1985)

IDLH:
250 mg/m3 (NIOSH, 1987)

TLV - TIME WEIGHTED AVERAGE:
2 mg/m3 Ceiling limit. ((C)ACGIH, 1986)

TLV - SHORT TERM EXPOSURE LIMIT:

NAME:
SODIUM HYDROXIDE, LIQUID

CAS Registry Number: 1310732

Label: CORROSIVE MATERIAL UN/NA: 1824

NFPA Ratings : Health: 3 Flam: 0 React: 1 Spec:

GENERAL DESCRIPTION:

Sodium hydroxide liquid is the water solution of sodium hydroxide. It is in chemical manufacturing, petroleum refining, paper making, cleaning com and for many other uses. The concentrated solutions will dissolve in add water with the evolution of heat. It is corrosive to metals and tissue. ((C)AAR, 1986)

FIRE & EXPLOSIVE HAZARD:

Not flammable. (USCG, 1985)

FIRE FIGHTING:

Extinguish fire using agent suitable for type of surrounding fire (materi itself does not burn or burns with difficulty). Use water in flooding quantities as fog. Apply water from as far a distance as possible. ((C) 1986)

PROTECTIVE CLOTHING:

Avoid breathing vapors or dusts. Avoid bodily contact with the material, boots, protective gloves, and goggles. Do not handle broken packages with protective equipment. Wash away any material which may have contacted the with copious amounts of water or soap and water. If contact with the mate anticipated, wear full protective clothing. ((C)AAR, 1986)

SUIT MATERIAL COMPATIBILITY (Based on ACGIH, 1985):

BUTYL	Good Resistance/Limited Data.
CHLOROBUTYL	
CHLOR RUB	
CPE	Good Resistance/Limited Data.
CR 39	
EVA/PE	
FEP OR TFE	
HYPALON	
NBR	Good Resistance/Limited Data.
NEOPRENE	Good Resistance/Good Data.
NEO/RUB	
NEO/SBR	Good Resistance/Limited Data.
NITRILE	Good Resistance/Good Data.
NITRILE/PVC	Good Resistance/Good Data.
PE	Good Resistance/Limited Data.
POLYCARB	
PU	Good Resistance/Limited Data.
PVA	
PVC	Good Resistance/Limited Data.
RUBBER	Good Resistance/Good Data.
RUB/NEO/NBR	
RUB/NEO/SBR	
SARANEX	
SBR	Good Resistance/Limited Data.
VITON	Good Resistance/Limited Data.
VITON/NEO	

NONFIRE RESPONSE:

Keep material out of water sources and sewers. Build dikes to contain fl necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain or solid material. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash or powder. Neutralize with vinegar or other dilute acid. Water spill: with dilute acid or removable strong acid. Air spill: Apply water spray mist to knock down vapors. ((C)AAR, 1986)

HEALTH HAZARDS:

LIQUID: Will burn skin and eyes. Harmful if swallowed. (USCG, 1985)

FIRST AID:

f this chemical comes in contact with the eyes, immediately wash the eyes wi large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when workin with this chemical. If this chemical comes in contact with the skin, immediately flush the contaminated skin with water. If this chemical penetra the clothing, immediately remove the clothing and flush the skin with water. Get medical attention promptly. If a person breathes in large amounts of thi chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and a rest. Get medical attention as soon as possible. If this chemical has been swallowed, get medical attention immediately. (NIOSH, 1987)

FLASH POINT:
Not Applicable. Not flammable. (USCG, 1985)

LOWER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

UPPER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

AUTO IGNITION TEMPERATURE:
Not Applicable. Not flammable. (USCG, 1985)

MELTING POINT:
Not Applicable. (USCG, 1985)

VAPOR PRESSURE:
Not Applicable. (USCG, 1985)

VAPOR DENSITY (AIR = 1):
Not Applicable. (USCG, 1985)

SPECIFIC GRAVITY-LIQUID (H2O=1):
1.5 @ 68 Deg F (USCG, 1985)

SPECIFIC GRAVITY-SOLID (H2O=1):

BOILING POINT:
>266 Deg F @ 760 mm Hg (USCG, 1985)

MOLECULAR WEIGHT:
40 (NIOSH, 1987)

IDLH:
250 mg/m3 (NIOSH, 1987)

TLV - TIME WEIGHTED AVERAGE:

TLV - SHORT TERM EXPOSURE LIMIT:

NAME:
SODIUM HYDROXIDE-SODIUM BOROHYDRIDE SOLUTION

CAS Registry Number:

Label: UN/NA: 1824

NFPA Ratings : Health: Flam: React: Spec:

GENERAL DESCRIPTION:

Sodium hydroxide and sodium borohydride solution is a colorless liquid. used for bleaching wood pulp and as a blowing agent for making plastic fo It is soluble in water. It is corrosive to metals and tissue. ((C)AAR,

FIRE & EXPLOSIVE HAZARD:

Some of these materials may burn but none of them ignite readily. Flammable/poisonous gases may accumulate in tanks and hopper cars. Some these materials may ignite combustibles (wood, paper, oil, etc.). (DOT

FIRE FIGHTING:

Extinguish fire using agent suitable for type of surrounding fire (materi itself does not burn or burns with difficulty). Use water in flooding quantities as fog. Apply water from as far a distance as possible. ((C) 1986)

PROTECTIVE CLOTHING:

Avoid breathing vapors or dusts. Avoid bodily contact with the material. boots, protective gloves, and goggles. Do not handle broken packages wit protective equipment. Wash away any material which may have contacted th with copious amounts of water or soap and water. If contact with the mat anticipated, wear full protective clothing. ((C)AAR, 1986)

SUIT MATERIAL COMPATIBILITY (Based on ACGIH, 1985):

BUTYL
CHLOROBUTYL
CHLOR RUB
CPE
CR 39
EVA/PE
FEP OR TFE
HYPALON
NBR
NEOPRENE
NEO/RUB
NEO/SBR
NITRILE
NITRILE/PVC
PE
POLYCARB
PU
PVA
PVC
RUBBER
RUB/NEO/NBR
RUB/NEO/SBR
SARANEX
SBR
VITON
VITON/NEO

NONFIRE RESPONSE:

Keep material out of water sources and sewers. Build dikes to contain fl necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain or solid material. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash or powder. Neutralize with vinegar or other dilute acid. Water spill: with dilute acid or removable strong acid. Air spill: Apply water spray mist to knock down vapors. ((C)AAR, 1986)

HEALTH HAZARDS:

Contact causes burns to skin and eyes. If inhaled, may be harmful. Fire may produce irritating or poisonous gases. Runoff from fire control or dilution water may cause pollution. (DOT, 1984)

FIRST AID:

Move victim to fresh air; call emergency medical care. Remove and isolate contaminated clothing and shoes at the site. In case of contact with materi immediately flush eyes with running water for at least 15 minutes. Keep vic quiet and maintain normal body temperature. (DOT, 1984)

FLASH POINT:

LOWER EXPLOSIVE LIMIT:

UPPER EXPLOSIVE LIMIT:

AUTO IGNITION TEMPERATURE:

MELTING POINT:

VAPOR PRESSURE:

VAPOR DENSITY (AIR = 1):

SPECIFIC GRAVITY-LIQUID (H2O=1):

SPECIFIC GRAVITY-SOLID (H2O=1):

BOILING POINT:

MOLECULAR WEIGHT:

IDLH:

TLV - TIME WEIGHTED AVERAGE:

TLV - SHORT TERM EXPOSURE LIMIT:

NAME:
HYDROCHLORIC ACID

CAS Registry Number: 7647010

Label: CORROSIVE MATERIAL UN/NA: 1789

NFPA Ratings : Health: 3 Flam: 0 React: 0 Spec:

GENERAL DESCRIPTION:

Hydrochloric acid is a colorless to yellow liquid with a pungent odor. I used for cleaning masonary and metals, manufacturing chemicals, in petrol production, and for many other uses. Its fumes are irritating to the eye mucous membranes. It is soluble in water with release of heat. It is co to metals and tissue. ((C)AAR, 1986)

FIRE & EXPLOSIVE HAZARD:

Not flammable. Flammable gas may be produced on contact with metals. To: irritating vapors are generated when heated. (USCG, 1985)

FIRE FIGHTING:

Extinguish fire using agent suitable for type of surrounding fire (materi itself does not burn or burns with difficulty). Use water in flooding quantities as fog. Cool all affected containers with flooding quantities water. Apply water from as far a distance as possible. ((C)AAR, 1986)

PROTECTIVE CLOTHING:

Avoid breathing vapors. Keep upwind. Avoid bodily contact with the mate: Wear boots, protective gloves, and goggles. Do not handle broken package without protective equipment. Wash away any material which may have cont the body with copious amounts of water or soap and water. If contact w material anticipated, wear full protective clothing. ((C)AAR, 1986)

SUIT MATERIAL COMPATIBILITY (Based on ACGIH, 1985):

BUTYL	Poor Resistance/Limited Data.
CHLOROBUTYL	Good Resistance/Limited Data.
CHLOR RUB	
CPE	Good Resistance/Limited Data.
CR 39	
EVA/PE	
FEP OR TFE	
HYPALON	
NBR	Good Resistance/Limited Data.
NEOPRENE	Good Resistance/Good Data.
NEO/RUB	
NEO/SBR	Poor Resistance/Limited Data.
NITRILE	Good Resistance/Good Data.
NITRILE/PVC	Good Resistance/Good Data.
PE	
POLYCARB	Poor Resistance/Good Data.
PU	Poor Resistance/Limited Data.
PVA	
PVC	Good Resistance/Good Data.
RUBBER	Good Resistance/Limited Data.
RUB/NEO/NBR	Good Resistance/Limited Data.
RUB/NEO/SBR	
SARANEX	
SBR	Poor Resistance/Limited Data.
VITON	Good Resistance/Limited Data.
VITON/NEO	

NONFIRE RESPONSE:

Keep material out of water sources and sewers. Build dikes to contain fl necessary. Use water spray to knock-down vapors. Neutralize spilled ma with crushed limestone, soda ash, or lime. Land spill: Dig a pit, por lagoon, holding area to contain liquid or solid material. Dike surfac using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb b liquid with fly ash or cement powder. Neutralize with agricultural lime

lime), crushed limestone, or sodium bicarbonate. Water spill: Neutralize wi agricultural lime (slaked lime), crushed limestone, or sodium bicarbonate. A spill: Apply water spray or mist to knock down vapors. Vapor knockdown wate is corrosive or toxic and should be diked for containment. ((C)AAR, 1986)

HEALTH HAZARDS:

VAPOR: Irritating to eyes, nose and throat. If inhaled, will cause coughing difficult breathing. LIQUID: Will burn skin and eyes. Harmful if swallowed (USCG, 1985)

FIRST AID:

If this chemical comes in contact with the eyes, immediately wash the eyes wi large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when workin with this chemical. If this chemical comes in contact with the skin, immediately flush the contaminated skin with water. If this chemical penetra the clothing, immediately remove the clothing and flush the skin with water. Get medical attention promptly. If a person breathes in large amounts of thi chemical, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and a rest. Get medical attention as soon as possible. If this chemical has been swallowed, get medical attention immediately. (NIOSH, 1987)

FLASH POINT:
Not Applicable. Not flammable. (USCG, 1985)

LOWER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

UPPER EXPLOSIVE LIMIT:
Not Applicable. Not flammable. (USCG, 1985)

AUTO IGNITION TEMPERATURE:
Not Applicable. Not flammable. (USCG, 1985)

MELTING POINT:
Not Applicable. (USCG, 1985)

VAPOR PRESSURE:
169.99 mm Hg @ 70 Deg F (USCG, 1985)

VAPOR DENSITY (AIR = 1):
Not Applicable. (USCG, 1985)

SPECIFIC GRAVITY-LIQUID (H2O=1):
1.19 @ 68 Deg F (USCG, 1985)

SPECIFIC GRAVITY-SOLID (H2O=1):

BOILING POINT:
123 Deg F @ 760 mm Hg (USCG, 1985)

MOLECULAR WEIGHT:
36.46 (USCG, 1985)

IDLH:
100 ppm For hydrogen chloride. (NIOSH, 1987)

TLV - TIME WEIGHTED AVERAGE:
5 ppm For Hydrogen Chloride Ceiling limit. ((C)ACGIH, 1986)

TLV - SHORT TERM EXPOSURE LIMIT:

chemists helping chemists in research & industry
aldrich chemical co.
P.O. Box 355, Milwaukee, Wisconsin 53201 USA • (414) 273-3850

ATTN: SAFETY DIRECTOR
US ARMY
MUNITIONS AND CHEMICAL COMMAND
AMSMC QAO C (A)
ABERDEEN PROV GROUND MD 21010
RAYMOND G CRAFTON

DATE: 01/16/87
CUST # 576131 P.O. #

MATERIAL SAFETY DATA SHEET

PA

IDENTIFICATION

PRODUCT # D19850-1 NAME: 2,4-DINITROPHENOL
CAS # 51-28-5

TOXICITY HAZARDS

RTECS # SL2800000
PHENOL, 2,4-DINITRO-

IRRITATION DATA		
SKN-RBT 300 MG/4W-I MLD		JIHTAB 30,10,48
TOXICITY DATA		
ORL-HMN	LDLO:4300 UG/KG	JAMAAP 101,1333,33
ORL-RAT	LD50:30 MG/KG	TXAPA9 21,315,72
IPR-RAT	LD50:20 MG/KG	JPPMAB 17,814,65
SCU-RAT	LD50:25 MG/KG	JPETAB 49,187,33
ORL-MUS	LD50:45 MG/KG	FATOAO 28,493,65
IPR-MUS	LD50:26 MG/KG	BCPCA6 18,1389,69
ORL-RBT	LD50:30 MG/KG	FATOAO 28,493,65
ORL-GPG	LD50:81 MG/KG	FATOAO 28,493,65
UNR-MAM	LD50:40 MG/KG	30ZDA9 -,97,71
ORL-BWD	LD50:13 MG/KG	TXAPA9 21,315,72

REVIEWS, STANDARDS, AND REGULATIONS
EPA GENETIC TOXICOLOGY PROGRAM, JANUARY 1984
REPORTED IN EPA TSCA INVENTORY, 1983
MEETS CRITERIA FOR PROPOSED OSHA MEDICAL RECORDS RULE FEREAC 47 ,30420, 82

HEALTH HAZARD DATA

ACUTE EFFECTS
MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.

CHRONIC EFFECTS
DAMAGE TO THE LIVER
DERMATITIS

FIRST AID
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINAT CLOTHING AND SHOES.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

PHYSICAL DATA

MELTING POINT: 106 C TO 108 C

FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.

aldrich chemical co.
P.O. Box 355, Milwaukee, Wisconsin 53201 USA • (414) 273-3850

MATERIAL SAFETY DATA SHEET

CATALOG # D19850-1 NAME: 2,4-DINITROPHENOL

SPECIAL FIRE FIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
FLAMMABLE SOLID.
UNUSUAL FIRE AND EXPLOSION HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

REACTIVITY DATA

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
STRONG BASES
ACID CHLORIDES
ACID ANHYDRIDES
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
WASTE DISPOSAL METHOD
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.

OBSERVE ALL FEDERAL, STATE & LOCAL LAWS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

WEAR APPROPRIATE OSHA/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
SAFETY SHOWER AND EYE BATH.
USE ONLY IN A CHEMICAL FUME HOOD.
DO NOT BREATHE DUST.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
READILY ABSORBED THROUGH SKIN.
WASH THOROUGHLY AFTER HANDLING.
HIGHLY TOXIC.
IRRITANT.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

ADDITIONAL PRECAUTIONS AND COMMENTS

ADDITIONAL INFORMATION
MATERIAL IS MOISTENED WITH 15% WATER.

2,4-DINITROTOLUENE

Common Synonyms	Solid or heated liquid	Yellow to red solid or yellow liquid	Slight odor
DNT 2, 4-Dinitrotoluol 1-Methyl-2, 4-Dinitrobenzene	Liquid solidifies. Solid and liquid sink in water.		

AVOID CONTACT WITH LIQUID AND SOLID. KEEP PEOPLE AWAY.
Wear rubber overclothing (including gloves).
Stop discharge if possible.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire	Combustible. POISONOUS GASES MAY BE PRODUCED IN FIRE. Containers may explode in fire. Wear goggles and self-contained breathing apparatus. Extinguish with water, dry chemicals, foam, or carbon dioxide. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. LIQUID OR SOLID POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED. Will burn skin and eyes. If swallowed will cause nausea, vomiting or loss of consciousness. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE
(See Response Methods Handbook)

Issue warning-poison, water contaminant
Restrict access
Should be removed
Chemical and physical treatment

2. LABEL
2.1 Category: None
2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS
3.1 CG Compatibility Class: Not listed
3.2 Formula: 2, 4-$(NO_2)_2C_6H_3CH_3$
3.3 IMO/UN Designation: Solid 6.1/2038, liquid 6.1/1600.
3.4 DOT ID No.: 1600 (Liquid), 2038 (Solid)
3.5 CAS Registry No.: 121-14-2

4. OBSERVABLE CHARACTERISTICS
4.1 Physical State (as shipped): Solid or liquid
4.2 Color: Yellow (liquid); yellow to red (solid)
4.3 Odor: Weak

5. HEALTH HAZARDS
5.1 Personal Protective Equipment: Air-line mask or self-contained breathing apparatus; safety goggles and face shield; rubber gloves and boots; protective clothing
5.2 Symptoms Following Exposure: Ingestion or overexposure to vapors from hot liquid can cause loss of color, nausea, headache, dizziness, drowsiness, collapse. Hot liquid can burn eyes and skin. Prolonged skin contact with solid can give same symptoms as after inhalation or ingestion.
5.3 Treatment of Exposure: INHALATION: remove victim from exposure; get medical attention for methemoglobinemia. EYES: flush with copious amounts of water and get medical attention. SKIN: wash well with soap and water. INGESTION: induce vomiting, if victim is conscious, give gastric lavage and saline cathartic; get medical attention.
5.4 Threshold Limit Value: 1.5 mg/m^3
5.5 Short Term Inhalation Limits: Data not available
5.6 Toxicity by Ingestion: Grade 4, oral LD_{50} = 30 mg/kg (rat)
5.7 Late Toxicity: May cause liver damage, anemia, neuritis
5.8 Vapor (Gas) Irritant Characteristics: Not pertinent
5.9 Liquid or Solid Irritant Characteristics: Data not available.
5.10 Odor Threshold: Data not available
5.11 IDLH Value: 200 mg/m^3

6. FIRE HAZARDS
6.1 Flash Point: 404°F C.C.
6.2 Flammable Limits in Air: Not pertinent
6.3 Fire Extinguishing Agents: Water, dry chemical, carbon dioxide from protected location
6.4 Fire Extinguishing Agents Not to be Used: Data not available
6.5 Special Hazards of Combustion Products: Nitrogen oxides and dense black smoke are produced in a fire.
6.6 Behavior in Fire: Decomposition is self-sustaining at 280°C. Containers may explode in a fire.
6.7 Ignition Temperature: Not pertinent
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not pertinent
6.10 Adiabatic Flame Temperature: Data not available

(Continued)

7. CHEMICAL REACTIVITY
7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: No reaction
7.3 Stability During Transport: Stable below 482°F (250°C)
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION
8.1 Aquatic Toxicity: Data not available
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): Data not available
8.4 Food Chain Concentration Potential: Data not available

9. SHIPPING INFORMATION
9.1 Grades of Purity: Technical. Mixtures such as an 80:20 mixture of 2, 4- and 2, 6-isomers are also available. The hazard properties are similar.
9.2 Storage Temperature: Ambient (solid), >80°C (liquid)
9.3 Inert Atmosphere: No requirement
9.4 Venting: Open (flame arrester)

6. FIRE HAZARDS (Continued)
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

10. HAZARD ASSESSMENT COD
(See Hazard Assessment Handboo
A-X-Y-8

11. HAZARD CLASSIFICATIONS
11.1 Code of Federal Regulations: ORM-E
11.2 NAS Hazard Rating for Bulk Wate Transportation: Not listed
11.3 NFPA Hazard Classification:

Category	Classific
Health Hazard (Blue)	
Flammability (Red)	
Reactivity (Yellow)	

12. PHYSICAL AND CHEMICAL
12.1 Physical State at 15°C: Solid
12.2 Molecular Weight: 182.1
12.3 Boiling Point at 1 atm: Decompo
12.4 Freezing Point: 158°F = 70°C = 343°K
12.5 Critical Temperature: Not pertin
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: 1.379 at 20°C (liquid)
12.8 Liquid Surface Tension: Data nc
12.9 Liquid Water Interfacial Tensio Data not available
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapo Not pertinent
12.12 Latent Heat of Vaporization: 170 Btu/lb = 93 cal/g = 3.9 X 10^5 J/kg
12.13 Heat of Combustion: −8,305 B = −4 614 cal/g = −193.0 X
12.14 Heat of Decomposition: Not pe
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pe
12.25 Heat of Fusion: 26.40 cal/g
12.26 Limiting Value: Data not availab
12.27 Reid Vapor Pressure: Data not

HAZARDOUS COMPONENT SAFETY DATA SHEET
(ARRADCOM Suppl 1 to DARCOMR 385-17)

Material/Component/Assembly: Nitrocellulose	Date: 16 Jun 83
	Number: 31
	Revision: D

Applicable DAR Safety Clause 7-104.79

SENSITIVITY

Friction Test (Apparatus & Comparison Values) PA Steel/Fiber - Burns

Impact Test (Apparatus & Comparison Values) See Attached Sheet

Electrostatic Discharge Test (Apparatus & Comparison Values) See Attached Sheet

HAZARDS

Fire High

Auto Ignition Temp 160 - 170^{0}C (320 - 338^{0}F)	Flash Point See Attached Sheet

Decomposition Products Toxic, Avoid Ingestion and Inhalation. Fumes include oxides of nitrogen and carbon monoxide.

Flammable Limits NA	Lower Percent	Upper Percent

Explosion High when dry (less than 2% water) can be detonated even wet when confined and initiated by a strong booster.

Explosive Temp (5 sec) See Attached Sheet	Dusts NA

ɩicity Not Toxic. When wet with solvent presents associated solvent hazards.

In-Process Hazards Classification See Attached Sheet

Special Requirements (Continuation Sheets Authorized)

Ref Dwg: 9248265; 9311164; 9313590; 9323278; 9323990; 11720511 and Spec: MIL-N-244; TT-N-350
Synonyms - Cellulose Nitrate, Pyrocellulose, Guncotton, Nitrocotton.
There are no approved packaging drawings. Packaging is covered in specification. See attached sheet for classification*.

* SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

DOD Hazard Class: See Attached Sheet	DOD Compatibility Group: See Attached Sheet
DOT Hazard Class: See Attached Sheet	DOT Container Marking: See Attached Sheet

Prepared by R. Batson *R. Batson*

ɔoncurred R. W. Snook *R.W. Snook*

Safety Office E. Demberg *[signature]*

Nitrocellulose

1. Nitrocellulose when dry is an explosive hazard that is extremely sensitive to shock, friction, heat and spark. NC when wet with solvent is a dangerous fire hazard. Water wet NC is less dangerous. Sensitivity data presented is for Nitrocellulose with 12.6% Nitrogen content.

2. Classification -

	In-Process & DARCOM Hazard Class	Compatibility Group
a. Nitrocellulose, Wet with Over 30% Water	None	None
8 - 30% Water, exposed to detonation hazards at less than intraline distance	1.1	D
8 - 30% water, exposed only to such fire hazard materials as other Class 1.3 items	1.3	D
Less than 8% water	1.1	Dry NC should not be stored

	Hazard Class	Container Marking
b. Nitrocellulose, Wet with 20% or more Water	Flammable Solid	Nitrocellulose, we with not less thar 20% water
30% of alcohol (or solvent)	Flammable Liquid	Nitrocellulose, we with not less thar 30% alcohol (or solvent)

c. See Title 46, CFR Parts 146.01-1 for shipment by vessel.

3. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METAL, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT. EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

4. Additional Sensitivity Data

a. Impact	PA Apparatus, in	Bureau of Mines, cm
12.6% N	5	8 (10% Point)
12.6% N	3	8
13.45% N	3	9
14.14% N	3	8

b. H_{50}(m)

	12 Tool	12B Tool
12% N	0.50	0.57

c. Electrostatic discharge (Highest Energy for Zero Probability Ignition)

	Unconfined	Confined
13.4% N	0.062	3.1
12.6% N	0.1238	

d. Explosion Temperature 5 Second

12.6% N	170°C	(338°F)	decomposes
12.6% N	170°C	(338°F)	"
13.45% N	230°C	(446°F)	

e. Flash Point, Closed Cup (12.6% N) 4°C (40°F)

f. Threshold Initiation Level (TIL)

(1) Impact (12.6% N) - 0.46×10^4 J/m^2

(2) Friction -

12.0% N	$3.28 \times 10^8/1.2$	N/m^2 @ m/sec
12.6% N	$1.57 \times 10^8/2.4$	" "
12.6% N	$4.69 \times 10^8/0.6$	" "
13.5% N	$3.07 \times 10^8/1.8$	" "
13.5% N	$3.28 \times 10^8/1.2$	" "

(3) ESD 12.6% 0.049 Joules

5. TNT Equivalency (%) At Scaled Distance

Distance		Pressure		Impulse	
ft/lb 1/3	m/kg 1/3	% (1)	% (2)	% (1)	% (2)
3.0	1.19	145	130	100	80
5.38	2.13	100	70	65	60
9.0	3.57	100	60	75	70
18.0	7.14	95	25	70	105
40	15.9	65	90	70	90

(1) Data for Scaled Storage Cans, Scaled Weigh Feeder Tubs & Standard Shipping Drums

(2) Data for Orthorhombic Test Fixture to simulate a section of the Thermal Dehydration Unit (TDU)

Ref - ARLCD-CR-81007 "TNT Equivalency of Bulk Nitrocellulose" 3 - 81

6. UN Ident & Hazard Class

UN Ident	Hazard Class	Remarks
0340	1.1D	Dry or wetted with less than 25% solvent or water.
0342	1.3C	Wetted with not less than 25% solvent
2555	4.1	Wetted with not less than 25% water

7. Sensitivity (Comparison Values)

a. Impact, PA Apparatus

Explosive	Inches
Lead Azide	4-5
TNT	14
RDX	8
Black Powder	16 (10% Point)

b. Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
TNT	Confined 4.4/unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/unconfined >12.5

HAZARDOUS COMPONENT SAFETY DATA STATEMENT (HCSDS)

1 DATE PREPARED (YYMMDD) 88 Oct 31	REPORT CONTROL SYMBOL MIL (AR) 1687	
2 MATERIAL/COMPONENT/ASSEMBLY Propellant, M6	3 NUMBER 371	4 REVISION E
5 APPLICABLE FEDERAL ACQUISITION REGULATION (FAR) SAFETY CLAUSE 28.7102		

PART I - SENSITIVITY *(Apparatus and Comparison Values)*

6 FRICTION TEST	7 IMPACT TEST	8 ELECTROSTATIC DISCHARGE TEST
PA Steel/Fiber = Unaffected	PA 4 Inches (Cotton) 3 Inches (Pulp)	Bureau of Mines > 11.03 Joules

PART II - HAZARDS

9 FIRE	10 AUTO IGNITION TEMP	11. FLASH POINT	12. DECOMPOSITION PRODUCTS
High	Unknown	NA	Toxic, Avoid Inhalation and Ingestion

13 FLAMMABLE AND/OR EXPLOSIVE LIMITS a LOWER PERCENT	b UPPER PERCENT	14. EXPLOSION	15. EXPLOSIVE TEMP. (5 Sec.)	16 DUSTS
NA	NA	Moderate	Unknown	***

17 HEALTH HAZARD INFORMATION *(Toxicity)*	18 UNPACKED *(In-Process)* HAZARD CLASS *(Specify Quantities Involved)*
Slight by inhalation and ingestion	Class ***

19 SPECIAL REQUIREMENTS *(If additional space is needed, use plain bond paper)*

Ref-Spec: MIL-STD-652, JAN-P-309, MIL-P-14940, MIL-P-46230, MIL-P-46484, MIL-P-48058, MIL-P-48231, MIL-P-48738, MIL-P-60359, MIL-P-60384, MIL-P-60417, MIL-P-60465, MIL-P-63404

Approved Packaging Drawings: 9381476, 9381477 (See Attached Sheet)

*** See Attached Sheet

PART III - SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

20 DOD HAZARD CLASS/DIV	21 DOD STORAGE COMPATIBILITY GROUP	22 DOT HAZARD CLASSIFICATION	23 DOT CONTAINER MARKING
***	C	***	***

	a TYPED OR PRINTED NAME	b SIGNATURE	c ORGANIZATION
24 PREPARED BY *(Initiator)*	R. W. BATSON	R.W. Batson	Safety Office, ARDEC
25 CONCURRED IN BY	R. W. SNOOK	R.W. Snook	Safety Office, ARDEC
26 SAFETY CHIEF OR AUTHORIZED REPRESENTATIVE	C. PETERS	C. Peters	Safety Office, ARDEC

The information relating to safety (herein referred to as "safety data") contained in this document is limited to those instances when the document is provided as a part of a procurement/production package which involves the development, testing, storage, manufacture, modification, renovation, demilitarization, packaging, transportation, handling, disposal, inspection, repair or any other use of the item, (material/component/assembly) which is specified in the contract. The safety data contained herein are examples which shall be used by the contractor to alert contractor personnel as well as other personnel of hazards associated with the procurement/production of the item. No representation is made that compliance with the information provided will prevent any accident to persons or property or that additional warnings may not be appropriate. Neither the foregoing nor any act or failure to act by the Government in regard to alerting personnel to the hazards of the item shall affect or relieve the contractor of responsibility for the safety of contractor personnel or property and for the safety of the general public in connection with the performance of the contract, or impose or add to any liability of the Government for such safety

DD Form 2357, APR 85

Propellant, M6

Spec: (See Attached Sheet f/ Additional Specs)

HCSDS: 371

Nitrocellulose

Spec: MIL-N-244

HCSDS: 31

(87%)

Potassium Nitrate

Spec: MIL-P-193

HCSDS: 773

(1% Added)

Dinitrotoluene

Spec: MIL-D-204

HCSDS: 439

(10%)

Diphenylamine

Spec: MIL-D-98

HCSDS: 408

(1% Added)

Dibutylphthalate

Spec: MIL-D-218

HCSDS: 482

(3%)

Special Requirements: (Con't)

1. Specifications and National Stock Numbers (NSN) associated with this HCSDS:

Specification	NSN	DOT Authorization**
MIL-STD-652	1376-01-129-4679	EX-8809141
	1376-01-129-4680	EX-8809141A
	1376-01-129-4681	EX-8809141B
	1376-01-129-8060	EX-8809141C
	1376-01-130-1974	EX-8809141G
JAN-P-309	-	
MIL-P-14940	1376-01-053-9372	EX-8809141I
MIL-P-46230	1376-01-053-9370	EX-8809141J
MIL-P-46484	1376-01-078-4062	EX-8809141D
MIL-P-48058	1376-01-218-9319	EX-8809141E
MIL-P-48231	1376-01-053-9362	EX-8809141K
MIL-P-48738	1376-01-063-8608	EX-8809141L
	1376-01-064-7316	EX-8809141H
MIL-P-60359	-	
MIL-P-60384	-	
MIL-P-60417	1376-00-451-2883	EX-8809141F
	1376-00-279-8760	EX-8809141M
MIL-P-60465	-	
MIL-P-63404	-	

2. The propellant is sensitive to impact and heat or flame. Precautions should be taken to prevent accidental exposure to these stimuli.

3. CAUTION: Explosives must be tested for compatibility with any material not specified in the production/procurement package with which they may come in contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compounds, floor and table coverings, packing materials and other similar materials, situations and equipment. Explosives include propellants and pyrotechnics.

4. Additional Sensitivity Data

Static Ignition Sensitivity of Dust

Particle Size (Microns)	Dust Films (Joules)	Dust Cloud (Joules)
149	0.072	0.090
74	0.022	0.055
53	0.019	0.006
43	0.010	0.005

(Ref: Indiana Arsenal Study No. PE-17, dtd 1 Feb 59)

5. TB 700-2 Tests were performed on M6 propellant packaged in Steel Container (Dwg: 9381476/9345265) and Fiber Container (Dwg: 9381477/9342857).

Classifications* are for shipment and storage when M6 propellant is packaged in accordance with packaging drawings or sections of 49 CFR as follows:

Definition: Section 173.88(f)
Packaging: Section 173.93
Marking: Section 172 Subpart D and Section 173.93(f) & (g)(1)
Labeling: Section 172 Subpart E (172.411) Explosive B Label

DOD Hazard Class/Div: 1.3
DOT Hazard Classification: Class B Explosive**
DOT Container Marking: Propellant Explosives (Solid), Class B (CK)**

Classifications are Tri-Service Coordinated

6. Classifications* are interim for shipment and storage of small or in-process quantities when M6 propellant is packaged in accordance with packaging drawings or sections of 49 CFR as follows:

Definition: Section 173.53(v)
Packaging: Section 173.64
Marking: Section 172 Subpart D and Section 173.64(f)
Labeling: Section 172 Subpart E (172.411) Explosive A Label

DOT Hazard Class/Div: 1.1
DOT Hazard Classification: Class A Explosive
DOT Container Marking: Propellant Explosive, Class A (CJ)

Dwg	Web Size Inches	Perf-oration	Container	Container Dwg
9282946	< 0.019	MP	M2	76-4-53
9282946	< 0.035	SP	M2	76-4-53
9282946	< 0.019	MP	MK7	138439
9282946	< 0.035	SP	MK7	138439

7. Classifications* are interim for shipment and storage of small or in-process quantities when M6 propellant is packaged in accordance with packaging drawings or sections of 49 CFR as follows:

Definition: Section 173.88(f)
Packaging: Section 173.93
Marking: Section 172 Subpart D and Section 173.93(f) & (g)(1)
Labeling: Section 172 Subpart E (172.411) Explosive B Label

DOD Hazard Class/Div: 1.3
DOT Hazard Classification: Class B Explosive
DOT Container Marking: Propellant Explosives (Solid), Class B (CK)

Dwg	Web Size Inches	Perf-oration	Container	Container Dwg
9282946	0.019	MP	MK7	138439
9282946	≥ 0.019	MP	M2	76-4-53
9282946	< 0.019	MP	M25	7549033
9282946	< 0.035	SP	M25	7549033
9282946	< 0.019	MP	Metal Lined Wooden Boxes	
9282946	< 0.035	SP	Metal Lined Wooden Boxes	
8858848	All configurations		M24	76-4-46
8858848	All configurations		M17	76-4-56
8858848	All configurations		PA54	9256486
8858577	< 0.019	MP	M25	7549033
8858577	≥ 0.019	MP	M25	7549033
8858577	< 0.035	SP	M25	7549033
-	All configurations		DOT 21C Container	

8. In-Process Hazard Classification
   a. Multi-perforated with web thickness exceeding 0.019 inches
      Class: 1.3

   b. Single perforated with web thickness not exceeding 0.035 inches and multi-perforated with web thickness not exceeding 0.019 inches.
      Class: 1.3 when ~~unconfined~~
      Class: 1.1 when confined

9. Sensitivity (Comparison Values):

a. Friction (Apparatus)

Explosive	PA Steel Shoe	Fiber Shoe
Lead Azide	Explodes	Explodes
PETN	Crackles	Unaffected
TNT	Unaffected	Unaffected
RDX	Explodes	Unaffected
Black Powder	Snaps	Unaffected
M1 Propellant	Unaffected	Unaffected
M9 Propellant	Snaps	Unaffected
M30 Propellant	Unaffected	Unaffected

b. Impact (Apparatus)

Explosive	PA inches	Bureau of Mines, cm	ERL,(PA Version) Type 12, 50%,cm
Lead Azide	4-5	10-17	-
PETN	6	17	<12
TNT	14	95-100+	80
RDX	8	32	23
Black Powder	16	32	229
M1 Propellant	6 (Grain)	-	-
	4 (Powder)	-	
M9 Propellant	2-3	-	-
M30 Propellant	4	-	16.2

c. Electrostatic Discharge, Bureau of Mines Apparatus:

Explosive	Joules
Lead Azide	0.007
PETN	Confined 0.21/Unconfined 0.06
TNT	Confined 4.4/ Unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/ Unconfined >12.5
M1 Propellant	11.03
M9 Propellant	5.2
M30 Propellant	>12.5

10. Radford Test Values

a. Impact: Material exposed to impact energy of a falling weight. Results measured and expressed as joules per square meter of contact. (Ref- Radford Rpt 100.10, dated Sep 76)

Threshold Initiation Level (TIL)

Material	Condition	Energy, N/m^2
M6 Propellant	Dry, Fines	$22x10^4$
Lead Azide	Dry, Solid	$2.2x10^4$
TNT	Dry, Solid	$6.7x10^4$
RDX	Dry, Solid	$2.7x10^4$
Black Powder	Granules	$5.4x10^4$
M1 Propellant	Flake	$1.4x10^4$
M9 Propellant	Flake	$1.7x10^4$
M30 Propellant	Fines	$2.2x10^4$

b. Friction: Material exposed to friction generated between stationary wheel and sliding surface (anvil). Results are expressed as newtons per square meter of contact surface at anvil speed used for test (Ref- Radford Rpt 100.10, dated Sep 76)

Theshold Initiation Level (TIL)

Material	Condition	Nm^2 @ m/sec
M6 Propellant	Dry, Fines	$3.91x10^8/2.4$
Lead Azide	Dry, Solid	$3.05x10^8/2.4$
TNT	Dry, Solid	$4.87x10^8/2.4$
RDX	Dry, Solid	$3.59x10^8/2.4$
Black Powder	Granules	$>12.2x10^8/2.4$
M1 Propellant	Flake	$4.15x10^8/2.4$
M9 Propellant	Flake	$2.34x10^8/2.4$
M30 Propellant	Fines	$5.71x10^8/2.4$

c. Electrostatic: Material exposed to energy stored in a charged capacitor. Results are expressed in joules as the minimum initiation level (Ref- Radford Rpt 100.10, dated sep 76)

Material	Condition	Energy,Joules
M6 Propellant	Dry, Fines	0.010
Lead Azide	Dry,Solid	0.0028
TNT	Dry,Solid	0.5
RDX	Dry,Solid	0.5
Black Powder	Granules	0.53
M1 Propellant	Flake	1.26
M9 Propellant	Flake	>5.0
M30 Propellant	Fines	0.26

HAZARDOUS COMPONENT SAFETY DATA STATEMENT (HCSDS)

1 DATE PREPARED (YYMMDD)	87 Jul 10
REPORT CONTROL SYMBOL	MIL (AR) 1687
2 MATERIAL/COMPONENT/ASSEMBLY	Propellant, M1
3 NUMBER	447
4 REVISION	D
5 APPLICABLE FEDERAL ACQUISITION REGULATION (FAR) SAFETY CLAUSE	28.7102

PART I - SENSITIVITY *(Apparatus and Comparison Values)*

6 FRICTION TEST	7 IMPACT TEST	8. ELECTROSTATIC DISCHARGE TEST
PA Steel/Fiber Unaffected	PA 6 Inches (Grain) 4 Inches (Powder)	Bureau of Mines 11.03 Joules

PART II - HAZARDS

9 FIRE	10. AUTO IGNITION TEMP	11. FLASH POINT	12. DECOMPOSITION PRODUCTS
High	183°C (361°F)	NA	Toxic, Avoid Inhalation and Ingestion

13 FLAMMABLE AND/OR EXPLOSIVE LIMITS a LOWER PERCENT	b. UPPER PERCENT	14. EXPLOSION	15. EXPLOSIVE TEMP. (5 Sec.)	16 DUSTS
NA	NA	Moderate	**	***

17 HEALTH HAZARD INFORMATION *(Toxicity)*	18 UNPACKED *(In-Process)* HAZARD CLASS *(Specify Quantities Involved)*
Moderate by inhalation and ingestion	***

19 SPECIAL REQUIREMENTS *(If additional space is needed, use plain bond paper)*

Ref-Spec: MIL-STD-652, MIL-P-46252, MIL-P-46698, MIL-P-46699, MIL-P-48154, MIL-P-48759, MIL-P-60318, MIL-P-60397, MIL-P-60416

**Explosive Temperature: 263°C (505°F)

***See Attached Sheet

Approved Packaging Drawings: 9381476, 9381477 (See Attached Sheet)

****Propellant Explosives (Solid), Class B (***See Attached Sheet)

PART III - SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

20 DOD HAZARD CLASS/DIV	21 DOD STORAGE COMPATIBILITY GROUP	22 DOT HAZARD CLASSIFICATION	23 DOT CONTAINER MARKING
1.3***	C	Class B Explosive***	CK****

	a TYPED OR PRINTED NAME	b SIGNATURE	c ORGANIZATION
24 PREPARED BY *(Initiator)*	R. W. BATSON	R. W. Batson	Safety Office, ARDEC
25 CONCURRED IN BY	R. W. SNOOK	R.W. Snook	Safety Office, ARDEC
26 SAFETY CHIEF OR AUTHORIZED REPRESENTATIVE	C. PETERS	Clarence Glover	Safety Office, ARDEC

The information relating to safety (herein referred to as "safety data") contained in this document is limited to those instances when the document is provided as a part of a procurement/production package which involves the development, testing, storage, manufacture, modification, renovation, demilitarization, packaging, transportation, handling, disposal, inspection, repair or any other use of the item, (material/component/assembly) which is specified in the contract. The safety data contained herein are examples which shall be used by the contractor to alert contractor personnel as well as other personnel of hazards associated with the procurement/production of the item. No representation is made that compliance with the information provided will prevent any accident to persons or property or that additional warnings may not be appropriate. Neither the foregoing nor any act or failure to act by the Government in regard to alerting personnel to the hazards of the item shall affect or relieve the contractor of responsibility for the safety of contractor personnel or property and for the safety of the general public in connection with the performance of the contract, or impose or add to any liability of the Government for such safety

447
D
10 Jul 87

Propellant, M1

Spec: MIL-STD-652 (See Attached Sheet f/additional Spec)

HCSDS: 447

Nitrocellulose

Spec: MIL-N-244

HCSDS: 31

(85%)

Dinitrotoluene

Spec: MIL-D-204

HCSDS: 439

(10%)

Dibutylphthalate

Spec: MIL-D-218

HCSDS: 482

(5%)

Potassium Sulfate

Spec: MIL-P-193

HCSDS: 773

(Added 1%)

Lead Carbonate

Spec: MIL-L-18618

(Added 1%)

Diphenylamine

Spec: MIL-D-98

HCSDS: 408

(Added 1%)

1. Specification and National Stock Numbers associated with this HCSDS:

National Stock Numbers (NSN):

NSN		Spec
1376-00-871-2829		MIL-STD-652
(DODIC: CX59	UN Ident: 0161)	
1376-01-129-4682		MIL-STD-652
1376-01-129-4683		MIL-STD-652
1376-01-129-8061		MIL-STD-652
1376-01-053-9360		MIL-P-46252
1376-01-055-8597		MIL-P-46698
1376-01-053-9358		MIL-P-46699
1376-01-068-5087		MIL-P-48154
1376-01-056-0768		MIL-P-48759
1376-00-009-0041		MIL-P-60318
1376-00-009-0042		MIL-P-60318
1376-01-055-3436		MIL-P-60318
1376-01-054-1577		MIL-P-60397
1376-00-451-2881		MIL-P-60416
1376-01-063-0140		MIL-P-60416

2. CAUTION: Explosives must be tested for compatibility with any material not specified in the production/procurement package with which they may come in contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compounds, floor and table coverings, packing materials and other similar materials, situations and equipment. Explosives include propellants and pyrotechnics.

3. Additional Sensitivity Data

a. Impact

Radford test apparatus. Material exposed to impact energy of a falling weight. Results measured and expressed as joules per square meter of contact. (Ref- Radford Rpt 100.10, dated Sep 76)

Threshold Initiation Level (TIL)

Condition	Energy, (j/m^2)
Finished, Flake	1.4×10^4
Finished, Granule	3.5×10^4
	4.3×10^4
	$\cancel{12.9} \times 10^4$
	13.4×10^4

b. Friction

Radford test apparatus. Material exposed to friction generated between stationary wheel and sliding surface (anvil). Results are expressed as newtons per square meter of contact surface at anvil speed used for test (Ref→ Radford Rpt 100.10, dated Sep 76)

Theshold Initiation Level (TIL)

Condition	Nm^2 @ m/se
Finished, Flake	$4.15 \times 10^8/2.4$

c. Electrostatic

Radford ESD test apparatus. Material exposed to energy stored in a charged capacitor. Results are expressed in joule as the minimum initiation level (Ref→ Radford Rpt 100.10, dated Sep 76)

1.26 Joules	Condition → Finished, Flake
$\leq$ 5.0 Joules	Condition → Finished, Granule

4. TNT Equivaleny (Percent)

		Scaled Distance ($ft/lb^{1/3}$)					
		3		9		18	
Perforated	Configuration	P*	I*	P	I	P	I
Single	Shipping Drum	220	165	85	75	65	65
	Open Hoppers	40	40	80	65	50	60
	Closed Hoppers	120	110	85	75	95	95
Multiple	Shipping Drum	160	110	60	65	55	65
	Open Hoppers	20	20	60	55	60	60
	Closed Hoppers	60	65	55	60	60	60

*Note P = Pressure I = Impulse

(Ref - MPBMA OSM 385-1, System Safety Program for Modernization and Expansion Projects, 5-80)

5. In Process Hazard Classification

(a) Multi-perforated with web thickness exceeding 0.019 inch

Class 1.3

(b) Single perforated with web thickness not exceeding 0.035 inch and multi-perforated with web thickness not exceeding 0.019 inch

Class 1.3 when unconfined

Class 1.1 when confined

6. Safe Separation Distance

Test Condition	Distance Meter	Distance Feet
68 Kg (150 lb) Drums	4.6	15.1

(Ref- ARLCD-CR-79007, Hazard Classification Testing of M10 and M1 Propellants Used in 81mm, 155mm and 8 Inch Ammunition, 6-79)

7. Dust Explosibility:

Particle Size (microns)	Dust Film Energy Joules	Dust Film Man- Equivalent Voltage	Dust Cloud Energy Joules	Dust Cloud Man- Equilalent Voltage
149	0.2250	38,730	0.1620	32,860
74	0.0841	23,750	0.1320	29,760
47	0.0529	18,840	0.0563	19,370
37	0.0265	13,280	0.0176	10,840

(Ref- Indiana Arsenal Study No. PE-17, Improvements In Single Base Propellant Manufacture, Vol III, 2-59)

8. Classifications* are interim for shipment and storage of small or in-process quantities when propellant is packaged in accordance with packaging drawings 9381476 and 9381477 or section of 49 CFR as follows:

Definition: Section 173.88(f)
Packaging: Section 173.93
Marking: Section 172 Subpart D and Section 173.93(f) & (g)(1)
Labeling: Section 172 Subpart E (172.411) Explosive B Label

9. Classifications* are interim for shipment and storage of small or in-process quantities when propellant is packaged in M17, M24 or PA-54 containers, in accordance with packaging drawing 8858848 or packaged in M2 (MP web greater than 0.019 inch) or M25 containers, in accordance with packaging drawings 8858577 and 9282946 or Sections of 49 CFR as follows:

Definition: Section 173.88(f)
Packaging: Section 173.93
Marking: Section 172 Subpart D and Section 173.93(f) & (g)(1)
Labeling: Section 172 Subpart E (172.411) Explosive B Label

10. Classifications are interim for shipment and storage of small or in-process quantities when propellant is packaged in M2 container (MP-Web 0.019 inch or less and SP-Web 0.035 inch or less), in accordance with packaging drawing 9282946 or Sections of 49 CFR as follows:

Definition: Section 173.53(v)
Packaging: Section 173.64
Marking: Section 172 Subpart d and Section 173.64(f)
Labeling: Section 172 Subpart D (172.411) Explosive A Label

DOD Hazard Class/Div - 1.1
DOD Hazard Classification - Class A Explosive
DOT Container Marking - Propellant Explosive, Class A (CJ)

11. Sensitivity (Comparison Values):

a. Friction (Apparatus)

Explosive	PA	
	Steel Shoe	Fiber Shoe
Lead Azide	Explodes	Explodes
PETN	Crackles	Unaffected
TNT	Unaffected	Unaffected
RDX	Explodes	Unaffected
Black Powder	Snaps	Unaffected
M9 Propellant	Snaps	Unaffected
M30 Propellant	Unaffected	Unaffected

b. Impact (Apparatus)

Explosive	PA inches	Bureau of Mines, cm	ERL, (PA Version) Type 12, 50%, cm
Lead Azide	4-5	10-17	-
PETN	6	17	<12
TNT	14	95-100+	80
RDX	8	32	23
Black Powder	16	32	-
M9 Propellant	2-3	-	-
M30 Propellant	4	+	16.2

c. Electrostatic Discharge, Bureau of Mines Apparatus:

Explosive	Joules
Lead Azide	0.007
PETN	Confined 0.21/Unconfined 0.06
TNT	Confined 4.4/ Unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/ Unconfined >12.5
M9 Propellant	5.2
M30 Propellant	>12.5

HAZARDOUS COMPONENT SAFETY DATA SHEET

(ARRADCOM Suppl 1 to DARCOMR 385-17)

Date	17 Jun 83
Number	33
Revision	D

Material/Component/Assembly
TNT (Trinitrotoluene)

Applicable DAR Safety Clause 7-104.79

SENSITIVITY

Friction Test (Apparatus & Comparison Values) PA Steel/Fiber - Unaffected

Impact Test (Apparatus & Comparison Values) PA 14 Inches

Electrostatic Discharge Test (Apparatus & Comparison Values) See Attached Sheet

HAZARDS

Fire
Moderate

Auto Ignition Temp $240^{o}C$ ($464^{o}F$)	Flash Point NA

Decomposition Products Toxic, Avoid Ingestion and Inhalation

Flammable Limits NA	Lower Percent	Upper Percent

Explosion
High

Explosive Temp (5 sec) Decomposes $475^{o}C$ ($887^{o}F$)	Dusts See Attached Sheet

Toxicity Highly toxic when inhaled or ingested.

In-Process Hazards Classification Class 1.1

Special Requirements (Continuation Sheets Authorized)

Ref Spec: MIL-T-248
Approved packaging drawings - 7548644, 7548645 and 9257923.*
8 hour time weight average (Skin) 0.5 mg/m^3
15 minute short term exposure limit - (Skin) 3 mg/m^3
UN Ident - 0209   UN Hazard Class - 1.1D
NSN
1376-00-628-3333
1376-00-672-0265
1376-01-047-0560

* SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

DOD Hazard Class 1.1	DOD Compatibility Group D
DOT Hazard Class Class A Explosive	DOT Container Marking High Explosive - Dangerous

Prepared by	R. Batson	R. Batson
Concurred	R. W. Snook	R.W. Snook
Safety Office	E. Demberg	[illegible]

TNT

1. TNT is a powerful explosive, sensitive to strong shock and high temperatures. The hazard to explosion is increased with higher temperatures or increased confinement. Cast TNT is more sensitive to shock than the pressed form. TNT is one of the most stable of the high explosives. It starts gaseous decomposition at 160°C.

2. TNT has a flammability index of 100. Small amounts of TNT will burn if not confined. Combustion of large quantities may proceed vigorously or even cause detonation.

3. To prevent skin and eye contact, inhalation and ingestion, personal protective clothing and eye protection should be provided. Personal cleanliness should be enforced. Indicator soaps are valuable to insure complete removal of TNT from skin. TNT operations that are dusty or in a confined area should have a ventilation system and/or respirators depending on the length of exposure and amount of dust or fumes generated.

4. Present NATO specification - STANAG 4025 "Specification for TNT (Tolite) for Deliveries from one NATO Nation to Another" in draft status as of 8/82.

5. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METALS, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT, EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

6. HAZARD CLASSIFICATION TESTS (TB700-2) (Ref-SMUPA-V (Temp) 2019 Jun 70)

a. Detonation Test - samples exploded (mushrooming 0.868 inches)

b. Ignition and Unconfined Burning Test - No explosions, samples burned. Average burning time - greater than 120 seconds.

c. Thermal Stability Test - No explosions, ignition or change in configuration

d. Card Gap Test - 162 cards (Produced hole in plate).

e. Impact Sensitivity Test - No explosions, flame or noise in 10 trials each at 3 3/4 and 10 inches.

7. Impact Sensitivity Test (TB700-2)

		NO OF TRIALS EXHIBITING		
Height, in	Sample Weight, mg	Explosion	Decomposition	No Reaction
3 3/4	20	0	0	10
	30	0	0	10
	40	0	0	10
	50	0	0	10

Heighting	Sample Weight, mg	NO OF TRIALS EXHIBITING Explosion	Decomposition	No Reaction
7	20	0	0	10
	30	0	0	10
	40	0	0	10
	50	0	0	10
10	20	0	0	10
	30	0	0	10
	40	0	0	10
	50	0	0	10
15	20	0	0	10
	30	0	0	10
	40	0	0	10
	50	0	0	10

8. Impact Sensitivity

a. Bureau of Mines - 95-100 + cm.

b. H_{50} Bare Tool using 2 kg weight

20 kg Sample (No Vacuum) - 102 cm (Multiple Crystal)

20 kg Sample (No Vacuum) - 53 cm (Single Crystal)

c. H_{50}(m)

	12 Tool	12B Tool
5 kg	0.80	>1.77
2.5 kg	1.48	~1.00

d. Sensitivity Versus Temperature
PA Apparatus, 2 kg Weight

°C (°F)	Inches
-40 (-40)	17
Room	14
80 (176)	7
90 (194)	3
105-110 (221-230)	2 (5 Explosions/20 Trials)

9. Electrostatic Sensitivity

a. Through 100 mesh

Unconfined 0.06 Joules
Confined 4.4 Joules

b. Bureau of Mines - 0.062 Joules

c. Through 100 Mesh

Unconfined 0.062 Joules
Confined 4.38 Joules

d. As Received

Unconfined >11.0 Joules
Confined 4.88 Joules

10. Explosion Temperatures

Seconds	°C (°F)
1	520 (968)
10	465 (869)

11. Dust Explosibility (Air)/Thin Layer Propagation

(Ref- Radford AAP, Prod. Engr. Proj. PE-489, Sept. 1976)

			DUST EXPLOSIBILITY (AIR)	
Material	Physical Condition	Partial Size, M	Min Conf g/m^3	Min Energy, Joules
TNT	Dry	< 840	70	0.075
HMX	Fines, Dry	< 53	470	0.02
HMX	Fines, Dry	-	≥ 810	≥ 5.0

12. Gap Sensitivity

(Ref - NOLTR 65-177)

		GAP SENSITIVITY, 50% POINT	
Material	Density, g/cc	Cards	Press, K bar
TNT	1.60	183	21
	1.49	208	16
Tetryl	1.62	261	10
	1.49	283	9
RDX	1.64	284	9
	1.53	336	7

13. Susan Test*

Threshold velocity ~235 ft/sec (~72 m/s); very difficult to ignite accidentally, and has very low probability of buildup to violent reaction.

14. Detonation Rate (Density 1.56 gm/cc)
    Pressed - 6825 meters/second
    Cast - 6640 meters/second

15. Conveyor Spacing Test

A 38-mm (1.5-in) depth of bulk TNT explosive on a 0.61-metre (24-inch) wide commercially available Serpentix (corrugated) rubber belt conveyor with a separation of 25 mm (1.0 in) between conveyor troughs, will prevent propagation of a high-order explosion along the entire conveyor system.

Ref - ARRADCOM
Large Caliber Weapon Systems Laboratory
Dover, NJ 07801
Technical Report ARLCD-TR-78003

16. Skid Test

    Impact angle (deg (rad)) - 14 (0.24)

    Drop, HT (ft (m)) - 10.0 (3.05)

    Event - 2

17. Gap Test

    a. Small Scale (mils (mm))

    8-16 (0.20 - 0.41) - Lawrence Livermor Rpt UCRL - 51319

    (3.96) - NWSC

    (0.33) - LANL

    b. Large Scale (mils(mm))

    1.944 (49.4) - LANL

18. Sensitivity (Comparison Values)

    a. Impact, PA Apparatus

Explosive	Inches
Lead Azide	4-5
RDX	8
Black Powder	16 (10% Point)

    b. Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
RDX	> 11.03
Black Powder	Confined 0.8/unconfined > 12.5

HAZARDOUS SUBSTANCES DATABANK NUMBER	1146
LAST REVISION DATE	850429
UPDATE HISTORY	Express Update on 05/10/86, 2 fields added/edited.
UPDATE HISTORY	Complete Update on 05/02/85
RECORD LENGTH	40492
NAME OF SUBSTANCE	2,4,6-TRINITROTOLUENE
CAS REGISTRY NUMBER	118-96-7
SYNONYMS	1-METHYL-2,4,6-TRINITROBENZENE **PEER REVIEWED**
SYNONYMS	2,4,6-TRINITROTOLUEEN (DUTCH) **PEER REVIEWED**
SYNONYMS	2,4,6-TRINITROTOLUOL (GERMAN) **PEER REVIEWED**
SYNONYMS	2-METHYL-1,3,5-TRINITROBENZENE **PEER REVIEWED**
SYNONYMS	ALPHA-TNT **PEER REVIEWED**
SYNONYMS	ALPHA-TRINITROTOLUOL **PEER REVIEWED**
SYNONYMS	BENZENE, 2-METHYL-1,3,5-TRINITRO- **PEER REVIEWED**
SYNONYMS	ENTSUFON **PEER REVIEWED**
SYNONYMS	NCI-C56155 **PEER REVIEWED**
SYNONYMS	S-TRINITROTOLUENE **PEER REVIEWED**
SYNONYMS	S-TRINITROTOLUOL **PEER REVIEWED**
SYNONYMS	SYM-TRINITROTOLUENE **PEER REVIEWED**
SYNONYMS	SYM-TRINITROTOLUOL **PEER REVIEWED**
SYNONYMS	TNT **PEER REVIEWED**
SYNONYMS	TNT-TOLITE (FRENCH) **PEER REVIEWED**
SYNONYMS	TOLIT **PEER REVIEWED**
SYNONYMS	TOLITE **PEER REVIEWED**
SYNONYMS	TOLUENE, 2,4,6-TRINITRO- **PEER REVIEWED**
SYNONYMS	TRILIT **PEER REVIEWED**
SYNONYMS	TRINITROTOLUENE **PEER REVIEWED**
SYNONYMS	TRITOL **PEER REVIEWED**
SYNONYMS	TRITON **PEER REVIEWED**
SYNONYMS	TROJNITROTOLUEN (POLISH) **PEER REVIEWED**
SYNONYMS	TROTYL **PEER REVIEWED**
SYNONYMS	TROTYL OIL **PEER REVIEWED**
MOLECULAR FORMULA	C7-H5-N3-O6 **PEER REVIEWED**
WISWESSER LINE NOTATION	WNR B1 CNW ENW; WNR BQ CNW ENW /Wet, containing at least 10% water/ **QC REVIEWED**
RTECS NUMBER	NIOSH/XU0175000
OHM-TADS NUMBER	7217371
SHIPPING NAME/NUMBER - DOT/UN/NA/IMCO	Trinitrotoluene, dry or containing, by wt, less than 30% water; Trinitrotoluene, wet containing at least 10% water; Trinitrotoluene, wetted with not less than 30% water; UN 0209; UN 1356
METHODS OF MANUFACTURING	NITRATION OF TOLUENE WITH MIXED ACID [SRI] **PEER REVIEWED**

HAZARDOUS COMPONENT SAFETY DATA SHEET
(ARRADCOM Suppl 1 to DARCOMR 385-17)

Date	31 July 19
Number	
Revision	

Material/Component/Assembly
Explosive RDX

Applicable ASPR Safety Clause 7-104.79

SENSITIVITY

Friction Test (Apparatus & Comparison Values) PA Fiber Shoe - Unaffected;Steel Shoe - Ex

Impact Test (Apparatus & Comparison Values) PA 8 Inches

Electrostatic Discharge Test (Apparatus & Comparison Values) B of M 11.03 Joules

HAZARDS

Fire High

Auto Ignition Temp 197°C (387°F) | Flash Point NA

Decomposition Products Toxic. Avoid Inhalation & Ingestion.

Flammable Limits NA | Lower Percent | Upper Percent

Explosion High

Explosive Temp (5 sec) 260°C (500°F) 5 sec
340°C (644°F) 1 sec | Dusts NA

Toxicity Low Toxicity by Ingestion & Inhalation. TLV (Skin) - 1.5mg/M^3

In-Process Hazards Classification 1.1

Special Requirements (Continuation Sheets Authorized)

Ref SPEC: MIL-R-398
Chemical Names - Cyclotrimethylenetrinitramine; Cyclonite; 1,3,5 - Trinitro - 1,3
Triazacyclohexane
There is no approved packaging drawings. Packaging is covered in specification.
powder should only be shipped wet or desensitized IAW specification or sections c
CFR as follows:

Packaging - Section 173.65(b)(e)(i)
Marking - Section 172 Subpart D & 173.65(j)
Labeling - Section 172 Subpart E (172.411)

SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

DOD Hazard Class 1.1	DOD Compatibility Group D (Wet) A (Dry
DOT Hazard Class Class A Explosive	DOT Container Marking High Explosive - Dangerous

Prepared by E. Demberg

Concurred J. E. Elliott

Safety Office R. A. Walterschied

ARRADCOM FORM 29, 1 MAY 79

1. RDX is one of the most powerful high explosives used today and is more sensitive to percussion, shock and friction than TNT. RDX has a detonation velocity - 8180 m/sec. Dry RDX can hold a large electrostatic charge; therefore, it is important for all equipment to be grounded.

2. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METALS, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT, EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

3. Sensitivity (Comparison Values)

a. Impact, PA apparatus

Explosive	Inches
Lead Azide	4-5
TNT	14
RDX	8
Black Powder	16 (10% Point)

b. Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
TNT	Confined 4.4/unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/unconfined >12.5

4. Additional Sensitivity Data - Impact(CM)H_{50} (Lawrence Livermore National Laboratories apparatus)

	5KG	2.5KG	
	12 Tool	12 Tool	12B Tool
PETN	0.11	0.13-0.16	0.14-0.26
RDX	0.28	0.28	0.32
TNT	0.80	1.48	~ 1.00

MATERIAL SAFETY DATA SHEET

'igma-Aldrich Corporation
01 West Saint Paul Ave, Milwaukee, WI 53233 USA

ıpril 1990 version

		Sigma	Aldrich
'or Emergency Contact	USA/Canada	800-325-5832	800-231-8327
	Outside USA/Canada	314-771-5765	414-273-3850

ıâ@@@@@@@@@@@@@@@@@@@@@@@@@@@@IDENTIFICATION@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

PRODUCT #: D6379 NAME: M-DINITROBENZENE
CAS #: 99-65-0
MF: C6H4N2O4

;YNONYMS
BENZENE, 1,3-DINITRO- * BINITROBENZENE * M-DINITROBENZENE * 1,3-DINITROBENZENE * 2,4-DINITROBENZENE * M-DINITROBENZENE (ACGIH,DOT, OSHA) * 1,3-DINITROBENZOL * DWUNITROBENZEN (POLISH) * UN 1597 (DOT) *

------------------ TOXICITY HAZARDS -------------------

RTECS NO: CZ7350000
BENZENE, M-DINITRO-

:OXICITY DATA

ORL-HMN LDLO:28 MG/KG	34ZIAG -,226,69
ORL-RAT LD50:83 MG/KG	NTIS** AD-A066-307
IPR-RAT LD50:28 MG/KG	AEPPAE 207,446,49
IVN-DOG LD50:10 MG/KG	NTIS** AD-A066-307
ORL-BWD LD50:42 MG/KG	TXAPA9 21,315,72

ŁEVIEWS, STANDARDS, AND REGULATIONS
ACGIH TLV-TWA 0.15 PPM (SKIN) 85INA8 5,214,86
MSHA STANDARD-AIR:TWA 0.15 PPM (1 MG/M3) (SKIN) DTLVS* 3,92,71
OSHA PEL:8H TWA 1 MG/M3 (SKIN) FEREAC 54,2923,89
OSHA PEL FINAL:8H TWA 1 MG/M3 (SKIN) FEREAC 54,2923,89

EPA GENETOX PROGRAM 1988, POSITIVE: HISTIDINE REVERSION-AMES TEST
EPA TSCA CHEMICAL INVENTORY, 1986
MEETS CRITERIA FOR PROPOSED OSHA MEDICAL RECORDS RULE FEREAC 47,30420, 82

ET ORGAN DATA

BEHAVIORAL (CHANGE IN MOTOR ACTIVITY)
LUNGS, THORAX OR RESPIRATION (CYANOSIS)
PATERNAL EFFECTS (SPERMATOGENESIS)
PATERNAL EFFECTS (TESTES, EPIDIDYMIS, SPERM DUCT)
MATERNAL EFFECTS (OVARIES, FALLOPIAN TUBES)
EFFECTS ON FERTILITY (MALE FERTILITY INDEX)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

----------------- HEALTH HAZARD DATA -----------------

CUTE EFFECTS

MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN.
MAY CAUSE IRRITATION.
ABSORPTION INTO THE BODY LEADS TO THE FORMATION OF METHEMOGLOBIN WHICH IN SUFFICIENT CONCENTRATION CAUSES CYANOSIS. ONSET MAY BE DELAYED 2 TO 4 HOURS OR LONGER.
SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND VOMITING.

CHRONIC EFFECTS

LABORATORY EXPERIMENTS HAVE SHOWN MUTAGENIC EFFECTS.

IRST AID

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS WITH FINGERS.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL A PHYSICIAN.
DISCARD CONTAMINATED CLOTHING AND SHOES.

-------------------- PHYSICAL DATA --------------------

BOILING PT: 297 C
MELTING PT: 88 C TO 90 C
SPECIFIC GRAVITY: 1.368

APPEARANCE AND ODOR

ORANGE POWDER

------------ FIRE AND EXPLOSION HAZARD DATA -----------

XTINGUISHING MEDIA

WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.

SPECIAL FIREFIGHTING PROCEDURES

WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

JNUSUAL FIRE AND EXPLOSIONS HAZARDS

THIS MATERIAL, LIKE MOST MATERIALS IN POWDER FORM, IS CAPABLE OF CREATING A DUST EXPLOSION.
MAY EXPLODE WHEN HEATED.
MAY BE SHOCK-SENSITIVE.
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

------------------- REACTIVITY DATA -------------------

NCOMPATIBILITIES
OXIDIZING AGENTS
REDUCING AGENTS
STRONG BASES
AZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, AND NITROGEN OXIDES.

--------------- SPILL OR LEAK PROCEDURES --------------

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
ASTE DISPOSAL METHOD
THE MATERIAL SHOULD BE IGNITED IN THE PRESENCE OF SODIUM CARBONATE AND SLAKED LIME (CALCIUM HYDROXIDE). THE SUBSTANCE SHOULD BE MIXED WITH VERMICULITE AND THEN WITH THE DRY CAUSTICS, WRAPPED IN PAPER AND BURNED IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.

--- PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE ---

CHEMICAL SAFETY GOGGLES.
WEAR HEAVY RUBBER GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
USE ONLY IN A CHEMICAL FUME HOOD.
RUBBER APRON.
DO NOT BREATHE DUST.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
READILY ABSORBED THROUGH SKIN.
WASH THOROUGHLY AFTER HANDLING.
HIGHLY TOXIC.
POSSIBLE MUTAGEN.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

L

HAZARDOUS COMPONENT SAFETY DATA STATEMENT (HCSDS)

HAZARDOUS COMPONENT SAFETY DATA STATEMENT (HCSDS)	1 DATE PREPARED (YYMMDD) 87 Jul 15	REPORT CONTROL SYMBOL MIL (AR) 1687
2 MATERIAL/COMPONENT/ASSEMBLY Nitroguanidine	3 NUMBER 491	4 REVISION E

5 APPLICABLE FEDERAL ACQUISITION REGULATION (FAR) SAFETY CLAUSE: 28.7102

PART I - SENSITIVITY *(Apparatus and Comparison Values)*

6 FRICTION TEST	7 IMPACT TEST	8. ELECTROSTATIC DISCHARGE TEST
PA Steel/Fiber = Unaffected	PA 26 Inches	20/20 no go @ 0.26 Joules

PART II - HAZARDS

9 FIRE	10 AUTO IGNITION TEMP	11. FLASH POINT	12. DECOMPOSITION PRODUCTS
High	215°C (419°F)	NA	Toxic, Avoid Inhalation and Ingestion

13 FLAMMABLE AND/OR EXPLOSIVE LIMITS a LOWER PERCENT	b. UPPER PERCENT	14. EXPLOSION	15. EXPLOSIVE TEMP. (5 Sec.)	16. DUSTS
NA	NA	High	**	**

17 HEALTH HAZARD INFORMATION (Toxicity)	18 UNPACKED (In-Process) HAZARD CLASS (Specify Quantities Involved)
Slight by ingestion and absorption	Class 1.1

19 SPECIAL REQUIREMENTS *(If additional space is needed, use plain bond paper)*

Ref-Spec: MIL-N-494

There are no approved packaging drawings (See Attached Sheet)

** See Attached Sheet

NSN: 1376-00-620-8329; 1376-01-066-4977; 1376-01-096-9978

DODIC: MOOO

PART III - SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

20 DOD HAZARD CLASS/DIV	21 DOD STORAGE COMPATIBILITY GROUP	22. DOT HAZARD CLASSIFICATION	23. DOT CONTAINER MARKING
1.1	D	See Attached Sheet	See Attached Sheet

	a TYPED OR PRINTED NAME	b SIGNATURE	c. ORGANIZATION
24 PREPARED BY (Initiator)	R. W. BATSON	R.W. Batson	Safety Office, ARDEC
25 CONCURRED IN BY	R. W. SNOOK	R.W. Snook	Safety Office, ARDEC
26 SAFETY CHIEF OR AUTHORIZED REPRESENTATIVE	C. PETERS	C. Peters	Safety Office, ARDEC

The information relating to safety (herein referred to as "safety data") contained in this document is limited to those instances when the document is provided as a part of a procurement/production package which involves the development, testing, storage, manufacture, modification, renovation, demilitarization, packaging, transportation, handling, disposal, inspection, repair or any other use of the item, (material/component/assembly) which is specified in the contract. The safety data contained herein are examples which shall be used by the contractor to alert contractor personnel as well as other personnel of hazards associated with the procurement/production of the item. No representation is made that compliance with the information provided will prevent any accident to persons or property or that additional warnings may not be appropriate. Neither the foregoing nor any act or failure to act by the Government in regard to alerting personnel to the hazards of the item shall affect or relieve the contractor of responsibility for the safety of contractor personnel or property and for the safety of the general public in connection with the performance of the contract, or impose or add to any liability of the Government for such safety.

1. Nitroguanidine is known as a flashless or cool explosive. It is sensitive to heat or flame, shock, electrostatic discharge and by chemical reaction with oxidizers. Precautions should be taken to prevent accidental exposure to these stimuli.

2. CAUTION: Explosives must be tested for compatibility with any material not specified in the production/procurement package with which they may come in contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compounds, floor and table coverings, packing materials and other similar materials, situations and equipment. Explosives include propellants and pyrotechnics.

3. Hazards (Cont)

   a. Explosive Temperature:5 second value= Decomposes 275°C (527°F)

   b. Dust explosibility:

      Minimum Concentration, oz/ft^3= $\geq$ 4.1

      Minimum Energy, Joules= $\geq$ 7.2

      Ignition Temperature, °C(°F)= 560(1040)

4. Additional Sensitivity Data

   a. Impact $ Test condition, steel/steel(TIL)*

Material	ft-lbs/in^2
Nitroguanidine	$\geq$ 68.2
TNT	24.6
RDX	16.3
Comp B	31.9

   b. Sliding Friction Test* Test condition, steel/steel(TIL)*

Material	psi @8 fps
Nitroguanidine	$\geq$ 195,800
TNT	81,000
RDX	34,200
Comp B	103,100

* TIL = Threshold In~~itiation Level,~~ energy level when 20 consecutive failures occured (no fires).

c. Card Gap Test (NOL) (50% Point)

Density, g/cc	No Cards
1.64	32
1.61	47
1.51	68
1.40	90-95

d. No 8 Blasting Cap Test= Explodes

e. Impact, Bureau of Mines Apparatus= 47cm

f. Electrostatic Discharge = 0.5 Joules
(Ref- Radford Rept RAD100.10)

g. TNT Equivalencies (Confinement- Lightly confined; density "as poured")

Scaled Distance (ft/lb$^{1}/_{3}$)	% Pressure	% Impulse
3	140	110
9	105	85
18	80	90
40	70	77

h. Safe Seperation Distance

Test Configuration	Distance	
	Meter	Feet
Fiber drum (25 lb)11.34 kg	1.68	5.50
Fiber drum (50 lb)22.7 kg	2.13	7.00
Fiber drum (450 lb)204.12 kg	> 4.89	> 16.00

5. Shipping Classifications

a. Dry: UN Ident- 0282

There are no approved packaging drawings. Packaging is covered in specification. Classifications* are interim for shipment and storage of small or in-process quantities when item is packaged in accordance with specification packaging or sections of 49 CFR as follows:

Definition: Section 173.53(c)
Packaging: Section 173.65
Marking: Section 172 Subpart D and Section 173.65(j)
Labeling: Section 172 Subpart E (172.411) Explosive A Label
DOT Hazard Class - Class A Explosive
DOT Container Marking - High Explosive - Dangerous (BT)
DOT Authorization; Ref: Ex-8604203

b. Wet with 20% or more water: UN Ident- 1336

There are no approved packaging drawings. Packaging is covered in specification. Classifications* are interim for shipment and storage of small or in-process quantities when item is packaged in accordance with specification packaging or sections of 49 CFR as follows:

Definition: Section 173.150
Packaging: Section 173.152 & 173.153 & 173.184
Marking: Section 172 Subpart D and Subpart B and Section 173.101
Labeling: Section 172 Subpart E (172.420) Flammible Solid Label
DOT Hazard Class - Flammable Solid
DOT Container Marking - Nitroguanidine, Wet with not less than 20% water.

6. Sensitivity (Comparison Values):

a. Friction (Apparatus)

Explosive	PA Steel Shoe	Fiber Shoe
Lead Azide	Explodes	Explodes
PETN	Crackles	Unaffected
TNT	Unaffected	Unaffected
RDX	Explodes	Unaffected
Black Powder	Snaps	Unaffected
M1 Propellant	~~Unaffected~~	Unaffected
M9 Propellant	Snaps	Unaffected
M30 Propellant	Unaffected	Unaffected

b. Impact (Apparatus)

Explosive	PA inches	Bureau of Mines, cm	ERL, (PA Version) Type 12, 50%, cm
Lead Azide	4-5	10-17	-
PETN	6	17	<12
TNT	14	95-100+	80
RDX	8	32	23
Black Powder	16	32	-
M1 Propellant	6 (Grain)	-	-
	4 (Powder)	-	
M9 Propellant	2-3	-	-
M30 Propellant	4	-	16.2

c. Electrostatic Discharge, Bureau of Mines Apparatus:

Explosive	Joules
Lead Azide	0.007
PETN	Confined 0.21/Unconfined 0.06
TNT	Confined 4.4/ Unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/ Unconfined >12.5
M1 Propellant	11.03
M9 Propellant	5.2
M30 Propellant	>12.5

HAZARDOUS COMPONENT SAFETY DATA SHEET

(ARRADCOM Suppl 1 to DARCOMR 385-17)

Material/Component/Assembly EXPLOSIVE, HMX	Date 3 June 80 Number 129 Revision D
Applicable ASPR Safety Clause 7-104.79	

SENSITIVITY

Friction Test (Apparatus & Comparison Values)
PA Fiber Shoe - Unaffected Steel Shoe - Explodes

Impact Test (Apparatus & Comparison Values)
PA 9 Inches

Electrostatic Discharge Test (Apparatus & Comparison Values)
0.075 Joules

HAZARDS

Fire High		
Auto Ignition Temp $234^{\circ}C$ ($453^{\circ}F$)	Flash Point NA	
Decomposition Products Toxic, Avoid Inhalation and Ingestion		
Flammable Limits NA	Lower Percent	Upper Percent
Explosion High		
Explosive Temp (5 sec) $327^{\circ}C$ ($621^{\circ}F$)	Dusts Unknown	
Toxicity Slightly toxic by inhalation		
In-Process Hazards Classification Class 1.1		

Special Requirements (Continuation Sheets Authorized)

REF - SPEC: MIL-H-45444 and DWG: 9226688

See Supplemental Sheet - SDS-1006

Chemical Name: Cyclotetramethylenetetranitramine

There are no approved packaging drawings. Packaging is listed in specification.*

*** SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS**

DOD Hazard Class 1.1	DOD Compatibility Group D(wet) A(Dry)
DOT Hazard Class Class A Explosive	DOT Container Marking High Explosive - DANGEROUS

Prepared by R.W.Snook *R.W. Snook*

Concurred E. Demberg *E. Demberg*

Safety Office R.A.Walterschied *Walterschied*

HMX

1. HMX is a high explosive more powerful and more sensitive than TNT.

2. Dry HMX creates an electrostatic hazard due to its ability to maintain a high potential with reference to ground. Therefore all equipment should be grounded.

Solutions of HMX should not be exposed to direct sunlight. There is a chance of instability in the presence of ultraviolet light.

3. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METALS, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT, EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

4. Additional Sensitivity Data - Extracted from Lawrence Livermore Lab Rpt UCRL-51319, Rev-1 "Properties of Chemical Explosives and Explosive Simulants," July 74.

Impact, cm, H_{50}

	12 Tool	12 B Tool
HMX	33	40
TNT	80	> 177

5. NOTE: Potential Safety Hazard

HMX/RD-1333 Lead Azide mixtures or interfaces of these two materials become supersensitive when heated to 204°C (400°F) for 1/2 hour. A similar supersensitivity condition also results when heated HMX is mixed with unheated RD-1333. This conclusion was based on the results of an experimental program conducted by E.I. DuPont de Nemours & Co (Inc) Wilmington, DE. Other primary explosives (dextrinated lead azide, lead styphnate and tetracene) were not sensitized by the heated HMX.

6. Sensitivity (Comparison Values)

a. Impact, PA apparatus

Explosive	Inches
Lead Azide	4-5
TNT	14
RDX	8
Black Powder	16 (10% Point)

b. Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
TNT	Confined 4.4/unconfined 0.06
RDX	$>$ 11.03
Black Powder	Confined 0.8/unconfined $>$ 12.5

HAZARDOUS COMPONENT SAFETY DATA SHEET

(ARRADCOM Suppl 1 to DARCOMR 385-17)

Date	31 Oct 83
Material/Component/Assembly: Dinitrotoluene	Number 439
	Revision E

Applicable DAR Safety Clause 7-104.79

SENSITIVITY

Friction Test (Apparatus & Comparison Values) PA Steel/Fiber - Unaffected

Impact Test (Apparatus & Comparison Values) See Attached Sheet

Electrostatic Discharge Test (Apparatus & Comparison Values) >12.5 Joules

HAZARDS

Fire Moderate

Auto Ignition Temp Decomposes at $300^{o}C$ ($572^{o}F$)	Flash Point NA

Decomposition Products Toxic, Avoid Ingestion and Inhalation

Flammable Limits NA	Lower Percent	Upper Percent

Explosion Moderate

Explosive Temp (5 sec) $310^{o}C$ ($590^{o}F$)	Dusts Unknown

Toxicity Highly toxic by ingestion, inhalation or absorption. Can cause anemia, methemoglobinemia, cyanosis and liver damage.

In-Process Hazards Classification

Special Requirements (Continuation Sheets Authorized)

Ref Spec: MIL-D-204

Formula: $C_7H_6N_2O_4$ Synonym - Dinitrotoluol

Un Hazard Class - 6.1 Un Ident - 2038

There are no approved packaging drawings. Packaging is covered in specification. Classifications* are for shipment and storage or for in-process quantities when materia' is packaged in accordance with specification or sections of 49 CFR as follows:

Packaging - Section 173.510
Marking - Section 172 Subpart B and D
Labeling - None Required

* SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

DOD Hazard Class: See Attached Sheet	DOD Compatibility Group: D
DOT Hazard Class: ORM-E	DOT Container Marking: Dinitrotoluene, Solid

Prepared by R. Batson *R. Batson*

Concurred R. W. Snook *R.W. Snook*

Safety Office *for* E. Demberg *Peters*

ARRADCOM FORM 29, 1 MAY 79

1. DNT is a yellow to red colored solid. In contact with strong oxidizers may c fires and explode. Contact with caustics and chemically active metals, such as t zinc, may cause evolution of heat and increase in pressure. Slow decomposition start at 250°C (482°F), will explode if confined and heated above 270°C (518°F).

2. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVE , ADHESIVES, METALS, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT, EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

3. Hazard Classification Tests (TB 700-2)

a. Detonation Test - No Explosions or Burning

b. Ignition and Unconfined Burning Test - No Explosion, Samples Burned. Orderly Burning for - 45 minutes.

c. Thermal Stability Test - No Explosions, Burning or Change in Configuration.

d. Card Gap Test - No Explosions 0 Cards

e. Impact Sensitivity Test - No Explosions, Smoke or Noise in 10 of 10 Trials at 10 inches.

4. Additional Sensitivity Data
Threshold Initiation Level (TIL)

a. Impact, J/m^2
Crude - 15×10^4
Refined - 13×10^4

b. Friction, N/m^2 @ m/sec
Crude - $>6.11 \times 10^8/2.4$
Refined - $>6.11 \times 10^8/2.4$

c. ESD, Joules - 1.26

Ref - Radford Rpt 100.10, A Compilation of Hazards Test Data for Propellants & Related Materials, dtd 9/76.

d. Friction (8 ft/sec) - 950 lb.

Ref - CPIA No - 194, V-II, Solid Rocket/Propellant Processing,Handling, Storage & Transportation, dtd - 5/70

5. Health Hazards

8 - hour time weight average - skin - 1.5 mg/m^3
Short term exposure limit - skin - 5 mg/m^3
Toxicity by ingestion: Grade 4; Oral LD_{50} = 30 mg/kg (RAT)

6. Storage Compatibility Group:

   a. 1.3 - When exposed to detonation hazard at more than interline distance.

   b. 1.1 - When exposed to detonation hazard at less than interline distance.

7. Sensitivity (Comparison Values)

   Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
TNT	Confined 4.4/unconfined 0.06
RDX	$>$ 11.03
Black Powder	Confined 0.8/unconfined $>$ 12.5

HAZARDOUS COMPONENT SAFETY DATA SHEET

(ARRADCOM Suppl 1 to DARCOMR 385-17)

Date: 13 Jun 83

Number: 116

Revision: D

Material/Component/Assembly: Explosive, Tetryl

Applicable DAR Safety Clause: 7-104.79

SENSITIVITY

Friction Test (Apparatus & Comparison Values): PA Steel - Crackles Fiber - Unaffected

Impact Test (Apparatus & Comparison Values): PA 8 Inches

Electrostatic Discharge Test (Apparatus & Comparison Values): (Confined) 4.40 Joules. (Unconfined) 0.007 Joules (through 100 m

HAZARDS

Fire: High

Auto Ignition Temp: 166^{o}C (331^{o}F)

Flash Point: NA

Decomposition Products: Toxic, Avoid Inhalation and Ingestion

Flammable Limits: NA

Lower Percent:

Upper Percent:

Explosion: High

Explosive Temp (5 sec): 257^{o}C (495^{o}F)

Dusts: Unknown

Toxicity: Moderately toxic by ingestion or inhalation. Contact can cause dermatitis.

In-Process Hazards Classification: Class 1.1

Special Requirements (Continuation Sheets Authorized)

Ref Spec: MIL-T-339
Chemical Name: Trinitrophenylmethylnitramine
8 hour time weight average - skin - 1.5 mg/m^3
15 minute short term exposure limit - skin - 3.0 mg/m^3
Approved packaging drawings 7548644 and 7548645*

NSN	UN Ident No.
1376-00-628-3332	0208

* SHIPPING/STORAGE CLASSIFICATION OF ITEM WHEN PACKED IN ACCORDANCE WITH APPROVED PACKING DRAWINGS

DOD Hazard Class: 1.1

DOD Compatibility Group: D

DOT Hazard Class: Class A Explosive

DOT Container Marking: High Explosive - DANGEROUS

Prepared by: R. Batson R. Batson

Concurred: R. W. Snook R.W. Snook

Safety Office: E. Demberg E Demberg

1. CAUTION: EXPLOSIVES MUST BE TESTED FOR COMPATIBILITY WITH ANY MATERIAL NOT SPECIFIED IN THE PRODUCTION-PROCUREMENT PACKAGE WITH WHICH THEY MAY COME IN CONTACT. MATERIALS INCLUDE OTHER EXPLOSIVES, SOLVENTS, ADHESIVES, METALS, PLASTICS, PAINTS, CLEANING COMPOUNDS, FLOOR AND TABLE COVERINGS, PACKING MATERIALS AND OTHER SIMILAR MATERIALS, SITUATIONS AND EQUIPMENT. EXPLOSIVES INCLUDE PROPELLANTS AND PYROTECHNICS.

2. a. Sensitivity (Comparison Values)

a. Impact PA Apparatus

Explosive	Inches
Lead Azide	4-5
TNT	14
RDX	8
Black Powder	16 (10% Point)

b. Electrostatic Discharge, Bureau of Mines apparatus

Explosive	Joules
Lead Azide	0.007
TNT	Confined 4.4/unconfined 0.06
RDX	>11.03
Black Powder	Confined 0.8/unconfined>12.5

3. Additional Sensitivity Data

a. Impact H_{50}

Weight, Kg	12 Tool	12 B Tool
2.5	0.37	0.41
5	0.28	-

b. Gap Test

		Density
1. Small Scale		
NSWC	(7.8mm)	1.687 g/cc
LANL	(3.84mm)	1.684 "
2. Large Scale		
LANL	2.386 mils (60.6mm)	1.666 g/cc

c. Electrical Properties
(Dielectric Constant or Relative Permittivity)

2.059 (P=0.9)	2.163 (P=1.0)
2.728 (P=1.4)	3.097 (P=1.6)
2.905 (P=1.5)	3.304 (P=1.7)

APPENDIX J

ADDITIONAL INFORMATION ON MATERIAL TREATED IN THE DEACTIVATION FURNACE

Additional Information on Material Treated in the Deactivation Furnace

The demolition area and the deactivation furnace are used to dispose of or thermal treat munition items. This Attachment provides the chemical composition and other pertinent data on these materials. The metal parts remaining after thermal treatment in the deactivation furnace are salvaged. The ash is collected and managed as hazardous waste. An analysis of the ash is included as a table titled "Residue and Ash analysis from the Deactivation Furnace at IAAP". Results of the analysis indicate the presence of cadmium and lead with residual amounts of TNT and RDX. TNT and RDX occur in concentrations which are non - reactive.

DETONATOR, M22

CUP MATERIAL - Aluminum
EXPLOSIVE MATERIALS:
- AN No. 6 PRIMING MIX - 50mg
  - $KC10_3$ - 33.4 percent
  - lead azide - 28.3 percent
  - Sb_2S_3 - 33.3 percent
  - caborundum - 5.0 percent
- Lead Azide - 150mg
- Tetryl - 70mg

DOT CLASSIFICATION - N/A

DETONATOR, M24

CUP MATERIAL - Aluminum
EXPLOSIVE MATERIALS:
- AN No. 6 PRIMING MIX - 68mg
  - $KC10_3$ - 33.4 percent
  - lead azide - 28.3 percent
  - Sb_2S_3 - 33.3 percent
  - caborundum - 5.0 percent
- Lead Azide - 185mg

DOT CLASSIFICATION - N/A

DETONATOR, M17

CUP MATERIAL - Aluminum
EXPLOSIVE MATERIALS:
- Lead Azide - 230mg
- Tetryl - 80mg

DOT CLASSIFICATION - N/A

DETONATOR, M55 (STAB)

CUP MATERIAL - Aluminum Alloy
EXPLOSIVE MATERIALS:
- NOL No. 130 MIX - 15mg
  - lead styphnate - 40 percent
  - lead azide - 20 percent
  - Tetracene - 5 percent
  - barium nitrate - 20 percent
  - antimony sulfide - 15 percent
- Lead Azide - 51mg
- RDX - 19mg

DOT CLASSIFICATION - N/A

FUZE, GRENADE, M204A2

WEIGHT - 2.54 oz.
EXPLOSIVE TRAIN (Primer,M42)
CUP MATERIAL - Guilding Metal
PA - 101 PRIMING MIX - 23mg
- lead styphnate - 53 percent
- antimony sulfide - 10 percent
- tetracene - 5 percent
- barium nitrate - 22 percent
- aluminum powder - 10 percent

DOT CLASSIFICATION - A

FUZE, GRENADE, M206A2

WEIGHT - 2.54 oz.
EXPLOSIVE TRAIN (Primer,M42)
CUP MATERIAL - Guilding Metal

PA - 101 PRIMING MIX - 23mg
lead styphnate - 53 percent
antimony sulfide - 10 percent
tetracene - 5 percent
barium nitrate - 22 percent
aluminum powder - 10 percent
DOT CLASSIFICATION - A

FUZE, GRENADE, M213

WEIGHT - 2.75 oz.
EXPLOSIVE TRAIN (Primer,M42)
CUP MATERIAL - Guilding Metal
PA - 101 PRIMING MIX - 23mg
lead styphnate - 53 percent
antimony sulfide - 10 percent
tetracene - 5 percent
barium nitrate - 22 percent
aluminum powder - 10 percent
DOT CLASSIFICATION - A

FUZE, GRENADE, M228

WEIGHT - information not available
EXPLOSIVE TRAIN - information not available
DOT CLASSIFICATION - C

FUZE, GRENADE, M215

WEIGHT - 2.75 oz.
EXPLOSIVE TRAIN (Primer,M42)
CUP MATERIAL - Guilding Metal
PA - 101 PRIMING MIX - 23mg
lead styphnate - 53 percent
antimony sulfide - 10 percent
tetracene - 5 percent
barium nitrate - 22 percent
aluminum powder - 10 percent
DOT CLASSIFICATION - A

BOOSTER ADAPTER, BOMB, NOSE, M125A1

WEIGHT - information not available
EXPLOSIVE - information not available
DOT CLASSIFICATION - C

PRIMER, M61

CUP MATERIAL - Stainless steel
EXPLOSIVE MATERIALS:
NOL no. 130 Mix - 42mg
lead styphnate - 40 percent
lead azide - 20 percent
tetracene - 5 percent
barium nitrate - 20 percent
Sb_2S_3 - 15 percent
DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, BALL, M2

PRIMER (FED 210) - 2.7gr
lead styphnate - 40 percent
antimony sulfide - 10 percent
barium nitrate - 45 percent
tetracene - 5 percent
PROPELLANT (double base) - 235gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.90 percent
DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, ARMOR PIERCING, M2

PRIMER (FED 210) - 2.7gr
lead styphnate - 40 percent
antimony sulfide - 10 percent
barium nitrate - 45 percent
tetracene - 5 percent
PROPELLANT (double base) - 235gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.9 percent
or PROPELLANT (single base) - 235gr
nitrocellulose - 89.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 1.0 percent
DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, TRACER, M1

PRIMER (FED 210) - 2.7gr
- lead styphnate - 40 percent
- antimony sulfide - 10 percent
- barium nitrate - 45 percent
- tetracene - 5 percent

PROPELLANT (single base) - 240gr
- nitrocellulose - 98.3 percent
- diphenylamine - 0.7 percent
- potassium sulfate - 1.0 percent

TRACER (COMP R-256) - 65gr
- strontium peroxide - 26.0 percent
- strontium nitrate- 33.3 percent
- calcium resinate - 9.0 percent
- strontium oxalate - 5.0 percent
- magnesium powder - 26.7 percent

IGNITER (COMP I-276) - 10gr
- barium peroxide - 83.98 percent
- zinc stearate - 1.12 percent
- magnesium powder - 15.0 percent

DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, INCINDIARY, M1

PRIMER (FED 210) - 2.7gr
- lead styphnate - 40 percent
- antimony sulfide - 10 percent
- barium nitrate - 45 percent
- tetracene - 5 percent

PROPELLANT (double base) - 235gr
- nitrocellulose - 89.3 percent
- sodium sulfide - 0.15 percent
- calcium carbonate - 0.65 percent
- nitroglycerin - 9.0 percent
- diphenylamine - 0.9 percent

INCINDIARY Mix (IM-11) - 34gr
- barium nitrate - 50 percent
- magnesium - 47.5 percent
- aluminum - 2.5 percent

DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, TRACER, M10

PRIMER (FED 210) - 2.7gr
- lead styphnate - 40 percent
- antimony sulfide - 10 percent
- barium nitrate - 45 percent
- tetracene - 5 percent

PROPELLANT (single base) - 240gr
- nitrocellulose - 98.3 percent
- diphenylamine - 0.7 percent

TRACER (COMP R-256) - 65gr
- strontium peroxide - 26.0 percent
- strontium nitrate- 33.3 percent
- calcium resinate - 9.0 percent
- strontium oxalate - 5.0 percent
- magnesium powder - 26.7 percent

IGNITER (COMP I-194) - 11gr (composition not available)

DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, TRACER, M17

PRIMER (FED 210) - 2.7gr
- lead styphnate - 40 percent
- antimony sulfide - 10 percent
- barium nitrate - 45 percent
- tetracene - 5 percent

PROPELLANT (single base) - 225gr
- nitrocellulose - 98.3 percent
- diphenylamine - 0.7 percent
- potassium sulfate - 1.0 percent

TRACER (COMP R-256) - 58.5gr
- strontium peroxide - 26.0 percent
- strontium nitrate- 33.3 percent
- calcium resinate - 9.0 percent
- strontium oxalate - 5.0 percent
- magnesium powder - 26.7 percent

IGNITER (COMP I-508) - 11gr
- barium peroxide - 79.2 percent
- zinc stearate - 0.94 percent
- magnesium powder - 14.15 percent
- tolurdine red toner - 0.5 percent
- parlon (chlorinated rubber) - 5.66 percent

DOT CLASSIFICATION - C

CARTRIDGE, .45 CALIBER, BALL, M1911

PRIMER (FED 210) - 2.7gr
- lead styphnate - 40 percent
- antimony sulfide - 10 percent
- barium nitrate - 45 percent
- tetracene - 5 percent

PROPELLANT (single base) - 5gr
nitrocellulose - 98.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 1.0 percent
or PROPELLANT (double base) - 5gr
nitrocellulose - 82 percent
diphenylamine - 0.75 percent
potassium nitrate - 0.5 percent
nitroglycerin - 15 percent
barium nitrate - 1.5 percent
graphite - 0.25 percent
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, ARMOR PIERCING, M2

PRIMER (FA-34) - 0.60gr
lead styphnate - 37 percent
barium nitrate - 32 percent
aluminum - 7 percent
tetracene - 4 percent
antimony sulfide - 15 percent
PETN - 5 percent
or PRIMER (FA-36) - 0.60gr
lead styphnate - 36 percent
barium nitrate - 29 percent
lead peroxide - 9 percent
tetracene - 3 percent
antimony sulfide - 9 percent
zirconium - 9 percent
PETN - 5 percent
PROPELLANT (double base) - 55gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.9 percent
or PROPELLANT (single base) - 55gr
nitrocellulose - 98.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 1.0 percent
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, CARBINE, HIGH PRESSSURE TEST, M18

PRIMER (FA-210) - 2.70gr
lead styphnate - 40 percent
barium nitrate - 45 percent
tetracene - 5 percent
antimony sulfide - 10 percent
PROPELLANT (double base) - 14gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.9 percent
DOT CLASSIFICATION - C

CARTRIDGE, .50 CALIBER, ARMOR PIERCING, INCINDIARY, M8

PRIMER (FED-210) - 2.7gr
lead styphnate - 40 percent
barium nitrate - 45 percent
tetracene - 5 percent
antimony sulfide - 10 percent
PROPELLANT (double base) - 235gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.9 percent
or PROPELLANT (single base) - 235gr
nitrocellulose - 98.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 1.0
INCINDIARY (IM-11) - 15.3gr
barium nitrate - 50 percent
magnesium - 47.5 percent
aluminum - 2.5 percent
or INCINDIARY (IM-161) - 11.75GR
composition not available
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, ARMOR PIERCING, INCINDIARY, M1

PRIMER (FA-34) - 0.60gr
lead styphnate - 37 percent
barium nitrate - 32 percent
aluminum - 7 percent
tetracene - 40 percent
antimony sulfide - 15 percent
PETN - 5 percent
or PRIMER (FA-36) 0.60gr
lead styphnate - 36 percent
barium nitrate - 29 percent

zirconium - 9 percent
tetracene - 3 percent
lead peroxide - 9 percent
antimony sulfide - 9 percent
PETN - 5 percent
PROPELLANT (double base) - 50gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.65 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.9 percent
or PROPELLANT (single base) - 50gr
nitrocellulose - 98.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 10
INCINDIARY (IM-11) - 2.0gr
barium nitrate - 50 percent
magnesium - 47.5 percent
aluminum - 2.5 percent
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, TRACER, M1

PRIMER (FA-34) - 0.60gr
lead styphnate - 37 percent
barium nitrate - 32 percent
aluminum - 7 percent
tetracene - 4 percent
antimony sulfide - 10 percent
PETN - 5 percent
or PRIMER (FA-36) - 0.60gr
lead styphnate - 36 percent
barium nitrate - 29 percent
lead peroxide - 9 percent
antimony sulfide - 9 percent
tetracene - 3 percent
lead peroxide - 9 percent
PETN - 5 percent
PROPELLANT (single base) - 50gr
nitrocellulose - 98.3 percent
diphenylamine - 0.7 percent
potassium sulfate - 1.0 percent
TRACER (COMP R-256) - 13gr
strontium peroxide - 26.7 percent
calcium resinate - 9.0 percent
magnesium powder - 26.0 percent
strontium oxalate - 5.0 percent
strontium nitrate - 33.3 percent
IGNITER (COMP I-276) - 3gr
barium peroxide - 83.98 percent
zinc stearate - 1.12 percent
magnesium powder - 15.0 percent
or IGNITER (COMP I-280) - 3gr
strontium peroxide - 76.5 percent
calcium resinate - 8.5 percent
magnesium powder - 1.0 percent
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, CARBINE, TRACER, M27

PRIMER (FED 210) - 2.7gr
lead styphnate - 40 percent
barium nitrate - 45 percent
tetracene - 5 percent
antimony sulfide - 10 percent
PROPELLANT (double base) - 13gr
nitrocellulose - 89.3 percent
sodium sulfide - 0.15 percent
calcium carbonate - 0.68 percent
nitroglycerin - 9.0 percent
diphenylamine - 0.90 percent
TRACER (COMP R-56) - 5.5gr
strontium peroxide - 26.0 percent
calcium resinate - 9.0 percent
magnesium powder - 26.7 percent
strontium oxalate - 5.0 percent
strontium nitrate- 33.3 percent
IGNITER (COMP I-276) - 1.0gr
barium peroxide - 83.98 percent
zinc stearate - 1.12 percent
magnesium powder - 15 percent
or IGNITER (COMP I-285) - 1.0gr
magnesium powder - 15 percent
T-130A (composition not available) - 85 percent
DOT CLASSIFICATION - C

CARTRIDGE, .30 CALIBER, TRACER, M25

PRIMER (FA-34) - 0.60gr
- lead styphnate - 37 percent
- barium nitrate - 32 percent
- aluminum - 7 percent
- tetracene - 4 percent
- antimony sulfide - 15 percent
- PETN - 5 percent

or PRIMER (FA-36) - 0.60gr
- lead styphnate - 36 percent
- barium nitrate - 29 percent
- zirconium - 9 percent
- tetracene - 3 percent
- lead peroxide - 9 percent
- antimony sulfide - 9 percent
- PETN - 5 percent

PROPELLANT (double base) - 50gr
- nitrocellulose - 89.3 percent
- sodium sulfide - 0.15 percent
- calcium carbonate - 0.65 percent
- nitroglycerin - 9.0 percent
- diphenylamine - 0.9 percent

or PROPELLANT (single base) - 50gr
- nitrocellulose - 98.3 percent
- diphenylamine - 0.7 percent
- potassium sulfate - 1.0 percent

TRACER (COMP R-321) - 6.0gr
- polyvinyl chloride - 16 percent
- strontium nitrate- 52 percent
- magnesium powder - 26 percent
- (chlorinated rubber) - 6 percent

or TRACER (COMP R-284) - 6gr
- polyvinyl chloride - 17 percent
- strontium nitrate - 55 percent
- magnesium powder - 28 percent

IGNITER (COMP I-136) - 1.0gr
- strontium peroxide - 90 percent
- calcium resinate - 10 percent

SUB-IGNITER (R-200) - 0.60gr
- lead dioxide - 3.4 percent
- magnesium powder - 21.55 percent
- strontium peroxide - 65.65 percent
- calcium resinate - 6.0 percent
- barium peroxide - 3.4 percent

or SUB-IGNITER (I-280) - 2.60gr
- strontium peroxide - 76.5 percent
- calcium resinate - 8.5 percent
- magnesium powder - 15 percent

DOT CLASSIFICATION - C

RESIDUE AND ASH ANALYSES FROM THE DEACTIVATION FURNACE AT IAAP

Sampling Date: 17 October 1983
Quantities expressed in mg/l

EP Toxicity Contaminats Plus TNT and RDX	Residue From Dumpster Bucket	Ash from Baghouse	Ash from Cyclone	Maximum Toxicity Contaminant Limit
Arsenic	0	0	0	5 mg/1
Barium	0.16	0.36	0.075	100 mg/1
Cadmium	11.9	502.5	0.045	1mg/1
Chromium	0.01	0.015	0.01	5 mg/1
Lead	0.26	100.4	0.13	5 mg/1
Mercury	0	0	0	0.2 mg/1
Selenium	0	0	0	1 mg/1
Silver	0	0	0	5 mg/1
TNT	0	11.5	0	-----
RDX	0	2.59	0	-----

APPENDIX K

PROCEDURES FOR THE MINIMIZATION/ PREVENTION OF LYME DISEASE

K.1 PREVENTION PROCEDURES

To minimize/prevent the occurrence of Lyme disease, the following protocols have been developed, and shall normally be used on a case-by-case basis by all JAYCOR field personnel working in, or near, areas of high grass (defined here as reaching past the ankle) or in brush (defined as any area where the leaves of trees or shrubs are present at heights between six inches and eight feet), and as specified in each site-specific HASP.

- Wear light-colored clothes and underclothes to help you see ticks easier; look for a "freckle that moves."
- If you have any contact with grass or brush, wear coveralls taped at the ankles and wrists.
- Spray your clothing and coverall with "Permanone"[1] a commercially-available tick pesticide (Safety Tech Co. 904-282-1200) containing permethrin (avoid inhaling the vapors). DO NOT USE PERMANONE DIRECTLY ON SKIN. Currently available insect repellents for application the skin ("Off!," "Deep Woods," and others), contain N,N-diethyl-m-toluamide, commonly called DEET.[2] Repellents containing less than 50% DEET can be used directly on the skin; formulations containing high concentrations of DEET should be used sparingly, if at all, on the skin, but can be used on outer clothing alone or together with Permanone. Be sure to apply any tick repellent to the shoe tops, socks, and pants cuffs, the areas most accessible to ticks. Prior to use of either repellent, personnel must read any literature accompanying the sprays, and follow all directions.
- After use, remove, wash (at high temperature), and dry clothing worn under Tyveks.
- Immediately after site work, check yourself and other team members for ticks that may have crawled on your clothes and skin several hours prior to biting.
- Remove attached ticks with fine tweezers by gently, repeatedly, and patiently tugging at the point where their mouth parts entered the skin. Pull the tick straight out; do not jerk, twist, or burn the tick off since the head may remain embedded. DO NOT GRASP OR SQUEEZE THE TICK BY ITS BODY BECAUSE THIS MAY FORCE ANY FLUID FROM THE TICK INTO THE PERSON'S BODY. After removal, disinfect the bite with rubbing alcohol, povidone iodine (Betadine), or other disinfectant contained in the first aid kit.
- Capture any tick you find on your clothes and/or skin for examination by medical personnel. If the tick is still alive, but it in a small jar with a moist paper towel,

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1 Permanone, actually a pesticide rather than a repellant, is an aerosol spray; nonstaining, nearly odorless, and resistant to degradation by light, heat, or immersion water. The chemical ingredient, permethrin, is toxic to the nervous system of insects, but is poorly absorbed by humans and then rapidly inactivated by ester hydrolysis. Objective signs of skin toxicity such as edema, erythema, and rash have been common, but reported; adverse systemic effects have not been reported.

2 DEET repels ticks, but does not kill them. It is absorbed through the skin into the systemic circulation. Toxic and allergic reactions have been reported. DEET has been associated with blistery eruptions in the antecubital fossa (area below and in front of the elbow) and contact urticaria (eruption of hives characterized by severe itching). Toxic encephalopathy has occurred with excessive or prolonged use, especially in children. It is important to note that these symptoms are rare and have occurred only at high concentrations and after repeated use.

screw on the cover, and put it in the refrigerator. If the tick is dead, preserve it in a small jar of alcohol for identification in case symptoms develop later. (At a minimum and if time/supplies are limited, affix any tick to a piece of paper with clear tape, or place it in a tightly-sealed jar in the refrigerator.) DO NOT HANDLE TICKS; SPIROCHETES CAN ENTER THE BODY THROUGH BREAKS IN THE SKIN.

- Contact John Labadie at JAYCOR, who will in turn contact Dr. Fine (Washington Occupational Health) for a recommendation of performing a Lyme titer (test).
- Whether you detect a tick bite or not, check your skin (and especially the bite area, if detected) for at least four weeks after you work in a Lyme-suspect area, to see if a rash develops.
- Report all tick bites and work in Lyme-suspect areas on your monthly incident/exposure report.

K.2 SYMPTOMS OF LYME DISEASE

- The routine screening of nonsymptomatic individuals is considered inappropriate.
- All potentially-exposed individuals should be advised to wear impervious clothing, use insect repellent, and examine their skin for ticks. Any tick found should be removed (see procedures previously summarized) and kept for later identification.
- All individuals should be alerted to, and made aware of, the signs and symptoms of Lyme disease. Any individual who manifests symptoms suggesting this disease should be advised to seek medical attention at once.
- The signs and symptoms of acute Lyme disease are:
  - An expending red ring, beginning at the point of the bite, which may exceed six-inches in diameter;
  - Localized burning sensation rather than an itching;
  - Subsequent rings may appear inside the original ring; and,
  - Symptoms generally appearing three days to three weeks after the bite.
- Flu-like symptoms lasting three to five days include:
  - Fever of 100-103°F;
  - Headache;
  - Sore throat;
  - Nausea and vomiting; and,
  - Backache.
- A Lyme disease titer (test) should be done only when symptoms suggest disease and then using the protocol recommended by the Center for Disease Control.
- The use of prophylactic antibiotics is not recommended, appropriate, or indicated.

K.3 GENERAL OVERVIEW OF LYME DISEASE

Lyme disease is the geographically-derived medical term for the multisystem inflammatory disorder communicated by the deer tick or Ixodes dammini (and two closely-related species, i.e., I.pacificus and possibly I.scapularis), also known as the ear tick in midwestern states. Of the 800 species of ticks worldwide, only a dozen or so varieties exist in the Washington, DC, Virginia, and

Maryland areas; unfortunately, one of thee ticks is the deer tick. I.dammini is prevalent in the midwest and northeast as far south as Virginia, with I.scapularis common in the south and southwest, and I.pacifius dominant on the west coast. One further arthropod, the Lone Star Tick, Ambylomma americanum, was identified in New Jersey as a vector of Lyme disease, and the wide distribution of this tick in the south suggests that the disease will spread to locations beyond the range of its recognized Ixodes-species vectors.

Originating in New England around 1975 (Lyme CT, where 39 children and 12 adults were afflicted), reports now confirm cases of the disease in 32 states, including the Washington, DC metropolitan area and as far west as California and Oregon.

The deer tick has a two-or three-year life cycle (Figure K-1), but the nymph stage in the second year is when the disease is most often transmitted. To stay alive, the nymph must take a blood meal from three separate hosts. In most cases, the tick is attracted to whitetail deer, white-footed mice, and birds. Researchers believe that the tick does not originate the disease, but rather picks it up when it alights on the white-footed mouse, and passes the disease onto the animal or person from whom it takes the next blood meal. The disease is actually caused by bacteria (spirochete) known as Borrelia burgdorferi.

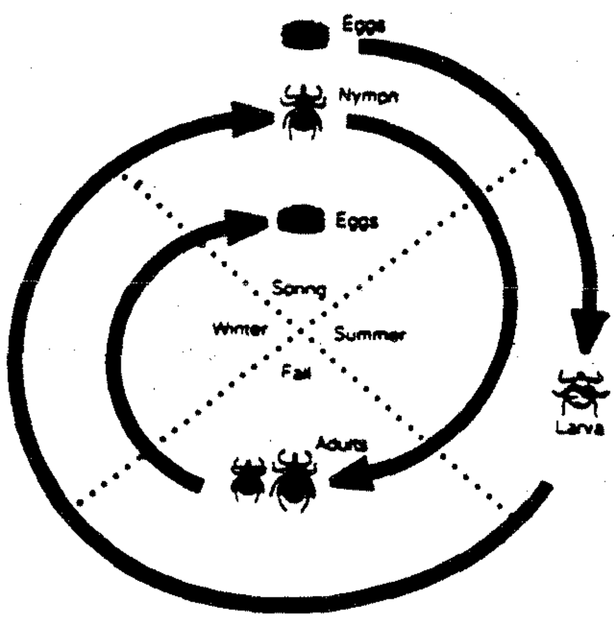


Figure K-1. The Life Cycle of Ixodes dammini

The schematic view of the life cycle of I.dammini, as shown in Figure K-1, helps in understanding why Lyme disease primarily presents itself clinically in midsummer. The tick deposits its eggs in the winter and early spring, with the larvae emerging and feeding in the late summer. Its blood meal is obtained from the mouse that is the prime reservoir of the Lyme disease agent. The next immature stage of the tick, the nymph, appears the following spring. This stage carries a complement of the disease-causing agent, ready to be transmitted to the nymph's own blood meal source, whether a mouse or a human. The nymphs become adults in the late fall and select deer as their final host and providers of a blood meal. After being inseminated while on these deer, the engorged female ticks drop to the ground, discharging their eggs, thus completing the arthropod's two-year cycle. Newly-hatched larvae are usually not infected because transovarial transmission of the spirochete appears to be minimal. The larvae become infected by feeding on infected rodents, and the spirochetes are maintained through each subsequent developmental stage. Although both female and male ticks may contain the spirochete, it is only the female that has been reported to transmit the disease.

The adult deer tick is tiny, only about one-tenth of an inch long, and has an orange-red area on its back. Similar to dog ticks, the deer tick swells dramatically in size as it feeds and becomes engorged with blood.

Deer ticks usually cling to vertical stalks of brush and tall grasses, most often at the edge of wooded areas (where deer and mice congregate). Ticks are most populous on stalks two-to-three feet high because they can attach themselves to anything that passes by (e.g., cat, deer, dog, horse, person, etc.).

Lyme disease is unlikely to be a problem in urban areas, but suburban and rural landscapes are prime candidates because of the animal populations. For this reason, the following steps should be taken to reduce potential animal and tick populations:

- Starting in early spring and continuing to early October, all brush and tall grass should be cut to the ground;
- Meadows are a prime attraction for mice because of the tall vegetation;
- If mice droppings are found around your property, locate and eliminate the nesting area and the mice will seek refuge elsewhere. Woodpiles and compost heaps are prime attractions for mice. Mothballs scattered liberally in these areas will repel rodents.
- Spilled bird seed from bird feeders is another attraction for mice. The grass or brush under bird feeders should be cut low at all times.

Personal hygiene is important when venturing outdoors, particularly from early spring to early October. Some of the basics associated with Lyme disease avoidance include:

- Avoid going barefoot except in the water at the beach; even then, avoid venturing into brushy areas unless your legs, feet, and arms are completely covered;
- Around rural and suburban gardens, wear long socks and pull them over the bottom of the pants leg;
- Wear light-colored clothing if at all possible, because it will be easier to detect ticks.
- When hicking through brush or in the woods, wear long pants with the tops of the socks pulled over the bottom of the pants, long-sleeve shirts, and perhaps a hat or cap.
- Check all parts of the body, especially the head and hair. If you encounter a tick, take a sturdy pair of tweezers, grip the tick with the prongs where the mouth parts of the tick enter the skin and pull gently, but firmly and repeatedly, until it releases its hold. Do not pull the other end of the tick because you will force any fluid from the tick into the person's body. The barbed mouthparts of the tick will not let go easily, so take your time and be patient. If the tick is still alive, place in a small jar with a moist paper towel, screw on the cover and refrigerate. If the tick is dead,

preserve it in a small jar of alcohol for identification if symptoms develop later. After removal, disinfect the bite with rubbing alcohol, povidone iodine (Betadine), or other disinfectant.

- Whether or not a tick bite is detected, check your skin (especially the bite area, if one is detected) for at least four weeks after working in a Lyme-suspect area, to see if a rash develops.

APPENDIX L

OCCUPATIONAL EXPOSURE LIMIT VALUES

APPENDIX L
OCCUPATIONAL EXPOSURE LIMIT VALUES

SWMU	CONTAMINANT	GUIDELINES[1]	IONIZATION POTENTIAL[2]
IAAP-1	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	TCEA[3]	TLV= 350 PPM IDLH= 1,000 ppm	11.25
	Toluene	TLV= 100 ppm IDLH= 2,000 ppm	8.82
	MEK[4]	TLV= 200 ppm IDLH= 3,000 ppm	9.53
	Chromium	TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a
IAAP-2	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	Toluene	TLV= 100 ppm IDLH= 2,000 ppm	8.82
IAAP-3	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	Toluene	TLV= 100 ppm IDLH= 2,000 ppm	8.82
IAAP-4	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-5	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Lead	TLV= 0.15 mg/m^3 IDLH= variable	n/a
IAAP-6	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-7	RDX	TLV= 1.5 mg/m^3	n/a
	Lead	TLV= 0.15 mg/m^3 IDLH= variable	n/a

SWMU	CONTAMINANT	GUIDELINES[1]	IONIZATION POTENTIAL[2]
IAAP-8	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-9	TNT	TLV= 0.5 mg/m^3	n/a
IAAP-10	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	TCEA[3]	TLV= 350 PPM IDLH= 1,000 ppm	11.25
IAAP-11	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	HMX	n/a	n/a
	2,4-DNT	TLV= 1.5 mg/m^3	n/a
	2,6-DNT	n/a	n/a
	1,3,5-TNB		n/a
	Cadmium	TLV= 0.05 mg/m^3 IDLH= 40 mg/m^3	n/a
	Chromium	TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a n/a
	Copper	TLV= 1 mg/m^3	n/a
	Lead	TLV= 0.15 mg/m^3 IDLH= variable	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	TCEA[3]	TLV= 350 PPM IDLH= 1,000 ppm	11.25
IAAP-12	Barium	TLV= 0.5 mg/m^3	
	TNT	TLV= 0.5 mg/m^3	
	RDX	TLV= 1.5 mg/m^3	
IAAP-13	TNT	TLV= 0.5 mg/m^3	
IAAP-14	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-15	Copper	TLV= 1 mg/m^3	n/a
	Zinc	TLV= 5 mg/m^3	n/a
IAAP-16	TNT	TLV= 0.5 mg/m^3	n/a
	Barium	TLV= 0.5 mg/m^3 IDLH= 250 mg/m^3	n/a

SWMU	CONTAMINANT	GUIDELINES[1]	IONIZATION POTENTIAL[2]
IAAP-17	Lindane	TLV= 0.5 mg/m^3 IDLH=1,000 mg/m^3	n/a
	Heptachlor	TLV= 0.5 mg/m^3 IDLH= 100 mg/m^3	n/a
	DDT	TLV= 1 mg/m^3 IDLH= ALARA	n/a
	Strychine	TLV= 0.15 mg/m^3 IDLH= 3 mg/m^3	n/a
	2,4,5-T	TLV= 10 mg/m^3	n/a
IAAP-18	TNT	TLV= 0.5 mg/m^3	
IAAP-19	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-20	Municipal Waste	n/a	n/a
IAAP-21	TNT	TLV= 0.5 mg/m^3	
IAAP-22	Unidentified Waste Oil	n/a	n/a
IAAP-23	TNT	TLV= 0.5 mg/m^3	
IAAP-24	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
IAAP-25	TNT	TLV= 0.5 mg/m^3	n/a
	RDX	TLV= 1.5 mg/m^3	n/a
	Chromium	TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a
	Xylene	TLV= 100 ppm IDLH= 10,000 ppm	8.56
	Toluene	TLV= 100 ppm IDLH= 2,000 ppm	8.82
	TCEA[3]	TLV= 350 PPM IDLH= 1,000 ppm	11.25
IAAP-26	Sewage Sludge	n/a	n/a
IAAP-27	Fly Ash	n/a	n/a
IAAP-28	Construction Debris	n/a	n/a
IAAP-29	Sewage Sludge	n/a	n/a

SWMU	CONTAMINANT	GUIDELINES[1]	IONIZATION POTENTIAL[2]
IAAP-30	TNT	TLV= 0.5 mg/m^3	
IAAP-31	Pentachloro-phenol	TLV= 0.5 mg/m^3 IDLH= 150 mg/m^3	n/a
IAAP-32	TNT RDX	TLV= 0.5 mg/m^3 TLV= 1.5 mg/m^3	n/a n/a
IAAP-33	Chromium	TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a
IAAP-34	TNT RDX	TLV= 0.5 mg/m^3 TLV= 1.5 mg/m^3	n/a n/a
IAAP-35	TNT RDX Chromium	TLV= 0.5 mg/m^3 TLV= 1.5 mg/m^3 TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a n/a n/a
IAAP-36	Lead	TLV= 0.15 mg/m^3 IDLH= variable	n/a
IAAP-37	TNT RDX Chromium	TLV= 0.5 mg/m^3 TLV= 1.5 mg/m^3 TLV= 0.5 mg/m^3 IDLH= 500 mg/m^3	n/a n/a n/a
IAAP-38	Sanitary Wastewater	n/a	n/a
IAAP-39	Xylene TCEA[3] Toluene MEK[4]	TLV= 100 ppm IDLH= 10,000 ppm TLV= 350 PPM IDLH= 1,000 ppm TLV= 100 ppm IDLH= 2,000 ppm TLV= 200 ppm IDLH= 3,000 ppm	8.56 11.25 8.82 9.53
IAAP-40	PCB	TLV= 1 mg/m^3 - 42% Cl .5 mg/m^3 - 54% Cl IDLH= 10 mg/m^3 - 42% Cl 5 mg/m^3 - 54% Cl	
IAAP-41	sulfates and chloride salts	n/a	n/a
IAAP-42	Coal	n/a	n/a

SWMU	CONTAMINANT	GUIDELINES[1]	IONIZATION POTENTIAL[2]
IAAP-43	Cadmium	TLV= 0.05 mg/m^3	n/a
		IDLH= 40 mg/m^3	
	Chromium	TLV= 0.5 mg/m^3	n/a
		IDLH= 500 mg/m^3	n/a
	Copper	TLV= 1 mg/m^3	n/a
	Lead	TLV= 0.15 mg/m^3	n/a
		IDLH= variable	

1 Guidelines:

a. TLV = Threshold Limit Value/Time Weighted Average (TLV/TWA). The value of a product a person can be exposed to repeatedly during an 8 hour day/40 hour week with no toxic effects.

b. IDLH/Toxic Atmoshere = A toxic atmosphere which poses immediate danger to life and health (IDLH)

c. Solids are rated as mg/m^3 for dust particles which might be inhaled. If dust is visible in the air, a respirator must be worn.

2 Ionization Potential - Used to set HNU approximate gain settings, See Appendix L, "User's Manual to the Photoionization Detector (HNU)."

3 TCEA: 1,1,1 - Trichloroethane

4 MEK: Methyl Ethyl Ketone

APPENDIX M

ELECTRICAL SAFETY

APPENDIX M
ELECTRICAL SAFETY

Guidance for Electrical Safety appears in the USACE Safety and Health Requirements Manual (EM-385-1-1), Section 15, Electrical Wiring and Apparatus. Some equipment at the IAAP site uses electricity as the power source. Only equipment designed and installed in compliance with the National Electrical Code [Fire Code #70 (1985) National Fire Prevention Association (NFPA), Quincy, MA 02269] may be used on site. Maintaining field equipment requires exposure to electrical hazards that may result in shock or death unless safe practices are strictly followed. When working with electricity, it must always be assumed that there is sufficient voltage and current present to cause injury.

No work will be performed on any energized electrical circuits. Electrical circuits will be de-energized by opening the circuit breaker or disconnect switch feeding them. After the circuit has been de-energized it shall be tested with a voltage tester to make sure that there is no voltage present. Before work starts on the circuit, the disconnect switch or circuit breaker shall be locked in the open position with the worker's safety lock. A warning tag shall be attached to the switch or breaker with the worker's name on it.

When work is performed on electrical equipment, the motor disconnect switch or circuit breaker to that equipment shall be locked in the open position with the worker's safety lock. A warning tag shall be attached to the switch or breaker with the worker's name on it. Before work starts on the equipment the worker shall attempt to operate the equipment to make sure that it is inoperative.

GENERAL

1. All electrical wiring and equipment shall be a type listed by UL, Factory Mutual Engineering Corporation, or another recognized test or listing agent for the specific application.
2. All installations shall comply with the National Electrical Safety Code (NESC), National Electrical Code (NEC), or United States Coast Guard regulations.
3. Live parts of wiring or equipment shall be guarded to protect all persons or objects from harm.
4. Electric wire or flexible cord passing through work areas shall be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
5. Before work is begun the person in charge shall ascertain by inquiry, direct observation, or by instruments, whether any part of an electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical contact therewith. Whenever possible, all equipment as well as circuits to be worked on shall be de-energized before work is started and personnel protected by clearance procedures and grounding.
6. Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment shall be marked to indicate the maximum operating voltage.
7. All circuits shall be protected against overload.

8. Suitable barriers or other means shall be provided to ensure that the work space for electrical equipment shall not be used as a passageway when energized parts of electrical equipment are exposed.

9. No over-current device or other disconnect shall be placed in any permanently grounded conductor, except where the device simultaneously opens all conductors of the circuit.

10. Attachment plugs or other connectors supplying equipment at more than 300 volts shall be skirted or otherwise designed so that arcs will be confined.

11. Attachment plugs for use in work areas shall be constructed so that they will endure rough use and be equipped with a cord grip to prevent strain on the terminal screws.

12. Flexible cord shall be used only in continuous lengths without splice, except molded or vulcanized splices may be used when made by a qualified electrician. The insulation shall be equal to the cable being spliced, and wire connections will be soldered.

13. Patched, oil soaked, and worn or frayed electric cords or cables shall not be used.

14. Portable hand lamps shall be of the molded composition or other type approved for the purpose. Metal-shell, paper-lined lamp holders shall not be used. Hand lamps shall be equipped with a handle and a substantial guard over the bulb that is attached to the lamp holder of the handle.

15. Extension cords or cables shall not be fastened with staples, hung from nails, or suspended by bare wire.

16. Disconnecting boxes shall be securely fastened to the surface and fitted with covers.

17. Splices in trailing cable shall be mechanically strong and insulated to retain the mechanical and dielectric strength of the original cable.

18. Plugs and receptacles shall be kept out of water unless of an approved submersible type.

DISCONNECT AND OVER-CURRENT PROTECTION

1. Switches, fuses and automatic circuit breakers shall be marked, labeled, or arranged for ready identification of circuits or equipment supplied through them.

2. Switches will be of the enclosed safety type, with enclosures grounded, and installed to minimize the danger of accidental operation.

3. Fuse cabinets shall have close-fitting doors that can be locked.

4. Switches shall be provided with a means for locking in the off-position during maintenance periods.

5. Fuses and circuit breakers shall be of the proper rating for the circuit protected.

6. A readily-accessible, manually operated switch shall be provided for each incoming service or supply circuit.

7. Switches, circuit breakers, fuse panels, and motor controllers in wet locations or outside shall be in a weatherproof enclosure or cabinet.

8. Disconnecting means shall be located or shielded so persons will not be injured when the disconnect is operated.

9. Over-current protection devices must be readily accessible, clearly labeled, not exposed to physical damage, and not placed in the vicinity of easily ignitable materials.

GROUNDING

1. Portable and semi portable electrical tools and equipment shall be grounded by a multiconductor cord having an identified grounding conductor and a multicontact polarized plug-in receptacle.
2. Semi portable equipment, floodlights, and work lights shall be grounded. The protective ground of such equipment should be maintained during moving unless supply circuits are de-energized.
3. Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools shall be distinctly marked and listed by UL or FM.

TEMPORARY WIRING

1. Temporary wiring shall be guarded, buried, or isolated by elevation to prevent accidental contact by workers or equipment.
2. Vertical clearance above walkways shall not be less than 10 feet for circuits carrying 600 volts or less.
3. Wires with non rated weatherproof insulation shall not be enclosed in metal raceways or used for wiring in tanks, penstocks, and tunnels. Receptacles used in damp or wet locations shall be approved for the purpose. Where a receptacle is installed outdoors (outdoors is considered a wet location) it shall be contained in a weatherproof enclosure, the integrity of which is not affected when an attachment plug is inserted.
4. Wires shall be insulated from their supports.
5. All temporary lighting strings in outdoor or wet locations such as tunnels, culverts, valve pits, outlets, floating plant, etc., shall consist of lamp sockets and connection plugs permanently molded to the hard service cord insulation.
6. Flexible cord sets shall be listed by UL or another recognized listing agent. Flexible cord sets used on construction sites shall contain the number of conductors required for the service plus an equipment ground wire. The cords shall be hard usage or extra hard usage as specified in the NEC. Approved cords may be identified by the word "outdoor" or by the letters "WA" on the jacket.
7. Bulbs attached to the temporary lighting strings and extension cords shall be protected by wire guards or equivalent unless deeply recessed in a reflector. Temporary lights shall not be suspended by their electric wire unless cord and lights are designed for this suspension.
8. Exposed empty light sockets and broken bulbs shall not be permitted.
9. Temporary electrical distribution systems and devices shall be checked and accepted for polarity, ground continuity, and ground resistance prior to use and after modification.

APPENDIX N

BACK STRAIN, HEAT STROKE, & SNAKE/INSECT BITES

APPENDIX N
BACK STRAIN, HEAT STRESS, & SNAKE BITE

BACK STRAIN AND INJURY

Many types of objects are handled during normal operation and maintenance of sites. Care should be taken in handling heavy or bulky items because they are the cause of a considerable number of accidents. Strained or injured backs can be prevented by using proper lifting techniques. The fundamentals for properly lifting materials are as follows:

- The size, shape, and weight of the object to be lifted must be considered. A worker shall not lift more than one person can handle comfortably.
- The feet shall be placed far enough apart for good balance and stability. The footing shall be solid.
- The worker shall get as close to the load as possible. The legs shall be bent at the knees.
- The back shall be kept as straight as possible.
- The object shall be gripped firmly.
- To lift the object, the legs are straightened from their bend.
- A worker shall never carry a load that cannot be seen over or around.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees and the object is lowered.

When two or more workers are required to handle an object, coordinating is essential to ensure that load is uniformly lifted and that the weight is equally divided between the persons carrying the load. When carrying the object, each worker, if possible shall face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines shall be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential.
- The hands and object shall be free of oil, grease, or water which might prevent a firm grip.
- The item shall be inspected for metal slivers, jagged edges, burrs, and rough or slippery surfaces.
- Gloves shall be used when necessary.
- The fingers shall be kept away from any points that may cause the fingers to be pinched or crushed, especially when setting the object down.

HEAT STRESS

Introduction

Stress can significantly contribute to accidents or harm workers in other ways. The term stress denotes the physical (gravity, mechanical force, heat, cold, pathogen, injury) and psychological (fear, anxiety, crises, joy) forces that are experienced by individuals.

The body's response to stress occurs in the following stages:

- Alarm reaction in which the body recognizes the stress or and the pituitary-adreno-cortical system responds by increasing the heart rate and blood sugar level, decreasing digestive activity, and dilating the pupils;
- Adaptive stage in which the body repairs effects of stimulation and the stress symptoms disappear.
- Exhaustion stage in which the body can no longer adapt to stress and individual may develop emotional disturbances, and cardiovascular and renal diseases.

Heat Stress

Heat stress is usually a result of protective clothing decreasing natural body ventilation, although it may occur at any time work is being performed at elevated temperatures.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement) to fatal. Because heat stress is one of the most common and potentially serious illnesses at hazardous waste sites, regular monitoring and other preventive measures are vital.

Site workers must learn to recognize and treat various forms of heat stress. The best approach is preventive heat stress management. In general:

- Have workers drink 16 oz. of water before beginning work, such as in the morning or after lunch. Provide disposable 4 oz. cups, and water that is maintained at 50-60° F. Urge workers to drink 1-2 cups of water every 20 minutes, for a total of 1-2 gallons per day. Provide a cool, preferably air-conditioned area for rest breaks. Discourage the use of alcohol in non working hours, and discourage the intake of coffee during working hours. Monitor for signs of heat stress.
- Acclimate workers to site work conditions by slowly increasing workloads, i.e., do not begin site work activities with extremely demanding activities.
- Provide cooling devices to aid natural body ventilation. These devices; however, add weight and their use should be balanced against worker efficiency. An example of a cooling aid is long cotton underwear, which acts as a wick to help absorb moisture and protect the skin from direct content with heat-absorbing protective clothing.
- Install mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.

- In hot weather, conduct field activities in the early morning or evening.
- Ensure that adequate shelter is available to protect personnel against heat, as well as cold rain, snow, etc., which can decrease physical efficiency and increase the probability of both heat and cold stress. If possible, set up the command post in the shade.
- In hot weather, rotate shifts of workers wearing impervious clothing.
- Good hygienic standards must be maintained by frequent changes of clothing and showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure the of heat-regulating mechanism of the body. The individual's temperature control system that causes sweating stops working correctly. Body temperature rises so high that brain damage and death will result if the person is not cooled quickly.

- Symptoms: Red, hot, dry skin, although the person may have been sweating earlier; nausea; dizziness; confusion; extremely high body temperature, rapid respiratory and pulse rate; unconsciousness or coma.
- Treatment: Cool the victim quickly. If the body temperature is not brought down fast, permanent brain damage or death will result. Soak the victim in cool, but not cold water, sponge the body with cool water or pour water on the body to reduce the temperature to a safe level (102° F). Observe the victim and obtain medical help. Do not give coffee, tea, or alcoholic beverages to the victim.

Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by the loss of fluids from the body. This condition is much less dangerous than heat stroke, but it nonetheless must be treated.

- Symptoms: Pale, clammy, moist skin; profuse perspiration; and, extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. The person may have a headache, may vomit, and may be dizzy.
- Treatment: Remove the person to a cool, air-conditioned place, loosen clothing, place in a head-low position, and provide bed rest. Consult physician, especially in severe cases. The normal thirst mechanism is not sensitive enough to ensure body fluid replacement. Have patient drink 1-2 cups water immediately and every 20 minutes thereafter, until symptoms subside. Total water consumption should be about 1-2 gallons per day.

Heat Cramps

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a condition that can lead to heat stroke.

- Symptoms: Acute painful spasms of voluntary muscles; e.g., abdomen and extremities.
- Treatment: Remove victim to a cool area and loosen clothing. Have patient drink 1-2 cups water immediately, and every 20 minutes thereafter, until symptoms subside. Total water consumption should be 1-2 gallons per day. Consult physician.

Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing clothes. The condition decreases ability to tolerate heat.

- Symptoms: Mild red rash, especially in areas of the body in contact with protective gear.
- Treatment: Decrease amount of time in protective gear, and provide powder to help absorb moisture and decrease chafing.

Heat Stress Monitoring and Work Cycle Management

For strenuous field activities that are a part of on going site work activities in hot weather, the following procedures may be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. The following procedures are to be instituted when the temperature exceeds 70° F.

- Measure Heart Rate (HR). Heart rate should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR, at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 110 beats/minute.
- Measure Body Temperature. Body temperature should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99.6° F. If it does, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the OT exceeds 99.6° F at the beginning of the next rest period, the following work period should be further shortened by 33%. The procedure is continued until the body temperature is maintained below 99.6° F.
- Manage Work/Rest Schedule. The following work/rest schedule shall be used as a guideline:

Adjusted Temperature (°F)	Active Work Time (min/hr) Using Level B/C Protective Gear
75 or less	50
80	40
85	30
90	20
95	10
100	0

Calculate the adjusted temperature: T(adjusted) = T(actual) + (13 • fraction sunshine)

- Measure the air temperature with standard thermometer. Estimate fraction of sunshine by judging what percent the sun is out (100% sunshine = no cloud cover = 1.0; 50% sunshine = 50% cloud cover = 0.5; 0% sunshine = full cloud cover = 0.0).
- Reduce or increase the work cycle according to the guidelines under heart rate and body temperature.

SNAKE BITE

- Poisonous snakes may frequent remote grassy or brushy areas on the IAAP site. Sampling locations also lie in these areas. Site workers and managers must be aware of the danger and take proper precautions.
- Snakes prefer cooler, shaded places that offer protection from the direct rays of the sun. Generally snakes will not strike unless provoked or disturbed.
- General precautions:
  - Do not reach under logs, rocks, boxes, or pieces of equipment; look first to see what is underneath, or turn it over with a stick or lever.
  - Do not reach or step into brush piles, grass clumps, or stream bank areas. Check first.
  - If confronted by a snake, do not approach it. Move away. The snake will usually leave when it senses your presence.
  - Wear boots, gloves, and long trousers when working in remote grassy areas or in areas where snakes are known to be present.

Treatment

- If a snake bite occurs, keep the victim calm (preferably seated or prone).
- Apply ice to the wound site.
- Immobilize the afflicted limb.
- Treat for shock.
- Do not apply a tourniquet or cut into the snake bite area.
- Seek medical attention immediately. Snake bites are seldom fatal given prompt and proper medical care.
- Do not waste time trying to kill the snake.

INSECT BITES & STINGS

As a rule, insect bites and bee stings only cause temporary pain and discomfort. Prompt relief can usually be achieved by applying a paste made from a few drops of water and a tablespoon of bicarbonate of soda, or by applying a wet dressing of witch hazel or Epsom salts. If this does not relieve the discomfort, an antihistamine cream or ointment may be applied. Generally, severe reactions occur quickly and demand immediate medical attention.

Severe reactions to bites and stings include the following:

- Difficulty breathing;
- A swollen face;
- Severe nausea;
- Vomiting;
- Diarrhea; and
- Possibly unconsciousness.

APPENDIX O
RESUMES OF KEY EMPLOYEES

MARY KNOWLES ROBERTSON

SUMMARY OF QUALIFICATIONS

Project Manager with 12 years of experience in the field of environmental monitoring and assessment. Skilled in managing technical staff, problem analysis, and site assessment and characterization. Superior written and oral communication skills.

PROFESSIONAL EXPERIENCE

JAYCOR Environmental Services Division
July 1991 - Present
Alexandria, Virginia

Senior Environmental Analyst
Manage a large-scale RI/FS project for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Project Management, control, and oversight of all office and field activities, including program planning, scheduling, mobilization, and subcontractor management.

ECOLOGY AND ENVIRONMENT, INC.
July 1987 to July 1991
Overland Park, Kansas

Assistant Field Investigation Team Manager
Oversaw technical staff of 24 scientists conducting environmental assessments of potential hazardous wastes sites in 4-state area under the U.S. Environmental Protection Agency CERCLA and RCRA regulatory programs. Assigned field projects, served as consultant for site-specific concerns, monitored progress of ongoing projects, and conducted peer review of all reports prepared by technical staff. Reported directly to FIT Manager on project status. Coordinated FIT activities with EPA contacts and site representatives.

Project Manager
Supervised field activities and handled all administrative tasks associated with preliminary assessments and site investigations. Designed sampling schemes, prepared work plans, and conducted field sampling in all environmental matrices. Acquired, collated, and interpreted all data required to accurately characterize site conditions, and prepared comprehensive final reports for submittal to EPA that detailed findings and imparted appropriate recommendations for future site work. Final reports included evaluating and scoring sites using the Hazard Ranking System (HRS) model, and preparing all requisite HRS scoresheets and documentation records. Project Manager of 17 CERCLA PAs, 3 CERCLA SIs, and 4 EPI PAs; team member of 19 CERCLA PAs and 7 CERCLA SIs.

Senior Technical Editor
Edited all technical reports generated by FIT staff. Responsible for readability, clarity, and technical accuracy of final reports to clients and EPA. Supervised 6-member report production staff; tracked and scheduled projects to assure that critical deadlines were met. Interpreted and applied State and Federal environmental regulations and legislation as applicable to field investigations and proposals for remedial work. Handled administrative reporting requirements to meet FIT contract mandates.

THE UNIVERSITY OF KANSAS
April 1985 to July 1987
Lawrence, Kansas

Publications Editor
Wrote, edited, and coordinated the production of a wide variety of print materials for off-campus distribution, including brochures, newsletters, press releases, direct mail pieces, handbooks, and others. Wrote feature-length articles for University publications. Completely knowledgeable in all production aspects of publishing, including 4-color process.

ENVIRONMENTAL LABORATORIES, INC.
1978 to 1985
Topeka, Kansas

Assistant Laboratory Director
Managed projects for analytical laboratory conducting NDPES monitoring for industrial and municipal clients. Prepared technical and administrative reports; initiated and responded to requests for bids; negotiated sales contracts and subcontracts; interpreted and applied State and Federal environmental legislation, regulations, and permits; and served as liaison between clients and regulatory agencies.

WILSON AND COMPANY ENGINEERS AND ARCHITECTS
1975 to 1978
Salina, Kansas

Environmental Scientist
Conducted field sampling and site assessments. Implemented field pilot studies designed by engineering staff, and interpreted data and prepared final reports. Conducted bench-test pilot studies for remedial projects. Performed chemical analyses of water and soil samples.

EDUCATION AND TRAINING

The University of Kansas, M.S. Journalism (emphasis Technical Writing), 1991
Fort Hays State University, B.S. Education (Biology minor), 1975

Courses

40-hour OSHA Health and Safety Training Program for Hazardous Waste Professionals
8-hour OSHA On-Site Management and Supervision Course
Risk Assessment
Resource Conservation and Recovery Act Regulations Training Program

Seminars

Transport and Fate of Contaminants in the Subsurface
On-Site Remediation Technologies
Supervisory Training for Technical Managers

Professional Affiliations

Metropolitan Washington Environmental Professionals

DAVID S. ROSA, P.E.

Education and Training:

B.S., Chemical Engineering, Virginia Tech., 1983
OSHA Health and Safety Training (40 Hours), with annual refreshers

Certifications:

Registered Professional Engineer, VA and SC

Experience:

11/91 - Present, Senior Environmental Engineer, JAYCOR, Environmental Services Division, Alexandria, VA. Task Manager for an RI/FS conducted for the U.S. Army Toxic and Hazardous Materials Command (USATHAMA). Assist in preparation of Work Plans and other project planning documents, and schedule and manager field activities. Provide management and technical support for several other USATHAMA and U.S. Corps of Engineers projects related to environmental assessments and environmental audits.

8/91 - 11/91, Contract Environmental Engineer, CDM Federal Programs Corp., Aiken, SC. Completed a fast turn around technical review, revision and update of a RCRA Part B permit application for a mixed waste incinerator at Department of Energy's Savannah River site.

11/90 - 5/91, Project Manager, Meredith/Boli and Associates, Inc., Los Angeles, CA. Primary responsibility was management of a large PRP search for a private client. A dedicated team under my responsibility was assigned to the project, which entailed identifying, screening, and demonstrating liability of parties in the vicinity of a contaminated aquifer. Other projects were analysis of RCRA regulations to determine regulatory impacts, proposal and work plan preparation for several fast turn-around projects to include site assessment and technical document critiques.

6/88 - 6/90, Project Manager, Resource Applications, Inc., Burke, VA. Complete management responsibility for investigations at several EPA Superfund sites. Responsibilities on the remedial investigation/feasibility study projects included project scoping, work plan/budget preparation, coordination of field efforts, procurement and oversight of all subcontractors, coordination of data management and report preparation. Types of site contamination included dioxin contaminated soils, solvent contaminated groundwater and leading underground storage tanks.

7/86 - 6/88, Project Management/Work Assignment Manager, CDM Federal Programs Corporation, Fairfax, VA. Management of a national research project of radon remediation. Responsibilities included project scoping, budget development, client interface, subcontractor procurement and management of field activities. Other technical involvements included technical review of numerous RI/FS work plans and final reports. Also, obtained good working knowledge of RCRA and CERCLA regulations.

8/83 - 7/86, Chemical Engineer, Science Applications International Corporation, Environmental Technology Group, McLean, VA. Involved with various projects dealing with hazardous waste generation, treatment, storage, and disposal. A large amount experience was gained in the areas of hazardous waste site remediation, waste water treatment systems, and manufacturing processes which generate hazardous wastes.

DAVID E. HREBENACH

Qualifications Summary

Mr. Hrebenach is an environmental scientist for CDM Federal Programs Corporation providing technical support for projects in: technical enforcement support (TES III & V), underground storage tanks (USTs), Hazardous Waste Remedial Action Program (HAZWRAP), and remedial response activities (REM II). He also has experience in ground and surface water research.

Education & Training

Graduate Course in Hydrogeology, University of Maryland, 1989
Course, Supervisory - Hazardous Materials Health and Safety Training, 1989
BS, Environmental Management, University of Maryland, 1985

Experience

Mr. Hrebenach has a strong involvement in remedial action projects. Under the HAZWRAP contract, he has worked on sampling and analysis plans, cost estimates for projects, and report writing. Under both HAZWRAP and TES, Mr. Hrebenach has gained field experience. This field work has predominantly consisted of water and soil sampling for hazardous constituents, and the associated planning (i.e., mobilization, demobilization, and procurement), as well as document writing (i.e., sampling plans, health and safety plans, and final reports).

Mr. Hrebenach has worked on a number of RCRA facility assessments (RFA). These assessments have included: performing investigations on hazardous waste facilities and determining compliance with RCRA regulations, preparing health and safety reports for visual site inspections (VSI), and researching and writing on the geology, hydrogeology, related physical aspects, and socioeconomic condition in the area of concern.

Mr. Hrebenach has worked on the development of a technical reference manual, requiring research and review of Superfund Records of Decisions (RODs), and Applicable, or Relevant and Appropriate Regulations (ARARs). As part of this and other projects, he has gained experience in abstracting, technical review, quality control, document research, and report production. Furthermore, Mr. Hrebenach has gained administrative experience in work plan development, project close outs, financial tracking, and maintenance of monthly reports.

Mr. Hrebenach is involved in the Environmental Protection Agency (EPA) Technology Evaluation and Design Information (TEDI) program to research new and innovative technologies for the clean up of hazardous wastes, and to abstract the capabilities and performance of each technology. He is responsible for implementation of much of the project, including: document research, review, abstracting, quality control, and report production.

Other project involvements include work on mining waste regulations, best demonstrated available technology (BDAT), and support to the Office of Cross Media.

Prior to joining FPC, Mr. Hrebenach gained experience in implementing, managing, and maintaining water quality research projects. He has managed various analytical studies on ground water and surface water transport of chemical pollutants including pollutant/soil interactions. He was involved in work on nutrient mass-balance accounting designed to understand the mechanics of agricultural ground water pollution. He has experience in surveying, and also has a background in construction materials estimating, layout, and blueprint reading.

Professional History

1988-Present Environmental Scientist - CDM Federal Programs Corporation, Fairfax, VA. Mr. Hrebenach serves as technical support for FPC projects, providing scientific analysis, research, field services, and report production.

1987-1988 Research Technician IV - University of Maryland, Wye Research and Education Center, Queenstown, MD. Implemented, managed and maintained water quality research projects concerning ground water and surface water transport of agrichemicals. Performed varied analytical tasks, as well as, ground and surface water sampling, and land surveying. Managed an automated weather station and associated data base.

1985-1986 Assistant Surveyor - Capitol Surveys, Gaithersburg, MD. Experience in the use of a transit, performing plat searches and drafting.

ALAN C. AMOR

Education and Training

BS. Civil Engineering, Virginia Polytechnical Institute & State University, 1989
Health and Safety Training for Hazardous Waste Site Workers
On-Site Management and Supervision Training

Certifications

Engineer-In-Training (EIT) - Commonwealth of Virginia

Experience

1991- Present Environmental Engineer, JAYCOR, Environmental Services Division, Alexandria, VA. Staff environmental engineer for RI/FS project for the U.S.Army toxic and Hazardous Materials Agency (USATHAMA). Performs preliminary assessments, site characterization, sampling (soil and water), RI/FS field work, and data validation at Picatinny Arsenal, and Iowa Army Ammunition Plant.

1987-1991 Hydrologist/Environmental Staff Engineer, Camp Dresser & McKee, Annandale, VA. Collected data for, and helped to develop, Fairfax County Sanitary Sewer Model. Supervised preparation of Auto CAD generated sewer maps for routing model. Collected and organized map and flood data for Henrico County, VA Regional Stormwater Plan. Performed Bench Test and Pilot Tests for Henrico County, VA Water Treatment Plant. Prepared samples and performed inspection supervision on remediation efforts at Hazardous Waste Sites. Developed RUNOFF model for Martin Marietta Y-12 Facility in Knoxville, TN. Evaluated soil, wetland and other data to recommend a site for a reservoir in Hall County, GA. Designed a spreadsheet to evaluate the processes in the Arlington County, VA Wastewater Treatment Plant. Collected data for and helped to develop and run a HEC-1 Model for Stafford County, VA. Collected data for Virginia Beach NPDES Stormwater Permit.

1985-1986 Structural Engineering Coop, David Taylor NSRDC, Bethesda, MD. Designed modifications to 1/3 scale propeller test stand. Supervised manufacturing and assembly of stand for AOE propeller blade. Designed, developed and supervised the construction of a novel test fixture for a shape charge test. Wrote computer program to analyze the structural integrity of ship hull plates.

Professional Affiliations

Member, American Society of Civil Engineers
Member, Chi Epsilon, Civil Engineering Honor Society

APPENDIX P

SITE WORKER CERTIFICATIONS

Certificate of Completion

This Certifies That

Mary Robertson

has completed an 8–hour OSHA Refresher Course
in accordance with 29 CFR 1910.120

SEAL

Presented by:

Dames & Moore

Training Director

Bethesda, Maryland
February 19, 1992

ecology and environment, inc.

Acknowledges that

Mary Knowles

has successfully completed the

40-HOUR BASIC
HEALTH AND SAFETY TRAINING COURSE

Paul W. Jonmaire
PAUL W. JONMAIRE, PH.D.
DIRECTOR, HEALTH AND SAFETY

Douglas P. Schuessler
DOUGLAS P. SCHUESSLER
TRAINING MANAGER

September 23, 1988
DATE

This course has been approved by the
United States Environmental Protection Agency
for workers on hazardous waste sites.

WASHINGTON OCCUPATIONAL HEALTH ASSOCIATES, INC.
Suite 410
1120 19th Street, N.W.
Washington, D.C. 20036
(202) 463-6698

MEDICAL MONITORING EXAMINATION EMPLOYER NOTIFICATION

Employee Mary Robertson Date 2.7.92

Employer Jaycor

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☐ is/☒ is not) complete. (Tests not performed: Bloodwork, 24 hr heavy metals, Lead 3 ZPP)

Please check all sections that are applicable to this examination:

Applicable | Not Applicable

☐ ☒ **Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☒ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☒ qualified/☐ not qualified) to use a respirator.

✓ ☐ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☒ passed/☐ not passed) a qualitative fit test.

☒ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

Pending lab tests. Pls ask Ms. Robertson re: to contact us re: completing these tests.

☐ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.

☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.

☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) A S Wolinsky MD (Signature) [signature]

Date 2/7/92

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

American Red Cross

This certifies that

Mary Robertson

has completed the **ADULT CPR**

course of instruction

at Wyandotte County

3/21/91

Date course completed

Chairman, American Red Cross

American Red Cross

This certifies that

Mary Robertson

has completed the

STANDARD FIRST AID

course of instruction

at Wyandotte County

3/21/91

Date course completed

Chairman, American Red Cross

Certificate of Completion

This Certifies That

David S. Rosa

has completed an 8–hour OSHA Refresher Course in accordance with 29 CFR 1910.120

SEAL

Presented by:

Dames & Moore

Training Director

Bethesda, Maryland
February 19, 1992

Roy F. Weston, Inc.

This certifies that

DAVID F. ROSA

has completed the

40-HOUR HAZARDOUS WASTE SITE TRAINING COURSE
In Accordance With 29 CFR 1910.120 (e) (3)

West Chester, Pennsylvania
August 15, 16, 17, 18, and 19, 1988

3.0 CONTINUING EDUCATION UNITS (CEUs) AWARDED

George M Crawford for CLH — Corporate Health & Safety Director

08/19/88 — Date

Certificate of Completion

This Certifies That

Alan C. Amor

has completed an 8–hour OSHA Refresher Course in accordance with 29 CFR 1910.120

SEAL

Presented by:

Dames & Moore

Kenneth E. Fischer

Training Director

Bethesda, Maryland
February 19, 1992

CERTIFICATE OF TRAINING

This Certifies That

ALAN AMOR

Has Successfully Completed

CDM 150.4 BASIC HEALTH AND SAFETY TRAINING

FAIRFAX, VIRGINIA

Date SEPTEMBER 25 - 29, 1989

Presented by

CDM Federal Programs Corporation

Martin Mathamel

Martin S. Mathamel, CIH
Health and Safety Manager

HAZMAT
TRAINING ▲ INFORMATION ▲ SERVICES
INC.

CERTIFICATE OF COMPLETION

This is to certify that

ALAN AMOR

has successfully completed

"8-HOUR OSHA ON-SITE MANAGEMENT AND SUPERVISION COURSE"

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

Manager, Training Programs Department

Chief Executive Officer

April 25, 1991
C91-0961

WASHINGTON OCCUPATIONAL HEALTH ASSOCIATES, INC.
Suite 410
1120 19th Street, N.W.
Washington, D.C. 20036
(202) 463-6698

MEDICAL MONITORING EXAMINATION
EMPLOYER NOTIFICATION

Employee allan amor Date 2.7.92

Employer Jaycor

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☑ is/☐ is not) complete. (Tests not performed: ______________)
(______________)

Please check all sections that are applicable to this examination:

Applicable	Not Applicable	
☐	☑	**Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☑ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☑ qualified/☐ not qualified) to use a respirator.

☑ ☐ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☑ passed/☐ not passed) a qualitative fit test.

☑ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

- ☑ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.
- ☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.
- ☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)

____

____

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) [illegible] MD (Signature) [illegible]

Date 2/12/92

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

HAZMAT

TRAINING ▲ INFORMATION ▲ SERVICES

INC.

CERTIFICATE OF COMPLETION

This is to certify that

JOHN R. LABADIE

has successfully completed

"8-HOUR OSHA ON-SITE MANAGEMENT AND SUPERVISION COURSE"

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

Thomas C. Carsick

Manager, Training Programs Department

Richard Ackfeld

Chief Executive Officer

June 27, 1991
C91-1337

HAZMAT
TRAINING ▲ INFORMATION ▲ SERVICES
INC.

CERTIFICATE OF COMPLETION

This is to certify that

JOHN LABADIE

has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

Manager, Training Programs Department

Chief Executive Officer

April 8 - 12, 1991
C91-0858

MEDICAL MONITORING EXAMINATION
EMPLOYER NOTIFICATION

Employee JOHN LABADIE Date 6-26-91

Employer JAYCOR

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☑ is/☐ is not) complete. (Tests not performed: ____________)
(____________)

Please check all sections that are applicable to this examination:

Applicable / Not Applicable

☐ ☑ **Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☑ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☑ qualified/☐ not qualified) to use a respirator.

☑ ☑ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☑ passed/☑ not passed) a qualitative fit test.

☑ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

☑ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.

☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.

☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)

Corrective lenses required

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) Robert Subtirsky (Signature) [signature]

Date 7-2-91

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

Certificate of Completion

This Certifies That

William F. Mayes

**has completed an 8–hour OSHA Refresher Course
in accordance with 29 CFR 1910.120**

Presented by:

Dames & Moore

Training Director

**Bethesda, Maryland
February 19, 1992**

Medical College of Virginia
Virginia Commonwealth University

Department of Preventive Medicine
and the
Program in Industrial Hygiene/Occupational and Environmental Health

HEREBY AWARD THIS

Certificate of Completion

TO

WILLIAM F. MAYES

for successful completion of the course

HAZARDOUS WASTE SAFETY & HEALTH PROGRAM

R Leonard Vance

R. Leonard Vance, Ph.D., CIH — Professor

February 2, 1991

Date

Martha Neff Smith

Chairman, Department of Preventive Medicine

Medical College of Virginia
Virginia Commonwealth University

Department of Preventive Medicine
and the
Program in Industrial Hygiene/Occupational and Environmental Health

HEREBY AWARD THIS

Certificate of Completion

TO

FRED MAYES

for successful completion of the course

8 - Hour Health & Safety Supervisor

R Leonard Vance

R. Leonard Vance, Ph.D., CIH Professor

March 1,1 991

Date

Martha Neff Smith

Chairman, Department of Preventive Medicine

Medical College of Virginia
Virginia Commonwealth University

Department of Preventive Medicine
and the
Program in Industrial Hygiene/Occupational and Environmental Health

HEREBY AWARD THIS

Certificate of Completion

TO

FRED MAYES

for successful completion of the course

HAZARDOUS WASTE SAFETY & HEALTH ANNUAL REFRESHER

R Leonard Vance

R. Leonard Vance, Ph.D., CIH — Professor

January 14, 1991
Date

Martha Moff Smith

Chairman, Department of Preventive Medicine

WASHINGTON OCCUPATIONAL HEALTH ASSOCIATES, INC.
Suite 410
1120 19th Street, N.W.
Washington, D.C. 20036
(202) 463-6698

MEDICAL MONITORING EXAMINATION
EMPLOYER NOTIFICATION

Employee MAYES, FRED Date 2-11-92

Employer JAYCOR

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☒ is/☐ is not) complete. (Tests not performed: ________)
(________)

Please check all sections that are applicable to this examination:

Applicable / Not Applicable

☐ ☒ **Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☒ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☒ qualified/☐ not qualified) to use a respirator.

☐ ☒ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☐ passed/☐ not passed) a qualitative fit test.

☒ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

- ☒ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.
- ☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.
- ☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)

____

____

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) SCHNEIDER (Signature) [signature]

Date 2-19-92

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

HAZMAT

TRAINING ▲ INFORMATION ▲ SERVICES

INC.

CERTIFICATE OF COMPLETION

This is to certify that

LINDA HAMRICK

has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

Eva C Stern

Manager, Training Services Department

Richard Ausfeld

Chief Executive Officer

March 23 - 27, 1992
C92-0800

WORKWELL, INC.
The Merion Building
700 S. Henderson Road
King of Prussia, PA 19406
(215) 768-9355
FAX 265-4708

NAME: Bharat Bham BIRTH DATE: 01/12/56

HOME PHONE: (215) 638-2339 SOC. SECURITY #: 211-64-5590

EMPLOYER: Burns & Roe DATE OF EXAMINATION: 06/17/91

Bharat Bham is enrolled in a medical surveillance program fulfilling the requirements outlined under 29 CFR 1910.120.

On the basis of an examination performed 06/17/91, Bharat Bham is qualified to wear all protective equipment including a respirator with

(X) no restrictions.

( ) the following restrictions:

____

____

____

Carole M. [illegible]
Examining Physician

MD021173E
PA License No.

coordinating group (Occupational and Environmental Medicine Program, University of Pittsburgh)

Name (to be completed by patient) Social Security Number

Robert Savill 160, 58, 7855

Work restrictions

✓ none

list ______________________

This patient is cleared for work on hazardous waste sites according to the OSHAct (29 CFR 1910.120) pending receipt of laboratory results.

✓ Yes
_ No

This patient is cleared for work that requires wearing a positive and negative pressure respirator (29 CFR 1910.134)

✓ YES
_ NO

E C KELTON SR MD physician name (print)

physician signature

4/23/9_ date

Print Name and Address

E C KELTON SR MD

OCCUPATIONAL HEALTH ...
7__ EAST MARSHALL STREET
SUITE 105
WEST CHESTER PA 19380
215-431-2282

NUS CORPORATION

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

ROBERT SAVILL

has successfully completed an 8 hour annual refresher course in

HAZARDOUS WASTE OPERATIONS

In accordance with OSHA 29 CFR 1910.120

prepared and conducted by the
NUS Corporation, FIT 3 Wayne, Pennsylvania

MARCH 7, 1991

Date of Award

Marcia Case - Regional
Health & Safety Co-ordinator

Garth Glenn - Regional
Office Manager

NUS CORPORATION

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

ROBERT M. SAVILL III

has successfully completed a 40 hour course of instruction in
OSHA 29 CFR 1910.120

HAZARDOUS WASTE HEALTH AND SAFETY TRAINING

prepared and conducted by the
NUS Corporation,
Pittsburgh, Pennsylvania

JANUARY 22-26, 1990
Date of Award

Kathleen S. Brady
Kathleen S. Brady
Principal Instructor, Project Manager
Environmental Management Group

Richard C. Gerlach
Richard C. Gerlach, Ph.D., C.I.H.
Manager, Health Sciences,
Environmental Management Group

CERTIFICATE OF TRAINING

This Certifies That

David Hrebenach

Has Successfully Completed

CDM 150.4 Basic Health and Safety Training Course

Fairfax, Virginia

Date January 23 - 27, 1989

Presented by

CDM Federal Programs Corporation

Martin Mathamel

Martin S. Mathamel, CIH
Health and Safety Manager

CERTIFICATE OF TRAINING

This Certifies That

David Hrebenach

Has Successfully Completed

CDM 150.98 Hazardous Waste Supervisory

Training Course, Fairfax, Virginia

Date January 28, 1989

Presented by

CDM Federal Programs Corporation

Martin Mathamel

Martin S. Mathamel, CIH
Health and Safety Manager

CERTIFICATE OF TRAINING

CDM FEDERAL PROGRAMS CORPORATION

Awarded in recognition of successful completion of Health and Safety Training in compliance with OSHA 29CFR1910.120

This Certifies That

Dave Hrebenach

Has Successfully Completed

The 8-hour Health and Safety Refresher

Training Course

Date 2/1/91

Certificate No. 008

Andrew P. Szilagyi

Andrew P. Szilagyi

Exhibit 6-2

RESPIRATOR FIT TEST WORKSHEET

CDM Respiratory Protection Program

NAME Dave Hrebenach

SOCIAL SECURITY NUMBER 220505974

FIRM/REGION FPC Fairfax

Clean Shaven? YES NO **Spectacle Kit Required?** YES NO

Test Atmosphere: *Isoamyl Acetate* *Irritant Smoke*

Test Atmosphere Recognition: pass fail pass fail

Manufacturer/Model: MSA/Ultratwin pass fail pass fail

Size: S M L

Result: ACCEPTED REJECTED

Manufacturer/Model: ______________ pass fail pass fail

Size: ______________

Result: ACCEPTED REJECTED

COMMENTS:

I (examiner) certify that the above named individual has been qualitatively fit tested in accordance with the guidelines established by the CDM *Health and Safety Assurance Manual* and that the above information reflects the results of the test.

EXAMINER'S SIGNATURE Christopher Brinsko 2/15/91 DATE

EMPLOYEE'S SIGNATURE David Hrebenach 2/15/91 DATE

Amended Medical Summary
Environmental Medicine Resources Inc.
4360 Chamblee Dunwoody Road
Atlanta, Ga 30341

Mr. David Hrabenach Site: Fairfax, VA
SS# 220-50-5974
Date of Exam: February 20, 1991
Date of Report: March 26, 1991

This individual has completed a medical surveillance examination. Medical review supports the following statements.

WORK STATUS

-Acceptable for employment. (See below for specific qualifications)

MEDICAL AND SAFETY RESTRICTIONS /RECOMMENDATIONS

-None

APPRAISAL OF LIFTING CAPACITY

-Lifting capacity for this individual appears to be II/III. (I = up to 25lbs; II= up to 60lbs; III= up to 100lbs frequently)

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS

-In accordance with 29 CFR 1910.120 (f), clearance is issued to permit this individual to work with hazardous materials.

USE OF RESPIRATORY PROTECTIVE EQUIPMENT

-In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory equipment.

EXPOSURE TO ENVIRONMENTAL TEMPERATURE EXTREMES

-Exposures to temperature extremes are acceptable providing that the conditions and safeguards are physically reasonable.

PUBLIC LAW 100-690

-Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION

-Not requested.

Respectfully,

David L. Barnes M.D., FACS, FACPM
V.P. Medical Affairs/Medical Director

TO:FPC OAK RIDGE
JAN-31-'91 THU 10:35 ID:FPC NEW YORK TEL NO:703-968-0915 #348 P02

JAN-30-1991 09:44 FROM CDM/FPC OAK RIDGE TN TO FPC FFX P.03

EXHIBIT 8-2

SITE / ACTIVITY CLEARANCE WORKSHEET

CDM Health and Safety Program

NAME: Bob Hinman

SOCIAL SECURITY NUMBER: 403-80-8164

FIRM/REGION: FPC - PADUCAH KY PGDP/MMES

MEDICAL CLEARANCE

PHYSICAL DATE:

( ) CDM PAID MEDICAL: Attach completed *Physical Examination Form* (MMP 1.0 2/1/88).

(x) NON CDM PAID MEDICAL: The undersigned, designated Health and Safety Manager (HSM) certifies that the above named individual has been examined by a licensed physician and the physician has determined the individual to be fit to perform hazardous waste remedial response activities and fit to use respiratory protective devices to perform hazardous waste remedial response activities.

RESPIRATOR CLEARANCE

FIT TEST DATE: 6/13/91 MMES PGDP

Attach *Respirator Fit Test Worksheet* (RPP 1.0 2/1/88) or equivalent.

TRAINING

TRAINING DATE: 8/24/90

CDMHEALTH Code, or NAME:

Attach course certificate or equivalent documentation. If equivalent experience, attach description and resume.

SITE / ACTIVITY CLEARANCE

CLEARANCE DATE: [redacted] LEVEL: BT [redacted]

The undersigned Health and Safety Manager certifies that the above statements and attachments are correct, and that the named individual has met *CDM Health and Safety Assurance Manual* requirements for Site/Activity Clearance.

SIGNATURE: 1·31·91 DATE:

Fit Test expired
~~[illegible]~~
Rejected Physical

RECEIVED JUL 25 1991

EMI

ENVIRONMENTAL MEDICINE RESOUR

MEDICAL SUM

4360 Chamblee Dunwo
Suite 202/Atlanta, Georgi

July 18, 1991

Mr. Andrew Szilagyi
CDM/Federal Programs
13135 Lee Jackson Memorial Hwy
Suite 200
Fairfax, VA 22033

Type of Exam: Baseline Toxin Exposure FPC FP.OAK
Exam: 06/26/91.10943 Employee: Bob Hines - 403-50-8964

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS

- NOTE: Spirometry results as reported do not meet accepted standards. Clearance cannot be issued. This study must be repeated.

APPRAISAL OF LIFTING CAPACITY

- Lifting Capacity for this individual appears to be III (I-up to 25lbs., II-up to 60 lbs., III-up to 100lbs. frequently)

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS

- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

USE OF RESPIRATORY EQUIPMENT

- No see NOTE
  - » Contact lenses shall not be worn when using respiratory protective equipment.
  - » Facial hair shall not be interposed between the face and t sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES

- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

PUBLIC LAW 100-690

- Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION

- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

David L. Barnes, M.D., FACPM
V.P. Medical Affairs/Medical Director

MARTIN MARIETTA

PGDP RESPIRATOR FIT CARD

HINES, CR 403-50-8964 S

EXPIRE: 06/13/91

NOT APPROVHALF FACE APF:10

MSA UV FULL FACE APF:50 L

NIOSH APPR. HALF FACE:

NIOSH APPR. FULL FACE: TC-21C

SPEC REQ

J. P. COCKRELL

ROANE STATE COMMUNITY COLLEGE
WASTE MANAGEMENT TRAINING CENTER

The Professional Development Program
for Hazardous Waste Remediation and
Emergency Response Workers

Certifies that

Charles R. Hines

has completed the 8-Hour Refresher Program
for Hazardous Waste Site Personnel
at Oak Ridge, Tennessee
on June 28, 1991
~~to satisfy OSHA~~ rules, 29 CFR 1910.120

Certificate Number: RS0628918HR446

SSN: 403-50-8964

Dan Steller, Interim Director

Tony King, Trainer

Roane-State Community College
Waste Management Training Center
728 Emory Valley Road
Oak Ridge, Tennessee 37830
615-481-3492

ENVIRO-SAF TRAINING CENTER

ACCREDITATION

to the effect that

CHARLES R. HINES

Attended and was successfully examined within the training program entitled

8-HR SUPERVISORY

as presented

Test Date:	Expiration Date:	Accreditation No:
07/11/91	07/92	403-50-8954

Trainer

MARTIN MARIETTA

PGDP RESPIRATOR FIT CARD

HINES, CR 403-50-8964 SUB
EXPIRE: 06/13/91
NOT APPROVHALF FACE APF:10
MSA UV FULL FACE APF:50 L HYC
NIOSH APPR. HALF FACE:
NIOSH APPR. FULL FACE: TC-21C-150
SPEC REQ
J. P. COCKRELL J Cockrell

HAZMAT TRAINING

This is to certify
that Charles R. Hines
SS # 403-50-8964
has successfully completed [illegible]
hours of Hazardous Waste Train[illegible]
accordance with Title 29, CFR 19[illegible]
Instructor [illegible]
Date 8-22-90

MARTIN MARIETTA ENERGY SYSTEMS, INC.

MMES PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

I HAVE RECEIVED A VISITOR INDOCTRINATION COMPRISED OF SECURITY, SAFETY, HEALTH AND EMERGENCY INSTRUCTIONS, AND UNDERSTAND THAT ACCESS TO PGDP IS CONTINGENT ON COMPLIANCE WITH THESE INSTRUCTIONS.

NAME (PRINT) Bob Hines
No. 001549

EMERGENCY SIGNALS - PAX 339

CONTINUOUS BLAST ON SPECIAL HIGH PITCHED AIR WHISTLE
RADIATION EMERGENCY - EVACUATE IMMEDIATELY TO ASSEM[illegible]

INTERMITTENT 2-SECOND BLAST ON PLANT HORNS
ATTACK WARNING - TAKE COVER

CONTINUOUS BLAST ON PLANT HORNS
ALERT SIGNAL - EVACUATE BUILDING AND LISTEN TO PLANT [illegible]
FOR INSTRUCTIONS

CASCADE BUILDINGS

THREE BLASTS ON BUILDING HORNS OR HOWLERS.
CALL AREA CONTROL ROOM.

OTHER BUILDINGS

ONE 10-SECOND BLAST ON BUILDING HORNS OR SIRENS.
LOCAL EMERGENCY NOTIFICATION
FOLLOW LOCAL PROCEDURES

(OTHER SIGNALS ARE IMPORTANT BUT DO NOT SIGNIFY EMER[illegible]

EMERGENCY NUMBERS - COMMERCIAL 333

ADD

SITE / ACTIVITY CLEARANCE WORKSHEET

CDM Health and Safety Program

NAME Laurie Wylie

SOCIAL SECURITY NUMBER 198-60-6585

FIRM/REGION FPC / Wayne

MEDICAL CLEARANCE

PHYSICAL DATE: 10-23-89

( ) **CDM PAID MEDICAL:** Attach completed *Physical Examination Form* (MMP 1.0 2/1/86).

( ) **NON CDM PAID MEDICAL:** The undersigned, designated Health and Safety Manager (HSM) certifies that the above named individual has been examined by a licensed physician and the physician has determined the individual to be *fit to perform hazardous waste remedial response activities and fit to use respiratory protective devices to perform hazardous waste remedial response activities.*

RESPIRATOR CLEARANCE

FIT TEST DATE: 1-10-90

Attach *Respirator Fit Test Worksheet* (RPP 1.0 2/1/86) or equivalent.

TRAINING

TRAINING DATE: 1/11/90 40hr. basic

CDMHEALTH Code, or NAME: 1-27-90 supervisor

Attach course certificate or equivalent documentation. If equivalent experience, attach description and resume.

SITE / ACTIVITY CLEARANCE

CLEARANCE DATE: 7-6-90

LEVEL: B-T D-S

The undersigned Health and Safety Manager certifies that the above statements and attachments are correct, and that the named individual has met *CDM Health and Safety Assurance Manual* requirements for Site/Activity Clearance.

SIGNATURE: [illegible] 7/6/90 [illegible] **DATE:** 2/9/90

sh

EMI
ENVIRONMENTAL MEDICINE RESOUR

4360 Chamblee Dunwo
Suite 202/Atlanta, Georgia
(404) 455-0818/(800) 22
FAX (404) 45

24 July, 1991

Toby Griggs
Health and Safety
CDM/Federal Programs Corporation
13135 Lee Jackson Memorial Highway
Fairfax, VA 22033

RE: Laurie Wylie

Dear Ms. Griggs,

Pursuant to our phone conversation, I spoke with Ms. Wylie. She has been off of the medication for about a week with little or no adverse effects. She is not presently on medication that would adversely affect her ability to deal with heat.

Based upon this information, I would accept the medical data previously forwarded to me and clear Ms. Wiley to work in environments of potential heat stress. It goes without saying, that care should be exercised in such an environment, which I know CDM/FPC does for all workers.

Respectfully,

David L. Barnes, M. D., FACS, FACPM
Senior Vice President, Medical Affairs

CERTIFICATE OF TRAINING

CDM FEDERAL PROGRAMS CORPORATION

Awarded in recognition of successful completion of Health and Safety Training in compliance with OSHA 29CFR1910.120

This Certifies That

Laurie Wylie

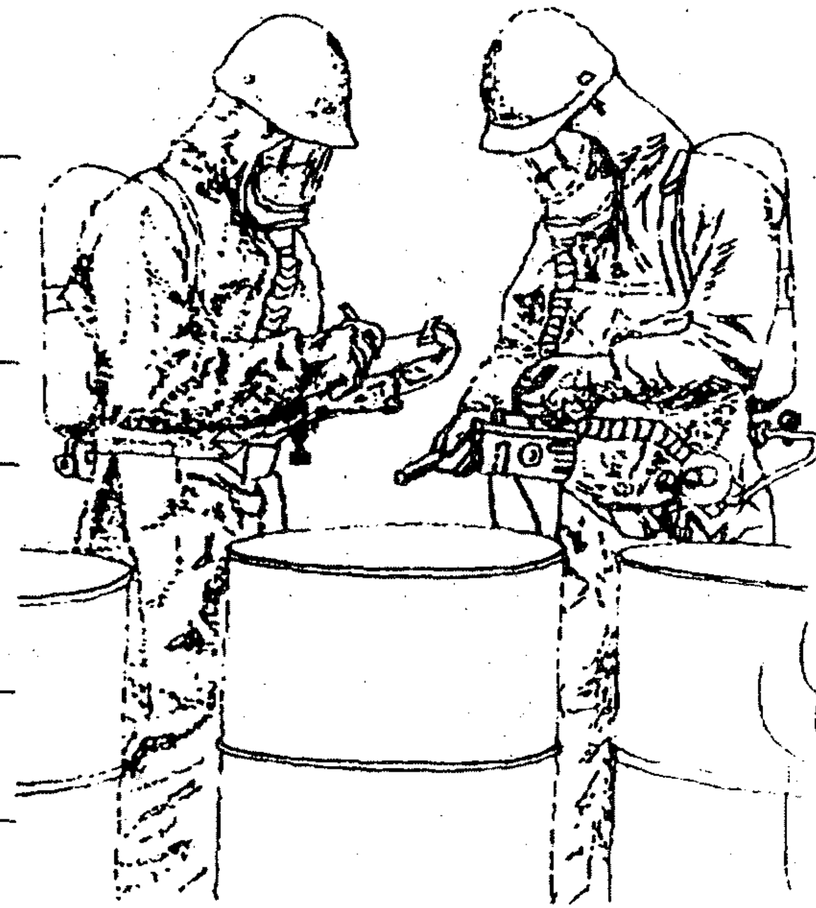
Has Successfully Completed

The 8-hour Health and Safety Refresher

Training Course

Date 2/12/91

Certificate No. 023



Andrew P. Szilagyi
Corporate Health and Safety Director

CDM

CERTIFICATE OF TRAINING

This Certifies That

LAURIE WYLIE

Has Successfully Completed

CDM 150.98 SUPERVISOR HEALTH AND SAFETY TRAINING

FAIRFAX, VIRGINIA

Date JANUARY 27, 1990

Presented by

CDM Federal Programs Corporation

Martin Mathamel

Martin S. Mathamel, CIH
Health and Safety Manager

EMILCOTT ASSOCIATES, INC.

HEALTH, SAFETY AND ENVIRONMENTAL TRAINING PROGRAM

RECEIVED JAN 1 5 '90 HEALTH SAFETY

This Certifies That

LAURIE BRINTON WYLIE

Has Successfully Completed

40 Hour Health and Safety Training Course for Hazardous Waste Operations and Emergency Response

Date **January 11, 1990** Location **Madison, N.J.**

Bruce D Groves

BRUCE D. GROVES, CIH
Course Director

EXHIBIT 8-2

SITE / ACTIVITY CLEARANCE WORKSHEET

CDM Health and Safety Program

NAME Kict [illegible]

SOCIAL SECURITY NUMBER 362-84-2732

FIRM/REGION CDM / North

MEDICAL CLEARANCE

PHYSICAL DATE:

(✓) **CDM PAID MEDICAL:** Attach completed *Physical Examination Form* (MMP 1.0 2/1/88).

( ) **NON CDM PAID MEDICAL:** The undersigned, designated Health and Safety Manager (HSM) certifies that the above named individual has been examined by a licensed physician and the physician has determined the individual to be *fit to perform hazardous waste remedial response activities and fit to use respiratory protective devices to perform hazardous waste remedial response activities.*

RESPIRATOR CLEARANCE

FIT TEST DATE:

Attach *Respirator Fit Test Worksheet* (RPP 1.0 2/1/88) or equivalent.

TRAINING

TRAINING DATE: 5/8/89

CDMHEALTH Code, or NAME: University of Illinois Hazardous Waste Worker Training Program

Attach course certificate or equivalent documentation. If equivalent experience, attach description and resume.

SITE / ACTIVITY CLEARANCE

CLEARANCE DATE: **LEVEL:** C-T/ ~~B-T~~

The undersigned Health and Safety Manager certifies that the above statements and attachments are correct, and that the named individual has met *CDM Health and Safety Assurance Manual* requirements for Site/Activity Clearance.

SIGNATURE: [illegible] **DATE:** 8/1/89 ED

SP

SEP . 1989

HEALTH & SA

HAZMAT

TRAINING ▲ INFORMATION ▲ SERVICES

CERTIFICATE OF COMPLETION

This is to certify that

KIRT SUOMELA

has successfully completed

OSHA HAZ-MAT SITE WORKER (Annual Recertification)

at

HAZMAT T.I.S.I., COLUMBIA, MARYLAND

Manager, Training

, 1991

561

UNIVERSITY OF ILLINOIS
At Urbana-Champaigr

under the auspices of
THE MIDWEST CONSORTIUM FOR HAZARDOUS WASTE WORKER TRAINING

CERTIFICATE OF PARTICIPATION

To KIRT D. SUOMELA

In Recognition of Attendance and Accomplishment in the

40-HOUR GENERAL SITE WORKER PROGRAM

Offered by the

Institute of Labor and Industrial Relations

at Elmhurst, IL date May 12, 1989

Walter H. Franke
Walter H. Franke
Director, Institute of Labor and Industrial Relations

Ronald J. Peters
Ronald J. Peters
Project Director

SEP 1989

Serial #: IL051289408 362842730

HEALTH & SA

HAZMAT
TRAINING ▲ INFORMATION ▲ SERVICES
INC.

CERTIFICATE OF COMPLETION

This is to certify that

AMY E. FRICK

has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

Thomas C. Cusick
Manager, Training Programs Department

Richard Arfield
Chief Executive Officer

June 10 - 14, 1991
C91-1150

MEDICAL MONITORING EXAMINATION
EMPLOYER NOTIFICATION

Employee Frick Amy Date ____________

Employer Jaycor ____________

I have reviewed the results of this employee's medical monitoring examination and certify that the record (☐ is/☐ is not) complete. (Tests not performed: ____________)
(____________)

Please check all sections that are applicable to this examination:

Applicable	Not Applicable	
☐	☒	**Asbestos Certification — Opinion of Increased Risk:**

This individual was examined as per OSHA Standards (29 CFR 1910.1001 and 29 CFR 1926.58. In my opinion, (☐ there is/☐ there is no) medical condition that places the individual at increased risk from exposure to asbestos, tremolite, anthophyllite, or actinolite.

☒ ☐ **Respirator Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and found (☒ qualified/☐ not qualified) to use a respirator.

☒ ☐ **Respirator Fit Testing:**

This individual has been examined as per OSHA Standards (29 CFR 1910.134) and has (☒ passed/☐ not passed) a qualitative fit test.

☒ ☐ **Hazardous Waste Certification:**

This individual has been examined as per OSHA Standards (29 CFR 1910.120). In my opinion, this individual is:

- ☒ qualified for full participation in hazardous waste site work when conducted under the conditions of adequate training and a health and safety plan.
- ☐ qualified with limitations that restrict full participation in hazardous waste site work as described below.
- ☐ not qualified for any direct work with hazardous waste or hazardous waste sites as described below.

Comments: (Please describe any work limitations including functional and environmental limitations, whether temporary or permanent, pending medical evaluation, etc.)
corrective lenses required

I have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

Physician Name: (Print) Ronald Fine (Signature) Ronald Fine MD

Date 6/27/91

WHITE - EMPLOYEE
YELLOW - PHYSICIAN
PINK - EMPLOYEE

APPENDIX Q

DRILLING SAFETY

APPENDIX Q
DRILLING SAFETY

The drillers working on site, like all other site personnel, shall have the 40 hour OSHA training as specified in 29 CFR 1910.120. Certificates of training for the drill teams will be maintained on file at the JAYCOR site office by the HSO. The HSO will also have the responsibility for conducting site inspections to the drill sites on a regular basis in order to ensure that the HASP and all pertinent regulations are being followed.

Prior to any drilling activities, the Project Team Leader will identify to the proper IAAP personnel the exact location of all drill sites. All pertinent regulations will be discussed with appropriate Plant personnel and required permits will be obtained before drilling proceeds. IAAP personnel with the help of Army UXO experts will investigate the drilling site and give approval or disapproval of drilling because of UXO or utility concerns. Drill teams shall stay within the cleared areas approved by the UXO experts when assessing and operating on site.

The drill team must wear all necessary PPE as determined by the HSO during all drilling activities. A minimum of one respiratory upgrade will be kept with the drilling team personnel while drilling is being done on site. The HSO for the site should be allowed to upgrade the level of respiratory protection at his or her discretion; the HSO should never be allowed to downgrade the level of respiratory protection without approval of the corporate Health and Safety Director. Monitoring personnel will be on site during all drilling activities to take headspace readings to ensure that adequate respiratory protection of the drill team is being utilized, and to ensure that the HASP and all pertinent regulations are being followed.

Drillers must wear protective clothing and safety equipment including a hard hat, steel-toed shoes, gloves, and eye and hearing protection regardless of level of protection required. "Hanging" or loose clothing will not be allowed around drilling equipment to prevent entanglement in the moving mechanisms.

All personnel shall be familiar with the locations of "kill switches" for the emergency shut down of drilling equipment prior to being involved, in any capacity, with the drill team.

Drillers shall avoid drilling in areas within 15 feet of overhead lines. Drill teams should survey the sites for all overhead lines and potential overhead hazards before setting up drill equipment.

Smoking, eating, or drinking is prohibited during drilling activities or around contaminated drilling equipment. No adjustments to the PPE is allowed to accommodate these activities.

Anyone on the site will have the right to question without fear of reprimand, UXO, drilling, or any other related health and safety issue if they believe these issues are being compromised. The HSO will be notified of these concerns and will make a decision on whether or not drilling operations should be stopped based on the merit of the concerns. The corporate Health and Safety Director will ultimately have the authority to resolve any issues that cannot be resolved satisfactorily in the field.

If site conditions warrant, the field team leader overseeing the drill team and the HSO may stop drilling at anytime. The FTM or HSO should then inform the Project Manager and IAAP personnel of the hazardous site conditions.

APPENDIX R

UXO SAFETY

UXO SAFETY

Prior to any drilling activities, the Project Team Leader will identify to the proper IAAP personnel the exact location of all drill sites. IAAP personnel with the help of Army UXO experts will investigate the drilling site and give approval or disapproval of drilling because of UXO or utility concerns.

After Army UXO personnel have cleared the site(s) of ordinance or have given approval for drilling to begin, the site HSO will visit the drilling teams periodically to conduct oversight of their activities with respect to health and safety concerns. Anyone on the site will have the right to question, without fear of reprimand, UXO, drilling, or any other related health and safety issue if they believe these issues are being compromised. The HSO will be notified of these concerns and will make a decision on whether or not drilling operations should be stopped based on the merit of the concerns. The corporate Health and Safety Director will ultimately have the authority to resolve any issues that cannot be resolved satisfactorily in the field.

A minimum of one respiratory upgrade will be kept with the drilling team personnel while drilling is being done on site. The HSO for the site should be allowed to upgrade the level of respiratory protection at his or her discretion; the HSO should never downgrade the level of respiratory protection without approval of the corporate Health and Safety Director.

APPENDIX S

HASP INFORMATION FOR THE USE OF THE GEOPROBE SYSTEM (RECON MULTIMEDIA SAMPLING SYSTEM)

PURPOSE

This procedure describes general precautions to be taken and good practices to be followed when performing environmental sampling using the RECON™ Multimedia Sampling System of the soil-gas van. This procedure also specifies the minimum chemical hazard protection protocols required for field activities if site-specific chemical hazards have not been addressed in a more specific project H&S guidance document.

REFERENCES

Occupational Safety and Health Guidance Manual For Hazardous Waste Site Activities

D.O.T. (Department of Transportation) driver safety regulations.

H&S Procedure 121 - Health and Safety Review of New Projects

H&S Procedure 131 - Incident Reporting

H&S Procedure 301 - Minimum Health and Safety Requirements

H&S Procedure 341 - Electrical Safety Practices/Buried Utilities

H&S Procedure 505 - General Safety Rules for Work on Hazardous Waste Sites Documents

Geoprobe System's 8-M Operations Manual

EQUIPMENT

Hard Hat (For Overhead Hazards)	Safety Glasses
Hearing Protection	Steel Toe Shoes
Safety Belt (Vehicle)	Work Gloves
	CPC (as needed)

FORMS

Completed hazardous materials shipping manifest for transport of GC supply compressed gases.

RESPONSIBILITIES

Department Manager, Project Managers, Site Supervisors, the Health and Safety Department and Sampling Technicians have responsibilities to implement this procedure as listed below.

Department Manager:

1. Assign only technically qualified personnel to perform a task.
2. Provide training and supervision such that the employee demonstrates adequate qualifications.
3. Where applicable, provide adequate personal protective and safety back-up equipment for employee activities.
4. Conduct periodic audits to determine if the applicable health and safety procedures are being followed.
5. Refer technical questions concerning H&S issues to the H&S Department.

Project Manager:

1. Consult the H&S Department for project-specific guidance on safety matters for activities on your job sites.
2. Provide appropriate H&S precautions for project use, in accordance with the project-specific H&S Guidance documents that apply.
3. Contact the H&S Department in the event that field conditions change such that additional requirements may be necessary.
4. Provide for subsurface utility clearances for project sites.

Site Supervisor/Senior Sampling Technician:

1. Implement project H&S requirements in accordance with this procedure and other applicable procedures, including but not limited to a site-specific health and safety plan and the client's facility safety program, if provided.
2. Provide and document project-specific training sessions. These training sessions should include a review of the requirements of this procedure with all field employees involved.

3. Verify subsurface utility clearances prior to subsurface penetration with the Geoprobe drive points.

4. Provide for appropriate environmental hazard monitoring and emergency response support for your site activities.

5. Consult the H&S Department, as needed, for support for your field operations.

6. Strictly enforce on-site compliance with this procedure and other applicable site-specific H&S guidelines by persons in your charge.

Health and Safety Department:

1. Upon request, perform a project-specific hazard evaluation. Prepare a site-specific health and safety plan to incorporate the elements of this procedure, if necessary.

2. Provide technical assistance to project personnel implementing this procedure.

3. Update this procedure periodically to include current industry practices to minimize the potential for exposure to hazardous environments.

Sampling Technicians:

1. Perform sampling operations in a safe manner using good judgment at all times. Refrain from any activity that might endanger yourself, fellow workers, or the general public.

2. Report any observed unsafe condition or act in a timely manner.

3. Report changed or unanticipated field conditions before continuing the field operation.

4. Report safety incidents and injuries in accordance with H&S Procedure 131 - Incident Reporting.

5. Report roadway accidents on your field vehicles to your Department Manager.

6. Abide by the H&S requirements set forth in this procedure and other applicable H&S procedures.

7. Consult with your Department Manager when H&S questions arise.

DISCUSSION

Field activities involving the Mathes RECON™ Multimedia Sampling System involve a wide range of site conditions and safety hazards. RECON™ activities are commonly conducted on chemically impacted sites, some of which are covered under OSHA Hazardous Waste Site Regulations 29 CFR Part 1910.120.

Numerous hazards are associated with field investigation of chemically contaminated sites. Chemical hazards include toxic effects to workers as well as hazards from encounter of flammable liquids or vapors. Hazards from sampling equipment, personnel protection practices, extreme weather conditions, and industrial operations on a client's active facility can cause physical injuries and thermal stress to workers.

Exposure of workers to chemical products are likely to be from direct dermal contact with free products, or inhalation of organic vapors released during handling of grossly contaminated sampled materials. In general, the chemical contaminants present relatively low inhalation and limited dermal exposure hazards. Sampling technicians are likely to be at greater risk from exposure to ambient levels of contaminants on certain sites than from the chemical hazards generated by their own activities.

Physical hazards to workers include physical injuries from operating RECON™ sampling equipment, and possibly thermal stress from wearing chemically protective clothing or being exposed to inclement weather, or both. Physical injuries can occur from operation or failure of RECON system equipment hydraulics, handling of pressurized gas supply cylinders for the on-board analytical GC, and any manual labor needed to support the field operation. However, the greatest potential physical hazard will be accidental penetration into pressurized chemical process piping or other "Live" buried utilities with the hydraulic-driven sampling probes.

In general, the nature of the RECON™ equipment and sampling procedures tends to limit most potential hazards for sampling/analytical technicians because:

- o the equipment is relatively small and lightweight;
- o quantities of chemically contaminated materials handled is small; and
- o subsequent chemical exposure of personnel is minimal

However, site-specific chemical hazards and project-specific H&S requirements must be evaluated on a case-by-case basis.

<u>PROCEDURE</u>

Implement the following procedure:

1. Sampling technicians operating the RECON™ system equipment must be adequately trained for the projects they are assigned to.

   1.1 Sampling personnel must meet the minimum training prequalification requirements for project field personnel performing activities on the subject job site.

   1.2 Sampling personnel must be provided the site-specific training required for their tasks on site. This training will be performed and documented by Mathes safety management representative assigned this responsibility for the project. This training may be provided by:

   - o the Project Safety Officer;
   - o the Site Safety Officer (if a large Mathes operation);
   - o the Site Supervisor, if also acting as the Site Safety Officer; or
   - o the senior technician of the RECON™ sampling team.

senior sampling technician must also assume roles and responsibilities of the Site Supervisor/Acting Site Safety Officer for the RECON™ field operation.

1.3 As a minimum, the sampling technicians will be provided a site safety orientation to discuss project safety organization, applicable guidance documents, site-specific hazards, topical safety protocols, and emergency preparedness measures.

1.4 The Project Manager must specify the project-specific training requirements for sampling technicians.

2. Sampling technicians must be medically qualified for the projects they are assigned to.

2.1 Sampling personnel must meet the medical certification requirements for project field personnel performing activities on the subject job site.

2.2 Medical certification requirements may include:

- o fitness to wear a respirator;
- o active participation in Mathes' medical surveillance program for hazardous waste site work; and
- o site-specific medical screening or monitoring.

2.3 The Project Manager must specify the project-specific medical qualification/ monitoring requirements for sampling technicians.

3. Access to the work zone should be restricted to authorized personnel only.

3.1 Access to the immediate vicinity of RECON™ system sampling activities will be limited to only those project personnel, including subcontractors, who have reason to be in the area. Mathes will not attempt to enforce access restrictions, but will summon facility security personnel, if available, or local law enforcement officers immediately. Mathes will not assume any responsibility for the activities or safety of intruders into our work zone.

3.2 Access into known (or suspected) chemical hazard areas by Mathes personnel will be limited to personnel meeting OSHA requirements for training, medical monitoring, and respirator fit test.

3.3 Non-Mathes personnel shall be cautioned against entry into a Mathes work zone judged to be a chemical hazard area. If they intrude despite the caution, shut down the operation and summon security.

4. The following minimum safety equipment shall be provided in the RECON™ system vehicle:

   o five pound, ABC rated fire extinguisher;

   o emergency eyewash (potable water, minimum);

<u>Note</u>: may use existing eyewash of client's facility);

   o first aid kit; and

   o pre-packaged, moistened sanitizing "wet" wipes, such as baby wipes (minimum on-site wash capability, for use following removal of splash protection clothing, or for emergency use for dermal exposure to free chemical product).

5. Chemically protective clothing (CPC) shall be selected and worn according to the nature of physical and chemical hazards of the work being performed, and the requirements specified in project-specific safety guidance documents.

5.1 Sampling technicians shall wear the CPC specified in the site-specific H&S plan (or the client's written facility plan) if provided.

5.2 If no site-specific H&S plan is provided, sampling technicians shall wear the CPC specified in the Mathes H&S operating procedure for handling the project contaminant of concern, if such an SOP exists.

5.3 If no site or contaminant-specific H&S protocols are provided, the CPC listed below will be worn during work activities.

- o hard hats (for overhead hazards);
- o hearing protection;
- o safety glasses;
- o steel-toed safety footwear;
- o field clothes or work uniform; and
- o work gloves with surgical gloves (minimum) for some chemical exposure protection.

NOTE: Additional dermal protection will be required when chemical hazards are present from site contaminants, and direct dermal contact is likely or unavoidable. Specific CPC required is based on the extent of site contamination and field conditions of the site or sample material handled (dry or wet).

When handling contaminated sample material or sampling equipment, also wear:

- o impermeable (neoprene or nitrile) outer gloves.

When working in a location known to be (or visibly) surface-contaminated, and conditions are dry, also wear:

- o dust goggles (if windy and dusty);
- o Tyvek coveralls; and
- o rubber outer boots.

Splash protection is required when activities involve handling of visibly contaminated groundwater, or soil saturated with free chemical product. Splash protection is also required during decontamination of equipment contaminated by these same materials. When splash protection is appropriate, also wear:

- o chemical splash-proof goggles; and
- o polyethylene (poly)-coated Tyvek coveralls.

5.4 Protective and personal clothing shall be changed daily.

6. Respiratory protection will be worn by sampling technicians when required by project-specific safety guidance documents, or when a respiratory hazard is detected or suspected.

6.1 Respirators will be worn as specified in site-specific safety protocols, in priority of:

- o the site H&S plan;
- o interim guidelines developed by the H&S Department for the project;
- o Mathes' H&S operating procedure for the contaminant(s) of concern; or
- o the client's facility-specific H&S plan.

6.2 If no guidelines are provided and sampling techncians observe or suspect that site contaminants are present that may require worker chemical protection, including possibly a respirator, further H&S review and guidance is required. When site contaminants are suspected or known to exceed one-half the threshold limit value (TLV), consult the H&S Department for further assistance.

6.3 The Project Manager must consult the H&S Department for a project-specific review of site hazards in order to establish appropriate protocols for protection of field personnel from respiratory hazards. The results of the review and project-required respiratory protection shall be communicated to Mathes site management personnel.

6.4 The results of the H&S review should also be communicated to field personnel when a respiratory hazard is not anticipated.

6.5 If site conditions warrant wearing a respirator, sampling technicians must be medically prequalified for, and trained in the use of, the respirator to be worn. They must also successfully demonstrate a documented fit test for the respirator to be worn, using stannic chloride irritant smoke (MSA part number 5645, or equivalent) as the challenging agent.

6.6 Sampling personal shall contact the Project Manager or H&S Department if site conditions are perceived to be changed or different than that anticipated so as to pose a potential respiratory hazard.

6.7 Field personnel may temporarily halt work activities for health and safety re-evaluation if they believe that they are at undue risk due to changed or unknown conditions.

7. Air monitoring shall be performed, as required or prudent, to verify that worker exposures to site respiratory hazards are within TLV (or other acceptable occupational exposure) guidelines.

7.1 Air monitoring of sampling technicians will be in accordance with project-specified protocols, as established by the H&S Department during the site hazard review process.

7.2 Use of air monitoring instrumentation for health and safety purposes is limited to personnel trained and qualified in the use of the equipment.

7.3 Use, calibration, and maintenance of air monitoring instruments shall be in accordance with Mathes Health and Safety Operating Procedures 441, 442, and 445, and the manufacturer's manual for the special instrument.

7.4 In general, sampling activities with the RECON™ system are not anticipated to generate sufficient contaminant emissions to pose a significant inhalation hazard to sampling personnel. For this reason, most RECON™ sampling tasks will not require air monitoring. However, if unanticipated ambient odors should become unexpectedly strong or irritating, halt operations and contact the Project Manager or H&S Department for directions on how to proceed.

7.5 "Rotten egg" odor detection of hydrogen sulfide (H_2S) gas during sampling will require suspension of further sampling activities at that location until either H_2S emission monitoring is implemented or supplied-air protection is provided. Detection of 10 ppm or greater H_2S with an H_2S monitor will require supplied-air respiratory protection.

7.6 If a pressurized release of vapor (from the RECON™ system-installed probe) is detected, irrespective of the response of on-site air monitoring instruments, shut down the equipment and evacuate the work zone immediately. Unless encounter with methane gas was anticipated and an combustible gas indicated (CGI) has been provided for such a situation, <u>Do not re-enter the work zone</u> until you have contacted the Project Manager or H&S Department.

8. Sampling personnel shall perform field operations with the recon™ system equipment in a prudent and safety-conscious manner. Sampling technicians must pay special attention to potential hazards from buried utilities, site chemical contaminants, and the sampling equipment itself.

8.1 Buried Utility Hazards

Each sampling location shall be inspected and approved as safe for subsurface penetration with the sampling probe. The inspection will be for buried utility pipes, wires, conduits, tanks or other potentially dangerous structures, overhead powerlines, stability of soil, and other obstructions.

It is always best to obtain clearance for underground utilities and other obstructions from site owners or public utility representatives. In Illinois, call J.U.L.I.E., (800) 892-0123. In Missouri, call Dig-Rite, (800) 344-7483. Some other states and major cities have similar underground utility location clearance hotlines. Call them, or the local utility companies to get drilling locations cleared. Refer to H&S Procedure 341 - Electrical Safety Practices/Buried Utilities for some guidelines on locating buried utilities and how to proceed with intrusive work.

When driving sampling probes near suspected electrical hazards, the rig should be grounded with a ground wire attached to a ground rod.

8.2 Site Contaminants

Site contaminants and potential safety hazards associated with encounter with these contaminants during sampling activities have been addressed by the project H&S review. The results of this review is the basis for the personal protective measures specified in project-specific safety guidance documents or provided, by default, in this SOP.

In addition, refer to Attachment 1 to this procedure for some recommended safety procedures specific to sampling activities. Also,, refer to H&S Procedure 505 - General Safety Rules For Work on Hazardous Waste Sites.

8.3 Recon™ Multimedia Sampling System Equipment Hazards

Use of mechanized, highly technical equipment, such as the RECON™ system, poses numerous predominantly physical hazards to sampling personnel. Sampling technicians must follow the specific operation and maintenance procedures provided in the equipment manufacturer's manual. In addition, the specific safety precautions from the manufacturer's manual are provided for ready reference in Attachment 2 to this procedure.

9. Exposure to extreme temperatures could pose a health hazard to sampling personnel. Although not usually a significant hazard unless manual labor is involved, ill effects and injury can result from improper worker protection for thermal stress. Heat and cold stress are best addressed by preventative measure, in particular worker monitoring for signs and symptoms of physical stress.

9.1 Specific procedures for monitoring and minimizing the effects heat stress and cold stress are provided in H&S Procedures 431 and 433, respectively.

9.2 The most effective way to minimize heat stress is to be in good physical condition, take "cool-down" rest breaks when needed to prevent severe overheating, and replace lost body fluids and electrolytes with plenty of chilled (not ice-cold) water or preferably a commercial "Body Thirst Quencher" such as Gatorade™, Quik Kick™ or Squencher™.

9.3 The most effective way to minimize cold stress is to wear adequate clothing and take "warm-up" breaks in a heated enclosure.

10. Employees shall remove personal protective equipment and remove residual contamination before leaving the jobsite. Decontamination protocols specified in project-specific safety guidance documents must be followed.

10.1 If personal protective equipment was worn, worker decontamination will consist of the following:

- o removal, bagging, and on-site disposal of spent protective clothing, including respirator cartridges;
- o washing exposed skin on site following the removal of protective clothing worn for splash protection; and
- o standard worker hygiene, including a recommended shower following the completion of the day's activities, especially if protective clothing was worn for splash protection.

10.2 In general, decontamination of RECON™ system sampling equipment should be minimal unless specifically required by the project work plan. However, equipment decontamination is required prior to demobilization from the work site for any equipment visibly contaminated by chemical product/ wastes. Detergent and water should remove most contaminants encountered.

11. Employees responding to an emergency situation should use the following guidelines.

11.1 Mathes' senior on-site Manager will act as the Site Safety Officer to coordinate responses to on-site physical and chemical injuries or exposures. This responsibility may fall to the senior sampling technician if no other Mathes personnel are on site.

11.2 Sampling personnel should review the site emergency plan and be prepared to respond to an emergency situation by using basic first aid techniques, and initiating, as necessary, the local emergency medical services (EMS) system. An EMS ambulance will be summoned, if needed.

11.3 Ill effects or injuries resulting from thermal stress to workers will be handled as a physical injury. Refer to H&S Procedure 431 and 433 for first aid procedures for heat and cold stress, respectively.

11.4 In the event of an overexposure or injury involving chemicals, move the victim from the immediate vicinity of the accident/exposure. Affected area(s) will be flushed with water, as needed. An EMS ambulance will be summoned.

11.5 The nearest working phone must be located to provide an emergency communication link to local medical emergency responders and project management. The exact location and specific directions to that phone will be communicated to on-site personnel in their site safety orientation.

11.6 Local emergency response contacts must be identified by the acting Site Safety Officer prior to on-site activities, and shall be communicated to on-site personnel.

11.7 This same information shall be posted in site facilities and/or vehicles, as appropriate.

Posted emergency contacts should include the local:

- o ambulance service;
- o hospital;
- o poison control center;
- o fire department; and
- o police department.

11.8 Specific directions (preferably a detailed map) to the hospital should be provided. It is advisable to travel the route to the hospital prior to an emergency to verify the accuracy of the route.

11.9 Should an emergency or near-emergency incident occur on-site, report the incident in accordance with H&S Procedure 131.

<u>EXCEPTIONS</u> None.

END OF H&S PROCEDURE 508

ATTACHMENT 1

SAMPLING SAFETY PROCEDURES

Safety practices for sampling activities, in general provide worker protection from chemical hazards associated with the sample materials and preservatives and sample decontamination chemicals. Required chemical protection will be specified in the Site Specific Health and Safety Plan or the applicable H&S Operating Procedure. In addition, the following points of good field practice should be implemented:

- use specified sampling techniques;
- exercise judgment in collecting and handling samples (if the sampling site is not accessible or your method is unfeasible, do not attempt to take a sample. Confer with project management about an alternate sampling site.);
- wipe off spills, dirt and residue immediately;
- immediately repair or replace any damaged gear or equipment;
- if you experience any physical discomfort, abnormalities, or lightheadedness -- stop work, tell the Site Safety Officer/Manager, and move from the immediate work area;
- avoid unnecessary physical contact with sample material;
- perform exposure/environmental monitoring required by Safety Plan;
- avoid contact with chemicals used for sample preservation or decontamination of sampling equipment;
- follow Safety Plan requirements when handling, processing, or packaging hazardous samples; and
- follow packaging, labeling, and shipping requirements of the Department of Transportation and others.

ATTACHMENT 2

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

(EXCERPTED FROM THE MANUFACTURER'S OPERATIONS MANUAL)

General Precautions

1. Always take vehicle out of gear and set emergency brake before engaging remote ignition.

CAUTION: 2. If vehicle is parked on a loose or soft surface, do not fully raise rear of vehicle with probe foot, as vehicle may fall or move, causing injury.

3. Always EXTEND the probe unit out from the vehicle and deploy the FOOT to clear vehicle roof line before folding the probe unit out.

4. Operators should wear OSHA approved steel-toed shoes and keep feet clear of probe FOOT.

CAUTION: 5. One person only should operate the probe machine and the assembly - disassembly of probe rods and accessories.

6. Never place hands on top of a rod while it is under the machine.

7. Turn off the hydraulic system while changing rods, inserting the hammer anvil, or attaching accessories.

8. Operator must stand to the control side of the probe machine, clear of probe foot and mast, while operating controls.

9. Wear safety glasses at all times during the operation of this machine.

10. Never exert down pressure on the probe rod so as to lift the machine base over six inches off the ground.

CAUTION: 11. Never exert down pressure on a probe rod so as to lift the rear tires of the vehicle off the ground.

12. Always remove the hammer anvil or other tool from the machine before folding the machine to the horizontal position.

CAUTION: 13. The vehicle catalytic converter is hot and may present a fire hazard when operating over dry grass or combustibles.

14. Geoprobe operators must wear ear protection. OSHA approved ear protection for sound levels exceeding 85 dba is recommended.

ATTACHMENT 2, Continued

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

15. The location of buried or underground utilities and services must be known before starting to drill or probe.

16. Shut down the hydraulic system and stop the vehicle engine before attempting to clean or service the equipment.

CAUTION: 17. Accidental engagement of this machine may cause injury.

Precautions For Operation of Electrical And Hydraulic Controls

1. It is necessary to be familiar with the Geoprobe Machine's controls before operating the machine.

CAUTION: 2. Never operate controls without proper training.

CAUTION: 3. Be sure vehicle is in park before using the remote ignition.

CAUTION: 4. Periodically, check the hydraulic hoses for leaks.

CAUTION: 5. Check the hydraulic fluid reservoir level at the beginning of each operating day.

CAUTION: 6. Check the oil cooling fan each day and make sure that it is operating properly.

CAUTION: 7. This machine vibrates. Tighten hydraulic fittings at least monthly.

CAUTION: 8. The hydraulic oil should be changed after the first 250 hours of service and after every 1000 hours of operation or one year of service thereafter.

9. It is a good habit to keep the electrical switch (3 position) in the off position when starting the engine using the remote ignition.

10. IMPORTANT: ALWAYS SHUT OFF ELECTRICAL SWITCH (DEACTIVATE HYDRAULICS) WHEN NOT USING THE HYDRAULIC CONTROLS.

ATTACHMENT 2, Continued

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

Precautions For Positioning Geoprobe

CAUTION: 1. Be sure to set the parking brake.

CAUTION: 2. Put engine in park and shut off engine.

CAUTION: 3. Check hydraulic hoses to see if they are free to move.

CAUTION: 4. Check hydraulic fluid level.

CAUTION: 5. Always set the vehicle park brake before you begin probing.

6. IMPORTANT: CHECK FOR CLEARANCE AT ROOF OF VEHICLE BEFORE FOLDING THE GEOPROBE OUT OF THE CARRIER VEHICLE.

7. IMPORTANT: KEEP REAR VEHICLE WHEELS ON THE GROUND SURFACE WHEN PUTTING THE WEIGHT ON THE PROBE UNIT. OTHERWISE, VEHICLE MAY SHIFT WHEN PROBING BEGINS.

Precautions For Drilling Through Surface Pavements

CAUTION: 1. Open Hammer Control Valve before drilling surface pavements.

CAUTION: 2. Keep the Hammer Lever fully depressed during the entire operation.

CAUTION: 3. Wear proper ear protection.

CAUTION: 4. Wear safety glasses.

CAUTION: 5. Wear steel-toed shoes.

6. IMPORTANT: WEAR PROPER EAR AND EYE PROTECTION BEFORE DRILLING SURFACE PAVEMENTS.

7. IMPORTANT: BE SURE TO SHUT OFF THE ROTARY ACTION BEFORE DRIVING PROBE RODS.

Precautions For Probing Operation

CAUTION: 1. Always set vehicle parking brake before beginning probing operations.

ATTACHMENT 2, Continued

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

CAUTION: 2. Never allow derrick foot to be lifted more than 6" off of ground surface.

CAUTION: 3. Keep probe rod parallel to probe cylinder.

CAUTION: 4. Keep rods threaded tightly together while using percussion.

CAUTION: 5. Wear steel-toed shoes.

CAUTION: 6. Wear eye protection.

CAUTION: 7. Wear safety glasses.

CAUTION: 8. Wear gloves.

CAUTION: 9. Always deactivate hydraulics when adding or removing probe rods, anvils, or any tool in the hammer.

Pertaining To Static Force:

10. IMPORTANT: MAKE SURE ALL THREADED PARTS ARE COMPLETELY THREADED TOGETHER BEFORE PROBING.

11. IMPORTANT: POSITIONING FIRST PROBE ROD IS CRITICAL IN ORDER TO DRIVE THE PROBE ROD VERTICALLY. THEREAFTER, BOTH THE PROBE ROD AND THE PROBE CYLINDER SHAFT MUST BE IN THE VERTICAL POSITION.

12. IMPORTANT: WHEN ADVANCING RODS, ALWAYS KEEP THE PROBE RODS PARALLEL TO THE PROBE CYLINDER SHAFT. THIS IS DONE BY MAKING MINOR ADJUSTMENTS WITH THE FOLD CONTROL. FAILURE TO KEEP PROBE RODS PARALLEL TO THE PROBE CYLINDER SHAFT MAY RESULT IN BROKEN RODS AND INCREASED DIFFICULTY IN ACHIEVING DEPTH.

Pertaining To The Percussion Hammer:

13. IMPORTANT: ALWAYS KEEP STATIC WEIGHT ON THE PROBE ROD OR THE ROD WILL VIBRATE AND CHATTER WHILE YOU ARE HAMMERING CAUSING ROD THREADS TO FRACTURE AND BREAK.

ATTACHMENT 2, Continued

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

14. IMPORTANT: PROBE RODS MUST BE TIGHTENED AT THE SAME TIME YOU ARE ADVANCING THEM. THEREFORE, IT IS NECESSARY TO OPERATE THE MACHINE WITH TWO PEOPLE, ONE TO RUN THE CONTROLS WHILE THE OTHER PERIODICALLY TIGHTENS THE PROBE RODS.

Pertaining To Adding Rods:

15. IMPORTANT: ALWAYS DEACTIVATE HYDRAULICS WHEN ADDING RODS.

Pertaining To Pulling Rods:

16. IMPORTANT: IF THE LATCH WILL NOT CLOSE OVER THE PULL CAP, ADJUST THE DERRICK ASSEMBLY BY USING THE EXTEND CONTROL. THIS WILL ALLOW YOU TO CENTER THE PULL CAP DIRECTLY BELOW THE HAMMER LATCH.

17. IMPORTANT: <u>DO NOT</u> RAISE PROBE CYLINDER ALL THE WAY WHEN PULLING PROBE RODS OR IT WILL BE IMPOSSIBLE TO LOWER THE PROBE CYLINDER FAR ENOUGH TO LATCH ONTO THE NEXT ROD THAT IS TO BE PULLED.

NOTE: It is a good idea to put a mark on the side of the derrick slide to keep you from raising the probe cylinder too high.

<u>Precautions For The Retractable Drive Point</u>

CAUTION: 1. To be sure all bearings are aligned with the discontinuous slots.

CAUTION: 2. Keep extra ball bearings. If the retractable drive point is assembled incorrectly, ball bearings may be lost.

<u>Precautions For Geoprobe Hammer Removal</u>

CAUTION: 1. Do not attempt to replace hammer on your own.

CAUTION: 2. Be sure hydraulics are shut off before removing hydraulic hoses.

ATTACHMENT 2, Continued

GEOPROBE MODEL 8-M

OPERATION SAFETY PRECAUTIONS

CAUTION: 3. Remember to mark the hydraulic hoses before removal.

4. IMPORTANT: Be sure to mark hydraulic hoses before disconnecting from the hammer. The top hose is flow to the hammer (supply) and the bottom hose is the return flow. Label these with tape or tags.

5. IMPORTANT: Hammers are heavy! Do not attempt to lift hammer from Geoprobe on your own, this is a two person job.

Prior to any drilling [illegible] team [illegible] personnel the exact location [illegible] drill sites [illegible] experts will investigate the [illegible] site and give [illegible] UXO or utility concerns.

After Army UXO personnel have cleared the site [illegible] drilling to begin, the site HSO will visit the drilling team [illegible] to [illegible] activities with respect to health and safety concerns. [illegible] to question without fear of reprimand [illegible] if they believe these issues are being compromised [illegible] concerns and will make a decision on [illegible] based on the [illegible] the concerns. [illegible] Health a[illegible] have the authority to resolve any issues that cannot be resolved [illegible]

A minimum of one respiratory [illegible] drilling [illegible] done on site. The HSO on the site should [illegible] [illegible] contamination [illegible] story [illegible] without approval of [illegible]