

FINAL

Operable Unit 1 Land Use Controls Implementation Plan

Iowa Army Ammunition Plant,
Middletown, Iowa

Contract No. W912QR-12-D-0005,
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Prepared for

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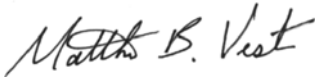
STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Environmental Services at Iowa Army Ammunition Plant Middletown, Iowa

U.S. ARMY CORPS OF ENGINEERS LOUISVILLE DISTRICT

The Leidos team has completed the Final submittal of the **Operable Unit 1 Land Use Controls Implementation Plan, Iowa Army Ammunition Plant, Middletown, Iowa**. Notice is hereby given that an independent technical review (ITR) has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Project Management Plan and Contractor Quality Control Plan. During the ITR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results including whether the product meets the United States Army Corps of Engineers' (USACE's) needs consistent with the law and existing USACE policy.

Leidos Project Manager



11/12/2019

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Date

Matthew Vest

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11/12/2019

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LIST OF ACRONYMS

2018 ESD	<i>Explanation of Significant Differences for the Records of Decision Soils OU-1 Addition of Land Use Controls, Off-Site Disposal of Contaminated Soil, and the Fire Training Pit for Iowa Army Ammunition Plant, Middletown, IA</i>
AO	American Ordnance, LLC
Army	U.S. Army
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CO	Commanding Officer
DNR	Department of Natural Resources
DoD	U.S. Department of Defense
EC	engineering control
ESD	Explanation of Significant Differences
EWI E01-012	<i>Environmental Work Instruction (EWI) E01-012 Incorporating Land Use Controls in Project Planning</i>
FFA	Federal Facilities Agreement
FUSRAP	Formerly Utilized Sites Remedial Action Program
GIS	geographic information system
HMX	high melt explosive
IAAAP	Iowa Army Ammunition Plant
IC	institutional control
LAP	load, assemble, and pack
LUC	land use control
LUCIP	Land Use Control Implementation Plan
NCP	National Contingency Plan
OU	operable unit
RAB	Restoration Advisory Board
RDX	royal demolition explosive
RG	remediation goal
TNT	2,4,6-trinitrotoluene
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
UU/UE	unlimited use and unrestricted exposure

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1.0 INTRODUCTION

This document presents the Land Use Controls Implementation Plan (LUCIP) for a portion of the Soils Operable Unit (OU-1) at the Iowa Army Ammunition Plant (IAAAP) in Middletown, Iowa. This LUCIP is a remedial design document to outline the process for implementation and maintenance of land use controls (LUCs) as a component of the selected remedy for OU-1 at the IAAAP under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (USC) §9601 et seq. This LUCIP was prepared by Leidos, Inc. (as part of the CH2M Hill Team), for the U.S. Army (Army) in accordance with contract W912QR-12-D-005, Delivery Order 006. This document satisfies the requirements of the U.S. Department of Defense (DoD) Manual 4715.20 (DoD 2012).

The IAAAP is a government-owned, contractor-operated munitions production facility under the command of the U.S. Army Joint Munitions Command, Rock Island, Illinois. The primary activity at the IAAAP since 1941 has been to load, assemble, and pack (LAP) a variety of conventional ammunition and fusing systems for the DoD.

Past munitions production has resulted in contamination of soil and groundwater. The primary source of contamination is attributable to past operating practices in which wastewaters and sludges contaminated with explosives (2,4,6-trinitrotoluene [TNT], royal demolition explosive [RDX], and high melt explosive [HMX]) were discharged to uncontrolled lagoons and impoundments at the IAAAP. Additional sources of contamination included open burning of explosives materials and munitions and landfilling of waste material. Metals, semi-volatile organic compounds, and polychlorinated biphenyls were also identified as contaminants. Hazardous substances have been detected at concentrations above human health-based screening values in soil at the IAAAP.

1.1 PURPOSE

The selected remedy for OU-1 soils includes excavation of soil with contaminant concentrations above the remediation goals (RGs), treatment of the most highly contaminated soils, and permanent disposal at both on-site and off-site facilities (USAEC 1998 and USACE 1998). The *Explanation of Significant Differences for the Records of Decision Soils OU-1 Addition of Land Use Controls, Off-Site Disposal of Contaminated Soil, and the Fire Training Pit for Iowa Army Ammunition Plant, Middletown, IA* (2018 ESD) (Leidos 2018) established LUCs as the long-term component of the selected remedy for OU-1 to provide overall protectiveness of human health and the environment in accordance with the U.S. Environmental Protection Agency's (USEPA's) remedy selection expectations described in 40 *Code of Federal Regulation (CFR)* §300.430(a)(1)(iii)(D) of the National Contingency Plan (NCP), 40 *CFR* Part 300. Because the OU-1 remedy was based on Commercial/Industrial Land Use, LUCs are required to limit access and exposures to residual soil contaminant concentrations that remain in place above those levels that allow for unlimited use and unrestricted exposure (UU/UE). LUCs are any type of physical, legal, or administrative mechanism that restricts the use of or limits access to real property to prevent or reduce risks to human health and the environment. The LUCs described in this LUCIP will be maintained until concentrations of site-related contaminants have been reduced to levels that allow for UU/UE.

The LUCIP specifies the following:

- Exposure scenarios associated with current and expected future land use,
- LUC performance objectives,

- LUCs to be implemented and how they will be maintained and managed,
- Requirements for LUC monitoring (inspections) and reporting,
- Procedures to modify or terminate the LUCs if conditions change, and
- Requirements for Five-Year Reviews.

This LUCIP is not intended to cover the LUCs that may be necessary for any portion of IAAAP that may be transferred out of Federal ownership.

1.2 SITE BACKGROUND

The IAAAP occupies approximately 19,000 acres in the town of Middletown in Des Moines County, Iowa (Figure 1). Approximately one-third of the IAAAP property is occupied by active or formerly active production or storage facilities including production lines, former surface impoundments, landfills and disposal areas, burn pads, demolition areas, and fire training areas. The remaining land is either woodlands or property leased for agricultural use.

The IAAAP was placed on the National Priorities List in 1990. The DoD established the Defense Environmental Restoration Program to address cleanup activities under the CERCLA, the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan. The Army is the lead DoD agency for implementing the environmental remediation activities at IAAAP with support from the USEPA as the lead regulatory agency. The USEPA and the Army signed the IAAAP Federal Facilities Agreement (FFA) for site cleanup, which became effective December 10, 1990 (U.S. Army and USEPA 1990). Due to the complexity of the remediation associated with the IAAAP, the facility has been divided into several OUs to facilitate project management. Portions of the IAAAP not included in OU-1 are outside the scope of this document.

The Army implemented the remedial actions for surface and subsurface soils at the OU-1 Areas in accordance with the *Interim Action Record of Decision, Soils Operable Unit, Iowa Army Ammunition Plant, Middletown, Iowa* (USAEC 1998), the *Record of Decision Soils Operable Unit #1 Iowa Army Ammunition Plant, Middletown, Iowa* (USACE 1998), and several Explanation of Significant Differences (ESD) documents (USEPA 2003, Tetra Tech 2006, Tetra Tech 2008, Tetra Tech 2009, Tetra Tech 2011, and Leidos 2018). The remedial action objectives were to (1) prevent human contact with contaminants of concern in soils at levels posing a threat, and (2) minimize potential impacts associated with contaminants leaching from soils to groundwater (USACE 2016).

The selected remedy for OU-1 Areas required excavation of surface and subsurface soil with contaminant concentrations above the Commercial/Industrial RGs, treatment of the most highly contaminated soils or soils exceeding land disposal restrictions, and permanent disposal of excavated soil in both on-site and off-site permitted facilities. The soil contaminants are primarily the explosives RDX and TNT, but also include metals, and polycyclic aromatic hydrocarbons. RGs were developed to reduce human health risks associated with ingestion and dermal contact under an industrial/commercial land use scenario and soil leaching RGs were calculated for RDX and TNT for the protection of groundwater.

Because the OU-1 soil RGs were based on commercial/industrial land use, the remedy leaves hazardous substances in place that pose a potential future risk that requires LUCs until the concentrations of site related contaminants in soil reach concentrations that allow for UU/UE. The 2018 ESD (Leidos 2018) established LUCs as the long-term component of the selected remedy for OU-1 to provide overall protectiveness of human health and the environment.

The *Explanation of Significant Differences for the Interim Action Record of Decision (IROD) Soils Operable Unit (OU-1) Addition of Environmental Protectiveness to the Remedy and Transfer of Sites from OU-4 to OU-1 for Iowa Army Ammunition Plant, Middletown, IA* (Tetra Tech 2008) established evaluation of residual soil concentrations for protection of ecological receptors at OU-1 Areas. The Baseline Ecological Risk Assessment (BERA) for the IAAAP was conducted using data collected during facility-wide investigations and the initial results of the BERA indicated that all potential risks to ecological populations were calculated to be below target limits (MWH 2004). However, the risk to the Indiana bat (a threatened and endangered species known to be present at the IAAAP) was evaluated further in the BERA. Copper was identified as a contaminant of ecological concern in soil at Line 3, Line 3A, and Line 800, resulting in ecologically-based excavation goal of 60 milligrams per kilogram for copper at these sites (Tetra Tech 2008). Thirteen (13) areas at Line 3, 3A, and Line 800 where copper concentrations posed a risk to the Indiana bat were excavated. The final ecological evaluation indicated that all risks calculated for potential Indiana bat exposures to chemical concentrations remaining on these sites, are less than the target limits (USACE 2016). Therefore, no LUCs are currently required for the protection of ecological receptors under the current and future expected land use.

1.3 SCOPE

LUCs associated with surface and subsurface soil at the nineteen (19) OU-1 Areas of IAAAP will be managed in accordance with this LUCIP. The OU-1 Areas (Figure 2) are as follows:

1. Line 1
2. Line 2
3. Line 3
4. Line 3A
5. Lines 4A/4B
6. Lines 5A/5B
7. Line 6
8. Line 8
9. Line 9
10. Line 800
11. East Burn Pads Area
12. Incendiary Disposal Area
13. Possible Demolition Area
14. Demolition Area/Deactivation Furnace
15. Burn Cages/West Burn Pads Area
16. North Burn Pads Area (and Landfill)
17. Fire Training Pit
18. Roundhouse Transformer Storage Area
19. Central Test Area

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2.0 SELECTED LAND USE CONTROLS

This section provides a description of the specific LUCs for the OU-1 Areas. The LUCs consist of both institutional controls (ICs) and engineering controls (ECs) to restrict land use, limit access, prohibit unauthorized intrusive activities, manage contaminated soil, and prohibit the use of the on-site groundwater as a drinking water supply. The Army or its representatives will be responsible for implementation, inspection, reporting, and enforcement of the LUCs for the OU-1 Areas.

2.1 LAND USE ASSUMPTIONS

The IAAAP is a federal military installation that manufactures explosive munitions. Because of the hazards associated with munitions, authorization to enter IAAAP is controlled and permitted on a limited and restricted basis. Industrial land use is currently maintained through the IAAAP's function as an Army Ammunition Plant, with its associated security and property access restrictions. The reasonably anticipated future use of the property is a DoD military installation with industrial/military land use. Therefore, land use at the OU-1 Areas will remain industrial while the IAAAP continues to be under federal control.

The receptors that could be affected by the residual contamination at the OU-1 Areas are industrial workers at the IAAAP and construction or utility workers conducting work at the IAAAP who could disturb contaminated soil, resulting in exposure to contaminants in surface and subsurface soils and any potential unauthorized use of on-site groundwater. Risks estimated for on-site workers under the exposure scenario presented in the baseline risk assessment were within or less than the USEPA's target excess lifetime cancer risk range (1E-04 to 1E-06) and less than the target non-cancer hazard index of 1.0 (JAYCOR 1996). However, without LUCs in place, on-site visitors (recreational users) could also potentially be exposed to soil at OU-1 Areas.

2.2 PERFORMANCE OBJECTIVES

LUCs are necessary to provide long-term protection to industrial workers, construction and utility workers, and site visitors (recreational users) from residual contamination at the OU-1 Areas. In addition, ICs, a subset of LUCs consisting of administrative and legal controls, are needed to prevent residential and similar use of OU-1 Areas. The LUC performance objectives are as follows:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.
- Restrict property access to only authorized individuals for approved commercial, industrial, and operation and maintenance purposes.
- Prevent unauthorized intrusive activity into soil areas or unauthorized removal or penetration of the building foundations or slabs where soil with contaminant concentrations above the OU-1 RGs are anticipated or known.
- Prevent worker exposures to soil where soil with contaminant concentrations above the OU-1 RGs and any potential exposure to or unauthorized use of on-site groundwater.
- Prohibit the reuse of soil from areas subject to LUCs for any off-site purpose.
- Prevent the improper disposal of soil with contaminant concentrations above the UU/UE.

Although responsibility for various actions defined in this LUCIP is delegated to the Operating Contractor (currently American Ordnance, LLC [AO]) or other third party, the Army is responsible

and if there is no Operating Contractor, the Army will take care of all aspects of the LUCIP including, but not limited to, management, enforcement, and compliance. Should any LUC deficiency result in failure to maintain remedy integrity, the Army will ensure appropriate actions are taken as soon as practicable to reestablish the remedy's protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Army's costs for remediating any discovered LUC violation(s). The responsibilities designated to the Operating Contractor are transferable to new Operating Contractors in the future.

2.3 INSTITUTIONAL CONTROLS

ICs are defined as legal or administrative mechanisms to prevent or reduce risk to human health or the environment by limiting access to real property (DoD 2012). The ICs defined for the OU-1 Areas include land use restrictions, lease restrictions, groundwater well restrictions, and property transfer restrictions. At the IAAAP, the Army uses the *Environmental Work Instruction (EWI) E01-012 Incorporating Land Use Controls in Project Planning* (EWI E01-012) (AO 2018) as the land use planning and management system. A Base Master Plan, if developed, will also be used as a land use planning and management system.

2.3.1 Land Use Restrictions

The Army will restrict land use at OU-1 Areas through a combination of the U.S. Army Corps of Engineers (USACE) Real Estate Division's outgrant program, project review and approval procedures for the Operating Contractor (EWI E01-012), and implementation of *Iowa Army Ammunition Plant Regulation 420-1 Hunting and Fishing Regulation* (IAAAP 2016). The Army will also create/update the geographic information system (GIS) layer for OU-1 Area LUCs.

Facility activities are confined to military (ordnance production and testing areas), commercial/industrial (leased, developed areas), agricultural (leased, non-developed areas), and permitted hunting (non-developed areas). Residential land use, including use for elementary and secondary schools, childcare facilities, and playgrounds, is prohibited. The USACE Real Estate Division will remove OU-1 Areas from the list of available land for residential use.

The DoD has no authority to grant a real property interest for an environmental covenant on an active installation; therefore, installations must use their own systems and processes for recording LUCs (DoD 2012). For active installations, the Army maintains authority over land use planning and can internally restrict and control use of the property. Once the decision has been made to place limitations on the use of property to mitigate exposure to residual hazards, the installation incorporates LUCs into the existing land use planning and management systems routinely used at the installation for planning and construction decisions. At the IAAAP, the Army uses the EWI E01-012 as the land use planning and management system. A Base Master Plan, if developed, will also be used as a land use planning and management system.

The project review and approval procedure, EWI E01-012, requires Army oversight when a project involves or is encumbered by potential contamination of environmental media, has potential impacts to remedial actions, when a project has the potential to change the land use, or activities that are likely to result in changes in surface water or groundwater flow are proposed. For all OU-1 Areas, this includes all soil disturbing activities, including, but not limited to, excavation, grading, trenching, utility installation or repair, investigative sampling, or maintenance activities. Additionally, drilling, sawing, or otherwise penetrating concrete or removal of concrete interior areas of the buildings at the OU-1 Areas where potentially or known contaminated soil (Table 1) may exist below the foundations will require evaluation. Additionally, any non-routine work

activities (e.g., subsurface soil investigations) that may be conducted by the Army at OU-1 Areas to support future remedial actions would also require compliance with EWI E01-012.

For those areas (Table 1 Level I) where the industrial soil cleanup levels (RGs) were not met, methods to prevent worker exposure (e.g., personal protection equipment) and contaminant controls (e.g., dust, storm water) must be implemented during any soil disturbance. If any construction or excavation actions are conducted at OU-1 Areas where soil with contaminant concentrations above UU/UE remains, a plan for management of excavated soil is necessary.

EWI E01-012 describes the procedure for assessing LUC requirements (“Project LUC Review”). The Operating Contractor’s Engineering Department and/or Facilities Maintenance are required to identify a project that includes potential disturbance of environmental media. The Operating Contractor’s Environmental Department reviews the detailed planning documents and identifies any additional information needed to complete the LUC review. The Environmental Department then reviews the detailed planning documents with the Army for LUC compliance and resolves any outstanding issues necessary for LUC compliance.

A Project LUC Review Form will be used to document the evaluation of LUCs requirements during the planning process. An example of a Project LUC Review Form is provided in Appendix A. As part of the Project LUC Review, details regarding the nature of the project, the project’s location, and the expected depth of any proposed trenching, excavation, drilling, or other soil disturbance will be recorded on the Project LUC Form. The GIS layer that depicts the LUCs will be reviewed to determine if LUCs are in place at proposed work areas. The evaluation of the proposed project may also require a review of all available data, including survey maps, remedial action reports, and five-year review reports, to determine the appropriate requirements regarding health and safety, storm water, and waste disposal. No work may begin until the IAAAP Project Manager approves the review form.

If the work is conducted in an emergency (e.g., ruptured subsurface gas line), a formal Project LUC Review is not required. However, the Operating Contractor and IAAAP Project Manager must evaluate the LUC requirements in place and ensure mitigation and/or control measures are employed to protect human health and the environment. After soil-disturbing activities are complete, the Operating Contractor will complete a LUCs site inspection (Section 4.1) to ensure LUCs are in compliance and/or restored. If the emergency work results in a LUC deficiency, the Army will then implement the procedures presented in Section 5.1, including notifying the USEPA within ten (10) business days.

EWI E01-012 will be amended to be the initial point at which all new projects or construction will be reviewed for compliance with LUC requirements. This instruction will be amended to require Army review of all projects identified by the Operating Contractor to be at or adjacent to sites identified as encumbered by LUCs. The project review and approval procedures are illustrated in a flow chart in the EWI E01-012.

Each year, IAAAP offers a limited number of recreational permits to members of the general public to participate in fishing and hunting activities at the installation. Hunting and fishing are regulated by the *Iowa Army Ammunition Plant Regulation 420-1 Hunting and Fishing Regulation* (IAAAP 2016). Appendix G of Regulation 420-1 details specific areas of the IAAAP that are closed to all recreational use on the IAAAP including the OU-1 Areas. The Army Natural Resources Manager administers the hunting and fishing programs and coordinates with safety and security personnel to ensure these activities comply with federal and state laws and IAAAP regulations including *Regulation 420-1*. Individual permits for IAAAP Recreational Use are issued

annually through a permit application process. The Army Natural Resources Manager also provides instructions and handouts to the permit holders identifying restricted access areas on the installation, including the OU-1 areas. All recreational users of the IAAAP must follow all rules and regulations concerning hunting and fishing while on the installation. Violations will be reported to the Environmental Restoration Manager.

2.3.2 Lease Restrictions

The management of real property at IAAAP for non-Army use is controlled by the USACE Omaha Real Estate Division through an outgrant program. The outgrant program involves managing the Government's real property holdings and authorizing the use of that property by others through the use of leases, permits, easements, or licenses. In the event of potential future agreements, the Army will work with the USACE Real Estate Division to ensure any leases of OU-1 Areas include restrictions on subsurface excavation, digging, drilling, or other surface disturbance and that any leases of the OU-1 Areas shall include language that requires the lessee to provide written notification to the Army of any plans to conduct surface disturbances. No outgrants are currently in place at the OU-1 Areas and are not expected in the near future.

Agricultural leases comprise a major portion of unimproved grounds on IAAAP. Agricultural land use is currently managed by the Contract Administration Branch at the IAAAP. Leases are drawn up by the Natural Resources Manager and once approved are submitted to the USACE for issuance. The Integrated Natural Resources Management Plan 20 *Agricultural Outleases* sets forth regulations that prevent or limit on-site visitors from exposures to contaminated soil and/or potentially contaminated groundwater at the OU-1 Areas.

2.3.3 Groundwater/Well Restrictions

The Army may require the installation of new or use of existing groundwater monitoring wells in the future to extract small volumes of water to monitor environmental conditions in and near OU-1 Areas. No other wells will be allowed in areas of known groundwater contamination and the suitability of wells near OU-1 Areas will be determined through the Iowa Department of Natural Resources (DNR) permitting process. The Army and Operating Contractor will maintain construction records for each well. The location of each well, along with its construction specifications and intended use, will be stored in the Army and, as appropriate, the Operating Contractor's GIS database.

The potential exposure scenarios used to derive the soil cleanup levels (RGs) were based on human health risks identified for the on-site worker including the potential ingestion of contaminated groundwater and dermal contact with groundwater (USAEC 1998). On-post groundwater remediation is not included under OU-1 and will be addressed separately. Accidental or incidental exposure to contaminated shallow groundwater could result during subsurface excavations. For the OU-1 Areas (Table 1 Level II) where the groundwater leaching RGs were not met, methods to prevent worker exposure (e.g. personal protection equipment) and contaminant controls (e.g., water management) must be implemented during any soil disturbance. Prior to any ground disturbance for the installation of groundwater wells, the Army and the Operating Contractor will implement the EWI E01-012 and complete a Project LUC Review Form (Section 3.1.2) to ensure workers are properly protected during work activities and any soil or water is properly managed for disposal.

2.3.4 Property Transfer Restrictions

The IAAAP is a federally-owned facility. No federal transfer of ownership has been conducted and no transfer of ownership is currently anticipated. However, if property transfer were to occur in the future, it would be conducted in accordance with CERCLA Section 120(h), 42 USC § 9620(h) and any pursuant regulations. Any property transfer from the Army will include a CERCLA Section 120(h)(3) covenant that will describe the residual contamination on the property and the environmental use restrictions, expressly prohibiting activities inconsistent with the OU-1 performance goals and objectives.

2.3.5 Stakeholder Outreach

LUCs can only remain effective if they are recognized, respected, and upheld by IAAAP stakeholders. An effective LUC outreach program is critical to maintain LUCs, respond to the needs of stakeholders, and provide and maintain appropriate LUC notifications and information. The IAAAP stakeholders include the Army, the contracting operator and IAAAP workers, recreational users (e.g., hunters and fishermen), community members, the Restoration Advisory Board (RAB), and regulatory agencies.

Activities that will be conducted regarding stakeholder outreach communication will include the development of newsletter articles and/or informational brochures, information sharing at RAB meetings, annual reporting of LUC inspections, and annual training for industrial workers and recreational users of the IAAAP. This LUCIP will become part of the information repository for the IAAAP. The IAAAP will also provide training to installation personnel, including the grounds, maintenance, real estate/real property, and contractor personnel regarding the physical location of LUCs and how to care for property subject to LUCs.

Additionally, the effectiveness of LUCs will be evaluated as part of the five-year review process (Section 5.4). During the five-year review process, stakeholders are also interviewed and provide feedback on the effectiveness of the remedy implementation and any modifications to the LUCs deemed necessary will be made.

2.4 ENGINEERING CONTROLS

ECs generally consist of physical measures designed to contain or reduce the potential for human exposure to contamination by limiting direct contact with contaminated areas, reducing contamination levels, or controlling migration of contaminants through environmental media (DoD 2012 and ITRC 2008). The ECs that are currently in place or will be implemented include fencing, warning signs, and surface covers.

IAAAP is a secure DoD facility; only authorized access to the facility is allowed. Public access to the installation is restricted by property boundary fencing, perimeter warning signs, and the IAAAP security staff. Signs regarding unauthorized entry and site access are posted on the access gates and at select locations around the perimeter. Access to the IAAAP is controlled 24-hours a day by site security.

2.4.1 Fencing

Fencing prevents access to the IAAAP by the general public. A 6-foot high fence topped with barbed wire surrounds the IAAAP property. All roads into the facility are gated and locked and/or guarded, and only authorized access is allowed.

2.4.2 Warning Signs

At Line 1 excavations EU3-C, EU3-D, EU4-A, EU4-B, EU5-A, EU5-F, EU5-H, EU5-I, EU7-E, EU8-A, EU8-B, EU8-C, EU9B-A, EU9B-B, EU9C-A, EU9C-B, and Line 800 Excavation E08, the Industrial RGs were not achieved (Table 1) and warning signs are required to restrict intrusive work. The warning signs will state “CONTAMINATED SOIL – PERMIT REQUIRED FOR INTRUSIVE WORK” and will include an appropriate point of contact. Health and safety precautions may be necessary to ensure adequate worker health measures (e.g., personal protection equipment, air monitoring).

2.4.3 Soil and/or Vegetative Cover

During excavation activities at the OU-1 Areas, contaminated soil was removed to the fullest extent possible until the RGs were met. However, some contaminated soil could not be excavated to meet the OU-1 RGs because the soil was adjacent to existing buildings or structures (e.g., walkways, platforms) or below the groundwater table. These areas (Table 1) have been defined as inaccessible and require additional soil remediation. However, the best time to complete the remediation is when the buildings or structures are no longer in service and can be demolished.

Additional areas of contaminated soil could not be excavated to meet the OU-1 RGs because the soil is in areas where the potential source of contamination is still present (e.g., asphalt, tar roofing material) and remediation is deferred until after the potential source material is removed (USACE 2019).

One area on Line 1 (EU1-A) exceeds the ecological critical concentration. However, LUCs are not needed due to the area not being good ecological habitat (part of an active munitions LAP operations area) and due to the relatively small areal extent of contamination. For these reasons, the likelihood of ecological receptor exposure and impact is minimal.

As part of the restoration activities at each of the OU-1 Areas, soil with contaminant concentrations less than the RGs was placed as backfill at all excavated areas including those areas defined as inaccessible or continuing source. A re-contouring of the backfill areas and reseeded (to establish a vegetative cover) was completed in order to promote surface water drainage and to prevent soil erosion. The use of a clean soil cover and/or the presence of the concrete foundation serves as a barrier to prevent incidental worker exposure to the underlying contaminated soil at inaccessible areas (Table 1). Mowing of the vegetative cover area will be conducted (at a minimum) twice annually. Bare spots or lack of growth will be noted and re-seeded as necessary. Invasive trees or bushes will be removed.

Table 1. Operable Unit 1 Area-Specific Land Use Control Requirements

IAAAP Area	Excavation Area	Contaminant	Location of Exceedance	Approximate Depth (feet) to Contaminated Soil	RG ^a Exceeded	LUC Requirement	
						Level I: <ul style="list-style-type: none"> • Signs – Access Restricted. • Maintain clean soil and/or vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions. 	Level II: <ul style="list-style-type: none"> • Maintain clean soil and vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.
Line 1 ^b	EU3-C	Benzo(a)pyrene	[REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU3-D	Benzo(a)pyrene	Active Transformer Pad east of [REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU4-A	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	[REDACTED] coal tar roof, adjacent to roadway, Floor of excavation	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU4-B	Benzo(a)pyrene	[REDACTED] Northeast of building with coal tar roof. Along concrete slab for building ventilation system	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU5-A	Benzo(a)pyrene	Along Active [REDACTED] Wall of excavation	Unknown	Industrial	<input checked="" type="checkbox"/>	

Table 1. Operable Unit 1 Area-Specific Land Use Control Requirements (Continued)

IAAAP Area	Excavation Area	Contaminant	Location of Exceedance	Approximate Depth (feet) to Contaminated Soil	RG ^a Exceeded	LUC Requirement	
						Level I: • Signs – Access Restricted. • Maintain clean soil and/or vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.	Level II: • Maintain clean soil and vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.
Line 1 ^b	EU5-E (South)	RDX	█ Floor of excavation was below ground-water level	Unknown	Groundwater Leaching		<input checked="" type="checkbox"/>
	EU5-F	Benzo(a)pyrene Dibenzo(a,h)anthracene	█ roof northwest area with roof material below ground surface	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU5-H	Benzo(a)pyrene	West of █ Active rail line	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU5-I	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	█ active rail line	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU5-P	RDX	█	Unknown	Groundwater Leaching		<input checked="" type="checkbox"/>
	EU6-A	RDX	Blast Berm █	Unknown	Groundwater Leaching		<input checked="" type="checkbox"/>

Table 1. Operable Unit 1 Area-Specific Land Use Control Requirements (Continued)

IAAAP Area	Excavation Area	Contaminant	Location of Exceedance	Approximate Depth (feet) to Contaminated Soil	RG ^a Exceeded	LUC Requirement	
						Level I: • Signs – Access Restricted. • Maintain clean soil and/or vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.	Level II: • Maintain clean soil and vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.
Line 1 ^b	EU7-D	RDX	West of [REDACTED] Foundation for Active Steam Line along West Wall	Unknown	Groundwater Leaching		<input checked="" type="checkbox"/>
	EU7-E	RDX	West of [REDACTED] foundation	Unknown	Industrial and Groundwater Leaching	<input checked="" type="checkbox"/>	
	EU8-A	Benzo(a)pyrene	North of [REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU8-B	Benzo(a)pyrene Dibenzo(a,h)anthracene	[REDACTED] Shield	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU8-C	Benzo(a)pyrene	West of [REDACTED] Active rail line	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU9B-A	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	Northwest corner of [REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	

Table 1. Operable Unit 1 Area-Specific Land Use Control Requirements (Continued)

IAAAP Area	Excavation Area	Contaminant	Location of Exceedance	Approximate Depth (feet) to Contaminated Soil	RG ^a Exceeded	LUC Requirement	
						Level I: <ul style="list-style-type: none"> • Signs – Access Restricted. • Maintain clean soil and/or vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions. 	Level II: <ul style="list-style-type: none"> • Maintain clean soil and vegetative cover. • Soil reuse/disposal restrictions. • Groundwater restrictions.
Line 1 ^b	EU9B-B	RDX TNT	Filter bed at [REDACTED]	Unknown	Industrial Groundwater Leaching	<input checked="" type="checkbox"/>	
	EU9C-A	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene	[REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	
	EU9C-B	Benzo(a)pyrene	[REDACTED]	Unknown	Industrial	<input checked="" type="checkbox"/>	
Line 2 ^c	L2-E10	RDX	Excavation Floor Below Groundwater	Unknown	Groundwater Leaching		<input checked="" type="checkbox"/>
	L2-E13	RDX	Sidewall near Building Foundation	7.5	Groundwater Leaching		<input checked="" type="checkbox"/>
Line 3 ^c	L3-E12	RDX	Sidewall near Utility	2.5	Groundwater Leaching		<input checked="" type="checkbox"/>
	L3-E26	RDX	[REDACTED]	3	Groundwater Leaching		<input checked="" type="checkbox"/>
Line 3A ^c	L3A-E03	RDX	Under Building	5	Groundwater Leaching		<input checked="" type="checkbox"/>
	L3A-E09	RDX	Sidewall under load platform	3	Groundwater Leaching		<input checked="" type="checkbox"/>
Line 800 ^c	L800-E08	RDX	Sidewall near Line 800 lagoon	6-14	Groundwater Leaching		<input checked="" type="checkbox"/>
	L800-E08	TNT	Sidewall near Line 800 lagoon	12-18	Industrial and Groundwater Leaching	<input checked="" type="checkbox"/>	

^a Verification samples collected from the floor or sidewall of the excavation exceeded the respective RG for the contaminant identified.

^b As described in Table 2-4 of the Formerly Utilized Sites Remedial Action Program (FUSRAP), Final Five-Year Review Report, March 2019 (USACE 2019).

^c As described in Table 2-4 of the Defense Environmental Restoration Program, Final Five-Year Review Report, February 2016 (USACE 2016).

3.0 IMPLEMENTATION STRATEGY

LUCs require specific implementation actions (e.g., tracking, monitoring, maintenance, and notification) to be conducted as part of the overall remedial action strategy. This section summarizes the activities that will be implemented to ensure the restrictions and controls described in Section 2 are managed and maintained. Table 2 summarizes the implementation activities. The successful implementation of LUCs is dependent on incorporating the maintenance of LUCs into the existing processes for the installation.

As the lead agency, the Army is responsible for ensuring the effectiveness of the LUCs as long as the Army controls the property, or until LUCs are no longer needed. The Army has designated the Commanding Officer (CO) at IAAAP as responsible for enforcing the LUCs. The IAAAP Project Manager is responsible for assisting the CO in the enforcement effort and inspecting LUC effectiveness at IAAAP. The USEPA is responsible for regulatory review of LUC effectiveness.

The IAAAP Project Manager will be responsible for the following:

- Planning and securing funding to support LUC management;
- Identifying LUCs deficiencies or failures and planning and implementing corrective actions;
- Communicating with state and federal agencies as they pertain to LUC effectiveness, maintenance, and management (including notifications regarding any LUC failures, proposed corrective actions, and/or land use changes);
- Reviewing any planned actions, programs, or construction that will take place in areas at which LUCs have been implemented and specifying, by signature (including electronic signature on an email), compliance requirements or conditions for these planned actions, programs, or construction; and
- Planning, conducting, and reporting annual LUC inspections.

The USEPA will be responsible for the following:

- Timely review of annual LUC inspection reports, and
- Constructive assistance for IAAAP to address identified LUC deficiencies or failures.

Although responsibility for various actions defined in this LUCIP is designated to the Operating Contractor, the Army will retain ultimate responsibility for remedy integrity. If there is no Operating Contractor, the Army will take care of all aspects of implementing the LUCIP including, but not limited to, management, enforcement, and compliance.

Access control on all IAAAP property is the responsibility of the Operating Contractor's Security Department. Maintenance of all IAAAP perimeter fencing is the responsibility of the Operating Contractor.

Roles and responsibilities are identified in Table 2.

3.1 MANAGEMENT OF INSTITUTIONAL CONTROLS

3.1.1 Land Use Restrictions

Upon approval of this LUCIP and with any subsequent updates to the LUCIP, the EW1 E01-012 (or any subsequent IAAAP land use planning document [e.g., Base Master Plan]) will be revised to reflect the LUCs and actions described here within for OU-1 Areas.

In the event of future lease agreements, the Army will work with the USACE Real Estate Division to ensure any leases of the OU-1 Areas shall include language regarding compliance with EWI E01-012 and the specific restrictions on subsurface excavation, digging, drilling, or other surface disturbance.

The Army will conduct an annual review of Project LUC Review Forms. In addition, the Army will conduct a review of approved plans to ensure implementation was consistent with the planned work. The annual review may involve interviews with Army and AO personnel involved with project execution. The Army will document the results of the record review/interviews, including any failures of the controls, lessons learned, and corrective actions in an annual LUC report to the USEPA.

3.1.2 Hunting and Fishing Regulations

The Army Natural Resource Manager is responsible for issuance of annual hunting and fishing permits which allows individuals to hunt (e.g., small game, wild mushrooms) or fish on IAAAP property. The Natural Resources Manager will provide training and instructions and/or handouts to the permit holders identifying restricted access areas on the installation.

The Operating Contractor is responsible for enforcing the provisions of Regulation 420-1 and controlling recreational user access to the facility.

Any updates to Regulation 420-1 will be reviewed by the IAAAP Natural Resources Manager to ensure OU-1 Areas continue to be closed to hunting and fishing activities.

The Army will conduct an annual review of the Natural Resources instructional information to ensure maps of restricted areas, and the OU-1 areas in particular, are current and clear. Furthermore, the Army will conduct an annual review of Natural Resource permits and conduct an interview with the Natural Resources Manager to ensure access to identify any issues and possible improvements. The Army will document the results of the record review/interview, including any failures of the controls, lessons learned, and corrective actions in the annual LUC report to the USEPA.

3.1.3 Geographic Information Systems/Overlay Maps

Computerized maps can depict an installation's historic structures, wetlands, utility systems, and other information as layers for purposes of visual display and analysis.

The Army and the Operating Contractor each maintain a GIS database. LUCs will be incorporated into these systems and a separate GIS layer will be created specifically for LUC information at the OU-1 Areas. These data will be updated as needed if LUCs or boundaries change, and act as a tracking mechanism for all land areas under restriction or control.

The Army GIS will be the definitive source of spatial data and maps for LUC implementation and reporting. In addition, metadata describing the terms and condition of LUCs for each OU-1 Area will be recorded in the GIS databases. The GIS information will be reviewed/updated in coordination with EWI E01-012 planning process.

3.1.4 Lease Restrictions

The Army will annually review existing lease agreements at the installation (including agricultural lease agreements) to confirm that the OU-1 Areas are not being leased for use inconsistent with the restrictions defined by this LUCIP and that restrictive language is documented in any lease involving use of OU-1 Areas. If such a situation arises, the Army shall inform the lessee of the

existence of LUCs and make the lessee's compliance with the LUCs a binding condition of the lease. The Army will document the results of the annual lease agreement review, including any failures of controls, lessons learned, and any modifications to agreements or corrective actions taken in the annual LUC report.

3.1.5 Groundwater Well Installations

The Army and the Operating Contractor will maintain records for each well location, along with its construction specifications and intended use in the Army's and, as appropriate, the Operating Contractor's GIS database.

3.1.6 Property Transfer Restrictions

The Army will conduct an annual review of any property transfer plans at the installation. The annual review may involve interviews with Army and Operating Contractor personnel involved with long-term planning. The Army will document the results of the property transfer review in the annual LUC report to the USEPA.

3.2 MANAGEMENT OF ENGINEERING CONTROLS

3.2.1 Signage and Fencing Maintenance and Inspections

Fencing and signage are effective in minimizing inadvertent access, but require routine inspection and maintenance to remain effective. The IAAAP security manager is responsible to ensure access control measures are in place and to ensure annual inspections of the boundary fencing and signage are conducted and when necessary, maintenance repairs are conducted. If trespasser activities (e.g., fishing, etc.) are observed, IAAAP will take actions to prevent these unauthorized uses. The type and frequency of trespassing events, if any, will result in more rigorous enforcement of ICs or additional ECs.

The Operating Contractor will be responsible for installation, maintenance, and protocol for fencing and signage. The Army will document the results of the annual inspections of the boundary fencing and signage in the annual LUC report to the USEPA.

3.2.2 Soil Cover Maintenance

Soil cover inspections will be performed annually to ensure the cover remains intact, and to evaluate damage due to settling, exposure to the weather, erosion, and other factors that can cause additional infiltration into or exposure to underlying soils. Surface swales, gullies, or mounding are signs of surface erosion, or uneven settlement. Vector damage such as mole holes, termite mounds, or animal nests will be noted and removed. Soil additions or reconstruction of the cover surface will be completed, if necessary. Inspections will also take place after severe storm or flash flood events. Soil covers will also be inspected after any soil disturbance to ensure the cover is intact.

The Operating Contractor will be responsible for maintenance of the soil cover. The Army will document the results of the annual inspections of the soil cover in the annual LUC report to the USEPA.

Table 2. Land Use Controls Implementation Tasks and Responsibilities

LUC	Applicable Areas ^a	LUC Implementation Task/Responsibility ^b	
		EC (Physical)	IC (Administrative)
Land Use Restrictions	All	<p><u>Operating Contractor Security:</u> Maintain log of recreational use violations and identify violations to Environmental Restoration Manager for LUCs monitoring.</p> <p><u>Army Natural Resources:</u> Conduct safety briefing for recreational users including locations of restricted areas and signage.</p>	<p><u>USACE Real Estate Division:</u> Remove OU-1 Areas from list of available land for residential land use.</p> <p><u>Operating Contractor:</u> Enforce the provisions of <i>Regulation 420-1 Hunting and Fishing</i>.</p> <p><u>Operating Contractor:</u> Review new and continuing projects for access issues.</p> <p><u>Army:</u> Review new and continuing projects for access issues</p> <p><u>Army Natural Resources:</u> Ensure that the hunting/fishing zone map provided in <i>Regulation 420-1</i> is maintained as necessary to prevent use of OU-1 Areas for recreational use.</p> <p><u>Army Engineering:</u> Create/update the GIS layer for OU-1 Area LUCs.</p>
<p>Project LUC Review:^c</p> <p>Activities involving potentially intrusive ground work for utilities, buildings or grounds maintenance, construction, soil excavation, or groundwater well installation, subsurface investigations.</p>	All		<p><u>Operating Contractor Engineering:</u> Identify projects that include potential disturbance of environmental media (EWI E01-012) for all operational requirements</p> <p><u>Army:</u> Identify projects that include potential disturbance of environmental media (EWI E01-012) for all facility management actions.</p> <p><u>Operating Contractor Environmental Department:</u> Conduct all Project LUC Review for project in accordance with EWI E01-012</p> <p><u>Army:</u> Approve completed Project Review LUC Forms.</p>

Table 2. Land Use Controls Implementation Tasks and Responsibilities (Continued)

LUC	Applicable Areas ^a	LUC Implementation Task/Responsibility	
		EC (Physical)	IC (Administrative)
Lease Restrictions	All	<u>Operating Contractor</u> : Report any agriculture use violations in OU-1 Areas to the Natural Resources Manager.	<u>USACE Real Estate Division</u> : Annual review of outgrants (e.g., leases, permits). <u>IAAAP Contract Administration Branch</u> : Remove OU-1 Areas from list of available land for agricultural leasing. <u>USACE Real Estate Division</u> : Add permit access and dig restrictions language to leases that would require use of OU-1 Areas.
Groundwater restrictions	All	<u>Operating Contractor</u> : Report any groundwater use violations in OU-1 Areas to the Environmental Restoration Manager.	<u>USACE Real Estate Division</u> : Add groundwater use restriction language to leases.
Fencing and signs	IAAAP Boundary Site specific at: Excavation Areas where contamination concentrations remain at levels greater than industrial RGs.	<u>Operating Contractor Maintenance</u> : Inspect and maintain IAAAP perimeter fencing and signage. <u>Operating Contractor Maintenance</u> : Inspect and maintain OU-1 area specific fencing and signage.	
Soil cover	Excavation Areas where contamination concentrations remain at levels greater than RGs.	<u>Operating Contractor Maintenance</u> : ^d Inspect and maintain soil cover to ensure vegetative growth, inspect and repair damage due to settling, exposure to the weather, or erosion.	<u>Operating Contractor Engineering</u> : Identify all operational requirements that would penetrate soil cover at OU-1 Areas (Table 1). <u>Operating Contractor Environmental Department</u> : Conduct all Project LUC Review for project in accordance with EWI E01-012 <u>Army</u> : Approve completed Project Review LUC Forms.

Table 2. Land Use Controls Implementation Tasks and Responsibilities (Continued)

LUC	Applicable Areas ^a	LUC Implementation Task/Responsibility	
		EC (Physical)	IC (Administrative)
Stakeholder Outreach	All		<p><u>Operating Contractor</u>: Conduct annual LUC training for workers in maintenance, grounds keeping, and engineering.</p> <p><u>Army Natural Resources</u>: Inform recreational users of restricted access areas and LUCs relevant to recreational use areas.</p> <p><u>Army</u>: Provide LUC information to RAB and other community groups as appropriate.</p>
LUC Monitoring	All	<p><u>Operating Contractor</u>: Implement modifications to ECs as deemed necessary by monitoring.</p>	<p><u>Army</u>: Conduct annual site inspections of OU-1 Areas.</p> <p><u>Army</u>: Evaluate effectiveness of LUCs and summarize in an annual report. Provide annual report to the USEPA and RAB.</p>

^a The scope of this LUCIP includes 19 areas at the IAAAP, as defined in Section 1.3. These 19 areas include Line 1, Line 2, Line 3, Line 3A, Line Lines 4A/4B, Lines 5A/5B, Line 6, Line 8, Line 9, Line 800, East Burn Pads Area, Incendiary Disposal Area, Possible Demolition Area, Demolition Area/Deactivation Furnace, Burn Cages/West Burn Pads Area, North Burn Pads Area (and Landfill), Fire Training Pit, Roundhouse Transformer Storage Area, and the Central Test Area.

^b Although responsibility for various actions defined in this LUCIP is designated to the Operating Contractor, the Army will retain ultimate responsibility for remedy integrity. If there is no Operating Contractor, the Army will take care of all aspects of the LUCIP including, but not limited to, management, enforcement, and compliance.

^c Drilling, sawing, or otherwise penetrating concrete or removal of concrete interior areas of the buildings at the OU-1 Areas where potentially or known contaminated soil may exist below the foundations will require evaluation.

^d Mowing needs to be conducted at the areas semi-annually, with re-seeding and brush/tree removal conducted as necessary.

4.0 LUC MONITORING

LUC monitoring refers to the collection of data and information about the use or activities at the IAAAP OU-1 Areas to help ensure that LUCs remain in place and function as intended. Monitoring of the environmental use restrictions and controls will be conducted by the Army. LUC Monitoring will include site inspections, reporting, and as necessary, corrective actions. As part of LUC monitoring, the Army will update the IAAAP GIS database at least annually to reflect any changes in areas with restrictions regarding access, leases, property transfer, or well installation.

4.1 SITE INSPECTIONS

Site inspections will include visual inspection of land use, soil disturbance, survey of the fencing and signage, review of access controls procedures, and review of administrative actions including review of recreational users, agricultural leases, and calendar year Project LUC Review Forms.

The Army shall visually inspect the OU-1 Areas to ensure compliance with this LUCIP on an annual basis at a minimum. Additional inspections may also take place during any Project LUC Review to ensure the controls are effective for the proposed activity. Additional periodic inspections (i.e., quarterly) may be implemented if LUC deficiencies are identified during the annual review or during Project LUC Reviews. Site inspections will continue as long as the LUCs are in place.

Visual site inspections will be documented using a LUC Site Inspection Checklist. An example checklist is included in Appendix B. The form documents evaluation of the presence and effectiveness of LUCs at each OU-1 Area, describes any non-compliance issues, and any follow-up or corrective actions for necessary repair of any areas, including areas where potential issues may arise in the near future. Issues identified in the report will be either addressed upon discovery or, when larger, scheduled for subsequent repair. All repairs should be documented on the inspection checklist when they are complete. The inspection checklists will be kept on site and made available for review by the USEPA upon request.

The annual inspection shall include evaluation of the LUCs to ensure the following:

- Maintenance of industrial/commercial land use;
 - *Observation of site activities for signs of use other than industrial.*
 - *Review of IAAAP operational management plans and Project LUC Review forms for land use control evaluations.*
- Soil cover is intact and effective with no subsidence, or burrowing;
 - *Visual observations for cover integrity.*
 - *Vegetative cover is properly maintained.*
- Soil disturbance notifications are utilized and effective;
 - *No soil disturbance without prior authorization via Project LUC Review Form.*
 - *Restrictions on soil/concrete removal and disposal without approval.*
- No evidence of unauthorized soil excavations;
 - *No contaminated soil is allowed to leave the IAAAP without notification to Army.*

- *All excavated soil with contaminant concentrations exceeding ROD RGs are properly disposed of at permitted, off-site disposal facilities in accordance with the ROD/ESDs.*
- Fencing, signage and administrative access controls are intact and effective; and
 - *Observation of fencing and signage for signs of entry/damage.*
 - *Site access control to prevent visitor entry.*
 - *Verification of IAAAP access records including distribution of keys for gated and locked areas.*
 - *Training records are completed to demonstrate communication of LUCs to industrial workers.*
 - *Training records are completed on an annual basis for recreational users.*
- Prohibit the use of groundwater.
 - *Potable use of groundwater is prohibited.*
 - *Other than environmental monitoring wells, no wells will be allowed in areas of known groundwater contamination and the suitability of wells near OU-1 Areas will be determined through the Iowa DNR permitting process.*

If any LUC violations do not cease after notification to the appropriate installation officials, the matter should be referred to the IAAAP Project Manager.

4.2 REPORTING

Annual inspection reports will be prepared by the Army, or designee, to summarize the site inspection activities and to document that the LUCs are being properly maintained and are effective and will assess the need for any additions to, or reductions in, inspection requirements. Issues identified during site inspections will be discussed in the report as to their resolution and status, if larger, or scheduled subsequent repair is required. The annual report will also evaluate the status of the LUCs and how any deficiencies or inconsistent uses have been addressed. The annual report will also address whether the LUCIP instructions remain current in regards to LUC enforcement, and whether use of the property has conformed to such restrictions and controls. The annual report, at a minimum, shall contain the following:

- A description of how the facility is meeting the OU-1 specific LUC objectives, including results of visual field inspections;
- An evaluation of whether or not all the OU-1 specific LUC requirements are being met; and
- A description of any deficiencies and the efforts or measures that have been or shall be taken to correct problems.

Annual inspection reports will be submitted to the USEPA within 90 days after the completion of the inspection period (calendar year). The annual inspection reports will also be used in preparation of the Five-Year Review to evaluate the effectiveness of the LUCs to ensure the protectiveness of the remedy.

5.0 MANAGEMENT OF LAND USE CONTROLS

The Army is responsible for implementing, maintaining, reporting, and enforcing LUCs at the IAAAP as long as the Army controls the property or until LUCs are no longer required. The Army's CO at IAAAP is responsible for enforcing the LUCs. The IAAAP Project Manager assists the CO in enforcing, inspecting, and maintaining LUCs. The USEPA is responsible for regulatory review of LUC effectiveness. Although the Army may later transfer some duties to other parties by contract or other means, the Army will retain ultimate responsibility for remedy integrity.

5.1 ENFORCEMENT

During an LUC inspection, Project LUC Reviews, or through some other process (e.g., security patrols) it becomes apparent that any activity is inconsistent with the LUC objectives or use restrictions, or any activity interferes with the effectiveness of the LUCs, appropriate installation officials shall be notified immediately. Should any LUC deficiency result in failure to maintain remedy integrity, the Army will ensure appropriate actions are taken as soon as practicable to reestablish the remedy's protectiveness.

The Army will provide notification to the USEPA as soon as practicable but no longer than ten (10) business days after discovery of the LUC deficiency. The Army's notification will identify the LUC deficiency, how the Army has addressed or will address the deficiency, and the process to avoid future problems.

The Army will provide notice to the USEPA at least six (6) months prior to any transfer, sale, or lease of any OU-1 Area so that the USEPA can be involved in the discussions to ensure appropriate provisions are included in the transfer terms or conveyance documents to maintain effective LUCs. If it is not possible for the facility to notify the USEPA at least six (6) months prior to any transfer, sale or lease, then the facility will notify the USEPA as soon as possible but no later than sixty (60) days prior to the transfer, sale, or lease of any property subject to LUCs. The Army has further agreed to provide the USEPA with similar notice within the same time frames as to any federal-to-federal transfer of property, and to provide a copy of any executed deed or transfer documents to the USEPA.

5.2 MODIFICATIONS OF LAND USE CONTROLS

If conditions at an OU-1 Area change, the LUCs in place are determined to be ineffective, or the OU-1 RGs are met, then the Army may evaluate whether to modify, discontinue, or add LUCs. The Army will notify and seek concurrence with the USEPA before any anticipated action that may change land use, disrupt the effectiveness of the LUCs, or any action that may alter or negate the need for LUCs. The Army shall not, without USEPA concurrence, make a modification to or terminate a LUC. Regulator concurrence shall be obtained consistent with the terms outlined in the most current FFA (U.S. Army and USEPA 1990). The determination to modify, discontinue, or add LUCs and USEPA concurrence will be documented in the annual LUC report and placed in the information repository for the IAAAP. In the case of an emergency action, the Army will obtain prior USEPA concurrence as appropriate to the constraints of the situation.

5.3 TERMINATION OF LAND USE CONTROLS

LUCs will be maintained until the concentrations of contaminants in the soil are at levels that allow for UU/UE. Once the Army and the USEPA have decided to terminate one or more of the LUCs or the implementation area thereof, the Army shall advise local stakeholders of the action. If some LUCs no longer apply and some are still required, the LUCIP will be modified to reflect what restrictions still apply.

5.4 FIVE-YEAR REVIEWS

The purpose of the Five-Year Review is to evaluate the implementation and performance of the remedy and determine whether the remedy implemented at OU-1 areas is protective of human health and the environment. The effectiveness of LUCs will be evaluated during the Five-Year Review. The evaluation will draw heavily upon the annual LUC reports submitted to the USEPA over the time period. In addition to summarizing the annual LUC reports, the Army will conduct focused inspections and interviews to assess the effectiveness of LUC elements for the Five-Year Review. The results of the compiled LUC inspection reports and interviews will be reviewed and assessed, and recommendations regarding LUCs will be made as appropriate.

Following each Five-Year Review, the Army shall consult with the USEPA to determine whether it is necessary for the LUCs to remain in effect, or whether the LUCs can be terminated entirely or amended to delete specific OU-1 Areas from the land-use restrictions.

6.0 REFERENCES

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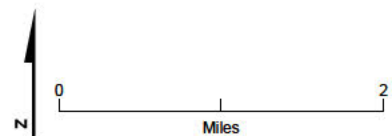
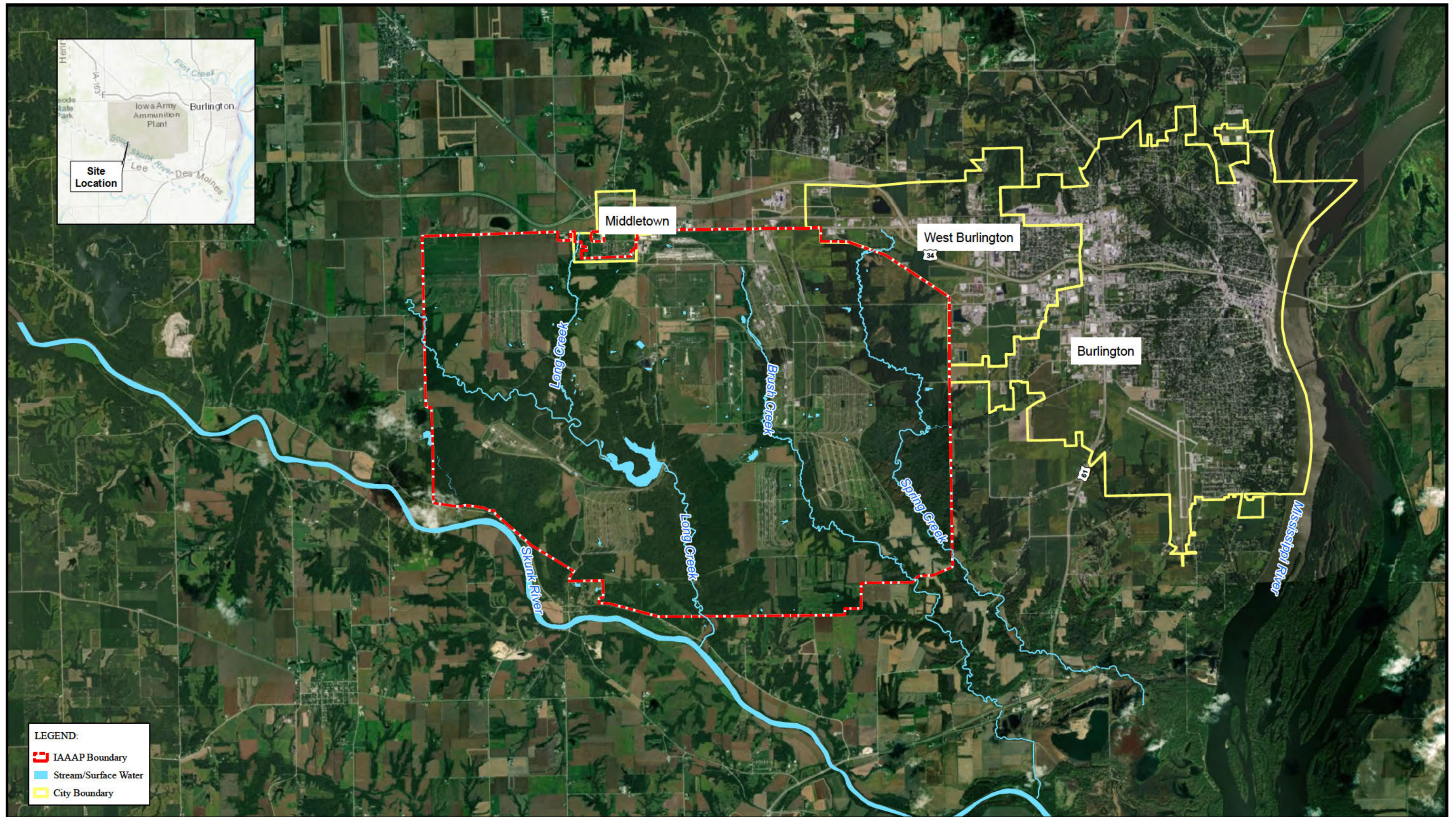
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FIGURES

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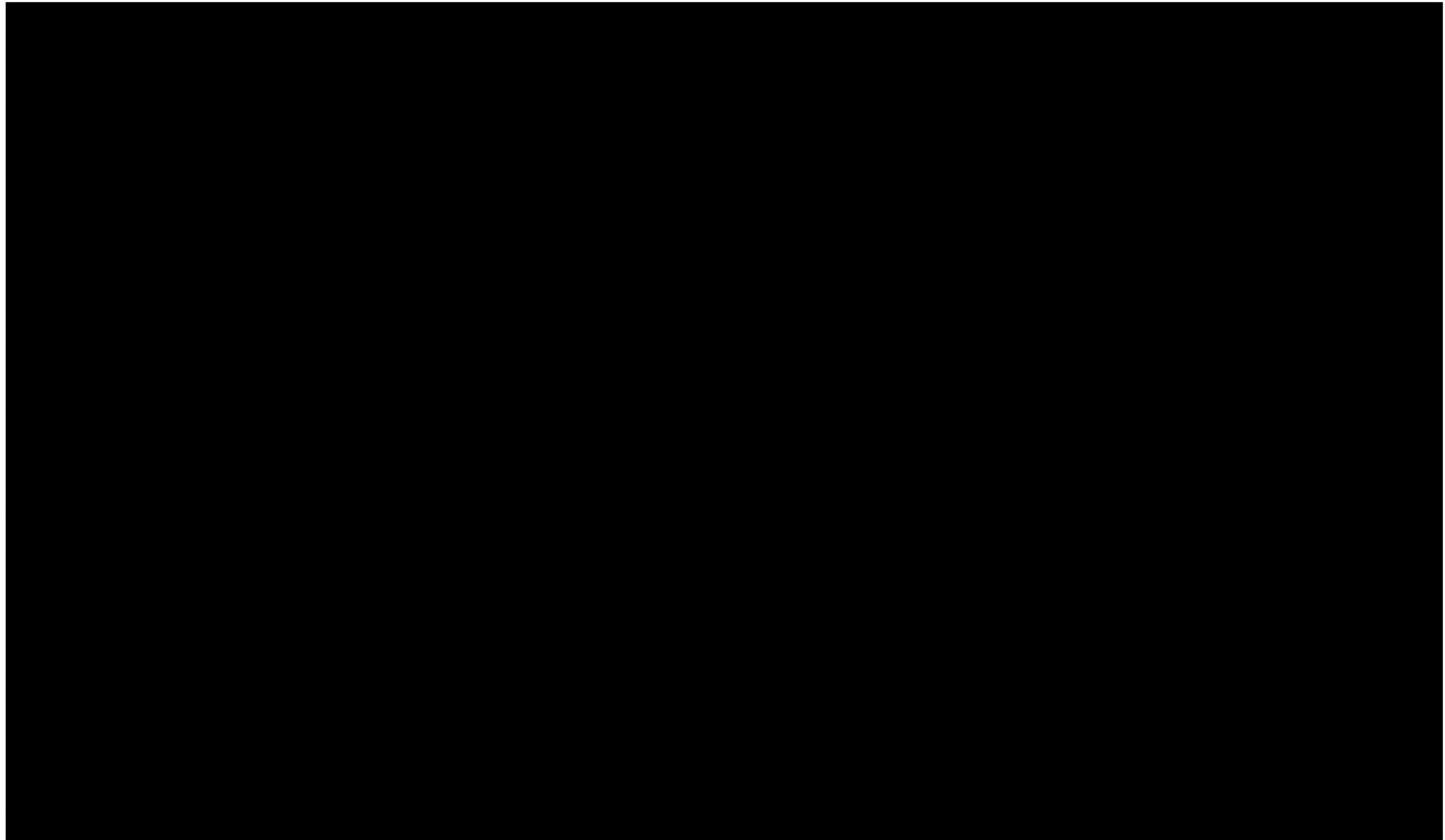
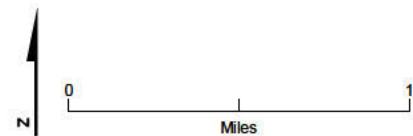


Figure 2. Location of the Operable Unit 1 Areas
at the IAAAP
Iowa Army Ammunition Plant
Middletown, Iowa



APPENDIX A
EXAMPLE PROJECT LUC REVIEW FORM

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EXAMPLE

Project LUC Review Form

Plans for activities involving potentially intrusive ground work for utilities, buildings or grounds maintenance, construction, soil excavation, or groundwater well installation at OU-1 Areas must be reviewed for compliance with LUCs prior to work. Any non-routine work activities (e.g., subsurface soil investigations) that may be conducted by the Army to support future remedial actions would also require compliance with LUCs.

1) Describe the proposed site activity and location. (Add GIS layer and supplemental documentation to this form as necessary).
2) Describe how the proposed activity disrupts the existing cover and/or land use restrictions.
3) Define the potential risks and hazards associated with this activity (worker exposure, environmental releases). Review as necessary LUCIPs, and other environmental documentation regarding soil or groundwater contamination potential.
4) Define the actions, precautions, and notifications (if any) required to mitigate risk as defined in 3) above.
5) Define the expected volume of material that will be removed and the proposed disposition for the material.
6) Define the inspection activities that will be conducted post-construction to ensure that the soil cover/concrete integrity is restored.

Prepared by: _____ Date: _____

Contact Info: _____

Army Remedial Project Manager: _____ Date: _____

Contact Info: _____

Form shall be completed by the requesting Operating Contractor department and submitted to the Environmental Manager for Approval prior to the start of work.

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APPENDIX B
LUC MONITORING SITE INSPECTION FORM

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IAAAP Operable Unit 1 Areas

This evaluation covers the period from _____ to _____. Inspected by: _____

OU-1 Area *: _____ . Inspection Date: _____

*If evaluating only a portion of the identified site, attach a figure identifying the portion being evaluated.

LUC Site Inspection Checklist

Describe major property improvements or physical changes since the previous LUC inspection (if any) (e.g. Buildings demolished or erected, extensive landscaping, road or parking lots constructed or modified, etc.).			
List personnel interviewed during the physical walk downs or during LUC monitoring.			
For each element, if parcel is found to be compliant with required control(s); indicate YES. If non-compliant, detail those items that require resolution.			
Inspection Item	Compliant?	Explanation of Deficiency(ies)	Follow-up Required/Completed
1) Has site remained industrial/non-residential, no agricultural use; and no known or anticipated property transfers or leases? <i>a. Visual observation of activities for signs of use other than industrial.</i> <i>b. Review of IAAAP operational management plans and Project LUC Review Forms for land use control evaluations.</i>			
2) Are controls in place to monitor visitor and site worker access? <i>a. Regular observation of fencing and signage for signs of entry/damage.</i> <i>b. Site access control to prevent visitor entry.</i> <i>c. Verification of IAAAP access records including distribution of keys for gated and locked areas.</i> <i>d. Training records are completed to demonstrate communication of LUCs to industrial workers.</i> <i>e. Training records are completed on an annual basis for recreational users.</i>			
3) Is there visual or administrative evidence of excavation or soil disturbance? If so, determine if the Project LUC Review Form has been followed and soil disturbance has been approved. <i>a. No soil disturbance without prior authorization via Project LUC Review Form.</i> <i>b. Restrictions on soil/concrete removal and off-site disposal without approval.</i> <i>c. All excavated contaminated soil materials are properly disposed of at permitted, off-site disposal facilities in accordance with the ROD/ESDs.</i>			
4) Is groundwater restricted from use as potable water or other purposes? <i>a. Potable use of groundwater is prohibited.</i> <i>b. Other than environmental monitoring wells, no wells will be allowed in areas of known groundwater contamination and the suitability of wells near OU-1 Areas will be determined through the Iowa DNR permitting process.</i>			
5) Are soil cover areas in good condition; no gullies, rills, or other erosion, no evidence of burrowing? Are land areas properly vegetated? <i>a. Visual observations for cover integrity.</i> <i>b. Vegetative cover is properly maintained.</i>			

I, hereby certify that as the authorized representative of the U.S. Army and the IAAAP, have determined that the above-described Land Use Controls have been evaluated for the period noted. Any known deficiencies and completed or planned actions to address such deficiencies are described by the Explanation of Deficiency(ies).

Inspected by (Print Name): _____ Company: _____

Signature: _____ Date: _____

Form shall be completed and submitted to the Army's Environmental Manager for final approval and review within 3 days of completion.

Approved by (Print Name): _____ Signature: _____ Date: _____