

5.0 INSTITUTIONAL ANALYSIS

An Institutional Analysis is commonly performed as part of the EE/CA process to identify the institutions that have jurisdiction at the site, their capability, stability and willingness to support the implementation and maintenance of land use controls. However, this analysis is more appropriate where the property has already been transferred into public or private ownership. In contrast, Fort McClellan is a former military reservation that is in the process of being transferred from the Federal government under the Base Realignment and Closure program (BRAC).

5.0.1 Recognizing that various forms of land use controls (LUCs) may be appropriate for sections of the Fort McClellan, a Memorandum of Agreement (MOA) among the U.S. Environmental Protection Agency (EPA), the Alabama Department of Environmental Management (ADEM), the U.S. Department of the Army (DA) on behalf of Fort McClellan, Alabama, (FMC) and the U.S. Army Training and Doctrine Command (TRADOC), and the Joint Powers Authority (JPA), was signed in December 2000. This MOA constituted the Land Use Control Assurance Plan (LUCAP). The LUCAP is presented in Appendix E.

5.1 THE PURPOSE OF THE LUCAP IS TO:

- Implement procedures to ensure the long-term effectiveness and viability of LUCs to protect human health and the environment,
- Raise the visibility of LUCs for Parties, property owners and operators, local authorities, and the public in order to minimize the possibility of inadvertent violations of LUCs and to provide a process for information exchange,
- Ensure that risk assumptions and land use assumptions upon which LUCs are based remain valid as long as the LUCs are relied upon to protect human health and the environment, and
- Develop a system of redundant or layered LUCs.

5.1.1 The LUCAP is a plan through which the effectiveness of LUCs at FMC are assured and establishes a process for maintaining, inspecting, and/or enforcing LUCs at FMC.

5.1.2 A Land Use Control Implementation Plan (LUCIP) will identify and describe each LUC placed on the site and include specific methods for ensuring that the effectiveness of each LUC is maintained. The LUCIP will be prepared by the Army, in consultation with the JPA and other third parties, as appropriate. The Army will work with the future transferee in preparing a LUCIP for a particular site. Regulatory agencies that are Parties to this LUCAP (i.e., EPA, ADEM) will be afforded an opportunity to review and comment on each proposed LUCIP.

5.1.3 The LUCIP will specify who is responsible for monitoring, maintaining, and enforcing LUCs with the understanding that the Army remains ultimately responsible for its remedies. The LUCIP will identify the enforcement options available in the event that a LUC is violated.

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6.0 IDENTIFICATION OF RESPONSE ACTION OBJECTIVES

6.1 INTRODUCTION

This chapter presents the response action objectives for the Alpha Area at Ft. McClellan. A number of factors must be considered when establishing specific objectives for a response action. The objectives must be able to meet the requirements set forth in the applicable or relevant and appropriate requirements (ARARs), while still being realistic and achievable in terms of cost. The alternatives considered for reducing the explosive threat posed by potential OE remaining at the Alpha Area must be effective, implementable, and economical. These criteria were used to evaluate the potential response actions considered for the Alpha Area in Chapter 7.0.

6.2 RESPONSE ACTION OBJECTIVES

The EE/CA is intended to determine the most effective alternatives that will meet the response action objectives:

- Ensure protectiveness of site workers and public during all response action operations,
- Ensure overall protectiveness of the public after completion of the response action,
- Comply with ARARs to the extent practicable, and
- Facilitate the intended future uses of the property.

6.2.1 The Army intends to comply with ARARs to the extent practicable. Ordnance poses a unique safety risk that must be considered in determining if it is "practicable" to comply with an ARAR. If an ordnance item is discovered, and it is too unstable to move, it must be blown in place. For example, if an ordnance item is found next to a protected plant, the risk of harming the plant will be weighed against the risk of injuring the worker and potential members of the public that might come into contact with the ordnance item. In such a situation, human safety outweighs protection of the plant. Therefore a waiver of the ARAR that ordinarily would require protection of the plant would be appropriate.

6.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable requirements are those cleanup standards, control standards, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant or contaminant, remedial action, location, or other circumstance at a CERCLA site (40 CFR 300.5). Relevant and appropriate requirements are cleanup standards and control standards, and the substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site, address problems or situations sufficiently similar to those encountered at a site where their use is well-suited (40 CFR 300.5). A requirement that is relevant and appropriate must be complied with to the same degree as if it were applicable. It is important to note that only those state standards that are identified by the state in a timely manner and are more stringent than the federal requirements may be considered ARARs (40 CFR 300.400(g)(4)).

6.3.1 Although the requirements of CERCLA Chapter 121 generally apply as a matter of law only to remedial actions, the U. S. Army Corps of Engineers' policy for OE removal actions is that ARARs will be identified and attained to the extent practicable. Two factors are applied to determine whether identifying and attaining ARARs is practical in a particular response situation. These factors include the urgency of the situation and the scope of the response action to be taken.

6.3.2 ARARs are identified on a site-specific basis and involve a two-part analysis. First, a determination is made whether a given requirement is applicable. Second, if it is not applicable, a determination is made whether it is both relevant and appropriate. When this analysis results in a determination that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable. There are three categories of ARARs: chemical-specific, location-specific, and action-specific.

6.3.3 According to the National Contingency Plan (NCP), chemical-specific ARARs are usually health or risk-based standards that establish the acceptable amount of concentration of a chemical that may remain in, or be discharged to, the ambient environment. Location-specific ARARs generally are restrictions placed upon the concentration of a hazardous substance or the conduct of activities solely because they are in special locations. Some examples of special locations include flood plains, wetlands, historic places, and sensitive ecosystems or habitats. Action-specific ARARs are usually technology or activity-based requirements or limitations placed on remedial activities taken with respect to hazardous wastes, or requirements to conduct certain actions to address particular circumstances at a site. These ARARs may specify particular performance levels, actions, or technologies to be used to manage hazardous substances, pollutants, or contaminants.

6.3.4 Non-promulgated advisories or guidance documents issued by federal or state governments do not have the status of potential ARARs. However, these "to be considered" (TBC) criteria may be used in determining the necessary level of cleanup for human safety and protection of the environment. In addition there are specific requirements that must be followed when conducting OE Response Actions. Potential ARARs and TBCs for the EE/CA of the Alpha Area are discussed in the following paragraphs.

6.4 DISCUSSION OF POTENTIAL ARARs/TBCs

6.4.1 Chemical-Specific ARARs

There are no applicable chemical-specific ARARs.

6.4.1.1 Location-Specific ARARs

Potential location-specific ARARs are presented in Table 6-1.

6.4.1.2 Action-Specific ARARs.

The National Environmental Policy Act (NEPA), as implemented by Army Regulation (AR) 200-2, Environmental Effects of Army Actions, is applicable to future land use alternatives that involve developing the site for commercial or residential purposes which could result in environmental impacts.

6.4.1.3 Specific Requirements and TBCs

OE response actions will be executed in compliance with the Military Munitions Rule (40 CFR Part 260 et al); the OE requirements of Ammunition and Explosives Safety Standards (DoD 6055.9-STD); Ammunition and Explosives Safety Standards (AR 385-64); and Explosives Safety Policy for Real Property Containing Conventional Ordnance and Explosives, and other applicable OE publications.

6.5 INTENDED LAND USE

If the Alpha Area is found suitable for transfer after the recommended response action alternatives have been implemented, it is intended that the property will be transferred to the Anniston-Calhoun County Fort McClellan Development Joint Powers Authority. According to the approved land use planning information available to date, the Alpha Area has three designated future land uses: active recreation, passive recreation and Industrial (see Chapter 4.2.2 Projected Future Land Use and the Specification of Risk Assessment Sectors). The majority of Sector M5-1L is designated as passive recreation with a small, southwest, corner of the sector designated industrial. Sector M6-1L is designated as a combination of active recreation, passive recreation, and industrial. The majority of Sector M6-1M is also designated as passive recreation with additional areas designated as industrial and active recreation in the northwest corner. The North and South Transect Areas are located in areas designated as passive recreation. The Smoke Ranges/T-38 area is also designated for passive recreation.

**Table 6-1
List of Potential Applicable or Relevant and Appropriate Requirements To Be Considered**

ARAR/TBC	Citation	Description	Comments
Chemical-Specific			
None required			
Location-Specific			
Archeological Resources Protection Act of 1979	43 CFR Part 7 36 CFR Part 296 32 CFR Part 229 18 CFR Part 1312	Protection of archeological resources on public land.	Potential ARAR for site activities which could impact an archeological resource area.
American Indian Religious Freedom Act	42 USC 1996	Requires consultation with Native Americans about traditional religious and cultural sites on Federal Lands to protect and provide access to such sites.	Potential ARAR for site activities which could impact a cultural site.
Clean Water Act, Section 404 (B)(1) Guidelines	40 CFR 230.10	Establishes criteria for evaluating impacts to waters of the US and sets factors for considering mitigation measures. Outlines the requirements for discharges of dredged or fill material into waters of the United States	Potential ARAR for sampling work, placement of equipment, any site removal or backfilling work within tidal areas and wetlands, and for dredge and fill activities
Endangered Species Act of 1973, as amended	16 USC 1531	Provides for the consideration of the impacts on endangered and threatened species and their critical habitats	Potential ARAR for activities in areas where there is considered to be current populations of endangered or threatened species of flora and fauna
Fish and Wildlife Conservation Act	16 USC 2901 50 CFR 83	Protects fish and wildlife when federal actions result in modification of a water body; requires consultation with U.S. Fish and Wildlife Service and state wildlife agencies to mitigate losses	Potential ARAR if the work activity is within a conservation area
Protection of Wetlands	33 CFR 320 et. Executive Order 11990	Requires consideration of impacts to wetlands in order to minimize their destruction, loss or degradation and to preserve/enhance wetland values	Potential ARAR for sampling work, placement of equipment and any site removal or backfilling work within tidal areas and wetlands
Protection of Historic Resources	36 CFR 800	Requires consideration of impacts to historic and cultural resources	Potential ARAR for site activities which could impact historic and cultural resources
Preservation of Historical and Archeological Data	16 USC 469a 36 CFR 66	Requires the preservation of archeological and historical data from destruction or becoming lost	Potential ARAR for site activities which could impact historic and archeological data
Native American Graves Protection and Repatriation Act	43 CFR 10	Consultation with Native Americans must occur before excavation of ancestral remains and other items commences	Potential ARAR for site activities which could impact Native American graves
Act for the Preservation of American Antiquities	16 CFR 251.50-64 43 CFR 3	A permit must be obtained before excavation of antiquities occurs	Potential ARAR for site activities which could impact American antiquities

**Table 6-1 (Continued)
List of Potential Applicable or Relevant and Appropriate Requirements To Be Considered**

ARAR/TBC	Citation	Description	Comments
Wilderness Act of 1964	PL 88-577 16 USC 1131-1136	Preserves and protects the wilderness areas	Potential ARAR for site activities which could impact wilderness areas
Migratory Bird Treaty Act of 1918	16 USC 703-712	Prevents the disturbance of birds, nests, and eggs	Potential ARAR for site activities which could impact birds, their nests, and their eggs
Protection and Enhancement of Sacred Indian Sites, 1976	Executive Order 13007	Protects the sacred Native American sites	Potential ARAR for site activities which could impact sacred Indian sites
Action-Specific			
National Ambient Air Quality Standards	40 CFR 50	Air quality standards for ambient air	Potential ARAR for any on-site detonation of OE
Particulate Emission Controls	40 CFR 50.6	Specifies limitations for the emission of particulate matter	Potential ARAR for on-site soil disturbances which generate dust
Environmental Effects of Army Actions	AR 200-2 (NEPA-40 CFR 1500-1508)	States that the need for an Environmental Assessment or Environmental Impact Statement must be evaluated if there is a potential for adverse impacts to the environment	Potential ARAR for site activities which could require NEPA actions
Occupational Safety and Health Act	29 USC 651-667	States that safety and health standards will be enforced during OE removal activities	Potential ARAR for site activities which may involve OE removal activities
RCRA Military Munition Rule	62 CFR 6654	Specifies the identification and management of residual munitions	Potential ARAR for site activities which may involve residual munitions
Safety and Health Requirements on Conventional Ordnance and Explosives Act	ER 385-1-95	Specifies the responsibilities in regards to safety and health for OE response actions	Potential ARAR for site activities which may involve OE response actions
To Be Considered (TBC) Criteria			
RCRA Management of Military Munitions	Military Munitions Rule (40 CFR 264 and 26 subpart EE; 266 subpart M)	Amendments to hazardous waste identification and management rules for military munitions and definition of explosive emergencies	Potential TBC for removal and management of unexploded ordnance pursuant to RCRA
Department of the Army Ammunition and Explosive Safety Standards	AR 385-64	Requires army standards to be implemented for locating, handling, and disposing of munitions	Potential TBC for site activities which may involve munitions
Department of Defense Ordnance Safety Standards	DoD 6055.9-STD	Requires that during detection, removal, and disposal of OE there must be specialized personnel attending	Potential TBC for site activities which may involve detection, removal, and disposal of OE
Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property	DDESB Memorandum	Specifies requirements for explosive safety submissions for removal actions	Potential TBC for site activities which may involve explosive safety submissions
Explosives Safety Policy for Real Property containing Conventional Ordnance and Explosives	Letter, Department of the Army	Specifies the policy for explosives safety controls on real property containing OE	Potential TBC for site activities which may require explosive safety controls

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7.0 IDENTIFICATION AND ANALYSIS OF RESPONSE ACTION ALTERNATIVES

Six response action alternatives have been identified as "reasonable measures" for protection of the public and the environment from exposure to OE. This chapter presents a description and evaluation of each alternative considered for the Alpha Area at Ft. McClellan. The next chapter (Chapter 8.0) presents a comparative analysis of the alternatives within each sector, resulting in a relative ranking of alternatives for each sector. The alternatives developed for the Alpha Area EE/CA include:

- Alternative 1—No Further Action
- Alternative 2—Area-Specific Land Use Controls
- Alternative 3—Construction Support
- Alternative 4—Surface Clearance
- Alternative 5—Clearance to One Foot
- Alternative 6—Clearance to Depth

7.0.1 These alternatives are designed to focus on the risk assumed to be present based on the information derived from archives and the additional investigations completed as part of this EE/CA effort. However, the potential exists that some residual OE contamination could remain following the implementation of the removal alternatives. For removal alternatives (except the clearance to depth alternative), residual contamination may potentially exist below the depth of clearance selected for the alternative, although the information upon which the clearance depth was selected indicated that all OE contamination should be within the selected clearance depth or the intended land use is not expected to disturb the area beneath the selected clearance depth. Although state of the art technology is employed in the detection and removal of OE it is not possible to ensure that 100-percent of all OE within the boundary of the investigation area are removed during the removal action. **Any residual OE will be managed through a community outreach program and a deed notice. The community outreach program will provide the general public awareness of the ordnance history and the potential dangers posed by any residual OE at Fort McClellan. The inclusion of a deed notice in all property transfer documents informs future property owners of the history of OE use and provides notification procedures in the event an OE item is discovered.**

7.1 DESCRIPTION OF ALTERNATIVES

7.1.1 Alternative 1—No Further Action

The No Further Action alternative requires no action at the site. This alternative does not impose any land use controls (i.e., as described below for Alternative 2). This alternative was evaluated for each sector of the Alpha Area as a baseline for comparing other alternatives.

7.1.2 Alternative 2—Area-Specific Land Use Controls

This alternative focuses on minimizing or controlling potential exposures to the public or the environment that may be associated with the OE within the study area using area-specific land use controls. These land use controls may consist of one or more institutional controls or engineering controls tailored to the study area, including a deed restriction that prohibits digging in the area without construction support by UXO-qualified personnel, signage, fencing or enhanced security measures, and/or periodic inspection and maintenance activities. This alternative also would increase public awareness of the ordnance history and the potential dangers posed by any OE that may still be present at Fort McClellan. Selection of this alternative will require compliance with the Land Use Control Assurance Plan (LUCAP), a joint agreement between the U.S. Environmental Protection Agency (USEPA), Alabama Department of Environmental Management (ADEM), the U.S. Department of the Army for Fort McClellan, and the Anniston-Calhoun County Fort McClellan Development Joint Powers Authority (JPA). The LUCAP lays out the process for determining when land use controls are needed, how land use control plans will be developed, and specifies responsibilities for monitoring and enforcement.

7.1.3 Alternative 3—Construction Support

Alternative 3 includes providing surface and subsurface clearance of OE in designated areas where construction activities are planned. UXO-qualified personnel, using metal detection instruments, will detect OE items that may exist on or below the ground surface in areas where intrusive building activities are planned. Any OE located during this action will be inspected to ensure its stability and disposed of in accordance with a previously approved work plan.

7.1.4 Alternative 4—Surface Clearance

This alternative involves removal of surface OE from the site. The area is divided into investigation grids and a visual search (aided by the hand held metal detection instruments) conducted by UXO personnel walking through each grid, visually scanning the surface for OE. Detected items will then be investigated to identify them as OE, OE Scrap, or non-OE Scrap. Items known or suspected to be OE will be marked with a pin flag for later disposition. OE items suspected to be UXO will be destroyed. Unfuzed UXO items could be removed and consolidated and then destroyed. OE Scrap will be removed, inspected, certified safe, and disposed in an appropriate manner. Land surveying would be a necessary component of this alternative. This alternative will include a deed restriction that prohibits digging in the study area without construction support by UXO-qualified personnel.

7.1.5 Alternative 5—Clearance to One Foot

Alternative 5 will include the surface and subsurface clearance of OE items to a depth of one foot. The depth of one-foot was selected based on site-specific information, future land use, and type of ordnance items that have been found in the vicinity and that may be present within the study area, and typical penetration depths for the types of OE items that may be present. Implementation of this alternative will require land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies.

These anomalies subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. This alternative will include a deed restriction that prohibits digging in the study area without construction support by UXO-qualified personnel.

7.1.6 Alternative 6–Clearance to Depth

This alternative includes the surface and subsurface clearance of OE items to a depth corresponding to the maximum depth of OE encountered in each sector. Under this alternative, investigation (i.e., excavation) of an anomaly (i.e., suspect OE item) will continue until the source of the anomaly is found, or until it is determined that no OE item is present. This alternative differs from Alternative 5 in that the depth of clearance is not limited to one foot. Implementation of this alternative would require land surveying and brush clearing operations.

7.1.6.1 After the sector is cleared of surface contamination, a subsurface investigation will be conducted. Due to the requirement to detect items deeper than one foot, this alternative will be performed using sensitive instruments capable of detecting anomalies at greater depths. Using a suitably sensitive detection system, the entire study area will be surveyed to locate potential OE items. The anomalies will then be investigated to identify them as OE, OE Scrap, or non-OE Scrap (metallic scrap). After identification, the items will be disposed of as scrap or OE in accordance with the previously approved OE operations work plan.

7.2 EVALUATION OF ALTERNATIVES

This chapter presents a general evaluation of each alternative by comparing the alternatives to three main criteria:

- Effectiveness
- Implementability
- Cost

7.2.1 The effectiveness criterion considers overall protection to human health and the environment; compliance with ARARs or other requirements; long-term effectiveness and permanence; and short-term effectiveness. The implementability criterion considers technical feasibility; availability of services and materials; administrative feasibility; state acceptance; and community acceptance. Cost is evaluated for each alternative on an area-specific basis. Appendix F contains cost estimates and pertinent assumptions. These criteria are more fully described in the following paragraphs.

7.2.2 Effectiveness

7.2.2.1 Overall protection to human health and the environment: Evaluates the effectiveness of an alternative and its ability to meet the objective within the scope of the proposed alternative. It is considered in terms of protectiveness of public health and the environment.

7.2.2.2 Compliance with ARARs or other requirements: Serves as a final check to assess whether each alternative meets all the potential federal and state ARARs as identified in the EE/CA process. ARARs are “those cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations promulgated under federal

environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site” (40 CFR 300.5). Selection of an ARAR is dependent upon the hazardous substances present at the site, site characteristics and location and action selected for remediation. Chemical-specific ARARs are health- or risk-based concentration limits for specific hazardous substances. Location-specific ARARs address circumstances such as the presence of endangered species on the site or location of the site in a 100-year floodplain. Action-specific ARARs control or restrict specific types of actions selected as alternatives for site cleanup. No chemical-specific ARARs exist for remediation of sites containing ordnance and explosives.

7.2.2.3 Long-term effectiveness and permanence: Addresses the effectiveness of an alternative in terms of the risk remaining at the site after the risk reduction objectives have been met, and generally considers the magnitude of risk remaining following the implementation of the alternative, and the adequacy and reliability of the controls that are used to manage residual risk remaining at the site.

7.2.2.4 Short-term effectiveness: Evaluates the potential effects on human health and the environment during the implementation of the alternative and considers the potential risk to the community and workers implementing the response action alternatives, and the potential for adverse impacts to the environment.

7.2.3 Implementability

7.2.3.1 Technical feasibility: Addresses the practicality of completing the alternative considering physical constraints.

7.2.3.2 Administrative feasibility: Addresses the activities required to coordinate with multiple offices and agencies (e.g., obtaining permits for off-site activities, right-of-way or alignment agreements, compliance with statutory limits, and enforcement of land use controls) and private property owners.

7.2.3.3 Availability of services and materials: Addresses the availability of personnel, equipment and materials required to implement the alternative.

7.2.3.4 Regulatory acceptance: Addresses the concerns and issues that the U.S. Environmental Protection Agency (EPA), the State of Alabama and local government agencies may have regarding the alternative. Regulatory acceptance will be a factor in the final selection of the alternative(s) presented in the EE/CA Action Memorandum.

7.2.3.5 Community acceptance: Addresses the concerns and issues the public and other stakeholders may have regarding the alternative. Community acceptance will be a factor in the final selection of the alternative(s) presented in the EE/CA Action Memorandum.

7.2.4 Cost

Costs for implementing individual alternatives are provided in Chapter 8.0 and cost estimates and pertinent assumptions are included in Appendix F.

7.3 EFFECTIVENESS

7.3.1 Alternative 1—No Further Action

Alternative 1, No Further Action, provides no reduction in the risk of OE exposure and no protection of the environment. Since OE exposure is dependent on the type of land use, the risk of future OE exposure can be expected to change (increase or decrease) if the land use changes. Since no action is taken, there are no impacts to human health or the environment during implementation. Because no action is taken, no location-specific, action-specific, or chemical-specific ARAR is applicable.

7.3.2 Alternative 2—Area-Specific Land Use Controls

Alternative 2, Area-Specific Land Use Controls, limited to deed restrictions and warning signs, will not include the removal or destruction of OE, therefore, it cannot be seen as providing absolute protection to public health and the environment. The threat to public health and the environment of OE exposure will be reduced only to the extent that the controls are initially effective and remain so. To achieve long-term effectiveness, public education is necessary to inform new land developers in Calhoun County.

7.3.2.1 Action-specific ARARs and Location-specific ARARs applicable to this alternative will be determined based on which component of this alternative is implemented. Area-specific land use controls may consist of several different institutional and/or engineering controls. Applicable Action-specific ARARs and Location-specific ARARs will be followed. There are no Chemical-specific ARARs requiring removal of OE to regulatory levels.

7.3.3 Alternative 3—Construction Support

Alternative 3, Construction Support will be effective in removal of OE items most likely to be encountered by construction workers and will reduce the risk of an accidental encounter with OE within construction footprint areas. Overall protection of the public and the environment will be strongly related to the quantity of OE that is on or near the surface. In footprint areas where surface OE is more common, this alternative will greatly reduce the level of risk. Therefore, this alternative should be reliable, but it will be much less reliable in areas outside the footprints. Effectiveness to protect the public in these areas will primarily depend on the implementation and continued maintenance of the sign posting requirements of this alternative.

7.3.3.1 Short-term effectiveness is dependent upon the potential for UXO workers to be exposed to OE during implementation of the alternative. Adherence to safety procedures and associated Site Safety and Health Plans will significantly limit the risk to UXO workers. Implementation of this alternative should have no short-term risk to the affected community and minimal adverse environmental impacts.

7.3.3.2 Action-specific ARARs potentially applicable to this alternative include National Ambient Air Quality Standards and the Occupational Safety and Health Act. During

construction, any OE items found will be removed by UXO-qualified personnel. No Location-specific ARARs are applicable to this alternative. There are no Chemical-specific ARARs requiring removal of OE to regulatory levels. TBC criteria applicable to this alternative include RCRA Management of Military Munitions, Department of the Army Ammunition and Explosive Safety Standards, Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property, and Explosives Safety Policy for Real Property containing Conventional Ordnance and Explosives.

7.3.4 Alternative 4–Surface Clearance

Alternative 4, Surface Clearance, will be effective in the removal of OE items located on the surface and therefore, will greatly reduce the risk of an accidental encounter with OE. However, OE that may be present in the subsurface will not be removed. Thus, this alternative will provide only limited protection against intrusive (i.e., digging, excavation) activities. Additionally, freeze/thaw cycles or erosion may potentially allow near-surface OE to migrate to the surface. The overall extent to which surface clearance will increase overall protection of public health and the environment will be directly related to the quantity of OE that is presently located on the surface. Effectiveness to protect the public will be increased by the inclusion of a deed restriction that prohibits digging in the study area without construction support by UXO-qualified personnel.

7.3.4.1 Short-term effectiveness will be dependent upon the potential for UXO workers to be exposed to OE during implementation of the alternative. Adherence to safety procedures and Site Safety and Health Plans will significantly limit the risk to UXO workers. In the event that OE is discovered and detonation-in-place is the preferred disposal option, the surrounding area may be affected by noise and ground shock. Environmental impacts from clearance should be minimal.

7.3.4.2 Action-specific ARARs potentially applicable to this alternative include National Ambient Air Quality Standards and the Occupational Safety and Health Act. During implementation of the alternative, OE items located on the surface within the specified area will be removed by UXO-qualified personnel. Location-specific ARARs potentially applicable to this alternative the Endangered Species Act and Protection of Wetlands. Along the southern border of Alpha, possible habitat for the gray bat has been mapped. Jurisdictional wetlands were also mapped. Location-specific ARARs will be followed by avoiding site activities that could potentially affect sensitive habitats. There are no Chemical-specific ARARs requiring removal of OE to regulatory levels. TBC criteria applicable to this alternative include RCRA Management of Military Munitions, Department of the Army Ammunition and Explosive Safety Standards, Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property, and Explosives Safety Policy for Real Property containing Conventional Ordnance and Explosives

7.3.5 Alternative 5–Clearance to One Foot

Alternative 5, Clearance to One-Foot Depth, will significantly reduce the potential for direct contact with OE. It will be an effective and permanent solution for reducing risk of exposure.

The risk of near-surface OE being moved to the surface by freeze/thaw cycles or erosion should be eliminated since OE would be removed down to a depth of 12 inches (frost depth is 6 inches at Fort McClellan).

7.3.5.1 Short-term effectiveness will be dependent upon the potential for UXO workers to be exposed to OE during implementation of this alternative. Adherence to safety procedures and Site Safety and Health Plans will significantly limit the risk to UXO workers. The short-term risk to the public resulting from implementation is minimal. In the event that OE is discovered and detonation-in-place is the preferred disposal option, the surrounding area may be affected by noise and ground shock. Environmental impacts from implementing this alternative should be minimal. This alternative will also include a deed restriction that prohibits digging in the study area without construction support by UXO-qualified personnel.

7.3.5.2 Action-specific ARARs potentially applicable to this alternative include National Ambient Air Quality Standards and the Occupational Safety and Health Act. During implementation of the alternative, any OE items located within one foot below ground surface, within the specified area will be removed by UXO-qualified personnel. Location-specific ARARs potentially applicable to this alternative include the Endangered Species Act and Protection of Wetlands. Along the southern border of Alpha, possible habitat for the gray bat has been mapped. Jurisdictional wetlands were also mapped. Location-specific ARARs will be followed by avoiding site activities that could potentially affect sensitive habitats. There are no Chemical-specific ARARs requiring removal of OE to regulatory levels. TBC criteria applicable to this alternative include RCRA Management of Military Munitions, Department of the Army Ammunition and Explosive Safety Standards, Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property, and Explosives Safety Policy for Real Property containing Conventional Ordnance and Explosives

7.3.6 Alternative 6—Clearance to Depth

Alternative 6, Clearance to Depth, will significantly reduce the potential for direct contact with OE, and be an effective and permanent solution for reducing risk of exposure. The risk of OE being moved to the surface by freeze/thaw cycles or erosion would be eliminated since all detectable subsurface OE will be removed.

7.3.6.1 Short-term effectiveness will depend on the potential for UXO workers to be exposed to OE during implementation. Adherence to safety procedures and Site Safety and Health Plans will significantly limit the risk to UXO workers. The short-term risk to the public resulting from implementation will be minimal. In the event that OE is discovered and detonation-in-place is the preferred disposal option, the area may be affected by noise and ground shock. Environmental impacts from implementing this alternative should be minimal.

7.3.6.2 Action-specific ARARs potentially applicable to this alternative include National Ambient Air Quality Standards and the Occupational Safety and Health Act. During implementation of this alternative, any OE items detected within the specified area will be removed by UXO-qualified personnel. Location-specific ARARs potentially applicable to this alternative include the Endangered Species Act and Protection of Wetlands. Along the southern border of Alpha, possible habitat for the gray bat has been mapped. Jurisdictional wetlands were also mapped. Location-specific ARARs will be followed by avoiding site activities that could

potentially affect sensitive habitats. There are no Chemical-specific ARARs requiring removal of OE to regulatory levels. TBC criteria applicable to this alternative include RCRA Management of Military Munitions, Department of the Army Ammunition and Explosive Safety Standards, Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property, and Explosives Safety Policy for Real Property containing Conventional Ordnance and Explosives

7.4 IMPLEMENTABILITY

7.4.1 Alternative 1—No Further Action

Technically, this alternative will be easy to implement, since there are no investigations or response actions being taken. However, administratively, implementation of this alternative will be difficult. An Explosives Safety Submission document must be prepared in accordance with (IAW) DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB). Furthermore, since this alternative takes no action to remove or reduce the risk of exposure to OE, there may be a strong reluctance on the part of EPA, ADEM, the local government and / or community to accept this approach, particularly in any areas where there is known or suspected presence of OE.

7.4.2 Alternative 2—Area-Specific Land Use Controls

Technically, this alternative will be relatively easy to implement, as it will not require any special materials or equipment. It will require services and materials (all readily available) to install warning signs at selected locations. UXO personnel will be required to clear the area prior to installation of signs and ensure that proper safety precautions are implemented to prevent untrained personnel from handling OE. Otherwise no special services or operators are required and the services required are readily available. However, administratively, implementation of this alternative will be more difficult. An Explosives Safety Submission document must be prepared IAW DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB).

7.4.2.1 This alternative will also require compliance with the Land Use Control Assurance Plan (LUCAP) which establishes the process for determining how land use control plans will be developed and specifies responsibilities for monitoring and enforcement. It will require coordination between USEPA, ADEM, the U.S. Department of the Army for Fort McClellan, and JPA, per the LUCAP.

7.4.2.2 Furthermore, since this alternative takes no action to remove OE, there may be some reluctance on the part of EPA, ADEM, the local government and / or community to accept this approach, particularly in any areas where there is known or suspected presence of OE. A positive community relations program will be warranted to support implementation of this alternative.

7.4.3 Alternative 3–Construction Support

Alternative 3, Construction Support, will be easy to implement technically, but less so administratively. Technically, the alternative will require equipment, skills, personnel and technologies associated with land clearing and OE detection, excavation, and disposal. UXO personnel will be required to clear the construction area prior to initiation of work activities and ensure that proper safety precautions are implemented to prevent untrained personnel from handling OE. Personnel, equipment and materials are readily available.

7.4.3.1 Administratively, activities associated with this alternative will need to be coordinated with construction contractors. Permits and/or approvals may be required if it becomes necessary to transport OE offsite for disposal. A Construction Support Work Plan will be required. An Explosives Safety Submission document prepared IAW DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB) will be required. Since this alternative does little to reduce the potential risk in the non-construction footprint areas, EPA, ADEM, the local government, and the community may be reluctant to accept this alternative, warranting a positive community relations program to support this alternative.

7.4.4 Alternative 4–Surface Clearance

Alternative 4, Surface Clearance, will be technically and administratively feasible. Technically, efforts associated with implementing this alternative will vary based on the topography, terrain, and vegetative cover. Implementation of this alternative will require equipment, skills, personnel and technologies associated with land clearing and OE detection, excavation, and disposal. UXO-qualified personnel must be used during implementation of all aspects of this alternative. Proper safety precautions must be implemented to prevent untrained individuals from handling OE.

7.4.4.1 Administratively, selection of this alternative will require an approved work plan that describes in detail, the procedures, equipment, and personnel required to implement this removal action. In addition, an Explosives Safety Submission document prepared IAW DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB) will be required.

7.4.4.2 This alternative reduces the public's risk of accidental exposure to OE; as a result, EPA, ADEM, the local government and the community may be willing to accept this alternative. However, concerns may still be expressed since this alternative does not remove subsurface OE items and therefore, does not decrease the risk resulting from intrusive activities. A positive community relations program may be warranted if this alternative is selected for implementation.

7.4.5 Alternative 5–Clearance to One Foot

Alternative 5, Clearance to One-Foot Depth, will be technically and administratively feasible. Technically, efforts associated with implementing this alternative will vary based on the topography, terrain, and vegetative cover, and will require equipment, skills, personnel and technologies associated with land clearing and OE detection, excavation, and disposal. UXO-qualified personnel must be used during implementation of all aspects of this alternative. Proper safety precautions must be implemented to prevent untrained individuals from handling OE.

7.4.5.1 An approved work plan that describes in detail, the procedures, equipment, and personnel required to implement this removal action will be required. An Explosives Safety Submission document prepared IAW DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB) will also be required.

7.4.5.2 It is anticipated that EPA, ADEM, the local government, and the local community will be willing to accept this alternative since it is designed to remove both surface and subsurface OE. However, some individuals may be concerned that the alternative will disrupt routine activities in the area and potentially destroy property and/or habitat by excavation and detonation-in-place. A positive community relations program may be warranted to support implementation of this alternative to ensure the public that appropriate measures will be taken to minimize inconveniences and prevent damage to local property or habitat.

7.4.6 Alternative 6–Clearance to Depth

Alternative 6, Clearance to Depth, will be technically and administratively feasible. Technically, efforts associated with implementing this alternative will vary based on the topography, terrain, and vegetative cover, and will require equipment, skills, personnel and technologies associated with land clearing and OE detection, excavation, and disposal. UXO-qualified personnel must be used during implementation of all aspects of this alternative. Proper safety precautions must be implemented to prevent untrained individuals from handling OE.

7.4.6.1 Administratively, an approved work plan that describes in detail, the procedures, equipment, and personnel required to implement this removal action will be required. An Explosives Safety Submission document prepared IAW DOD 6055.9- STD, Ammunition and Explosives Safety Standards, and approved by the Department of Defense Explosives Safety Board (DDESB) will also be required.

7.4.6.2 It is anticipated that EPA, ADEM, the local government, and the local community will be willing to accept this alternative since it is designed to remove both surface and subsurface OE. However, some individuals may be concerned that the alternative will disrupt routine activities in the area and potentially destroy property and/or habitat by excavation and detonation-in-place. A positive community relations program may be warranted to support implementation of this alternative to ensure the public that appropriate measures will be taken to minimize inconveniences and prevent damage to local property or habitat.

7.5 COST

7.5.1 Alternative 1—No Further Action

The cost to implement Alternative 1 includes the effort associated with the preparation of the Explosives Safety Submission (ESS) and should be relatively independent of the sector to which it is applied. The level of effort covers the initial preparation and submittal of a draft and final ESS document. Chapter 8.0 provides cost estimates for individual sectors.

7.5.2 Alternative 2—Area-Specific Land Use Controls

The estimate for Alternative 2, Area-Specific Land Use Controls, is dependent upon the size, material, number, and spacing of signs. Chapter 8.0 provides cost estimates for individual sectors.

7.5.3 Alternative 3—Construction Support

The estimated cost to provide construction support will depend on the nature and duration of construction activities. The estimate includes the cost for management and UXO construction support (this will vary depending on the total acreage and the future land use). Chapter 8.0 provides cost estimates for individual sectors.

7.5.4 Alternative 4—Surface Clearance

The estimated cost to perform Alternative 4 varies with surface OE density, topography, coverage area, vegetative cover, and site access. The cost to implement this alternative is based on the estimated density of surface OE, which is based on the information developed during this EE/CA investigation and available from previous investigations conducted in the Alpha Area. The estimate includes the cost for management; the Removal Report; site preparation; OE detection, excavation, and disposal; OE Scrap disposal; posting of signs. If engineering controls are employed for sectors near inhabited areas, the costs for implementing this alternative may increase. Chapter 8.0 provides cost estimates for individual sectors.

7.5.5 Alternative 5—Clearance to One Foot

The estimated cost to perform Alternative 5 varies with OE density, topography, coverage area, vegetative cover, and site access. The cost to implement this alternative is based on the estimated density of surface and subsurface OE, which is based on the information developed during this EE/CA investigation and available from previous investigations conducted in the Alpha Area. The estimate includes the cost for management; the Removal Report; site preparation; OE detection, excavation, and disposal; and OE Scrap disposal. If engineering controls are employed for sectors near inhabited areas, the costs for implementing this alternative may increase. Also, costs for highly contaminated areas are not part of these estimates and may need to be addressed under mechanical removal. Chapter 8.0 provides cost estimates for individual sectors.

7.5.6 Alternative 6—Clearance to Depth

The estimated cost to perform Alternative 6 varies with OE density, topography, coverage area, vegetative cover, and site access. The cost to implement this alternative is based on the estimated density of surface and subsurface OE, which is based on the information developed during this EE/CA investigation and available from previous investigations conducted in the Alpha Area. The estimate includes the cost for management the Removal Report; site preparation; OE detection, excavation, and disposal; and OE Scrap disposal. If engineering controls are employed for sectors near inhabited areas, the costs for implementing this alternative may increase. Also, costs for highly contaminated areas are not part of these estimates and may need to be addressed under mechanical removal. Chapter 8.0 provides cost estimates for individual sectors.

8.0 COMPARATIVE ANALYSIS OF RESPONSE ACTION ALTERNATIVES

In the preceding chapter, six alternatives for addressing OE-related risks within the Alpha Area were described and individually evaluated with respect to effectiveness, implementability, and cost. In this chapter, a comparative analysis uses the same three criteria to evaluate the alternatives on a sector-specific basis, resulting in a relative ranking of alternatives for each sector. In Chapter 4.0, within each of the identified sectors, an OE risk and protectiveness assessment (risk assessment) was performed for each of the alternatives. The results of the risk assessments were integrated into the “effectiveness” evaluation completed below for each alternative. The overall results of the comparative analysis are summarized in Tables 8-1 through 8-11 (located at the end of this chapter) and briefly discussed in the following paragraphs.

8.0.1 The Sectors for which the comparative analysis was performed are listed below. The descriptors (i.e., I, AR, PR, I/AR) appended to each sector designate projected future land use. The description of the different land uses and the selected designations for each individual sampling sector were presented earlier in Chapter 4.2.2 (Projected Future Land Use and the Specification of Risk Assessment Sectors). Because land use determines the frequency and type of activity, it is a critical component to the determination of future risk due to the presence of OE. Thus in Chapter 4.0, for each sector, separate risk assessments were completed for each different land use, potentially resulting in a different relative ranking of alternatives for that same sector. Several of the sectors have more than one projected future land use. The land uses are active recreation (AR), passive recreation (PR), and industrial (I). It was explained in Chapter 4.2.2 that the industrial (I) and active recreation (AR) land uses were combined (thus the classification of I/AR) for the purposes of the risk assessment as both land uses were considered to have effectively the same potential for possible contact with OE.

- M5-1L(North)-PR
- M5-1L(South)-PR
- M5-1L-I
- M6-1L Remainder-I/AR
- M6-1L Suspect Area-I/AR
- M6-1M Burn Pit-PR
- M6-1M Remainder-I/AR
- M6-1M Remainder – PR
- M6-1M Suspect Area (North) – PR
- M6-1M Suspect Area (South) – PR
- M6-1M Transect Area 1 (South)-PR
- M6-1M Transect Area 2 (North)-PR
- Smoke Ranges R and S / T-38-PR

8.1 SECTOR M5-1L (NORTH)-PR

8.1.1 Effectiveness

As described in Chapter 7.0, the criterion of Effectiveness has four major components for evaluating an alternative:

- Overall protectiveness to human health and the environment.
- Long-term effectiveness and permanence.
- Short-term effectiveness.
- Compliance with ARARs.

8.1.1.1 The risk assessments completed in Chapter 4.0, effectively addressed the combined criteria of overall protectiveness to human health and the environment and long-term effectiveness and permanence.

8.1.1.2 Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot) and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, whereas Alternative 1 (No Further Action) was considered to be the least effective. The removal alternatives 4, 5, and 6 were all three rated high. No OE items were found in this sector. Only OE Scrap, including items such as illumination signals and practice grenades, was found in M5-1L (North)-PR from 0 inches to one foot. Because of the low density of scrap found, Area-Specific Land Use Controls offer a moderate level of protectiveness. Therefore, a surface clearance (i.e., Alternative 4) was considered to provide a high level of protectiveness, with Alternatives 5 and 6 providing only an incremental increase in protectiveness.

8.1.1.3 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6) have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. In summary, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has the potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.1.2 Implementability

As described in Chapter 7.0, the criterion of Implementability has five major components for evaluating an alternative:

- Technical feasibility.
- Administrative feasibility.
- Availability of services and materials.
- Regulatory acceptance.
- Community acceptance.

8.1.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.1.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.1.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4 and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of land use controls.

8.1.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of land use controls and the requirements to comply with the LUCAP.

8.1.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, and coordination with the LUCAP. Even more services and materials will be required for

Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.1.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.1.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection (or the perception of protection) that each alternative offers. For this sector, OE Scrap has been detected on the surface, in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves potential OE in place, it may be received poorly by both regulators and the public.

8.1.2.4.1 Alternative 3 (Construction Support) may be received favorably since it provides protection to construction workers. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) may be expected to receive an even higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface. On the other hand, the belief that significant numbers of subsurface OE may be present, may lead to reduced acceptance of this alternative. Alternative 5 (Clearance to One-Foot Depth) and Alternative 6 (Clearance to Depth) may receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE.

8.1.2.4.2 For this sector, since OE or UXO has not been detected either on the surface or subsurface, the regulatory community and public may be willing to accept a minimal response action, such as Alternative 1 (No Further Action), Alternative 2 (Area-Specific Land Use Controls), or Alternative 3 (Construction Support).

8.1.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 – Area-Specific Land Use Controls – \$22,800. This cost includes planning and the sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$296,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre.

- Alternative 4 - Surface Clearance – \$909,89.15. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$1,133,899.15. This cost includes management and planning; preparation of an Explosives Safety Submission; preparation of a site specific work plan; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$2,896,899.15. This cost includes management and planning; preparation of an Explosives Safety Submission; preparation of a site specific work plan; OE removal activities; and reporting.

8.2 SECTOR M5-1L (SOUTH)-PR

8.2.1 Effectiveness

8.2.1.1 Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot), and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, whereas Alternative 1 (No Further Action) was considered to be the least effective. Alternatives 5 and 6 were both rated high, and Alternative 4 received a rating of moderate. Since OE and UXO found was located on the surface and OE Scrap was found down to two feet, a surface clearance (i.e., Alternative 4) was considered to provide a moderate level of protectiveness, with Alternatives 5 and 6 providing an increase in protectiveness.

8.2.1.2 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6) have the greatest potential short-term impact on the workers and public since each involves the potential of more direct contact with OE. In summary, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has the potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.2.2 Implementability

8.2.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.2.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.2.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of land use controls.

8.2.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of land use controls and the requirements to comply with the LUCAP.

8.2.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.2.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.2.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, OE has been detected on the surface, in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves potential OE in place, it may be less acceptable by both regulators and the public.

8.2.2.4.1 Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) may be expected to receive an even higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface. On the other hand, the belief that significant numbers of subsurface OE may be present, may lead to reduced acceptance of this alternative. Alternative 5 (Clearance to One-Foot Depth) and Alternative 6 (Clearance to Depth) may receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE.

8.2.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth), followed in order by Alternative 4 (Surface Clearance), Alternative 2 (Area-Specific Land Use Controls), Alternative 3 (Construction Support), and lastly, Alternative 1 (No Further Action).

8.2.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 – Area-Specific Land Use Controls – \$22,800. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$304,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning and sign posting.
- Alternative 4 - Surface Clearance – \$935,450.95. This cost includes management and planning; sign posting; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$2,300,174.62. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$2,914,265.55. This cost includes management and planning; OE removal activities; and reporting.

8.3 SECTOR M5-1L-I

8.3.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot) and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, whereas Alternative 1 (No Further Action) was considered to be the least effective. Alternative 6 (Clearance to Depth) received a rating of ‘high’ for overall protectiveness. Alternatives 4 and 5 received low ratings. OE Scrap and one UXO item was found on the surface in this sector during the site characterization by Foster Wheeler Environmental. Therefore, Alternative 6 was considered to provide a high level of protectiveness, with Alternatives 4 and 5 providing lower levels of protectiveness.

8.3.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.3.2 Implementability

8.3.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.3.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.3.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of

a work plan since each alternative involves onsite OE activities. Alternative 2 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of land use controls.

8.3.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternatives 3, 4, 5, and 6 next, and Alternative 2 being the most difficult of the alternatives to administer due to the inclusion of land use controls and the requirements to comply with the LUCAP.

8.3.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it will require all that Alternative 2 requires plus a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.3.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.3.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, UXO was detected on the surface, in an area where the future land use is projected to be industrial. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably not be received favorably since it will provide only limited protection to workers involved in intrusive construction activities (i.e., excavations, etc.).

8.3.2.4.1 Alternative 3 (Construction Support) may be received favorably since it provides protection to construction workers. Alternative 4 (Surface Clearance) may be expected to receive a similar level of acceptance as Alternative 3. It includes removal of potential OE from the surface (not subsurface) across the entire sector, not just within construction. However, the belief that significant numbers of subsurface OE may be present may lead to reduced acceptance of this alternative. Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth) may receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE in an area expected to experience significant subsurface excavations during construction and installation of utilities.

8.3.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth), followed in order by Alternative 4 (Surface Clearance), Alternative 3 (Construction Support), Alternative 2 (Area-Specific Land Use Controls), and lastly, Alternative 1 (No Further Action).

8.3.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$16,200. This cost includes planning. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$537,000. This estimate is based on an assumption of 240 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$158,828.04. This cost includes management and planning and OE removal activities.
- Alternative 5 - Clearance to One-Foot Depth – \$201,828.04. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$697,765.91. This cost includes management and planning; OE removal activities; and reporting.

8.4 M6-1L REMAINDER-I/AR

8.4.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives– 4 (Surface Clearance), 5 (Clearance to One Foot), and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, with Alternative 1 (No Further Action) the least effective. Alternative 3 (Construction Support) was considered to be somewhat more effective than Alternative 2, but only within construction footprint areas. The removal alternatives each received a rating of high. Only one piece of demolition block was found in this sector. OE Scrap was found on the surface and up to twelve inches. A surface clearance (i.e., Alternative 4) was considered to provide a high level of protectiveness, with Alternatives 5 and 6 providing only an incremental increase in protectiveness.

8.4.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5,

and 6) have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE, if present. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE, if present. With respect to the compliance with ARARs criterion, each alternative will comply.

8.4.2 Implementability

8.4.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.4.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.4.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.4.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.4.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and

materials. In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.4.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, since OE or UXO has not been detected on the subsurface and only one piece of demolition block was found on the surface, the regulatory community and public may be willing to accept a minimal response action, such as Alternative 1 (No Further Action), Alternative 2 (Area-Specific Land Use Controls) or Alternative 3 (Construction Support).

8.4.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$19,200. This cost includes planning (sign posting is not included for this sector). No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$1,411,000. This estimate is based on an assumption of 240 hours of UXO Specialists support per acre and includes planning
- Alternative 4 - Surface Clearance – \$408,863.25. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$515,863.25. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$1,312,863.25. This cost includes management and planning; OE removal activities; and reporting.

8.5 M6-1L SUSPECT AREA-I/AR

8.5.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives– 5 (Clearance to One Foot) and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 4 (Surface Clearance) were considered less effective, with Alternative 1 (No Further Action) the least effective. Alternative 3 (Construction Support) was considered to be somewhat more effective than Alternatives 2 and 4, but only within construction footprint areas. The removal Alternatives 4 and 5 were each rated moderate and Alternative 6 received a rating of high. Since the UXO found was located within one foot of the surface and OE Scrap was found up to

fourteen inches a surface clearance (i.e., Alternative 4) or a one-foot clearance (i.e., Alternative 5) were both considered to provide a moderate level of protectiveness, with Alternative 6 providing a high level of protectiveness.

8.5.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.5.2 Implementability

8.5.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.5.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.5.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.5.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.5.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.5.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.5.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, UXO has been detected to a depth of one foot in an area where the future land use is projected to be industrial and active recreation (OE Scrap has been detected below one foot). Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably not be received favorably since it will provide only limited protection to workers involved in intrusive construction activities (i.e., excavations, etc.). It may however, be more effective with respect to participants in active recreation.

8.5.2.4.1 Alternative 3 (Construction Support) may be received favorably since it provides protection to construction workers. Alternative 4 (Surface Clearance) may be expected to receive a similar level of acceptance as Alternative 3. It includes removal of potential OE from the surface (not subsurface) across the entire sector, not just within construction footprints. However, the belief that significant numbers of subsurface OE may still be present may lead to reduced acceptance of this alternative. Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth) may receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE in an area expected to experience significant subsurface excavations during construction and installation of utilities.

8.5.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth), followed in order by Alternative 4 (Surface Clearance), Alternative 3 (Construction Support), Alternative 2 (Area-Specific Land Use Controls), and lastly, Alternative 1 (No Further Action).

8.5.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$15,600. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$396,000. This estimate is based on an assumption of 240 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$196,241.71. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$235,241.71. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$277,196.27. This cost includes management and planning; OE removal activities; and reporting.

8.6 M6-1M BURN PIT-PR

8.6.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be Alternative 4 (Surface Clearance), 5 (Clearance to One Foot) and 6 (Clearance to Depth), followed by Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support. Alternative 1 (No Further Action), was judged to be the least effective of all. The removal alternatives 4, 5, and 6 were all rated high. No OE or UXO was found. OE Scrap was found on the surface and down to nine inches below the surface (several items were found in a 2-foot depression on the surface). A surface clearance (i.e., Alternative 4) was considered to provide a high level of protectiveness, with Alternatives 5 and 6 providing only an incremental increase in protectiveness.

8.6.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.6.2 Implementability

8.6.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.6.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.6.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.6.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.6.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.6.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.6.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, OE Scrap has been detected on the surface, in an area where the future land use is projected to be passive recreation. No OE or UXO items were found in this sector. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves potential OE in place, it may be received poorly by both regulators and the public.

8.6.2.4.1 Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) may be expected to receive an even higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface. On the other hand, the fact that subsurface OE Scrap has been found may lead to the belief that OE exists below ground, making this alternative less attractive to the regulators and public. Alternative 5 (Clearance to One-Foot Depth) and Alternative 6 (Clearance to Depth) will likely receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE.

8.6.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternatives 5 (Clearance to One Foot) and 6 (Clearance to Depth), followed by Alternative 4 (Surface Clearance), then Alternative 2 (Area-Specific Land Use Controls) and 3 (Construction Support), and lastly, Alternative 1 (No Further Action).

8.6.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$13,800. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$9,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$26,551.80. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$58,360.01. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$91,784.06. This cost includes management and planning; OE removal activities; and reporting.

8.7 M6-1M REMAINDER-I/AR

8.7.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot), and 6 (Clearance to Depth), followed by Alternatives 3 (Construction Support) and Alternative 2 (Area-Specific Land Use Controls). Alternative 1 (No Further Action) was considered to be the least effective of all. The removal alternatives all received a high rating. For this sector, OE and UXO was not found. OE Scrap was found on the surface and up to two feet below the surface. Because of the low density of scrap found, Area-Specific Land Use Controls offer a moderate level of protectiveness. A surface clearance (i.e., Alternative 4) was considered to provide a high level of protectiveness, with Alternatives 5 and 6 providing only an incremental increase in protectiveness.

8.7.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE, if present. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE, if present. With respect to the compliance with ARARs criterion, each alternative will comply.

8.7.2 Implementability

8.7.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.7.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.7.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of

a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will also require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.7.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.7.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials. In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.7.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, since OE has not been detected either on the surface or subsurface, the regulatory community and public may be willing to accept a minimal response action, such as Alternative 2 (Area-Specific Land Use Controls) or Alternative 3 (Construction Support).

8.7.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$22,200. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$383,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$836,761.03. This cost includes management and planning; OE removal activities; and reporting.

- Alternative 5 - Clearance to One-Foot Depth – \$1,053,761.03. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$2,681,761.03. This cost includes management and planning; OE removal activities; and reporting.

8.8 M6-1M REMAINDER-PR

8.8.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternative 5 (Clearance to One Foot) and 6 (Clearance to Depth), followed by Alternatives 3 (Construction Support) and 4 (Surface Clearance). Alternative 2 (Area-Specific Land Use Controls) was considered to provide even less protection and Alternative 1 (No Further Action) was considered to be the least effective of all. Alternative 4 received a rating of moderate, while Alternatives 5 and 6 received a rating of high. For this sector, one illumination round was found at 2 inches and OE Scrap was found by Foster Wheeler Environmental in the range of 0 to eighteen inches. Because of the low density of scrap found, Area-Specific Land Use Controls offer a moderate level of protectiveness. A surface clearance (i.e., Alternative 4) would also provide a moderate level of protectiveness with Alternatives 5 and 6 providing an incremental increase in protectiveness.

8.8.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE, if present. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5, and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE, if present. With respect to the compliance with ARARs criterion, each alternative will comply.

8.8.2 Implementability

8.8.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.8.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.8.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will also require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.8.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.8.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials. In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.8.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, UXO was found on the surface and up to two inches, in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves potential OE in place, it may be received poorly by both regulators and the public.

8.8.2.4.1 Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) may be expected to receive

an even higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface. On the other hand, the fact that subsurface OE Scrap has been found may lead to the belief that OE exists below ground, making this alternative less attractive to the regulators and public. Alternative 5 (Clearance to One-Foot Depth) and Alternative 6 (Clearance to Depth) will likely receive the highest level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE.

8.8.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternatives 5 (Clearance to One Foot) and 6 (Clearance to Depth), followed by Alternative 4 (Surface Clearance), then Alternative 2 (Area-Specific Land Use Controls) and 3 (Construction Support), and lastly, Alternative 1 (No Further Action).

8.8.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared.
- Alternative 2 - Area-Specific Land Use Controls – \$28,800. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$780,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$2,406,524.12. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$3,006,524.12. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$7,666,524.12. This cost includes management and planning; OE removal activities; and reporting.

8.9 M6-1M SUSPECT AREA (NORTH)-PR

8.9.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot) and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, whereas Alternative 1 (No Further Action) was considered to be the least effective. Alternative 4 was given a moderate rating. Alternatives 5 and 6 were rated high. UXO was found only on the surface. OE Scrap was found on the surface and up to two inches. A surface clearance (i.e., Alternative 4) was considered to provide a moderate level of protectiveness, with Alternatives 5 and 6 providing an increase in protectiveness.

8.9.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.9.2 Implementability

8.9.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.9.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.9.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will also require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.9.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.9.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 2 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials, since it only requires effort to prepare the ESS. More services and materials will be required for the

implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.9.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.9.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, UXO has been detected on the surface, in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably not be received favorably since it will provide only limited protection. Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities.

8.9.2.4.1 Alternative 4 (Surface Clearance) may be expected to receive a similar level of acceptance as Alternative 3. It includes removal of potential OE from the surface across the entire sector, however, because the potential of subsurface OE it may not be received very favorably. Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth) can be expected to receive a higher level of acceptance by both regulators and the public since they both involve a subsurface removal of potential OE.

8.9.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 6 (Clearance to Depth) and Alternative 5 (Clearance to One Foot), followed in order by Alternative 4 (Surface Clearance), Alternative 2 (Area-Specific Land Use Controls), Alternative 3 (Construction Support) and lastly, Alternative 1 (No Further Action).

8.9.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$14,400. This cost includes planning and sign posting. No annual maintenance costs are included.

- Alternative 3 - Construction Support – \$25,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$65,558.77. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$118,310. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$165,065.77. This cost includes management and planning; OE removal activities; and reporting.

8.10 M6-1M SUSPECT AREA (SOUTH)-PR

8.10.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternatives 4 (Surface Clearance), 5 (Clearance to One Foot) and 6 (Clearance to Depth). Alternatives 2 (Area-Specific Land Use Controls) and 3 (Construction Support) were considered less effective, whereas Alternative 1 (No Further Action) was considered to be the least effective. Alternative 4 was given a moderate rating and Alternatives 5 and 6 were both rated high. UXO was found at depths greater than one foot. OE Scrap was found on the surface and up to six inches below the surface. A surface clearance was considered to provide a moderate level of protectiveness, with Alternatives 5 and 6 providing an increase in protectiveness.

8.10.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.10.2 Implementability

8.10.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically

feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.10.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.10.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will also require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.10.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.10.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 2 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.10.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.10.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, UXO has been detected at depths greater than one foot, in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably not be received favorably since it will provide only limited protection. Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers

and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities.

8.10.2.4.1 Alternative 4 (Surface Clearance) may be expected to receive a similar level of acceptance as Alternative 3. It includes removal of potential OE from the surface across the entire sector, however, because the potential of subsurface OE has not been ruled out it may not be received very favorably. Alternative 5 (Clearance to One Foot) and Alternative 6 (Clearance to Depth) can be expected to receive a higher level of acceptance by both regulators and the public since they both involve a subsurface removal of potential UXO.

8.10.2.4.2 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 6 (Clearance to Depth) and Alternative 5 (Clearance to One Foot), followed in order by Alternative 4 (Surface Clearance), Alternative 2 (Area-Specific Land Use Controls), Alternative 3 (Construction Support) and lastly, Alternative 1 (No Further Action).

8.10.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$14,400. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$16,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$44,979.42. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$82,404.56. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$127,283.64. This cost includes management and planning; OE removal activities; and reporting.

8.11 M6-1M TRANSECT AREA 1 (SOUTH)-PR

8.11.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternatives for protection of human health and the environment were judged to be the removal alternatives—Alternative 5 (Clearance to One Foot) and 6 (Clearance to Depth), followed by Alternatives 3 (Construction Support) and 4 (Surface Clearance). Alternative 2 (Area-Specific Land Use Controls) was considered to provide even less protection and Alternative 1 (No Further Action) was considered to be the least effective of all. Alternative 4 received a moderate rating and Alternatives 5 and 6 received a high rating. UXO was found on the surface and down to two inches. OE Scrap was found on the surface and down to one foot below the surface. A Surface Clearance (i.e.,

Alternative 4) would provide a moderate level of protectiveness and Alternatives 5 and 6 would provide an increased level of protectiveness.

8.11.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6) have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. In summary, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has the potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.11.2 Implementability

8.11.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.11.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.11.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.11.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.11.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, , as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.11.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.11.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection (or the perception of protection) that each alternative offers. For this sector, UXO has been detected on the surface and subsurface within the range of 0 to one foot in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves OE in place, it is likely to be unacceptable to both regulators and the public. Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) can be expected to receive a higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface . However, it does not remove any OE that may exist below the surface. Alternatives 5 (Clearance to One-Foot Depth) and 6 (Clearance to Depth) can be expected to receive the most support from the regulators and public, with Alternative 6 receiving the highest level of support.

8.11.2.4.1 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 6 (Clearance to Depth), followed closely by Alternative 5 (Clearance to One Foot), followed next by Alternative 4 (Surface Clearance), and then Alternative 2 (Area-Specific Land Use Controls) and Alternative 3 (Construction Support). Alternative 1 (No Further Action) would likely be the least acceptable alternative.

8.11.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$20,400. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$177,000. This estimate is based on an assumption of 120 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$613,022.97. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$1,412,950.69. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$1,736,611.93. This cost includes management and planning; OE removal activities; and reporting.

8.12 M6-1M TRANSECT AREA 2 (NORTH)-PR

8.12.1 Effectiveness

Based on the assessments completed in Chapter 4.0, the most effective alternative for protection of human health and the environment was judged to be the Alternative 6 (Clearance to Depth), with Alternatives 5 (Clearance to One Foot), 4 (Surface Clearance), and 3 (Construction Support) providing the next highest level of protection. Alternative 2 (Area-Specific Land Use Controls) was considered to provide even less protection and Alternative 1 (No Further Action) was considered to be the least effective of all. Alternative 4 received a moderate rating and Alternatives 5 and 6 received high ratings. One unfuzed 60mm Mortar was found at six inches and several UXO items were found on the surface and down to fourteen inches below the surface. OE Scrap was found down to one foot below surface. A surface clearance (i.e. Alternative 4) would only provide a moderate level of protectiveness and Alternatives 5 and 6 would provide high levels of protectiveness.

8.12.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6) have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE. In summary, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has the potential for longer and more intense exposure to OE. With respect to the compliance with ARARs criterion, each alternative will comply.

8.12.2 Implementability

8.12.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.12.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.12.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will also require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.12.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.12.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials.

8.12.2.3.1 In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.12.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection that each alternative offers. For this sector, OE has been detected within one foot and UXO was found on the surface and in the subsurface below one foot in an area where the future land use is projected to be passive recreation. Alternative 1 (No Further Action) does nothing to provide any degree of protection and therefore is unlikely to be accepted by the regulatory community or the public. Alternative 2 (Area-Specific Land Use Controls) would probably be received more favorably since it will provide some degree of protection, however, since it leaves OE in place, it is likely to be unacceptable to both regulators and the public. Alternative 3 (Construction Support) may receive similar levels of acceptance as Alternative 2. Alternative 3 provides protection to construction workers and removes OE within the construction footprint. The projected future land use is passive recreation, with little expected construction activities. Alternative 4 (Surface Clearance) can be expected to receive a higher level of acceptance than any of the previous alternatives since it includes actual removal of potential OE from the surface. However, it does not remove any OE that may exist below the surface. Alternatives 5 (Clearance to One-Foot Depth) and 6 (Clearance to Depth) can be expected to receive the most support from the regulators and public, with Alternative 6 receiving the highest level of support, since it also removes potential OE below one foot.

8.12.2.4.1 In summary, the alternatives that may be best received by the regulators and/or public would be Alternative 6 (Clearance to Depth), followed closely by Alternative 5 (Clearance to One Foot), followed next by Alternative 4 (Surface Clearance), and then Alternative 2 (Area-Specific Land Use Controls) and Alternative 3 (Construction Support). Alternative 1 (No Further Action) would likely be the least acceptable alternative.

8.12.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$19,800. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$170,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$767,885.56. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$1,151,722.51. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 6 - Clearance to Depth – \$2,091,657.22. This cost includes management and planning; OE removal activities; and reporting.

8.13 SMOKE RANGES R AND S/T-38-PR

8.13.1 Effectiveness

Based on the assessments completed in Chapter 4.0, each alternative, except for Alternative 1 (No Further Action) and Alternative 2 (Area-Specific Land Use Controls), will provide a high level of protection. Alternative 2 provides a moderate level of protection. For this sector, OE/UXO were not found. OE Scrap was found by Parsons ES. Alternative 1 will be the least effective alternative.

8.13.1.1 With respect to the other effectiveness criteria, Alternative 1 (No Further Action) clearly has the least short-term effects since no action is being taken that might impact on local workers or the public. Alternative 2 (Area-Specific Land Use Controls) also presents little short-term effects since the only activity that might have impact on the workers or the public involves installation of a limited number of warning signs. The removal alternatives (Alternatives 3, 4, 5, and 6), have the greatest potential impact on the workers and public since each involves the potential of more direct contact with OE, if present. Overall, Alternative 1 will have the least short-term effects, followed by Alternative 2 and 3, and then Alternatives 4, 5 and 6. Among the later three alternatives, the short-term effects will increase from Alternative 4 to 6, since each has a potential for longer and more intense exposure to OE, if present. With respect to the compliance with ARARs criterion, each alternative will comply.

8.13.2 Implementability

8.13.2.1 Technical Feasibility

All six alternatives are technically feasible with Alternative 1 being the most technically feasible since there is no action required at the site (i.e., investigation or removal actions). Alternative 2 is the second most technically feasible alternative. It requires that technical actions be taken at the site (i.e., installation of signage at the site). The remaining alternatives are each technically feasible but less so than Alternatives 1 and 2, because they each involve more intense site activities and dependence on technology.

8.13.2.1.1 In summary, Alternative 1 will be the most technically feasible, Alternative 2 next, followed by Alternatives 3, 4, 5 and 6.

8.13.2.2 Administrative Feasibility

All six alternatives will require the preparation and DDESB-approval of an Explosives Safety Submission document. Alternatives 3 through 6 will each require the preparation and approval of a work plan since each alternative involves onsite OE activities. Alternatives 2, 3, 4, and 5 will require compliance with the LUCAP for Fort McClellan, since each involves the implementation of area-specific land use controls.

8.13.2.2.1 In summary, considering these requirements, Alternative 1 will be the simplest to administer, with Alternative 6 next, and Alternatives 2, 3, 4, and 5 being the most difficult of the alternatives to administer due to the inclusion of area-specific land use controls and the requirements to comply with the LUCAP.

8.13.2.3 Availability of Services and Materials

Services and materials will be required and are readily available for preparing the plans mentioned above and to complete the fieldwork associated with Alternatives 3 through 6. Based on the levels of services needed, Alternative 1 will require the least services and materials since it only requires effort to prepare the ESS. More services and materials will be required for the implementation of Alternative 2 since it requires the preparation of the ESS, installation of signs, as well as coordination with the LUCAP. Even more services and materials will be required for Alternative 3 since it requires a work plan to support construction support activities and the field service activities to provide the actual construction support. Alternative 4 will be similar in scope of required services and materials. Alternatives 5 and 6 will require the most in services and materials. In summary, Alternative 1 will require the least in services and materials to implement, with Alternative 2 next. Alternatives 3 and 4 will require a higher level of services and materials than Alternatives 1 and 2, but less than Alternatives 5 and 6.

8.13.2.4 Regulatory and Community Acceptance

The level of regulatory and/or community acceptance for each alternative can be expected to largely depend on the protection (or the perception of protection) that each alternative offers. For this sector, since OE and UXO have not been detected either on the surface or subsurface, the regulatory community and public may be willing to accept a minimal response action, such as Alternative 2 (Area-Specific Land Use Controls) or Alternative 3 (Construction Support).

8.13.3 Cost

The projected costs to implement the alternatives are summarized below:

- Alternative 1 - No Further Action – \$20,000. An Explosives Safety Submission (preparation, draft, and final) will be prepared for a group of areas.
- Alternative 2 - Area-Specific Land Use Controls – \$21,600. This cost includes planning and sign posting. No annual maintenance costs are included.
- Alternative 3 - Construction Support – \$283,000. This estimate is based on an assumption of 24 hours of UXO Specialists support per acre and includes planning.
- Alternative 4 - Surface Clearance – \$724,519.32. This cost includes management and planning; OE removal activities; and reporting. This cost includes management and planning; OE removal activities; and reporting.
- Alternative 5 - Clearance to One-Foot Depth – \$748,519.32. This cost includes management and planning; OE removal activities; and reporting.

- Alternative 6 - Clearance to Depth – \$2,063,519.32. This cost includes management and planning; OE removal activities; and reporting.

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9.0 RECOMMENDED RESPONSE ACTION ALTERNATIVES

In Chapter 7.0, six alternatives for reducing OE risk within the Alpha Area were individually evaluated against the National Contingency Plan (NCP) evaluation criteria of effectiveness, implementability, and cost. In Chapter 8.0, a comparative analysis was performed, evaluating the same six alternatives on a sector-specific basis, using the same NCP criteria.

9.0.1 Based on the results of Chapters 7.0 and 8.0, recommendations are made herein for each of the fourteen sectors. Recommendations range from no further action for areas considered to present little or no potential risk, to clearance to depth for areas considered to present significant potential hazard if no action is taken to remove potential OE. Each of the recommendations is considered to meet the response action objectives as outlined in Chapter 6.0:

- Ensure protectiveness of site workers and public during all response action operations.
- Ensure overall protectiveness of the public after completion of the response action.
- Comply with ARARs to the extent practicable.
- Facilitate the intended future uses of the property.

9.0.2 The recommended alternative and cost for each sector is summarized in Table 9-1. In the following paragraphs, a description and rationale is presented for each sector recommendation. Detailed cost estimates for each alternative in each sector are presented in Appendix F.

9.0.3 With the implementation of each alternative, recurring reviews by the Army will be completed every five years to ensure the public health, safety, and environment are being protected by these response actions. The reviews will evaluate site-specific factors that may impact the continued effectiveness of the response actions, such as changes in physical conditions at the site and/or changes in public accessibility and land use. More specifically, the reviews will focus on answering the following questions:

- Is the response functioning as intended?
- Are the assumptions used at the time of response selection still valid?
- Does new information indicate that the previously selected response is no longer protective of human health, safety, and the environment considering the best available technology?

9.0.4 In Table 9-1, implementation costs that have been presented for each of the alternatives represent stand-alone response actions. In reality, assuming that these alternatives will be implemented collectively, considerable cost savings are possible from the sharing of cost items among the various sites. For example, each sector includes the cost for the preparation of an ESS. However, it is likely that only one ESS that addresses all sectors will be required, thus saving on the costs associated with duplication of efforts

**Table 9-1
Recommended Alternatives**

Sector	Alternative	Area (acres)	Estimated Cost
M5-1L (North)-PR	No Further Action	110	*
M5-1L (South)-PR	Clearance to One Foot	113	\$2,300,174.62**
M5-1L-I	Clearance to Depth	19	\$697,765.91**
M6-1L Remainder-I/AR	No Further Action	50	*
M6-1L Suspect Area-I/AR	Clearance to Depth	14	\$277,196.27**
M6-1M Burn Pit-PR	Clearance to One Foot	3	\$58,360.01**
M6-1M Remainder-I/AR	No Further Action	102	*
M6-1M Remainder-PR	No Further Action	291	*
M6-1M Suspect Area (North)-PR	Clearance to One Foot	6.3	\$118,310.00
M6-1M Suspect Area (South)-PR	Clearance to One Foot	4.6	\$82,404.56
M6-1M Transect Area 1 (South)-PR	Clearance to One Foot	66	\$1,412,950.69**
M6-1M Transect Area 2 (North)-PR	Clearance to One Foot	63	\$1,151,722.51**
Smoke Ranges Rands/T-38-PR	No Further Action	88	*

*The estimated cost to implement the recommended Alternative for all of these sectors is \$100,000.

**Does not include costs for highly contaminated areas that may require mechanical removal.

9.0.5 The boundary of the sectors and corresponding acreage discussed in the following chapters are approximate. The boundaries were estimated based on the OE items found during the site characterization. Since the accuracy of each boundary is unsure, the approach to be taken during response action will be to begin the investigation at the area that appears to be the most contaminated and step out from that area until no UXO items are found within a pre-selected number of contiguous investigation grids. The number of contiguous grids will be determined and pre-approved as part of the ESS and the site-specific removal action work plan.

9.1 M5-1L (NORTH)-PR

9.1.1 Description and History

This area consists of approximately 110 acres in the southern portion of the Alpha Area. Historically, OA-29 - World War I Artillery Range (North Half), OA-10 - World War II Machine Gun Range, AOC-3 - Smoke Ranges R and S, and OA-04 - 37mm Anti-Tank Range (T-31) were all located within sector M5-1L (North)-PR. Artillery and mortar was used at OA-29 - World War I Artillery Range (North Half) 1912 to the beginning of World War II. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. AOC-3 - Smoke Ranges was established prior to 1958. OA-04- 37mm Anti-Tank Range (T-31) was built during World War II and included a moving target on a track. It is unlikely that explosive ordnance was used on the moving target. By 1958, the track was removed and a new firing line was established for the M1 Rifle Transition Table. The firing range was closed by 1967 and the area was listed as T-31 with an unspecified use. The projected future land use for this sector is Passive Recreation.

9.1.2 Recommendation

The recommended alternative for M5-1L (North)-PR is No Further Action. This alternative requires no action at the site and, therefore, may leave undiscovered OE in the environment that could pose a potential risk to the public. This alternative does not impose any land use controls; however, it will include a deed notice in the property transfer documents that informs future property owners of the historical OE use and provides notification procedures in the event an OE item is discovered.

9.1.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis in Chapter 8.0 indicated that No Further Action would be adequate for this sector. Only a few OE Scrap items were found in this sector and the scrap density is very low. The types of OE Scrap items that were found in this sector include items such as expended illumination signals and practice grenades. These items indicate that this portion of the Alpha Area was primarily used for maneuver training activities. Parsons ES conducted a CWM EE/CA for the Smoke Ranges and T-38 area at Fort McClellan. The field sampling activities for that EE/CA included sampling within this sector. Parsons conducted geophysical surveys and intrusive sampling, and this sampling falls within the M5-1L Sector of the Alpha EE/CA. The Parsons data has been incorporated into the Alpha EE/CA as it pertains to conventional OE contamination issues. Findings included dummy grenades, a grenade base, and 7.62 metal clips. Further the projected land use for this sector is Passive Recreation, associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with this land use. The documented historical use of this area, combined with the types of practice items found and given the anticipated land use for this area, all support the recommendation for No Further Action.

9.2 M5-1L (SOUTH)-PR

9.2.1 Description and History

This area consists of approximately 113 acres along the southern border of the Alpha Area. Historically, OA-29 - World War I Artillery Range (North Half), OA-37 - Bandholtz Rifle Range (Range 25), OA-10 - World War II Machine Gun Range, and AOC-3 - Smoke Ranges R and S were all located within sector M5-1L (South)-PR. Artillery and mortar was used at OA-29 - World War I Artillery Range (North Half) 1912 to the beginning of World War II. OA-37 - Bandholtz Rifle Range was built during the Inter-War period. This range was continually used as a known distance range and is now referred to as Range 25. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. AOC-3 - Smoke Ranges was established prior to 1958. The projected future land use for this sector is Passive Recreation.

9.2.2 Recommendation

The recommended alternative for M5-1L (South)-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. Residual risk that may remain will be managed through the inclusion of a deed restriction in the property transfer documents that will prohibit digging in this area without construction support by UXO-qualified personnel. The estimated cost to implement this alternative is \$2,300,174.62.

9.2.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. The 75mm, HE, M48 that was found in this sector by Foster Wheeler Environmental was located on the surface. No subsurface UXO was found. OE Scrap was found on the surface and below the surface. Findings included 75mm projectile shrapnel, a pusher plate from a 75mm, 3.8-inch projectile shrapnel, a fuze from a stokes mortar, 4.2-inch mortar base, and a tail boom from a rifle grenade. Two UXO items (stokes mortar and 3.8-inch projectile) were identified on the surface. Parsons ES conducted a CWM EE/CA for the Smoke Ranges and T-38 area at Fort McClellan. The intrusive activities for that EE/CA included sampling within two of the sectors covered by the Alpha EE/CA. The Parsons data has been incorporated into the Alpha EE/CA as it pertains to conventional OE contamination issues. Findings included several dummy grenades, 7.62 metal clips, a smoke grenade, and a slap flare. Further the projected land use for this sector is Passive Recreation, which is associated with activities such as hiking, walking, and biking. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0-6 inches) soils. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expected depth (6 inches) of contact. This alternative will also include a deed restriction that prohibits digging without construction support by UXO-qualified personnel. Since the projected land use is Passive Recreation and no significant construction of recreational facilities or underground utilities is associated with this land use, the recommendation for Clearance to One Foot was determined to be the most appropriate removal action.

9.3 M5-1L-I

9.3.1 Description and History

This sector is a 19-acre, triangular-shaped area located along the southwestern border of the Alpha Area. The historical range located within sector M5-1L-I includes OA-46 - Bivouac Site B-40. OA-46- Bivouac Site B-40 was a company sized bivouac area. Training debris found at this site included expended rifle blanks and pyrotechnic devices such as smoke grenades. An expended Livens Round was found during a site visit. The projected future land use for this sector is Industrial.

9.3.2 Recommendation

The recommended alternative for M5-1L-I is Clearance to Depth. Components of this alternative will include land surveying and brush clearing operations to prepare the site. After the sector is cleared of surface contamination, a subsurface investigation will be conducted. Due to the requirement to detect items deeper than one foot, this alternative will be performed using sensitive instruments capable of detecting anomalies at greater depths. Using a suitably sensitive detection system, the entire study area will be surveyed to locate potential OE items. The anomalies will then be investigated to identify them as OE, OE Scrap, or non-OE Scrap (metallic scrap). After identification, the items will be disposed of as scrap or OE in accordance with the previously approved OE operations work plan. The estimated cost to implement this alternative is \$697,765.91.

9.3.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that clearance to depth should provide sufficient protection for this sector. One UXO item and several OE Scrap items were found on the surface. Although the items were all found on the surface, no intrusive sampling occurred within this small sector. The planned land use for this sector is Industrial. Industrial land use involves routine interaction with the surface and near-surface soils by the employees of the industrial facility. The construction of new industrial facilities and structures or underground utilities and the maintenance or replacement of existing structures or utilities is assumed to be reasonably associated with this land use. Given the planned future land use for this sector, the types of items identified in this sector during the suite characterization, and the fact that this sector borders M5-1L (South)-PR, in which items such as a 75mm HE projectile were found, clearance to depth in this sector would provide the highest overall protectiveness.

9.4 M6-1L REMAINDER-I/AR

9.4.1 Description and History

This area consists of approximately 50 acres along the northern border of the Alpha Area. Ranges known to be located within sector M6-1L Remainder-I/AR include OA-11 - Tank Combat Range, OA-10 - World War II Machine Gun Range, OA-15 - Grenade Court, OA-12 - Tank Range #1, and The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. The Grenade Court (OA-15) was established during World War II and abandoned in 1967. Tank Range #1 (OA-12) was established prior to 1949 and abandoned by 1958. A historical map indicated the range was a Tank Sub-Caliber with 14 firing points. IT Corporation conducted a site investigation of two areas within M6-1L Remainder-I/AR. These areas are known as the Fill Area East of Reilly Airfield, Parcel 227 (7) and the Former Post Garbage Dump, Parcel 126 (7). There were no records of disposal activities for the two parcels.

Therefore, a site investigation was conducted to determine the presence or absence of Chemical contamination at these sites. The site investigation included a geophysical survey, field sampling and analysis, and installation of monitoring wells. Fill definition activities were also conducted to determine the vertical and horizontal extent of the fill area and to characterize the fill material. Fill area definition activities included trenching and fill material sampling and analysis. Seventeen exploratory trenches were excavated at the Fill Area East of Reilly Airfield and the Former Post Garbage Dump. The trenches were excavated to depths ranging from ten to fifteen feet deep. Fill material such as scrap metal, glass bottles, bricks, wood, concrete rubble, and other miscellaneous non-ordnance related items was observed in 16 of the 17 trenches. One rifle cartridge casing was found in Trench T227-14. Following the exploratory trenching the boundaries of the areas were redefined and the extent of waste fill was estimated to be 6.44 acres. The exploratory trenching conducted by IT Corporation, although not part of the EE/CA site characterization, provides useful information about this sector. No OE or UXO items were identified by IT Corporation during these field activities. The projected future land use for this sector is a combination of Industrial and Active Recreation.

9.4.2 Recommendation

The recommended alternative for M6-1L Remainder-I/AR is No Further Action. This alternative requires no action at the site and, therefore, may leave undiscovered OE in the environment that could pose a potential risk to the public. This alternative does not impose any land use controls; however, it will include a deed notice in the property transfer documents that informs future property owners of the historical OE use and provides notification procedures in the event an OE item is discovered.

9.4.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that No Further Action would be adequate for this sector. The projected future land use of this sector is a combination of Active Recreation and Industrial. One piece of a Demolition Block of TNT was found in Grid 092 and two OE Scrap items (an expended signal illumination flare and a slap flare) were found on the surface. Other OE Scrap items were found at depths ranging from two to twelve inches. The types of OE Scrap items that were found in this sector indicate that this area was used for maneuver training activities. Also, this area was identified by HTRW investigations as the former Post Garbage Dump. This is most likely the reason for the high anomaly counts and the findings in this area. IT Corporation conducted a site investigation in the fill area and former dump. During exploratory trenching activities only one rifle cartridge casing was identified.

9.4.3.1 Technically, the amount of acreage sampled in this sector during the site characterization does not meet the required acreage for a density level of 0.1 (industrial use). However, the sampling acreage in this sector does meet the required acreage for a density level of 0.5 (active recreation use). M6-1L Remainder-I/AR consists of 50% Active Recreation land use in the western portion and 50% Industrial Land Use in the eastern portion. In the eastern, Industrial land use portion of this sector a 14 acre piece (basically 1/2 of the industrial portion) was further subdivided into a separate sector and is discussed in 9.5. A body of water is also

located in this area, which limits the remaining acreage. The remaining acreage is spatially covered with a concentration of grids that were sampled during the site characterization. Grids 109, 118, 126, 127, 128, 131, and 132 are spaced throughout this area and only OE Scrap and small arms were identified. Further, this sector is on the northern boundary of the Ft. McClellan Installation. There is a very low likelihood that a target would be located in such close proximity to the end of the installation. The western, active recreation portion would fall into the moderate usage (0.5). The acreage required for moderate usage would be 4.4 acres for this sector, which has been sampled. Based on the low risk posed by the items found during the site characterization and the intended land use for the two portions of this sector, the quantity of sampling in this sector is adequate and the proposed response action is protective for the intended land use.

9.5 M6-1L SUSPECT AREA-I/AR

9.5.1 Description and History

This area consists of approximately 14 acres in the northern portion of the Alpha Area. Historical ranges located within sector M6-1L Suspect Area-I/AR include OA-08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), OA-11 - Tank Combat Range, OA-10 - World War II Machine Gun Range, OA-09 - Bivouac Site B-30, and OA-69 - POW Compound. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and reopened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. Bivouac Site B-30 (OA-09) is a battalion sized bivouac area. Training debris such as expended rifle blanks and pyrotechnic devices (e.g. smoke grenades) probably remain at the site. The projected future land use for this sector is a combination of Industrial and Active Recreation.

9.5.2 Recommendation

The recommended alternative for M6-1L Suspect Area-I/AR is Clearance to Depth. Components of this alternative will include land surveying and brush clearing operations to prepare the site. After the sector is cleared of surface contamination, a subsurface investigation will be conducted. Due to the requirement to detect items deeper than one foot, this alternative will be performed using sensitive instruments capable of detecting anomalies at greater depths. Using a suitably sensitive detection system, the entire study area will be surveyed to locate potential OE items. The anomalies will then be investigated to identify them as OE, OE Scrap, or non-OE Scrap (metallic scrap). After identification, the items will be disposed of as scrap or OE in accordance

with the previously approved OE operations work plan. The estimated cost to implement this alternative is \$277,196.27.

9.5.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to Depth should provide sufficient protection for this sector. The projected future land use of this sector is a combination of Active Recreation and Industrial. These land uses both involve some interaction with near surface soils. The items found in this sector were found on the surface and down to 3 inches. Two UXO items and four OE Scrap items were identified on the surface and at shallow depths during site characterization. One additional OE Scrap item (hand grenade part) was found deeper at 14 inches. The type of items that were recovered in this area normally does not penetrate below 12 inches of the surface; however, the recommendation of Clearance to Depth is considered to be more protective based on the land use. The clearance depth is expected to be 12 – 14 inches.

9.6 M6-1M BURN PIT-PR

9.6.1 Description and History

This area consists of approximately 3 acres along the eastern border of the Alpha Area. Historically, OA-08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), OA-10 - World War II Machine Gun Range, OA-20 - Range, and OA-16 - Rifle Transition Range were all located within sector M6-1M Burn Pit-PR. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and re-opened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000 yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. OA-20 - Range was built prior to 1949 and abandoned by 1958. Explosive ordnance use in this range is unknown. The Rifle Transition Range (OA-16) was first used during World War II as a machine gun range. The range was abandoned by 1967. A portion of this range may have been used for artillery and mortar fire during World War I. The projected future land use for this sector is Passive Recreation.

9.6.2 Recommendation

The recommended alternative for M6-1M Burn Pit-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan.

Residual risk that may remain will be managed through the inclusion of a deed that will prohibit digging in this area without construction support by UXO-qualified personnel. Planning for this response action will require preparation of an ESS and a site-specific work plan. The estimated cost to implement this alternative is \$58,360.01.

9.6.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. Only OE Scrap items were found in this sector. OE Scrap items were found primarily at shallow depths and down to a maximum depth of 24 inches. However, the item reported at 24 inches was actually on the surface of a 24-inch depression. Further, the future land use of this sector is Passive Recreation, which is associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with this land use. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0-6 inches) soils. This alternative will also include a deed restriction that prohibits digging without construction support by UXO-qualified personnel. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expected depth (6 inches) of contact. The depths at which OE items were identified, combined with the future use of this sector and the deed restriction for use, support the recommendation of Clearance to One Foot.

9.7 M6-1M REMAINDER-I/AR

9.7.1 Description and History

This area consists of approximately 102 acres in the western portion of the Alpha Area. Historical ranges known to be located within M6-1M Remainder-I/AR include OA-05 - World War I Machine Gun Range, OA-11 - Tank Combat Range, 08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), OA-OA-15 - Grenade Court, OA-10 - World War II Machine Gun Range, and OA-69 - POW Compound. The World War I Machine Gun Range (OA-05) was built during World War I and abandoned prior to World War II. The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and re-opened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. The Grenade Court (OA-15) was established during World War II and abandoned in 1967. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. IT Corporation conducted a site investigation of one area within this sector. This area is known as the Probable Fill Area at Range 30. Fill area definition activities conducted at this site included trenching and fill material sampling and analysis. Six

exploratory trenches were excavated in this fill area. The trenches were excavated to depths ranging from one to eight feet deep and fifty feet long. Fill material such as gravel, tree limbs and roots, metal wrapped wire, metal straps, corrugated piping, carpet pieces, plastic trash bags, bricks, concrete, and aluminum cans was observed in the trenches. The projected future land use for this sector is a combination of Industrial and Active Recreation.

9.7.2 Recommendation

The recommended alternative for M6-1M Remainder-I/AR is No Further Action. This alternative requires no action at the site and, therefore, may leave undiscovered OE in the environment that could pose a potential risk to the public. This alternative does not impose any land use controls; however, it will include a deed notice in the property transfer documents that informs future property owners of the historical OE use and provides notification procedures in the event an OE item is discovered.

9.7.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that No Further Action would be adequate for this sector. Only OE Scrap was found in this sector. Seventeen OE Scrap items were found on the surface and down to a maximum depth of 20 inches. The types of OE Scrap items that were found in this sector include expended signal illumination flares, slap flares, signal illumination grenades, and practice items. These items indicate that this portion of the Alpha Area was used for maneuver training activities. Although the acreage indicated by UXO Calculator to meet a 90% confidence at the given OE Density level of .1 was not met for this sector, the amount of acreage sampled did meet the density level of 0.5. The items identified in this sector were the types that would be expected in this sector due to historical activities recorded in the Archives Search Report. Historical records indicate that rifle and machine gun fire were the only training activities conducted in this area. The OE Scrap items found during the site characterization support this. Further, no ordnance related items were found by IT Corporation during the exploratory trenching of the probable fill area. The documented historical use of this area, combined with the types of practice items found and given the planned future use of this area, all support the recommendation for no further action.

9.8 M6-1M REMAINDER-PR

9.8.1 Description and History

This area consists of approximately 291 acres in the north central portion of the Alpha Area. Historical ranges known to be located within M6-1M Remainder-PR include OA-14 - Excavated Trench, OA-11 - Tank Combat Range, OA-08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), OA-10 - World War II Machine Gun Range, OA-07/AOC-18 - Range 31, OA-04 - 37mm Anti-Tank Range (T-31), OA-20 - Range, OA-12 - Tank Range #1, OA-13 - Tank Range #2, OA-37 - Bandholtz Rifle Range (Range 25), AOC-1 - Training Area 31 (Part of Range 30), OA-63 - Bivouac Site 31, OA-16 - Rifle Transition Range, and OA-61 - 1967 Defendum Grenade Range. The Excavated Trench (OA-14) was open during World War I and was closed prior to the Inter-War period. A wire obstacle metal picket and two artillery propellant charge container lids were found during a site

visit. The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and re-opened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. OA-10 – World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. Range 31 (OA-07/AOC-18) was built during World War II. The initial use of the range is unknown. Aerial photographs show target pits and an extremely long open area. In 1958, the range was used as a Machine Gun Transition Range. In 1967, the range was used for chemical munitions. A variety of explosive devices including 40mm Grenades, Fougasse, smoke, flame-thrower, LAW, incendiary rockets, and other explosive ordnance were used at the range. OA-04- 37mm Anti-Tank Range (T-31) was built during World War II and included a moving target on a track. It is unlikely that explosive ordnance was used on the moving target. By 1958, the track was removed and a new firing line was established for the M1 Rifle Transition Table. The firing range was closed by 1967 and the area was listed as T-31 with an unspecified use. OA-20 – Range was built prior to 1949 and abandoned by 1958. Explosive ordnance use in this range is unknown. Tank Range #1 (OA-12) was established prior to 1949 and abandoned by 1958. A historical map indicated the range was a Tank Sub-Caliber with 14 firing points. Tank Range #2 (OA-13) was established prior to 1949 and abandoned by 1958. Use of explosive ordnance in this range is unknown. OA-37 – Bandholtz Rifle Range was built during the Inter-War period. This range was continually used as a known distance range and is now referred to as Range 25. Training Area 31 (AOC-1) was originally part of Range 30 and later became the Technical Escort Reaction Training Area. Toxic agents were used to contaminate an area so that students could go through reaction and decontamination procedures. The Rifle Transition Range (OA-16) was used in World War II as a machine gun range. It was abandoned by 1967. Part of this range may have been used for artillery and mortar firing during World War I. IT Corporation conducted a site investigation of an area within M6-1M Remainder-PR. This area is known as the Fill Area North of Landfill No. 2 Parcel 230(7). There were no records of disposal activities for the parcel. Therefore, a site investigation was conducted to determine the presence or absence of Chemical contamination at these sites. The site investigation included a geophysical survey, field sampling and analysis, and installation of monitoring wells. Fill definition activities were also conducted to determine the vertical and horizontal extent of the fill area and to characterize the fill material. Fill area definition activities included trenching and fill material sampling and analysis. Five exploratory trenches were excavated at the Fill Area. The trenches were excavated to depths ranging from two to seven feet deep. Fill material such as scrap metal, glass bottles, bricks, wood, concrete rubble, and other miscellaneous non-ordnance related items was observed in the trenches. Following the exploratory trenching the boundaries of the areas were redefined and the extent of waste fill was estimated to be 24 acres. The projected future land use for this sector is Passive Recreation.

9.8.2 Recommendation

The recommended alternative for M6-1M Remainder-PR is No Further Action. This alternative requires no action at the site and, therefore, may leave undiscovered OE in the environment that could pose a potential risk to the public. This alternative does not impose any land use controls; however, it will include a deed notice in the property transfer documents that informs future property owners of the historical OE use and provides notification procedures in the event an OE item is discovered.

9.8.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that No Further Action would be adequate for this sector. Only one illumination round and OE Scrap was found in this sector. Some of the types of OE Scrap items found in this sector include signal illumination flares, slap flares, and signal illumination grenades. These items indicate that this portion of the Alpha Area was used for maneuver training activities. Other types of OE Scrap found in this sector include 60mm fragments, 75mm shrapnel and 81mm tail fin pieces. These items are most likely a result of fragments thrown from the North and South Transect Areas. For the ordnance expected at Fort McClellan, impact areas are composed of target zones, firing miss zones, and fragmentation zones. Target and firing miss zones have a high likelihood of containing OE and UXO items. A fragmentation zone exists beyond the target and firing miss zones and can extend over 1,000 feet beyond the edge of the target zone depending upon the fragmentation distance of the munition. Fragmentation zones have a low likelihood of containing OE and UXO items and instead contain fragments of fired munitions. Fragments pose no hazards to the public. Based on the density of fragment found in this sector and the location of this sector, this sector was determined to be in a fragmentation zone. Therefore, it is unlikely that a UXO item exists this far into a fragmentation zone. Further the projected land use for this sector is Passive Recreation, which is associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with this land use. The documented historical use of this area, combined with the types of practice items found and given the planned future use of this area, all support the recommendation for no further action.

9.9 M6-1M SUSPECT AREA (NORTH)-PR

9.9.1 Description and History

This area consists of approximately 6.3 acres in the northern portion of the Alpha Area. Historical ranges known to be located within M6-1M Suspect Area (North)-PR include OA-11 - Tank Combat Range, OA-08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), and OA-10 - World War II Machine Gun Range. The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and re-opened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing

(R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. OA-10 – World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. The projected future land use for this sector is Passive Recreation.

9.9.2 Recommendation

The recommended alternative for M6-1M Suspect Area (North)-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. Residual risk that may remain will be managed through the inclusion of a deed that will prohibit digging in this area without construction support by UXO-qualified personnel. The estimated cost to implement this alternative is \$118,310.

9.9.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. During the site characterization, three practice 3.5-inch rockets were found on the surface. Six OE Scrap items were found on the surface and down to a maximum depth of two inches. Further, the future land use of this sector is Passive Recreation. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0 – 6 inches) soils. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expected depth (6 inches) of contact. This alternative will also include a deed restriction that prohibits digging without construction support by UXO-qualified personnel. The recommended Clearance to One Foot is therefore considered to be adequate.

9.10 M6-1M SUSPECT AREA (SOUTH)-PR

9.10.1 Description and History

This area consists of approximately 4.6 acres along the western border of the Alpha Area. Historical ranges known to be located within M6-1M Suspect Area (South)-PR include OA-04 - 37mm Anti-Tank Range (T-31) and AOC-1 - Training Area 31 (Part of Range 30). OA-04-37mm Anti-Tank Range (T-31) was built during World War II and included a moving target on a track. It is unlikely that explosive ordnance was used on the moving target. By 1958, the track was removed and a new firing line was established for the M1 Rifle Transition Table. The firing range was closed by 1967 and the area was listed as T-31 with an unspecified use. Training Area 31 (AOC-1) was originally part of Range 30 and later became the Technical Escort Reaction Training Area. Toxic agents were used to contaminate an area so that students could go through

reaction and decontamination procedures. The projected future land use for this sector is Passive Recreation.

9.10.2 Recommendation

The recommended alternative for M6-1M Suspect Area (South)-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. Residual risk that may remain will be managed through the inclusion of a deed that will prohibit digging in this area without construction support by UXO-qualified personnel. The estimated cost to implement this alternative is \$82,404.56.

9.10.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. UXO items and OE Scrap were found at depths ranging from the surface to 24 inches below ground surface in this sector. The future land use for this sector is Passive Recreation, which is associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with the land use. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0 – 6 inches) soils. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expect depth (6 inches) of contact. Also, this alternative will include a deed restriction that prohibits digging without construction support by UXO-qualified personnel. Therefore, the recommendation of Clearance to One Foot is considered to be adequate.

9.11 M6-1M TRANSECT AREA 1 (SOUTH)-PR

9.11.1 Description and History

This area consists of approximately 66 acres in the central portion of the Alpha Area. Ranges historically know to be located within M6-1M Transect Area 1 (South)-PR include OA-11 – Tank Combat Range, OA-08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), OA-10 - World War II Machine Gun Range, OA-07/AOC-18 - Range 31, and OA-04 - 37mm Anti-Tank Range (T-31). The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and reopened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. OA-10 – World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it

was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. Range 31 (OA-07/AOC-18) was built during World War II. The initial use of the range is unknown. Aerial photographs show target pits and an extremely long open area. In 1958, the range was used as a Machine Gun Transition Range. In 1967, the range was used for chemical munitions. A variety of explosive devices including 40mm Grenades, Fougasse, smoke, flame-thrower, LAW, incendiary rockets, and other explosive ordnance were used at the range. OA-04- 37mm Anti-Tank Range (T-31) was built during World War II and included a moving target on a track. It is unlikely that explosive ordnance was used on the moving target. By 1958, the track was removed and a new firing line was established for the M1 Rifle Transition Table. The firing range was closed by 1967 and the area was listed as T-31 with an unspecified use. The projected future land use for this sector is Passive Recreation.

9.11.2 Recommendation

The recommended alternative for M6-1M Transect Area 1 (South)-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. Residual risk that may remain will be managed through the inclusion of a deed that will prohibit digging in this area without construction support by UXO-qualified personnel. The estimated cost to implement this alternative is \$1,412,950.69.

9.11.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. OE Scrap was found to a depth of twelve inches and UXO to a depth of two inches in this sector. The majority of the OE Scrap was found at lesser depths. The projected future use of this sector is Passive Recreation, which is associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with this land use. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0 – 6 inches) soils. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expected depth (6 inches) of contact. This alternative will also include a deed restriction that prohibits digging without construction support by UXO-qualified personnel. Given the depth at which items were identified, the future land use of this sector, and the inclusion of a deed restriction, the recommendation of Clearance to One Foot is considered to be adequate.

9.12 M6-1M TRANSECT AREA 2 (NORTH)-PR

9.12.1 Description and History

This area consists of approximately 63 acres in the northeastern portion of the Alpha Area. Historically, 08 - Defendum Rifle Range (1950 Sub Caliber Tank Range, R-32, R-34, Range 30, Defendum Known Distance Range), A-11 - Tank Combat Range, OA-10 - World War II Machine Gun Range, OA-12 - Tank Range #1, OA-13 - Tank Range #2, and OA-37 - Bandholtz Rifle Range (Range 25) were known to be located within sector M6-1M Transect Area 2 (North)-PR. The Defendum Known Distance Range (OA-08) was built during World War I. The range was abandoned during the Inter-War period and re-opened during World War II. By 1958, the range was made into a Carbine Transition Range (R-32) and by 1967; the range was used for machine gun field firing (R-34). In 1974 the area was used as a training area (Range 30). Historical documentation indicates only rifle and machine gun fire were conducted on this range. The Tank Combat Range (OA-11) was used during the Inter-War period. Possible uses of the range include driver training, tactical maneuvers, or main gun firing. OA-10 - World War II Machine Gun Range was built during World War II and includes a portion of the World War I, 1000-yard rifle range. In 1967, it was being used as an Squad/Platoon Attack Course and was later abandoned. This range also lies in the area designated during the Inter-War period as a Tank Combat Range. Tank Range #1 (OA-12) was established prior to 1949 and abandoned by 1958. A historical map indicated the range was a Tank Sub-Caliber with 14 firing points. Tank Range #2 (OA-13) was established prior to 1949 and abandoned by 1958. Use of explosive ordnance in this range is unknown. OA-37 - Bandholtz Rifle Range was built during the Inter-War period. This range was continually used as a known distance range and is now referred to as Range 25. The projected future land use for this sector is Passive Recreation.

9.12.2 Recommendation

The recommended alternative for M6-1M Transect Area 2 (North)-PR is Clearance to One Foot. Components of this alternative will include land surveying and brush clearing operations to prepare the site. Geophysical detection instruments will be used to locate subsurface anomalies, which subsequently will be investigated down to 12 inches. After identification, the item will be disposed of as scrap or OE in accordance with a previously approved OE operations work plan. Residual risk that may remain will be managed through the inclusion of a deed that will prohibit digging in this area without construction support by UXO-qualified personnel. The estimated cost to implement this alternative is \$1,151,722.51.

9.12.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that Clearance to One foot should provide sufficient protection for this sector. One unfuzed 60mm Mortar and a total of 35 UXO items were found between the surface and fourteen inches by Foster Wheeler Environmental Corporation. None of the OE Scrap was found deeper than 12 inches. Three UXO items were identified by IT Corporation during a separate environmental investigation. The projected future land use for this sector is Passive Recreation, which is

associated with activities such as hiking, walking, and biking. No significant construction of recreational facilities or underground utilities is associated with this land use. Consistent with the Passive Recreation land use is the occasional incidental interaction with surface and very near surface (0 – 6 inches) soils. The recommendation of clearance to one foot provides a safety buffer of 2 beyond the expected depth (6 inches) of contact. Therefore, clearance to a one-foot depth should be adequate since this alternative will include a deed restriction that prohibits digging without construction support by UXO-qualified personnel.

9.13 SMOKE RANGES R AND S/T-38-PR

9.13.1 Description and History

This area consists of approximately 88 acres along the western border of the Alpha Area. AOC-2 - T-38 Site and AOC-3 - Smoke Ranges were both located within sector Smoke Ranges R and S/T-38-PR. T-38 (AOC-2) was used as a toxic agent storage yard. Chemical agents, HD, VX, and GB were stored here. Later, the nerve agents were removed from the yard and moved to Igloo 13 at ASP. After the Chemical School Closed in 1973, the remaining blister agents were transferred to a near-by motor pool in preparation to move the agents to Anniston Army Depot. AOC-3 – Smoke Ranges was established prior to 1958. It is unknown if toxic agents were used in this area. The projected future land use for this sector is Passive Recreation.

9.13.2 Recommendation

The recommended alternative for Smoke Ranges R and S/T-38-PR is No Further Action. This alternative requires no action at the site and, therefore, may leave undiscovered OE in the environment that could pose a potential risk to the public. This alternative does not impose any land use controls; however, it will include a deed notice in the property transfer documents that informs future property owners of the historical OE use and provides notification procedures in the event an OE item is discovered.

9.13.3 Supporting Rationale

The risk analysis in Chapter 4.0 and the comparative analysis completed in Chapter 8.0 indicated that No Further Action would be adequate for this sector. Parsons ES is conducting a CWM EE/CA for the Smoke Ranges and T-38 area at Fort McClellan. The field sampling activities for that EE/CA included sampling within this sector. Parsons conducted geophysical surveys and intrusive sampling. The sampling in the T-38 Sector was geared toward CWM characterization, but the results provide data that can be used in the characterization of conventional ordnance as well. The Parsons data was incorporated into the Alpha EE/CA as it pertains to conventional OE contamination issues. Six OE Scrap items were found by Parsons at a depth of twelve inches. This item is believed to be an isolated ordnance item not related to a target area, firing miss zone, or training area. Items such as this appear sporadically in various locations within the Alpha Area and cannot be related to any target or training area. It is not possible to locate individual ordnance items on Fort McClellan without clearing 100% of the land. The projected land use for this sector is Passive Recreation, which is associated with activities such as hiking, walking, and

biking. No significant construction of recreational facilities or underground utilities is associated with this land use. The documented historical use of this area, combined with the minimal findings and the planned future use, all support the recommendation for no further action.

9.14 CLEARANCE ACTION RECOMMENDATIONS SUMMARY

The specific actions that lead to the recommended clearance actions are:

1. EE/CA Investigation and data analysis
2. OE Risk Assessment
3. Development and Analysis of Alternatives
4. Selection of recommended alternative for each specific area or sector

The recommended actions outlined in the Table 9-1 have been developed in accordance with DoD 6055.9 Standard, Chapter 12, Paragraph 12.3.4.3 "Site-Specific Remediation Depth Determination" and will be presented in an Action Memorandum. Approval of the Action Memorandum leads to the next phase of the OE/UXO process whereby removal actions are planned and executed. All areas recommended for action are then surveyed, mapped as necessary, and removals completed.

10.0 RECURRING REVIEWS

10.1 FOLLOW-ON ACTIVITIES

10.1.1 Follow-on activities associated with the (Alpha, Bravo, Charlie) Area at Fort McClellan, Alabama will be conducted by the USACE in the form of recurring reviews. The recurring review process is consistent with Section 121(c) of CERCLA, as amended by SARA, and Section 300.430(f)(4)(ii) of the NCP. Recurring review, as outlined by these statutes, require that periodic (at least every five years) reviews be conducted for sites where hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions.

10.1.2 Recurring reviews will be conducted at Fort McClellan to:

- Ensure that public health, safety, and the environment are being protected by the response actions that were implemented.
- Verify the integrity of any site controls.
- Determine if new information has become available that was not available for consideration during the EE/CA that may warrant further action.
- Determine if there is an immediate threat to the public or environment that may require an accelerated response.

10.1.3 The recurring review team will gather data to determine if any changes within sectors are relevant and may affect the prior recommendations of the EE/CA. Changes to be evaluated consist of:

- Physical conditions of the sector;
- Public accessibility and land use;
- New technology or techniques that have become available and may warrant reconsideration or the EE/CA recommendations; and
- Effectiveness of the response action to reduce risk.

10.1.4 Data gathered during the review process will be used to determine if further action needs to be taken to protect public safety and the human environment. If no changes have taken place, the sector will continue to be monitored at the specified intervals. At the completion of the review, a Recurring Review Report will be prepared, a public notice will be placed in the local newspaper concerning the continued effectiveness of the OE response action, and a formal Decision Document referencing any actions taken will be prepared.

10.1.5 The initial recurring review will be scheduled by the government after the completion of the removal action phase to address the issues and evaluate the data as described above. The estimated cost for the site visit and review is expected to be \$35,000.

11.0 REFERENCES

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