FINAL

Environmental Assessment for BRAC 05 Disposal and Reuse of the Kansas Army Ammunition Plant, Kansas

Prepared by:

U.S. Army Corps of Engineers: Mobile District

With Technical Assistance from:
Marstel-Day, LLC
Fredericksburg, VA, 22401

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Prepared by:
U.S. Army Corps of Engineers
Mobile District

3 Jul 08

BYRON G. JORNS
Colonel, U.S. Army Corps of Engineers
Commanding

DATE

Approved by:
KSAAP, Kansas

2 Sep 08

DONALD D. DAILEY
Army Site Manager
KSAAP

DATE

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EXECUTIVE SUMMARY

INTRODUCTION

The 2005 Base Closure and Realignment (BRAC) Commission made recommendations for realignment and closure actions for military installations on 8 September 2005, in conformance with the provisions of the Defense Base Closure and Realignment Act of 1990 (Base Closure Act), Public Law 101-510, as amended. These recommendations included the closure of the Kansas Army Ammunition Plant (KSAAP), Kansas. In the absence of Congressional disapproval, the BRAC Commission's recommendations became binding on 9 November 2005. The KSAAP installation property was determined to be surplus to U.S. Army needs. Under the Base Closure Act, closure is required by no later than 15 September 2011.

This Environmental Assessment (EA), prepared in accordance with the National Environmental Policy Act (NEPA), analyzes the environmental and socioeconomic effects of disposal of the federal property and considers reasonable foreseeable reuse alternatives.

BACKGROUND

KSAAP consists of 13,727 acres of land located approximately 2 miles east of the town of Parsons (population 11,500, U.S. Census 2000) in Labette County, in southeastern Kansas. KSAAP is located about 30 miles west of the Missouri border and 20 miles north of the Oklahoma border. KSAAP includes 111 acres of easement right-of-way. The installation has over 600 structures, consisting of approximately 2.5 million square feet of building space (including igloos-magazines). The installation has over 75 acres of parking lots, over 100 miles of roadway, and over 30 miles of railroad tracks.

KSAAP is a government-owned, contractor-operated (GOCO) installation constructed in 1941. Since World War II, the installation's mission has been the production of military munitions to support the U.S. Department of Defense (DoD). The installation's operations include loading, assembling, packing, and storing ammunition products for the Army. KSAAP contains areas used for administrative and support functions; maintenance areas; inactive and active production areas that support, or supported in the past, the loading, assembling, and packing of ammunition products; areas used for storage of both inert materials and munitions and raw materials; operation ranges; oxidation ponds and lagoons; wastewater treatment facilities; water treatment facility; demolition areas; burning grounds; waste incineration facilities (Contaminated Waste Processor [CWP] and Explosive Waste Incinerator); and landfills. The ammunition storage areas include 242 igloos-magazines, as well as inactive and active munitions production areas. Following the Vietnam War, only three of the eight production lines remained in operation. In 1993, as a result of the decreased demand for ammunition following the end of the Cold War, the plant was designated inactive. Ammunition production continued, however, and expanded under a Facility Use Contract that allowed the operator to compete in open

solicitations. Increased plant utilization resulted and the plant was returned to active status in 2002. The GOCO contractor at KSAAP is Day & Zimmermann, Inc.

PROPOSED ACTION AND ALTERNATIVES

The proposed action (Army primary action) is to dispose of the surplus federal property generated by the BRAC-mandated closure of KSAAP.

Laws and regulations applicable to the proposed action include the Base Closure Act and the Federal Property and Administrative Services Act of 1949. The latter act is implemented by the Federal Management Regulations. Other major legislation governing the disposal and reuse of KSAAP properties includes: 32 Code of Federal Regulations (CFR) Part 174 (Revitalizing Base Closure Communities – Addressing Impacts of Realignment); 32 CFR Part 176 (Revitalizing Base Closure Communities – Community Redevelopment and Homeless Assistance); regulations issued by DoD to implement BRAC law; the Pryor Amendment; and the President's Program to Revitalize Base Closure Communities. Additional relevant federal statutes include: the Clean Air Act; Clean Water Act; Noise Control Act; Endangered Species Act; National Historic Preservation Act; Migratory Bird Treaty Act, Archaeological Resources Protection Act; Resource Conservation and Recovery Act; Community Environmental Response Facilitation Act; Toxic Substances Control Act; and Comprehensive Environmental Response, Compensation, and Liability Act. The framework of these laws within the context of the NEPA analysis provides standards that guide environmental compliance and planning. Furthermore, their consideration in the NEPA process helps ensure the preservation and promotion of environmental values in property transfer and reuse planning. Issues related to implementation actions consistent with several Executive Orders relevant to this BRAC action are also considered in this EA.

Alternatives to the proposed action are early transfer disposal, traditional disposal, caretaker status, and no action. Encumbrances or legal requirements such as those pertaining to munitions and explosives of concern, wetlands, cultural resources, threatened and endangered species, access easements, and remedial activities will be in effect for any disposal alternative.

The Army considers the KSAAP Local Redevelopment Planning Authority's (LRPA) reuse plan (i.e., *KSAAP Comprehensive Master Redevelopment Plan),* which was finalized in August 2007, to be the primary source from which to determine reuse scenarios to be considered. Reuse alternatives for KSAAP are analyzed in terms of intensity-based probable reuse scenarios; specifically, Medium-low Intensity Reuse (MLIR) and Low Intensity Reuse (LIR) scenarios for KSAAP. The MLIR scenario, as determined for the purposes of this document and as described further in the EA, could result in a maximum of 6,500 employees at KSAAP and the establishment of up to 6 million square feet of building space. The LIR scenario could result in a maximum of 2,000 employees at KSAAP and the establishment of up to 2.8 million square feet of building space. Both reuse scenarios encompass the anticipated redevelopment activities at the site. The KSAAP reuse plan includes the establishment of parcels dedicated to the following uses:

- conservation and agriculture (e.g., natural resource conservation and outdoor recreational activities);
- commercial energetics and munitions storage (e.g., continued and expanded use of existing production lines and existing igloo-magazine storage facilities);
- industrial/manufacturing (e.g., redevelopment of existing industrial areas for new industry/manufacturing);
- warehousing and distribution uses (e.g., rail car storage and use of existing cold storage warehouses [currently 19 cold storage warehouse buildings exist, providing over 400,000 square feet of facility space]);
- energy park use (for several reasons outlined in the EA, the energy park proposals [i.e., power plant, oil refinery, bioenergy facility] outlined in the plan are not considered reasonably foreseeable for NEPA purposes and were not analyzed further in this document);
- public education and training (e.g., college classes and training and education for fire, rescue, police, and emergency responders);
- special events (e.g., farm museum, outdoor events, and conservation activities);
- office/business park (i.e., adjacent to the existing administrative building with up to 1,000,000 square feet of building space);
- limited housing (if needed, a small area would be made available for housing with build-out expected in 10 to 15 years); and
- hazardous waste treatment (e.g., the CWP facility may have reuse potential as a commercial processing center for incineration of hazardous materials).

The plan also includes upgrades to the wastewater treatment plant and installation-wide utility systems (including rail, roads, telecommunications, power generation, water systems, etc.). The Army expresses no preference with respect to reuse scenarios because reuse planning decisions are not within its authority.

ENVIRONMENTAL CONSEQUENCES

The evaluated resource areas include land use, aesthetics and visual resources, air quality, noise, geology and soils, water resources, biological resources, cultural resources, socioeconomics, transportation, utilities, and hazardous and toxic substances. Direct and indirect impacts of each disposal alternative on the resource areas include a variety of short- and long-term impacts, both adverse and beneficial.

Early Transfer Disposal Alternative. Early transfer disposal would result in minor or moderate adverse effects for all resource areas, with no significant adverse effects. In the short term, the change from government to private ownership may result in some reduced management required under Army regulations (e.g., the Integrated Natural Resource Management Plan [INRMP] would no longer be implemented), which may have an adverse effect on some resources (e.g., reduced conservation and restoration of prairie habitat). Although parcels may be transferred more readily under this alternative, remediation activities would continue and land use controls would be put in place to ensure protection of human health and the environment. In the long term, disposal may result in long-term moderate adverse impacts to biological resources as a result of habitat disturbance from redevelopment and reduced preservation and management as prescribed in the INRMP. Long-term potential moderate adverse impacts to land use, noise, utilities, cultural resources, and air quality are also possible. Moderate cumulative adverse effects would also occur in the context of air quality and biological resources. Minor cumulative adverse or beneficial effects would occur in the context of land use, aesthetics and visual resources, noise, water resources, socioeconomics, and transportation. In general, the early transfer alternative would not result in direct environmental impacts concerning hazardous and toxic substances, because the Army would remediate all known sites, or would establish agreements for such remediation, regardless of the disposal alternative selected. It is possible that early transfer may expedite cleanup actions since redevelopment may occur sooner in time. In the case of KSAAP, however, redevelopment will happen very slowly thereby reducing such benefits. Indirect, short-term minor to moderate adverse impacts are possible due to enhanced demolition of old production lines.

Traditional Disposal Alternative. For traditional disposal, minor or moderate adverse effects would occur for all resource areas, with no significant adverse effects. As with early transfer, the change from government to private ownership may result in some reduced management required under Army regulations, which may have an adverse effect on some resources. Since parcels would be transferred after the completion of remediation, the effects associated with traditional disposal would occur over a longer period of time, as compared to the early transfer disposal alternative. Moderate adverse impacts would also occur in the area of biological resources, air quality, noise, utilities, cultural resources, land use, and hazardous and toxic substances. Minor adverse and beneficial cumulative effects would occur in the context of land use, aesthetics and visual resources, and socioeconomics, while minor adverse effects would occur for noise, water resources, and transportation. In addition, moderate adverse cumulative effects would occur in the context of air quality and biological resources, while moderate beneficial effects would occur for socioeconomics.

Caretaker Status Alternative. For the caretaker status alternative, minor adverse or beneficial effects would occur for all resource areas. Minor beneficial cumulative effects would occur for most resource areas. In addition, adverse cumulative effects would occur for socioeconomics.

No Action Alternative. The no action alternative would result in no adverse or cumulative impacts.

Reuse. The two reuse scenarios could result in a variety of adverse and beneficial short- and long-term direct, indirect and cumulative effects. To bound potential effects under reuse, the MLIR scenario for KSAAP represents development intensity higher than would occur in the KSAAP LRPA reuse plan. The MLIR scenario would result in short-term minor adverse impacts to all resource areas. Moderate adverse effects are expected for biological resources, primarily as a result of habitat disturbance from redevelopment activities. Moderate adverse effects to land use, noise, utilities, cultural resources, air quality, and hazardous and toxic substances may also occur. Minor long-term or short-term beneficial effects would occur for land use, aesthetics and visual resources, noise, geology and soils, water resources, socioeconomics, transportation, utilities, and hazardous and toxic substances. In addition, moderate beneficial effects would also occur for socioeconomics under the MLIR scenario.

Reuse of the installation properties per the LIR scenario, which would be similar to the level of intensity at current build-out (assuming all facilities were fully operational), would result in either minor beneficial or adverse effects or no effects to all resource areas, with the exception of biological resources and cultural resources, where moderate adverse effects could also occur. The LIR scenario would result in fewer effects than the MLIR scenario.

Cumulative effects related to reuse would be most noticeable if the MLIR scenario were implemented. Cumulative minor to moderate beneficial changes in economic development, socioeconomic conditions, and quality of life would occur as more jobs were created and the tax base increased. Net increases in air emissions from both stationary and mobile sources would occur at KSAAP, and throughout the region, and could result in moderate adverse impacts to air quality. Loss of some remnant high-quality prairie and riparian habitat on KSAAP may also result in moderate adverse effects. Implementation of the MLIR scenario would also have minor cumulative adverse or beneficial effects on land use, and would have minor adverse effects on aesthetics and visual resources, noise, water resources, and transportation, as well as moderate adverse effects on biological resources and air quality. Cumulative effects under the LIR scenario would be similar to those under the MLIR scenario.

Table ES-1.1 presents an overview of the environmental and socioeconomic effects associated with each of the alternatives evaluated in this EA (with the exception of the no action alternative, for which no effects were identified).

MITIGATION AND RECOMMENDATIONS FOR PLANNING AND MANAGEMENT

No specific mitigation is required of the Army to reduce or avoid effects below levels of significance for any of the alternatives evaluated in the EA. Furthermore, federal, state, and local regulations, policies and permitting requirements by entities who receive property at KSAAP will govern to a large extent the proper use and conservation of the

environment including air quality, wetlands resources, water quality, cultural resources, and other resources. Permits necessary for the redevelopment of KSAAP will be the responsibility of those entities who receive the property in the future. In addition, encumbrances related to land use restrictions and deed notifications were assumed to apply. For example, the Army is documenting and coordinating its findings and recommendations with the Kansas State Historic Preservation Office (see Section 4.9). If any National Register of Historic Places eligible properties are found to be present at KSAAP, an encumbrance requiring the protection of listed sites will be placed upon the property itself (i.e., deed restrictions, building restrictions, historic easements, etc.) and remain as a restriction on the land itself, regardless of property owner. Beyond such measures, certain management measures may be implemented by the Army or the KSAAP LRPA to successfully manage the disposal and redevelopment of KSAAP according to the principles of sound and sustainable planning.

CONCLUSION

Analysis in the EA shows that implementation of the proposed action would not result in significant adverse environmental effects. Thus, issuance of a Finding of No Significant Impact would be appropriate, and an Environmental Impact Statement is not required prior to implementation of the proposed action.

Table ES-1.1. Summary of Effects from Disposal and Reuse of KSAAP

RESOURCE AREAS	CARETAKER STATUS			EARLY TRANSFER DISPOSAL			TRADITIONAL DISPOSAL			REUSE SCENARIOS				
	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Medium-Low Intensity Direct	Medium-Low Intensity Indirect	Low Intensity Direct	Low Intensity Indirect	Cumulative
Land Use	○	▫	○	▫△	▫	▫○	▫△○	▫	▫○	▫△○	○	▫○	○	▫○
Aesthetic/Visual Resources	▫		○	▫○		▫	▫○		▫○	▫○	▫	▫○	▫	▫
Air Quality	○		○	▫△	▫△	△	▫△	▫△	△	▫△	▫	▫	▫	△
Noise	○	○	○	▫△	▫○	▫	▫△	▫○	▫	▫△	▫○	▫	▫○	▫
Geology and Soils		○		▫	▫○		▫	▫○		▫	▫○	▫	▫○	
Water Resources	▫○		○	▫○	○	▫	▫○	○	▫	▫○	▫○	▫○	▫○	▫△
Biological Resources	▫	○	▫○	△	▫△	△	△	▫△	△	△	▫△	▫△	▫△	△
Cultural Resources	▫			▫△	▫		▫△	▫		▫△	▫	▫△	▫	
Socioeconomics	▫	▫	▫○	▫○⊕	▫○	▫○⊕	▫○⊕	▫○	▫○⊕	▫⊕	▫○⊕	▫○	▫○	▫○⊕
Transportation	▫○		○	▫○	▫	▫	▫○	▫	▫	▫○	▫	▫○	▫	▫
Utilities	▫		○	▫△○			▫△○			▫△○		▫○		
Hazardous/Toxic Substances	○▫				▫△○			▫△○			▫△○		▫○	

○ Beneficial Effect (Minor)
⊕ Beneficial Effect (Moderate)
● Beneficial Effect (Significant)
[BLANK] No Effects Expected

▫ Adverse Effects (Minor)
△ Adverse Effects (Moderate)
■ Adverse Effects (Significant) NOTE: No significant adverse effects have been identified.

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1 PURPOSE, NEED, AND SCOPE

1.1 INTRODUCTION

Recommendations of the Base Closure and Realignment (BRAC) Commission made on 8 September 2005 in conformity with the provisions of the Defense Base Closure and Realignment Act of 1990 (Base Closure Act), Public Law 101-510, as amended, included the closure of the Kansas Army Ammunition Plant (KSAAP), Kansas. In the absence of Congressional disapproval, the BRAC Commission's recommendations became binding on 9 November 2005. The KSAAP installation property has been determined to be surplus to Army needs, and will be disposed of according to applicable laws, regulations, and national policy. Pursuant to the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations, the Army has prepared this Environmental Assessment (EA) to evaluate the environmental and socioeconomic impacts of disposing of the federal property and to consider reasonable reuse alternatives.

In its 2005 report to the President (DBCRC 2005), the BRAC Commission recommended the following actions for KSAAP:

- Close Kansas Army Ammunition Plant, Kansas.
- Relocate the sensor fused weapon/cluster bomb function and missile warhead production to McAlester Army Ammunition Plant (AAP), Oklahoma.
- Relocate the 155MM ICM artillery and 60MM, 81MM, and 120MM mortar functions to Milan AAP, Tennessee.
- Relocate the 105MM HE, 155 MM HE, and missile warhead functions to Iowa AAP, Iowa.
- Relocate detonator, relay, and delay functions to Crane Army Ammunition Activity, Indiana.

Pursuant to these recommendations, all Army missions at KSAAP must cease or be relocated. This, however, does not preclude the continued operation of private-sector contracting activities in support of the Army mission.

1.2 PURPOSE AND NEED

The purpose of the proposed action is to dispose of the surplus federal property generated by the BRAC-mandated closure of KSAAP (13,727 acres at KSAAP). The need for the proposed action is to comply with the BRAC law and improve the ability of the nation to respond rapidly to the challenges of the 21st century. The proposed action of disposal is more fully described in Section 2, Description of the Proposed Action.

1.3 SCOPE

This EA has been developed in accordance with NEPA and implementing regulations issued by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) 1500—1508) and the Army (32 CFR Part 651). Its purpose is to inform decision makers and the public of the likely environmental consequences of proposed action and alternatives. The EA identifies, documents, and evaluates the potential environmental effects of property disposal and future uses of KSAAP.

The Base Closure Act specifies that NEPA does not apply to actions of the President, the Commission, or the Department of Defense (DoD) except "(i) during the process of property disposal, and (ii) during the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated."[1]

The Commission's deliberations and decision, as well as the need for closing or realigning a military installation, are also exempt from NEPA.[2] Accordingly, this EA does not address the need for closure or realignment. NEPA does, however, apply to disposal of excess property as a direct Army action and the reuse of such property as an indirect effect of disposal; therefore, those actions are addressed in this document.

Two disposal alternatives (early transfer and traditional disposal) are identified in the EA, as well as a caretaker status alternative (which might arise prior to disposal) and the no action alternative. Two reuse scenarios, based on low and medium-low intensity uses, encompass the community's reuse plan and are evaluated as secondary actions. These alternatives and scenarios, and the rationale for their selection, are further described in Section 3, Alternatives.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archeologists, historians, and military technicians performed the impact analysis. The team identified the affected resources and topical areas, analyzed the proposed action against the existing conditions, and determined the relevant beneficial and adverse effects associated with the action. Section 4, Affected Environment and Consequences, describes the baseline conditions of the affected resources and other areas of special interest at KSAAP as of November 2005 (the time when the BRAC Commission's recommendations became binding). The environmental consequences of

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[1] Public Law 101-510, Sec. 2905(c)(2)(A). The Base Closure Act further specifies in Section 2905(c)(2)(B) that, in applying the provisions of NEPA to the process, the Secretary of Defense and the Secretaries of the military departments concerned do not have to consider (i) the need for closing or realigning the military installation that has been recommended for closure or realignment by the Commission, (ii) the need for transferring functions to any military installation, or (iii) military installations alternative to those recommended or selected.

[2] Public Law 101-510, Sec. 2905(c)(2).

disposal and reuse are also described in Section 4. Conclusions regarding potential environmental and socioeconomic effects of the proposed action are presented in Section 5, Findings and Conclusions.

1.4 PUBLIC INVOLVEMENT

The Army invites full public participation in the NEPA process to promote open communication and better decision-making. All persons and organizations that have a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the NEPA environmental analysis process.

Public participation opportunities with respect to the proposed action and this EA are guided by the provisions of 32 CFR Part 651, Environmental Analysis of Army Actions. The final EA and a draft Finding of No Significant Impact (FNSI) were made available for a 30-day comment period. A Notice of Availability of the final EA and draft FNSI were published in local newspapers and the document made available to the public via the internet (http://www.hqda.army.mil/acsimweb/brac/env_ea_review.htm) and libraries in the area (see Section 7). The final EA and draft FNSI were also delivered to various agencies, organizations, and public officials outlined in the distribution list presented in Section 7. During this 30-day comment period, the Army will consider any comments submitted by agencies, organizations, or members of the public on the proposed action, the EA, or the draft FNSI. At the conclusion of the comment period, the Army may, if appropriate, execute the FNSI and proceed with the proposed action. If it is determined that implementation of the proposed action would result in significant impacts, the Army will publish in the Federal Register a notice of intent to prepare an Environmental Impact Statement (EIS).

1.5 FRAMEWORK FOR DISPOSAL

Numerous factors contribute to Army decisions relating to disposal of installation property at KSAAP. The Base Closure Act triggers action under several other federal statutes and regulations. In addition, the Army must adhere to specific rules and procedures pertaining to transfer of federal property, as well as executive branch policies. There are also practical concerns, such as identifying base assets to allow for disposal in a manner most consistent with statutory and regulatory guidance. These matters are further discussed below.

1.5.1 BRAC Procedural Requirements

***Statutory Provisions*.** The two laws that govern real property disposal in BRAC are the Base Closure Act (Public Law 101-510, as amended) and the Federal Property and Administrative Services Act (FPASA) of 1949 (Title 40 of the United States Code [USC], Sections 471 and following, as amended). The latter is implemented by the Federal Management Regulations at Title 41 CFR, Subpart 101-47. The disposal process is also governed by 32 CFR Part 174 (Revitalizing Base Closure Communities) and 32 CFR Part 176 (Revitalizing Base Closure Communities – Base Closure Community Assistance), regulations issued by DoD to implement BRAC law and matters known as the Pryor

Amendment and the President's Program to Revitalize Base Closure Communities (see below).

Screening Process. Having been recommended for closure and realignment, the KSAAP property has been determined to be excess to Army needs and, therefore, subject to specific procedures to identify potential subsequent public-sector users. That is, the property has been offered to a hierarchy of potential users through procedures called the screening process. This process and its results to date are discussed in Section 2.3.4, Real Estate Disposal Process.

The President's Program to Revitalize Base Closure Communities. On 2 July 1993, President Clinton announced a major new program to speed the economic recovery of communities near closing military installations. The President pledged to give top priority to early reuse of each closing installation's most valuable assets. A principal goal of the initiative was to provide for rapid redevelopment and creation of new jobs. In announcing the program, the president outlined the five parts of his community revitalization plan:

- Job-centered property disposal that puts local economic redevelopment first
- Fast-track environmental cleanup that removes delays while protecting human health and the environment[3]
- Appointment of transition coordinators at installations slated for closure
- Easy access to transition and redevelopment help for workers and communities
- Larger economic development planning grants to base closure communities

The Army is fully committed to the President's Program to Revitalize Base Closure Communities. A BRAC Environmental Coordinator and a Base Transition Coordinator have been appointed for the KSAAP property, and the Army has taken an active role in providing assistance to local officials in the community.

The Pryor Amendment. Congress endorsed the president's plan by enacting the Base Closure Communities Assistance Act (contained in Title XXIX, Public Law 103-160), popularly known as the "Pryor Amendment" in recognition of its principal legislative sponsor. This act, as amended, provides legal authority to carry out the president's plan by granting conveyances of real and personal property to a Local Redevelopment Authority (LRA). In the case of KSAAP, the KSAAP Local Redevelopment Planning Authority (LRPA) has been recognized as the LRA by DoD. Specifically, the act created a new federal property mechanism, the Economic Development Conveyance (EDC). An EDC can help induce a market for the property, thereby enhancing economic recovery and generating jobs. The Army is required to seek fair market value consideration for

[3] Fast-track cleanup per the President's Program to Revitalize Base Closure Communities is no longer being exercised by the Army.

EDC conveyance of property on installations that were approved for closure or realignment after 1 January 2005. Some flexibility is given to the military departments and the communities to negotiate the terms and conditions of the EDC. A detailed application, including the approved community redevelopment plan, serves as the basis for determining an LRA's eligibility for an EDC. DoD's regulations implementing the Pryor Amendment appear at 32 CFR Parts 174 and 176. The EDC is further described in Section 2.3.4, Real Estate Disposal Process.

1.5.2 Relevant Statutes and Executive Orders (E.O.)

A decision on whether to proceed with the proposed action rests on numerous factors, such as mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, the Army is guided by several relevant statutes (and their implementing regulations) and E.O.s that establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, the Clean Air Act (CAA), Clean Water Act (CWA), Noise Control Act, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Migratory Bird Treaty Act (MBTA), Archaeological Resources Protection Act, Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), E.O. 11988 (Floodplain Management), E.O. 11990 (Protection of Wetlands), E.O. 12088 (Federal Compliance with Pollution Control Standards), E.O. 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), E.O. 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), and E.O. 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Key provisions of these statutes and E.O.s are described in more detail, as needed, in the text of this EA.

1.5.3 Other Reuse Regulations and Guidance

DoD's Office of Economic Adjustment published its Community Guide to Base Reuse in May 1995. The guide describes the base closure and reuse processes that have been designed to help with local economic recovery and summarizes the many assistance programs administered by DoD and other agencies. In 2006, DoD published its DoD Base Redevelopment and Realignment Manual (DoD 4165.66-M) to prescribe the procedures on how to reuse and redevelop bases. DoD and the U.S. Department of Housing and Urban Development (HUD) have published guidance (at 32 CFR Part 176) required by Title XXIX of the National Defense Authorization Act for Fiscal Year 1994. The guidance establishes policy and procedures, assigns responsibilities, and delegates authority to implement the President's Program to Revitalize Base Closure Communities (2 July 1993), as endorsed through Congressional enactment of the Pryor Amendment (see above).

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2 DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

The proposed action (Army primary action) is to dispose of the surplus federal property generated by the BRAC-mandated closure of KSAAP. Although not an Army action, potential reuse of the property is considered a related secondary action resulting from disposal. The KSAAP LRPA's reuse plan is further discussed in Sections 2.2.2 and 3.3.3, as well as Appendix A.

KSAAP consists of 13,727 acres of land located approximately 2 miles east of the city of Parsons, population 11,500 (U.S. Census 2000) in Labette County, in southeastern Kansas (Figure 2.1-1). KSAAP is located about 30 miles west of the Missouri border and 20 miles north of the Oklahoma border. Joplin, Missouri, population 45,000, (U.S. Census 2000) is about 50 miles east of KSAAP. The small community of Labette City, Kansas, population 68, (U.S. Census 2000), is located 3/4 miles to the south. Surrounding land use is primarily agricultural and is sparsely populated other than the City of Parsons. There is no zoning in Labette County.

KSAAP is a government-owned, contractor-operated (GOCO) installation constructed in 1941. Since World War II, the installation's mission has been the production of military munitions to support DoD. The installation's operations include loading, assembling, packing, and storing ammunition products for the Army. KSAAP contains areas used for administrative and support functions; maintenance areas; inactive and active production areas that support, or supported in the past, operations of ammunitions items; areas used for storage of both inert materials and munitions and raw materials; operation ranges; oxidation ponds and lagoons; wastewater treatment facilities; a water treatment facility; demolition areas; burning grounds; waste incineration facilities (Contaminated Waste Processor [CWP] and Explosive Waste Incinerator [EWI]); and landfills. The ammunition storage areas include 242 igloos-magazines, as well as inactive and active munitions production areas (Figure 2.1-1). Following the Vietnam War only three of the eight production lines remained in operation. In 1993, as a result of the decreased demand for ammunition following the end of the Cold War, the plant was designated inactive. Ammunition production continued, however, and expanded under a Facility Use Contract that allowed the operator to compete in open solicitations. Increased plant utilization resulted, and the plant was returned to active status in 2002. The GOCO contractor at KSAAP is Day & Zimmermann, Inc. (DZI).

Overall, KSAAP consists of 13,727 acres (which includes 6 acres at the water intake at the Neosho River to the east), plus 111 acres of easement right-of-way. The installation has over 600 structures, consisting of approximately 2.5 million square feet of building space (including igloos-magazines). The installation has over 75 acres of parking lots, over 100 miles of roadway, and over 30 miles of railroad tracks.

Figure 2.1-1 Location Map of KSAAP

2.2 PROPOSAL IMPLEMENTATION

2.2.1 Army Disposal Action

The Army proposes to implement the BRAC recommendations for the closure of KSAAP. Under provisions of the Base Closure Act, Public Law 101-510 mandates the initiation of closures and realignments no later than two years after the president transmits the recommendation to the Congress, and closures no later than six years after the president

transmits the recommendation to the Congress. The proposed action for KSAAP will be the disposal and reuse of surplus federal property.

Identification of recipients of the property being disposed of at KSAAP is governed by expressions of interest submitted by potential recipients in response to the Army's Declaration of Excess Property and Determination of Surplus Property (71 FR 26930, 9 May 2006). As a result of the screening process (see Section 2.3.4, Real Estate Disposal Process), the installation property would be available for transfer or conveyance to, and subsequent reuse by, the KSAAP LRPA or other entities.

2.2.2 Community Reuse

The DoD has recognized the KSAAP LRPA as the LRA for the reuse planning associated with KSAAP. The KSAAP LRPA developed a Final Comprehensive Master Redevelopment Plan (reuse plan, KSAAP LRPA 2007) for KSAAP BRAC surplus property and received an approval of their plan from HUD on 19 December 2007. An extract of the plan is provided in Appendix A. The reuse plan focuses on achieving the following primary goals (KSAAP LRPA 2007):

- Stabilize the existing employment base and grow area businesses;
- Position KSAAP redevelopment as a catalyst for long-term economic expansion – minimizing impediments for reuse of the facility;
- Broaden the type and quality of available jobs;
- Prepare a realistic reuse and implementation plan for KSAAP that supports the long-term economic growth of the region;
- Evaluate the potential for an "Energy Park";
- Develop a reuse plan for KSAAP that is environmentally sensitive to the high-value habitat located on the site;
- Accomplish the acquisition of property in a fiscally responsible manner;
- Focus reuse efforts on those portions of the KSAAP site that offer the greatest potential for successful redevelopment;
- Undertake the redevelopment of KSAAP in a manner that ensures that the environmental cleanup of hazardous waste sites is effective, efficient and relates to the redevelopment needs identified in the reuse plan;
- Encourage redevelopment efforts that retain existing private sector employment opportunities currently at KSAAP;
- Encourage the continued use of property at KSAAP for agricultural purposes; and

- Encourage the organization responsible for implementing the reuse plan to work with federal, state, and local agencies in establishing conservation and/or recreational areas at KSAAP.

The KSAAP LRPA completed the reuse plan and it was formally approved by the LRPA on 16 August 2007 (KSAAP LRPA 2007). The plan includes reuse alternatives, which were reviewed by HUD and community stakeholders (as previously noted, HUD approved the plan on 19 December 2007). As described further in Section 3.3, Reuse Alternatives, redevelopment of KSAAP property could include:

- the establishment of a conservation and agricultural area, including use for outdoor activities by the general public on approximately one fourth of the property;
- continuation of a commercial energetics and munitions storage function on approximately one fourth of the property;
- industrial and manufacturing areas;
- regional, multimodal transportation and warehousing area, with rail access and use of existing cold storage areas;
- establishment of an energy park zoned area;
- public education and training areas;
- a special events area;
- an office/business park;
- a small residential housing area to the north; and
- a small hazardous waste treatment facility in the eastern portion of the property.

The preferred redevelopment alternative presented in the reuse plan was based on the synthesis of two alternatives considered in detail during the development of the plan. The development phasing plan for KSAAP includes three phases, in which parcels would be progressively developed in accordance with a master planning strategy that seeks to ensure compatibility among an array of land use types considered across this large parcel of land.

Additional information regarding reuse scenarios evaluated in the EA is provided in Section 3.3, Reuse Alternatives.

2.2.3 Implementation

Under the Base Closure Act, closure is required no later than 15 September 2011.

The BRAC process of property disposal includes predisposal activities and real estate disposal, which in turn allow for subsequent reuse development. Predisposal activities may include, but are not limited to, NEPA compliance, Section 106 coordination in accordance with the NHPA, property inventories and title reviews, completion of environmental remediation (unless early transfer is negotiated), interim uses, and caretaking of vacated facilities until disposal. In transferring or conveying federally owned property at KSAAP, the Army would identify encumbrances consistent with requirements of law, agency negotiation, and protection of environmental values. Section 3.2.4, Encumbrances Applicable to Either Disposal Alternative, provides details on the encumbrances expected to exist at the time of transfer.

2.3 DISPOSAL PROCESS

2.3.1 Caretaking of Property Until Disposal

Prior to disposal, the Army may find it necessary to maintain KSAAP property for an undetermined period. The Army would employ two levels of maintenance if disposal of BRAC property were delayed.

***Initial Maintenance*.** From the time of operational closure until conveyance of the property, the Army would provide for maintenance procedures to preserve and protect those facilities and equipment items needed for reuse in an economical manner that facilitates redevelopment. In consultation with the KSAAP LRPA and consistent with available funding, the Army would determine required levels of maintenance of facilities and equipment for an initial period following operational closure. The levels of maintenance during this initial period would not exceed maintenance standards in effect before approval of the closure decision. Maintenance would not include any property improvements such as construction, alteration, or demolition. In an appropriate case, however, demolition could occur if required for health, safety, or environmental reasons, or if it were economically justified in lieu of continued maintenance.

***Long-Term Maintenance*.** In the unlikely event that the property were not transferred, the Army would reduce maintenance levels to the minimum level for surplus government property required by 41 CFR 102-75.945, 41 CFR 102-75.965, and Army Regulation 420-70 (Building and Structures). Long-term maintenance would not be focused on keeping the facilities in a state of repair to permit rapid reuse. Rather, maintenance during this period would consist of negligible activities intended primarily to ensure security and to avoid deterioration. This reduced level of maintenance would continue indefinitely until disposal. Activities that would occur during this maintenance period, including continuation of planned remediation activities, are identified in Section 3.2, Disposal Alternatives.

2.3.2 Cleanup of Contaminated Sites

Unless the property transfer requirements under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are otherwise deferred, all site remediation activities must be completed before federal property at KSAAP may be transferred. To determine the baseline nature of contamination at KSAAP as a result of past activities that may have released contaminants, the U.S. Army prepared the Environmental Condition of Property (ECP) report for the installation property (U.S. Army 2006a). The findings of the ECP are presented in Section 4.13, Hazardous and Toxic Substances.

2.3.3 Interim Uses

Pending issuance of a FNSI following the NEPA analysis for disposal and reuse of KSAAP, the Army will not make commitments that would significantly affect the quality of the human environment or irreversibly alter the environment in a way that precludes any reasonable alternative for disposal of the property. The Army may, however, enter into an interim lease that would terminate at the time the property conveys to its new owner, if the Army determines that the lease would facilitate state and local economic efforts and not interfere with or delay property disposal (U.S. DoD 2006). In such a case, the Army would consult with the KSAAP LRPA before entering into such a lease. Interim leases would allow limited use of the property and facilities such that no reasonable reuse options would be eliminated or compromised.

The extensive environmental and other requirements to ensure that property is suitable for such an interim lease could, however, detract from the Army's ability to accomplish actions needed to dispose of the property (U.S. DoD 2006); as a result, the Army will not lease base closure property should such leasing potentially delay the property's disposal. Before entering into such a lease, the Army must meet certain environmental requirements, including consultation with the appropriate regulatory agencies to determine whether the environmental condition of the property is such that a lease is advisable. A lease may be suitable under a Record of Environmental Consideration, for example, if the lease involved continuation of ongoing activities or would not otherwise involve an irretrievable commitment of natural resources (32 CFR Part 651 Appendix B, Categorical Exclusions (f)(1)).

2.3.4 Real Estate Disposal Process

Although it is the Army's preference to dispose of property as a single entity, the Army may also dispose of the KSAAP property in parcels. After identification of parcels, disposal may occur to meet community objectives related to reuse goals, such as tax revenue generation, and job creation. Methods available to the Army for property disposal include EDC, public benefit conveyance, negotiated and competitive sale, exchanges for military construction, conservation conveyance, and conveyance for cost of environmental remediation.

- *Economic Development Conveyance* (*EDC).* The 1994 Defense Authorization Act provides for conveyance of property to an LRA to promote economic development

and job creation in the local community. An EDC is not intended to supplant other federal property disposal authorities. The Army is required to seek fair market value consideration for EDC conveyance of property on installations that were approved for closure or realignment after 1 January 2005. To qualify for an EDC, the LRA must submit an application to the Army describing its proposed economic development and job creation program.

- *Public Benefit Conveyance.* State or local government entities may obtain property when sponsored by a federal agency for uses that would benefit the public, such as education, parks and recreation, wildlife conservation, or public health.

- *Negotiated Sale.* The Army would negotiate the sale of the property to state or local governmental entities, including tribal governments, or private parties at fair market value.

- *Competitive Sale.* Sale to the public would occur through either an invitation for bids or an auction.

- *Exchanges for Military Construction.* Section 2869 of Title 10 USC provides an alternative authority for disposal of real property at a closing or realigning installation. This authority allows any real federal property not subject to reversion at such an installation to be exchanged for military construction on that or another location. The Military Department may seek offers of military construction in exchange for real property.

- *Conservation Conveyance.* 10 USC 2694a allows the military to convey property to state or local government agencies, as well as nonprofit organizations, to conserve natural resources. The deed of the property must include a reversion clause in the event that the property is no longer used for conservation purposes.

- *Conveyance for Cost of Environmental Remediation.* Public Law 101-510, Section 2905(e) stipulates that the Military Department may convey property to an entity that agrees to undertake the responsibility for all remaining environmental actions on the property, such as environmental clean-up actions. Under this provision, the Military Department would pay the entity the difference between the fair market value of the property and the total remediation costs, if such costs exceed the fair market value. Otherwise, if the environmental costs are below the fair market value of the property, then the entity would pay the Military Department the difference.

***DoD and Federal Agency Screening*.** The Army begins the screening process by offering its excess properties to other DoD agencies and federal agencies for their potential use. That screening process for the KSAAP property resulted in no requests for use by other agencies.

***LRA Screening*.** Pursuant to the Base Closure Community Redevelopment and Homeless Assistance Act of 1994, federal property not subject to reversion that is surplus

to the federal government's needs is to be screened through an LRA's soliciting notices of interest (NOI) from state and local governments, representatives of the homeless, and other interested parties. An LRA's outreach efforts to potential users or recipients of the property include working with HUD and other federal agencies that sponsor public benefit transfers under the FPASA. As part of this coordination effort, the KSAAP LRPA published a public notice on 8 June 2006 requesting NOI from qualified organizations and representatives of the homeless. The deadline for response was 15 September 2006. The LRPA received no NOIs from any qualified organization or representatives of the homeless (KSAAP LRPA 2007).

***Public Agency Screening*.** Consistent with the FPASA, screening notices have been sent to federal agencies that approve or sponsor public benefit conveyances and appropriate state and local agencies in the vicinity of the property. The Army initiated this screening after coordination with the KSAAP LRPA. In response to this screening, the Army received no requests for transfer of the KSAAP property.

3 ALTERNATIVES

3.1 INTRODUCTION

This section addresses alternatives to the Army's primary action of disposal of federal property and the secondary action of property reuse by other entities. Pursuant to the Base Closure Act and the BRAC 2005 Commission's recommendations pertaining to KSAAP, continuation of Army operations at KSAAP is not feasible. There is no alternative to closure at KSAAP as described by the BRAC Commission's recommendation without further legislative action. For federal property, the Army has identified two disposal alternatives (early transfer and traditional disposal), a caretaker status alternative, and the no action alternative. Two reuse scenarios, based on low and medium-low intensity uses, encompass the community's reuse plan and are evaluated as secondary actions. Future reuse of the KSAAP property is analyzed in the context of land use intensity categories, as described in Section 3.3, Reuse Alternatives.

The KSAAP LRPA's reuse plan is the primary factor in the development of the reuse scenarios and effects analysis. Taking into consideration both the reuse plan and the proposed federal action allows both the community and the Army to make informed decisions on reuse issues. The Army expresses no preference with respect to reuse scenarios because decisions implementing reuse will be made by other entities.

As discussed in Section 1.0, Purpose, Need, and Scope, the Army is closing KSAAP in compliance with BRAC 2005. Federal property at the installation is surplus and will be disposed of. Predisposal activities may include but are not limited to NEPA compliance, Section 106 coordination in accordance with the NHPA, property inventories and title reviews, identifying and cleaning up hazardous substance contamination, transfer or termination of environmental permits, and caring for vacated facilities. (As part of the NEPA process, Appendix B includes correspondence letters with federal and state agencies, and Native American tribes relative to natural and cultural resource issues concerning this action.)

3.2 DISPOSAL ALTERNATIVES

3.2.1 Early Transfer Alternative

Under this alternative, the Army has a property transfer and disposal method that allows the reuse of the property to occur before environmental remedial action has been completed. This method of early disposal, allowable under the provisions of Section 120(h)(3)(C) of CERCLA, would defer the requirement to complete all necessary environmental cleanup prior to the transfer of the property. This provision, known as early transfer authority (ETA), authorizes the deferral of the CERCLA covenant that requires remedial actions to be completed before federal property is transferred. On 12 February 2007, the KSAAP LRPA formally requested early transfer of the property. The Governor of Kansas must concur with the deferral request for property at KSAAP (as none of the property is listed on the National Priorities List [NPL]).

ETA is not an actual conveyance mechanism, just a deferral of the CERCLA covenant based on a finding that:

- The property is suitable for transfer for the use intended by the transferee, and the intended use is consistent with protection of human health and the environment.
- The deed or other agreement proposed to govern the transfer between the U.S. and the transferee of the property contains specified assurances.
- The federal agency requesting deferral has provided notice, by publication in a newspaper of general circulation in the vicinity of the property, of the proposed transfer and of the opportunity for the public to submit, within a period of not less than 30 days after the date of the notice, written comments on the suitability of the property for the transfer.
- The deferral and the transfer of the property will not substantially delay any necessary response action at the property.

The property could also be transferred to a new owner who agrees to perform all environmental remediation, waste management, and environmental compliance activities required for the property under federal and state requirements.

Under the early transfer alternative, property transfer may also occur prior to the completion of the Army missions at KSAAP; however it is the Army's preference to transfer property after mission completion.

3.2.2 Traditional Disposal Alternative

Under this alternative, the Army would transfer or dispose of property once environmental remediation is completed for individual parcels of the installation. Under traditional disposal, if a particular long-term environmental remedy is deemed to be working and approved, the Army may transfer the land while holding continuing obligations for limited environmental actions, such as continued monitoring, five-year review, and continued operation of remedy systems (such as a groundwater recovery system).

The Army is required under CERCLA, as amended by the Community Environmental Response Facilitation Act (CERFA), to identify uncontaminated property within 18 months of the date the property is selected for closure. The Army has categorized parcels through the analysis documented in the ECP report for KSAAP. For the purposes of CERFA, uncontaminated property is defined as areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas. The CERFA Report, which identified the uncontaminated properties, was submitted to the regulatory agencies on 15 November 2006.

If a property has been or is contaminated, and the Army opts for traditional disposal, it must be able to certify that actions necessary to protect human health or the environment

have been taken before the transfer or disposal, which may include land use restrictions to preclude or limit contact with environmental media that is still undergoing remediation. Transfer of property not fully remediated is allowed if a long-term environmental remedy is shown to be operating properly and successfully. Specifically, under traditional disposal, properties that have been classified as Categories 1, 2, 3, or 4 per the ASTM 5746-98 Standard Classification of Environmental Conditions of Property Area Types for Defense Base Closure and Realignment Facilities would be suitable for transfer. For properties classified as Categories 2 and 3, a release of contaminants may have occurred, but because of the nature of the release, response or cleanup actions would generally not be required (an exception may be remediation of an underground storage tank [UST]). For properties currently classified as Category 5, 6, or 7, transfer of property is not allowed under Traditional Disposal. These properties would need to undergo continued environmental actions until they can be reclassified (such as ensuring that a long-term environmental remedy is shown to be operating properly and successfully and a parcel has been reclassified from Category 5 or 6 to a Category 4). In addition, Category 7 parcels still require evaluation or additional investigation work to determine the nature and extent, if any, of the environmental contamination.

Some environmental remedial actions may take a long time to be selected, approved, and implemented. Therefore, there may be a prolonged period under this alternative during which parcels are not available for transfer or disposal. Furthermore, it is possible that an installation be moved to long-term caretaker status during this period as discussed further in Section 3.2.3 below.

3.2.3 Caretaker Status Alternative

The caretaker status alternative would arise if the Army were unable to dispose of any or all portions of the federal property within the period of initial maintenance (refer to Section 2.3.1, Maintenance of Property Until Disposal). Once the time period for initial maintenance elapses, and if the Army has not yet disposed of its property, the Army would then reduce maintenance to levels consistent with federal government standards for excess and surplus properties (i.e., 41 CFR 102-75.945 and 41 CFR 102-75.965) and Army Regulation 420-70 (Buildings and Structures). This long-term maintenance, or “caretaker status” stage, would no longer be focused on keeping the facilities in a state of repair to facilitate rapid reuse. Rather, maintenance during this period would consist of minimal activities intended primarily to ensure security, health, and safety, and to avoid physical deterioration. Caretaker status would also include continuation of planned remediation and agricultural leasing activities. However, to be conservative it was assumed that active natural resource management activities and tenant industrial operations beyond those required by law would cease under caretaker status.

3.2.4 Encumbrances Applicable to Either Disposal Alternative

The Army’s methodology for promoting environmentally sustainable redevelopment of BRAC disposal property includes identifying natural and man-made resources that should be protected after ownership transfers out of federal control. The Army develops this information from the environmental baseline information early in the NEPA process and

provides it to the LRA, with the recommendation that the reuse plan consider protecting these valuable resources and any other conditions that might influence reuse. Using this methodology, the Army hopes to promote sustainable redevelopment and protection of valuable resources.

Encumbrances are legal constraints imposed to protect environmental values, to implement results from Army negotiations with regulatory agencies, or to address specific Army needs. Encumbrances can also arise as a result of past Army management of real property. For example, the presence of special hazardous wastes such as asbestos-containing material (ACM), lead-based paint (LBP), radon, and polychlorinated biphenyls (PCBs), and radiological material might require specific handling or management strategies. In most cases, these conditions will not materially or adversely affect redevelopment. Some other types of conditions may be identified to an LRA as potentially limiting redevelopment but not classified as legal encumbrances because they are not within the ability of the Army to control or modify (U.S. Army 2006b).

The Army's identification and imposition of encumbrances takes into consideration opportunities for the protection and preservation of sensitive environmental resources, as well as the requirements of federal law and specific Army requirements. Consistent with the stewardship principles by which it operates its installations, the Army has a vital interest in perpetuating important resource protections, which in some cases the Army is able to do by use of encumbrances. Identification of encumbrances reflects the Army's objective of returning property to public and private sector use in a manner that will result in continued stewardship of environmental resources, protection of public health and safety, and promotion of Army and reuse interests. For some property transferred, there will be a clause in the deed allowing the United States access to the property to take environmental remedial or corrective action (See 42 USC Section 9620(h)(3)(A)(iii)). This constitutes an encumbrance.

In general, encumbrances that the Army would consider if found applicable in this analysis include the protection and preservation of natural and cultural resources, land use restrictions relative to public health and safety concerns, access to remediation sites, and deed notifications. Encumbrances generally are not imposed for other facets of environmental protection and conservation, such as endangered species protection, Coastal Zone Management, wetlands protection, hazardous waste remediation, and other issues, as these concerns are already regulated by local, state, and/or federal statutes and must be complied with regardless of property ownership. Furthermore, special easements, rights-of-way, and leases will continue to remain as restrictions on the land itself, regardless of property ownership; thus, specific encumbrances are not necessary.

Consistent with this methodology and as part of the disposal process, the Army will also meet all applicable requirements of federal law necessary to carry out agreements reached in negotiations with regulatory agencies, or to address specific Army needs.

3.2.4.1 Types of Encumbrances

Major categories of encumbrances, outlined below, can be identified on federal properties (U.S. Army 2006b).

- *Easements, rights-of-way, and other rights.* Real estate might be burdened with utility system, other infrastructure-related, roadway, or access easements, right-of-ways, and other rights (e.g., water rights, mineral rights).

- *Use restrictions*. Activities on property might be limited by existing conditions or in recognition of adjacent land uses. For example, use of a former landfill site would preclude ground disturbance of a clay cap but could permit passive uses such as recreation. The presence of munitions and explosives of concern (MEC) might preclude some uses of a parcel because of potential safety hazards. In other cases, restrictive covenants could impose or maintain buffer zones between incompatible uses. Use restrictions might also require that transferees of property take certain actions (e.g., remediate ACM or LBP prior to use of buildings for residential purposes) or refrain from certain actions (e.g., prohibit use of on-site groundwater pending completion of cleanup activities).

- *Habitat and wetlands protection*. The presence of federally listed threatened or endangered species of wildlife, plants, or wetlands might constrain unlimited use of property.

- *Historic building or archaeological site protection*. Negotiated terms of transfer or conveyance might result in requirements for new owners to maintain the status quo of historic buildings or archaeological sites or might impose a requirement for consultation with the State Historic Preservation Office (SHPO) before any actions affecting such resources take place.

- *Water Rights.* Protective covenants may be required to protect existing well fields or aquifers.

3.2.4.2 Encumbrances Identified at KSAAP

The following specific encumbrances and easements are expected to apply at the time of transfer or conveyance of KSAAP:

Land Use Restrictions. As a component of remedy implementation, the Army may restrict certain types of future land use, impose institutional controls, or take other actions affecting land use to protect human health and the environment. Restrictions such as those on the use of groundwater, provisions against disturbing soils in certain locations (landfills, active Installation Restoration Program [IRP] sites), and access controls for certain parcels would be included in conveyance documents as restrictions on future land use. Furthermore, as specific projects are proposed as part of redevelopment in the future, additional planning studies are required to design sufficient buffer zones and security measures between land use parcels in order to ensure that noise propagation, safety arcs, or other safety concerns do not create incompatible land use conditions.

***Protection of Cultural Resources*.** The U.S. Army Corps of Engineers (USACE), Mobile District is completing extensive cultural resource surveys of KSAAP properties. Currently, the Army is documenting and coordinating its findings and recommendations with the Kansas SHPO (see Section 4.9). As part of the Section 106 consultation process, a Programmatic Agreement (PA) concerning cultural resources at KSAAP is in progress and is currently being negotiated by the U.S. Army, the Kansas SHPO, and the Advisory Council on Historic Preservation (ACHP). Coordination with all affiliated federally recognized tribes with an interest in KSAAP is ongoing and will continue until the Section 106 process is complete. The PA will provide deed restrictions requiring continued maintenance and protection of properties deemed eligible for inclusion in the National Register of Historic Places (NRHP), as well as require new owners to consult with the Kansas SHPO prior to soil disturbing activities or any actions affecting cultural resources and implementing appropriate mitigation, as necessary. If any NRHP-eligible properties are found to be present at KSAAP, the encumbrances requiring the protection of listed sites will be placed upon the property itself in accordance with the PA (i.e., deed restrictions, building restrictions, historic easements, etc.) and remain as a restriction on the land, regardless of property ownership. Property disposal and reuse would not occur until the PA has been ratified by all parties. If the new owners desire to lessen or remove the deed restrictions requiring preservation, the deed will delineate a process for the new owners to consult with the Kansas SHPO to arrive at mutually agreeable and appropriate measures for mitigating the adverse effects of their proposed undertaking.

***Floodplains*.** Portions of KSAAP properties lie within 100-year floodplains of the Neosho River and Labette Creek. In consideration of E.O. 11988, Army property conveyance documents will notify property transferees of their obligations to adhere to applicable restrictions on the property imposed by federal, state, or local floodplain regulations.

***Munitions and Explosives of Concern (MEC)*.** As a result of on-site operations, buried shells and munitions may be encountered at discrete sites on KSAAP properties during excavations. The presence of MEC could present a hazard to numerous types of activities such as construction and some types of landscaping operations. Prior to transfer or conveyance, the Army would establish some form of administrative or other land use controls (LUCs) to ensure safety and protection of human health and the environment.

***Asbestos-Containing Materials (ACM)*.** Surveys at KSAAP revealed the presence of ACM in 98 percent of the installation buildings (U.S. Army 2006a). Before transfer or conveyance, the Army must either remove, enclose, or encapsulate all friable ACM posing a risk to human health or negotiate agreements with transferees to remediate ACM. Transfer or conveyance documents would notify new owners or lessees of the property that they would be responsible for any future remediation of ACM found to be necessary. Appendix C shows the notification the Army would typically provide.

***Lead-Based Paint (LBP)*.** Paints used at KSAAP between the 1940s and 1970s contained lead. LBP is assumed to be present in buildings constructed before 1978 (the vast majority of the buildings at the installation). Consistent with the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Public Law 102-550), the Army may provide

notice in transfer and conveyance documents addressing buildings containing LBP. Appendix C shows LBP provisions the Army would typically provide.

***Easements for Public Access to Cemeteries*.** Two cemeteries, the Franklin and Fairview Cemeteries, are located on the installation property. These cemeteries are still visited by family members. To ensure continued public access to these sites, the Army would include in conveyance documents, as a condition of acceptance of title, an affirmative obligation on the part of the transferee to provide public access to these cemeteries that meets all state regulatory requirements for public access to cemeteries along with perpetual maintenance.

***Easements, Right-of-Ways, and Other Rights*.** Existing easements, right-of-ways, and other rights (e.g., water rights, mineral rights) benefiting or burdening KSAAP property would continue after transfer or conveyance. An example of such easements is one held by Kansas Gas and Electric Company for a 69 kV transmission line through the northeastern section of KSAAP. It was assumed for the purposes of this EA that the Kansas Vested Water Rights (file # LB08) for Kansas Ordnance Plant in the quantity of 868.20 acre-feet of surface water from the Neosho River at a maximum use rate of 0.998 million gallons per day to an annual maximum quantity of 282.9 million gallons will be transferred in the deed to the property recipient. Also, it was further assumed that the 110-acre right of way from the Neosho River pump and treatment site west to the east boundary of the facility will be transferred to the property recipient. Furthermore, it was assumed that a small 5.99-acre tract known as the dam, pump station and water treatment plant will be transferred to the property recipient. In addition, it was assumed that the mineral rights would be transferred to the property recipient.

Groundwater Use Restrictions. The ECP report indicates that groundwater contamination has been found below some of the areas included in KSAAP. There is currently no use of groundwater either on base or within the immediate vicinity of KSAAP (e.g., all farms and residences within 1 mile of KSAAP receive their potable water from other treated water sources). Transfer or conveyance of some KSAAP property might include restrictions on the use of impacted groundwater. This encumbrance on the property would extend until such time as the Army and state regulators deem appropriate.

3.3 REUSE ALTERNATIVES

Consistent with Congress's mandate, the Army must cease performance of its active Army missions at KSAAP no later than 15 September 2011. Depending on numerous factors, including information presented in this EA, disposal might occur as a single event involving transfer of all federal property within the KSAAP facility to one or more subsequent owners. Alternatively, disposal might occur over time with multiple transactions involving the same or several new owners. Regardless of the method of disposal, timing, or identity of new owners, reuse of KSAAP property is reasonably foreseeable. Consistent with statutory requirements, this EA analyzes the impacts of closing KSAAP, disposal of the federal property, and reuse of federal property associated with the installation. Reuse of federal property is treated as a secondary action resulting from closure.

The KSAAP LRPA reuse plan involves federally owned land subject to disposal. CEQ regulations require evaluation of reasonably foreseeable actions, without limitation on the party conducting them, and evaluation of consequent environmental impacts. Accordingly, reuse of federal property is evaluated as a secondary action in time, following the Army's primary action of disposal.

The following subsections discuss the methodology used to define the reuse scenarios to be considered. Because of the speculative and changeable nature of reuse planning, specific activities can not be precisely identified at this time. The Army considers the KSAAP LRPA reuse plan to be the primary factor in defining the reuse scenarios to be considered, and evaluates that reuse plan for potential environmental effects. Encumbrances as described above for the disposal alternatives would also apply under reuse.

3.3.1 Development of Reuse Alternatives

The reuse planning process is dynamic and is often dependent on market and general economic conditions beyond the control of the reuse planning authority. In recognition of the complexities attending reuse planning, the Army uses intensity-based probable reuse scenarios to identify the range of reasonable reuse alternatives required by NEPA and by DoD implementing directives. That is, rather than speculatively predicting exactly what will occur at a site, the Army establishes ranges or levels of activity that reasonably might occur. These levels of activity, referred to as intensities, provide a flexible framework capable of reflecting the different kinds of uses that could result at a location. Reuse intensity levels also take into account the effects that encumbrances exert on reuse.

Due to the general nature of the reuse plan and the type of redevelopment envisioned by the KSAAP LRPA, several approaches were used to describe reuse intensity, including metrics typically used for Army BRAC NEPA documents. Descriptions of the nature of certain types of activities (e.g., rail yards) were also important in formulating reuse scenarios for KSAAP for the EA. Furthermore, since the reuse plan did not provide specific metrics that defined redevelopment (e.g., employment projections or total square footage estimates), follow-up consultation with the LRPA was conducted to ensure that intensity scenarios described in the EA were commensurate with the range of intensity levels envisioned by the KSAAP LRPA. This process was further informed by an assessment of current development intensity, surrounding land use, and consideration of reasonably foreseeable development.

3.3.1.1 Land Use Intensity Categories Described

As previously discussed, reuse intensity scenarios developed by the Army were used, in part, to describe redevelopment intensity. Five intensity-based levels of reuse can be evaluated for their potential environmental and socioeconomic impacts, as outlined in Base Realignment and Closure Guidelines for Compliance with NEPA (U.S. Army 2006b). These are Low Intensity Reuse (LIR), Medium-Low Intensity Reuse (MLIR), Medium Intensity Reuse (MIR), Medium-High Intensity Reuse (MHIR), and High Intensity Reuse

(HIR). At any given installation, however, analysis of all five levels of intensity might not be appropriate due to historical usage, physical limitations, or other compelling factors.

Levels of reuse intensity can be viewed as a continuum. At KSAAP, an LIR level of reuse could be represented by demolition, conversion, or replacement of existing modern era and older buildings not eligible for consideration under the NHPA and the establishment of some new industrial and light industrial uses; continued use of existing facilities in the same way that they have been used (i.e., continued DZI operations); and open-space or conservation functions occurring over substantial portions of the installations. Levels of use of existing facilities at the time of the BRAC 2005 Commission's recommendations for closure and realignment would represent a very low intensity use, while full utilization of existing infrastructure could still be considered LIR, given the level of development and expansive acreage of KSAAP. A MLIR level of reuse, in the context of KSAAP, would represent a greater level of use intensity than LIR, with more area on the installation dedicated for industrial/commercial uses, for example.

Indicators of levels of intensity can be quantified by counting the number of people at a location (employees or residents), the potential number of vehicle trips generated as a result of the nature of the activity, or the number of dwelling units. Other indicators of the intensity of use are the rates of resource consumption (e.g., electricity, natural gas, water) and the amount of building floor space per acre (identified as the Floor Area Ratio [FAR], and expressed as the amount of square feet of built space per area of land in square feet. FAR is dimensionless if acres are converted into square feet, i.e., 1 acre = 43,560 square feet. Also, the FAR is typically presented as a fraction).

Development of intensity parameters is based on several sources, including existing land use plans for various types of projects and planning jurisdictions, land use planning reference materials, and prior Army BRAC land use planning experience (U.S. Army 2006b). Private sector reuse of property subject to BRAC action, on the other hand, seeks different objectives and uses somewhat different planning concepts in that it focuses on the creation of jobs and capital investment costs and typically uses traditional community zoning categories (e.g., residential, industrial).

Upon evaluating various types of indicators and their applicability to Army lands subject to BRAC action, the Army has selected four representative, illustrative intensity parameters: residential density, employee density (general spaces), employee density (warehouse spaces), and FAR (U.S. Army 2006b). These intensity parameters aid in evaluating environmental effects at various levels of reuse (see Table 3.3-1).

Table 3.3-1 Land Use Intensity Parameters

Intensity Level	Residential Intensity[1]	Square Feet per Employee (General Space)	Square Feet per Employee (Warehouse Space)	FAR
Low	<2	>800	>15,000	<0.05
Medium-Low	2-6	601-800	8,001-15,000	0.05-0.10
Medium	6-12	401-600	4,000-8,000	0.10-0.30
Medium-High	12-20	200-400	1,000-4,000	0.30-0.70
High	>20	<200	<1,000	>0.70

[1]Dwelling Units per Acre
Source: U.S. Army 2006b

The intensity parameters are discussed below.

- *Residential density*. This parameter identifies the number of dwelling units per acre. It indicates the number of people who might reside or work in an area.

- *Square feet per employee (general space)*. This parameter indicates the number of square feet available per employee in all types of facilities at an installation, except family housing and warehouses or storage structures.

- *Square feet per employee (warehouse and storage space)*. This parameter indicates the number of square feet available per employee engaged in warehouse or storage activities at an installation. Only built, fully enclosed and covered storage space is calculated; sheds and open storage areas are excluded from computation. In describing Army uses of facilities, estimates of the number of employees engaged in warehouse or storage operations are used to determine the portion of the installation workforce in this employee density category.

- *Floor Area Ratio (FAR)*. This ratio reflects how much building development occurs at a site or across an area. For example, a three-story building having a 7,500-square foot footprint on a 4-acre site would represent a FAR of 0.13 in the medium intensity range (22,500 square feet of floor space within a 174,240 square foot property).

Residential density, employee density, and FAR shown in Table 3.3-1 are appropriate to describe intensity levels for reuse planning at KSAAP within the respective parcel sectors where they apply. The intensity parameters shown in Table 3.3-1 reflect generalized values or ranges appropriate to describe the variety of installations subject to Army management, as well as the variety of reuse situations. The intensity parameters should be considered together in evaluating the intensity of reuse of a site so as to provide full context. Use of any single parameter, without considering the others, could unduly emphasize certain aspects of a site or preclude a broader understanding. As applied to any particular parcel or area, or the whole of the installation, the values given might

require some adjustment to account for the context in which an activity is located. For example, the size of a redevelopment project might result in distorting effects on the generalized values for the parameters provided.

3.3.2 Baseline Land Use Intensity

Use of KSAAP as of November 2005 is characterized as low intensity. The total floor area of all buildings is 2.5 million square feet over 13,727 acres, resulting in an FAR of 0.004 (which represents a very low intensity use). Furthermore, if the agricultural buffer lands and conservation areas are excluded from the analysis, the FAR is still only 0.006. By assuming that only 25 percent of these remaining lands are developed (which is commensurate with current use), the FAR is still only 0.024, the midpoint of the LIR scenario. Therefore, it is reasonably concluded that the baseline intensity for KSAAP is low intensity (i.e., LIR). Furthermore, the employee density in general space (over 7,500 square feet per employee, even while excluding all ammunition storage and warehousing areas) is also a very low intensity value. The presence of less than 200 employees at the time of the BRAC Commission closure recommendation reflects a workforce much smaller than the historical workforce employed at the site. Considered together, these factors indicate a low intensity level of use at the time of the BRAC closure announcement.

3.3.3 Local Reuse Plan

The following text is excerpted from the KSAAP LRPA reuse plan and provides a brief summary of the reuse plan process (KSAAP LRPA 2007). An excerpt from the reuse plan describing the selected reuse alternative for KSAAP is also provided in Appendix A.

> *Planning Process Overview. In November 2006, the LRPA initiated the preparation of a Comprehensive Master Redevelopment Plan for the Kansas Army Ammunition Plant. An important consideration in preparing the Redevelopment Plan was public comments, suggestions and direction. During the planning process, 10 public meetings were held, including four public forums. At the public forums, specific elements related to the planning process were reviewed and written summaries of project activities were distributed for discussion purposes.*
>
> *The planning process began with an evaluation of existing facilities at KSAAP including buildings, utility systems and transportation assets. A review of natural, environmental and historic conditions was also conducted, including an examination of data and information relating to hazardous wastes and explosive hazards at KSAAP. In addition, a regional real estate market and economic analysis was prepared in order to identify possible private sector uses for property at KSAAP. Once these steps were completed two different redevelopment alternatives were identified for the site. After a careful public review of these alternatives, a preferred land use plan for the redevelopment of KSAAP was identified by the LRPA.*

Homeless Considerations. As part of the initial screening process for reuse and disposal of a BRAC property, consideration must be given to potential use of the property to provide housing and/or services for the homeless. Property that has been identified for potential use to the homeless must be conveyed to either an organization that is a representative homeless provider, as approved by the U.S. Department of Housing and Urban Development (HUD), or the LRPA. If the property is conveyed to the LRPA, it must then make it available to the homeless provider for no cost. The LRPA is also responsible for monitoring the use of the property and ensuring that the homeless provider complies with the legally binding agreement that must accompany all such conveyances. In accordance with base closure statutes and regulations, the LRPA must solicit Notices of Interest (NOI) from state and local governments, representatives of the homeless, and other interested parties in the vicinity of the installation that may be eligible for a public benefit conveyance related to the KSAAP facility. The LRPA must give notice as to the timeframe in which NOIs will be accepted for submittal and hold hearings to allow interested parties to provide input into the reuse planning process. On June 8, 2006, the LRPA published a public notice soliciting interest from the types of organizations noted above with a deadline for receipt of said notices by September 15, 2006. During this time period, the LRPA received no notices of interest from any qualified organizations or representatives of the homeless.

3.3.4 Alternatives to Be Evaluated in Detail

This section presents various metrics and descriptions of reuse scenarios evaluated in the EA. It should be noted that the KSAAP LRPA reuse plan does not provide specific redevelopment metrics that describe reuse; rather the plan utilizes a master planning approach that only generally characterizes intended uses of specific parcels. These parcel descriptions, acreages, and land uses were used in formulating the reuse scenarios outlined below, which are further discussed in Appendix A. Further consultation with the KSAAP LRPA was also conducted to derive planning metrics that could be used to bound the analysis of potential reuse, including consideration of current and surrounding land use. Thus, the reuse intensity scenarios described below and further analyzed in this EA bound the reasonably foreseeable outcome of redevelopment envisioned in the KSAAP LRPA reuse plan, as confirmed through consultation with LRPA.

***Low Intensity Reuse*.** Redevelopment intensity metrics, such as proposed square footage of facilities for each land use type and employment projections, are not specified in the KSAAP LRPA reuse plan. Rather, the plan utilizes a master planning approach that allocates particular land uses to specific parcels within the boundaries of the KSAAP property. To assign specific intensity levels to be analyzed in this EA, a range of redevelopment intensities were assumed for selected parcels based on consideration of current and surrounding land use. Currently, KSAAP facility infrastructure represents a very low intensity of redevelopment and the adjacent land use is even more rural, being principally agricultural in nature. Even if the entire KSAAP complex was at full operational capacity commensurate with historic levels, the facility would still only be operating at a low intensity. Thus, given the present state of conditions at KSAAP and the region, the LIR scenario is considered a reasonable redevelopment alternative to consider in this EA

(presented in Table 3.3-2). Comments from the LRPA also indicate that the LIR scenario is the "most probable" relative to other industrial parks in the region.

Table 3.3-2 Reuse Scenarios to be Evaluated in the EA

Intensity Level	Residential Units	Employees	Square Feet per Employee		Building Space (square feet)	FAR (mid-point)
			General	Warehouse		
Low (LIR)	130	2,000	900	18,500	2,800,000	0.025
Medium-Low (MLIR)	520	6,500	700	11,500	6,000,000	0.075

The LIR scenario assumes that existing facilities will continue to be utilized by DZI and/or other similar tenants, and that other facilities and storage areas that are under-utilized will be redeveloped through renovation and/or demolition and construction. Overall, the LIR scenario calls for approximately 2.8 million square feet of facilities; representing a FAR of 0.025 over approximately 2,500 acres (This acreage includes current and future redevelopment areas. The FAR of 0.025 is the midpoint [or half] of the FAR metric for the LIR scenario as presented in Table 3.3-1. The detailed calculations and acreage applied to this statistic is further described below under *KSAAP Reuse Scenarios*, Item 3). These statistics were calculated using the acreage estimates allocated to specific land use types specified in the Comprehensive Master Redevelopment Plan for KSAAP (KSAAP LRPA 2007). Parcels designated for particular land use types described in the reuse plan (see Appendix A) and their associated acreages are outlined below:

- Conservation and agriculture (3,881 acres);
- Commercial energetics and munitions storage (3,450 acres);
- Industrial/manufacturing (2,561 acres);
- Transportation/warehousing (1,145 acres);
- Energy park (826 acres);
- Public education and training (783 acres);
- Special events area (484 acres);
- Office/business park (405 acres);
- Low-density housing (173 acres); and
- Hazardous waste treatment facility (19 acres).

The estimated total square footage was derived by applying the FAR metric for LIR (0.025) to a portion of acreage that would yield a level of development that would be commensurate with current intensity. It was assumed that all facilities would eventually be redeveloped and operational by a wider range of tenants as outlined above and further described in Appendix A. It was further assumed that only 25 percent of the acreage allocated for nonresidential and nonconservation/agricultural activities would be redeveloped, which is commensurate with current development intensity patterns (as discussed in Section 3.3.2).

Utilizing the planning metrics presented in Table 3.3-1, it is estimated that this level of development would generate approximately 2,000 jobs for the local economy. This statistic was derived by calculating the estimated total square footage of warehouse and general employee space based on current development within the commercial energetics and warehousing area (which will largely be retained) and the relative acreage of parcels of land allocated to new redevelopment in other areas (i.e., square footage was derived based on the relative proportion of acreage allocated to each land use type). The total number of jobs generated by total warehouse and total general space were derived using the midpoints of the reuse scenario statistics presented in Table 3.3-1.

In addition to the redevelopment described above, the LIR scenario would include the establishment of a conservation and agricultural area commensurate with the area and intended uses outlined in the KSAAP LRPA reuse plan (KSAAP LRPA 2007). Furthermore, it is assumed that conservation and agricultural buffer areas would be established within the various redeveloped parcels to serve as additional buffer zones between facilities, as well as management areas for rare native prairie grass habitat and agricultural leasing.

Medium-Low Intensity Reuse. To accurately capture, or “bracket,” the higher end of the potential reuse of KSAAP property, a MLIR scenario is also evaluated in this EA. Although it is less likely that this level of intensity of reuse would ultimately be established at the KSAAP property, this scenario is included to ensure that potential impacts resulting from reuse are evaluated conservatively. Consultation with the KSAAP LRPA would indicate that the MLIR scenario defined below is a reasonable upper-bound scenario for the NEPA analysis.

Table 3.3-2 shows the attributes of the LIR and MLIR reuse scenarios to be evaluated in the EA. These scenarios are formulated to define a reasonable upper-bound intensity of reuse planned for the KSAAP property after closure for the purposes of the analysis in the EA, in consultation with the LRPA. Specific assumptions relative to the KSAAP property are discussed below.

KSAAP Reuse Scenarios. The intensity levels for the scenarios shown in Table 3.3-2 above are considered to be conservatively high, and are based on the following assumptions:

1. The primary land uses at KSAAP may include (acreages were presented above):

   - Conservation and agriculture (e.g., natural resource conservation and outdoor recreational activities);
   - Commercial energetics and munitions storage (e.g., continued use of existing production lines and existing igloo-magazine storage facilities);
   - Industrial/manufacturing (e.g., redevelopment of existing industrial areas for new industry/manufacturing);
   - Warehousing and distribution uses (e.g., rail car storage and use of existing cold storage warehouses [currently 19 cold storage warehouse buildings exist, providing over 400,000 square feet of facility space]);
   - Energy park use (no specific project is proposed at this time, but the types of projects of interest include bio-fuel facilities [ethanol], oil refinery, and/or coal-fired power plant);
   - Public education and training (e.g., college classes, training and education for fire, rescue, police, and emergency responders);
   - Special events (e.g., farm museum, outdoor events, and conservation activities);
   - Office/business park (i.e., adjacent to the existing administrative building with up to 1,000,000 square feet of building space);
   - Limited housing (if needed, a small area would be made available for housing with build-out expected in 10 to 15 years); and
   - Hazardous waste treatment (e.g., the CWP facility may have reuse potential as a commercial processing center for incineration of hazardous materials).

   Beyond the Commercial Energetics and Munitions Storage area, the majority of existing buildings will likely be demolished and new buildings constructed to support new uses at the site. Existing road and rail infrastructure will, for the most part, remain to serve the new uses at the site, but will need to be upgraded.

2. At full build-out, which may occur 20 years into the future, the general types of land uses envisioned in the KSAAP LRPA reuse plan were assumed. The LIR scenario is commensurate with current facility square footage available at KSAAP (2.8 million square feet utilized under the LIR scenario versus 2.5 million square feet of current space). It was assumed, however, that these facilities would include large portions of new development and renovation and would be utilized at full operational capacity after build-out. Over the phasing period specified in the

KSAAP LRPA reuse plan, dilapidated facilities will be demolished and/or renovated and new facilities constructed to meet the needs of new tenants. At full operational levels the LIR scenario would generate approximately 10 times the level of employment currently at KSAAP. In the end, the LIR scenario would generate a landscape that would appear similar to current use and intensity, but would be modernized and operational, as well as fully utilized. The MLIR is intended to bracket the higher end of possible reuse intensity at KSAAP, which represents nearly three times the current facility infrastructure and over 20 times the current level of employment. The MLIR scenario represents two to three times the intensity of reuse envisioned for the LIR scenario.

Development would be concentrated in areas as outlined in the KSAAP LRPA's parcelization map for KSAAP, shown in Figure 3.3-1 (approximately three quarters of the acreage of the installation). It was assumed that development within the Commercial Energetics and Munitions Storage area would remain commensurate with current levels under both intensity scenarios. Thus, approximately 1 million square feet of facilities and storage area would remain within these parcels. Unlike current land use, however, the MLIR scenario assumes more aggressive demolition and redevelopment activities would occur within this area over time to modernize these facilities. For other parcels slated for redevelopment (not including the housing area and conservation and agricultural area or 6,000 acres that remain), it was assumed that approximately 1,500 acres of land (i.e., about 25 percent of the acreage slated for redevelopment excluding conservation/agricultural areas and housing, as previously discussed) would be highly developed/disturbed at KSAAP based on current and projected development patterns within the next 20 years (i.e., this acreage does not include buffer areas, green space, natural areas, access roads, low use areas [e.g., right of ways, open areas], nor the designated housing area or the designated conservation and agricultural area). This acreage may include redevelopment of currently disturbed or built-up areas or construction of facilities in relatively undisturbed areas within the designated parcel. Applying the LIR (0.025) and MLIR (0.075) FAR metrics (which represent the midpoints of the FAR metrics presented in Table 3.3-1) to the calculated number of acres of highly developed/disturbed land (i.e., 1,500 acres), added to the current facility infrastructure within the Commercial Energetics Munitions Storage area (slightly over 1 million square feet of existing infrastructure), yields approximately 2.8 and 6.0 million square feet of developed building area for the LIR and MLIR scenarios, respectively (see Table 3.3-2).

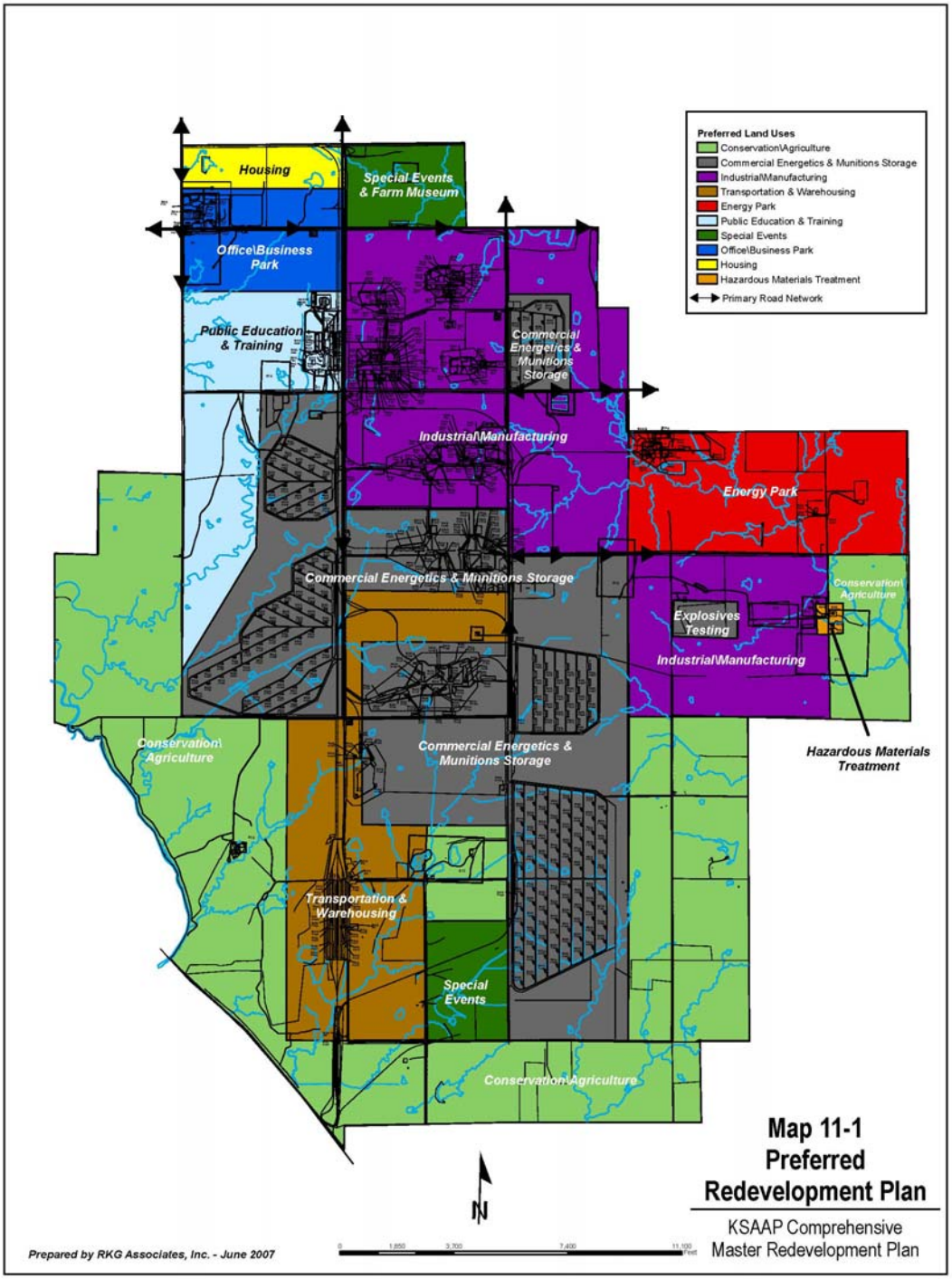

Figure 3.3-1 Land Parcelization Map for KSAAP

3. To calculate the number of employees for both LIR and MLIR scenarios (shown in Table 3.3-2), estimated building square feet per employee for both general and warehouse space for the LIR and MLIR scenarios were utilized. General facility space versus warehouse space was calculated based on existing facilities within the Commercial Energetics and Munitions Storage area and the proportion of acreage allocated to various land uses as presented in the KSAAP LRPA reuse plan. These statistics are based on intensities commensurate with the LIR and MLIR reuse scenarios provided in the Army BRAC NEPA Guidelines.

4. Residential development would take place only within a 173-acre parcel tract in the northwestern corner of the KSAAP property. It was assumed that approximately three quarters of this area would be developed at residential development intensities consistent with the LIR and MLIR scenarios (i.e., one unit per acre and four units per acre, respectively). It was assumed that these would be single family homes.

5. Redevelopment of KSAAP will be limited by the continued requirement to maintain proper safety buffer zones between facilities and storage igloos-magazines. It is assumed that many of the buffer areas that currently exist between storage igloos-magazines will be maintained and managed as conservation areas and agricultural areas as in the past. In addition, there are six former ranges, as well as open burning and open detonation (OB/OD) areas on KSAAP that will limit future development in these areas. It should be noted that the current layout of the KSAAP infrastructure already incorporates these safety arcs between production and storage facilities, with many of these areas being retained as part of the commercial energetics and munitions storage area, an area that will continue like use into the future. Nevertheless, adjacent parcels and redevelopment of former production areas, ranges, and OB/OD sites will be limited (see Section 4.13 for further discussion) in accordance with cleanup standards and other land use restrictions. The reuse plan has already factored these elements into their planning, as many of these areas may be utilized as buffer areas between new facilities.

Particular site uses and redevelopment issues are further described below.

Commercial Energetics and Munitions Storage. Operations that previously took place across the installation would be consolidated in this area. It is likely that DZI will be the future occupant with the largest presence at KSAAP, at least in the short term. DZI and/or other tenants with similar operations would ultimately occupy up to 3,450 acres of the installation (KSAAP LRPA 2007). These parcels contain over 500,000 square feet of facility/production space and over 600,000 square feet of igloos-magazines for the storage of high explosives and ammunition. Igloos-magazines will be retained within the Commercial Energetics and Munitions Storage area and will likely be used in a similar manner and may be leased on a contractual basis for storage, explosives, or other products manufactured at other locations. The Commercial Energetics and Munitions storage area would also include the Open Demolition Grounds (ODG) within Area 2700.

This area is routinely used for detonating off-specification munitions that are manufactured within the production areas. Due to past demolition activities, the fragment zone is expected to be over 2,500 feet from the area of detonation, resulting in a hazard area of over 500 acres. It is expected that like use of the ODG will continue into the future. See the KSAAP LRPA reuse plan for details regarding reuse of this area (also see Appendix A).

Conservation/Agricultural. Over one quarter of the KSAAP property (28 percent or 3,881 acres) will be designated as a "Conservation/Agricultural" area. According to the KSAAP LRPA, this area will be used for long-term agricultural production (leasing), natural resource management, conservation, and outdoor recreation. Significant opportunities for general public access for outdoor recreational activities will be provided within this area according to the KSAAP LRPA reuse plan (KSAAP LRPA 2007). These lands would also function as a buffer area for operations that occur in the interior of the KSAAP property. In particular this area is being established for the protection of high-quality, sensitive habitat, which includes the old-growth forest habitat and some native prairie grass habitat within these areas. Sustainable timber harvest strategies will be used to preserve this unique habitat. These areas would be managed for conservation, enhancement, management, and nonconsumptive recreational use of this habitat (e.g., bird-watching, hiking, photography, horseback riding), controlled hunting and fishing, and agriculture, as well as access.

Energy Park. The KSAAP LRPA reuse plan puts forth a comprehensive master planning approach to managing future long-term development at KSAAP. Although no specific project proposals have been put forward, there is an expressed interest and recommendation as part of this master plan to attract an energy-sector industrial tenant at KSAAP, such as a "power plant, ethanol facility, traditional refinery or another related entity" (KSAAP LRPA 2007). As outlined in the reuse plan, siting of such large projects is very competitive. Such facilities create highly sought after jobs, and competition between communities is very high. Furthermore, the enormous capital investment that is required to build such facilities reduces the number of projects that will actually go forward for siting, design, construction, and operation. For example, there have been no new oil refineries constructed in the United States in the past 30 years, and typically such facilities are located near highly developed port regions of the country. If necessary capital were available to construct such a facility in the near term, the task for Parsons, Kansas, to out-compete other locations in the country will be very challenging. With respect to coal-fired power facilities, there was early interest in the siting of a coal-fired power plant at a select group of sites, that included KSAAP, but the project was put on hold. There is a recognized growing need for such facilities within the state of Kansas, but no specific project has been proposed for KSAAP. In regards to bioenergy production, several ethanol processing plants are operating or under construction in Kansas. Based on its location, KSAAP is considered a "good fit" for such a facility as there are nearby fuel sources (e.g., Labette County, in 2005, produced over 3 million bushels of corn, which is the principal fuel source for ethanol plants), potential for local use of by-products, and rail infrastructure. In any event, no specific proposals have been put forth relative to the construction of a facility at KSAAP.

Given the lack of specific energy-related project proposals, there is insufficient data on which to analyze the effects of developing a coal-fired power plant, oil refinery, or bioenergy production facility at KSAAP. In each case, the effects are highly dependent on several critical variables including:

- Output of the facility that would be envisioned (e.g., volume of output in terms of millions of gallons of product produced per year, or megawatts of power generated);

- Type of raw materials (e.g., type of coal, type of bioenergy source [biodiesel plant utilizing vegetable oils and animal fats or alcohol-based fuel derived from corn, cheese whey, waste beer and milo, or cellulose-based waste products], grade of oil used in the refinery process);

- Volume and sources of water supply for cooling water, process water, and potable water (e.g., volume, location, depth, and quality of groundwater production wells; volume, source, and quality of surface water intakes including consideration of base and seasonal flows of rivers and streams, and/or lake acreage);

- Fuel sources and combustion unit and boiler facility configuration (e.g., coal, natural gas, ethanol, or gas/diesel based units);

- Transportation network design (e.g., fuel/material unloading facilities; rail, truck, and/or pipeline transport; conveyor systems);

- Air pollution control (APC) system design and technology (e.g., use of selective non-catalytic reduction or selective catalytic reduction systems for control of nitrogen oxides [NO_x]; limestone injection [circulating fluidized bed boiler] or flue gas desulfurization web-scrubbing systems for control of sulfur dioxide [SO_2] and other acid gases; use of activated carbon injection for control of mercury; a fabric filter baghouse for control of particulate emissions as well as additional control of acid gases and mercury; fly ash management; CO_2 processing facility for reducing greenhouse gas emissions and creating ethanol plant by-products);

- Water pretreatment system design and technology (e.g., potable water treatment, demineralization systems for boiler makeup, treatment for cooling water);

- Condenser cooling system design and technology (e.g., open-cycle once through cooling water heat exchangers, closed-cycle recirculation cooling towers, air coolers, etc.).

- Wastewater treatment system design and technology (e.g., sanitary treatment plant, oil/water separators, coal pile runoff pH neutralization systems, treatment of cooling tower blowdown [if needed]);

- Wastewater/storm water discharge technology (e.g., large once-through cooling water outfalls, smaller cooling tower blowdown discharge outfalls, sanitary wastewater outfalls, process water outfalls, storm water outfalls, groundwater infiltration or injection systems, etc.);

- Electrical transformers, substations, and transmission systems and associated right-of-way configurations; and

- Product transport system design (e.g., rail, truck, pipeline, transmission lines).

No project data are available on the above listed key elements that are necessary for conducting an analysis of effects. Furthermore, the nature of these proposals is highly speculative and uncertain. Therefore, the Army is unable to analyze these hypothetical proposals because of their highly speculative nature and the lack of sufficient project information or proposals that would allow for a meaningful presentation of the potential effects. The energy park proposals are therefore not considered reasonably foreseeable for NEPA purposes and will not be analyzed in this document.

If a coal-fired power plant, oil refinery, or biorefinery facility were to be proposed for the KSAAP property in the coming decades, there would be considerable licensing and permitting requirements to ensure that environmental issues are adequately addressed. Table 3.3-3 provides an overview of the regulatory licensing and permitting requirements that would be necessary for energy facilities. In particular, extensive permitting requirements would likely be required in the event that an oil refinery or coal-fired power plant facility were to be developed on KSAAP. Furthermore, intensive studies and permitting requirements would be required under the CAA Prevention of Significant Deterioration (PSD) approval process as these facilities would be considered a major new source. Although the U.S. Environmental Protection Agency (USEPA) has regulatory authority for the CAA PSD approval, the PSD process is exempt from NEPA according to the Energy Supply and Environmental Coordination Act of 1974 (Section 7(c)(1)), as the PSD process essentially parallels the NEPA process. For a PSD approval, additional impact analyses requirements are typically at the discretion of the State regulatory agency (Kansas Department of Health and Environment [KDHE]). Before a PSD permit to construct is granted, the KDHE will request public comments, and if the comments are substantial, the agency could require even further analyses than presented initially in the application. In any event, when future proposals for the energy park are put forth, these would undergo strict licensing and permitting requirements, including potential EIS-level analysis, to ensure that operations comply with federal, state, and local regulations, as outlined in Table 3.3-3.

Table 3.3-3 Permits and/or Reviews Potentially Associated with Energy Facility Development

Activity	Applicability	Permit	Agency
Air			
Air pollution emitting facilities	Assures compliance with national ambient air quality standards.	PSD Permit 40 CFR 52.21, K.A.R. 28-19-302(a), K.A.R. 28-19-350	KDHE
Air pollution emitting facilities	Required for major Hazardous Air Pollutant (HAP) facilities, facilities subject to Part 63, facilities subject to Part 61, incinerators.	State Construction Permit under K.A.R. 28-19-300(a)	KDHE
Air pollution emitting facilities	Assures compliance with national ambient air quality standards over short periods of time. Facilities subject to Part 60, landfills, facilities subject to RACT.	State Construction Approvals under K.A.R. 28-19-300(b)	KDHE
Water			
Discharge construction storm water from construction sites greater than 1 acre	Restrictions on siting and discharge may require the site to obtain an individual Stormwater Discharge Permit.	Construction Stormwater General Permit S-MCST-0110-1 or Individual storm water discharge permit	KDHE
Water use	Withdrawal of surface or groundwater.	Appropriation Permit	Kansas Department of Agriculture (KSDA), Division of Water Resources
Discharge of wastewater to a surface water	A NPDES wastewater discharge permit would be required for operation phase discharges of wastewater and storm water to a surface water. If the project requires an industrial pretreatment approval from USEPA, NEPA must be satisfied. If the facility will result in a direct discharge of industrial wastewater to surface waters, NEPA is not applicable to the State approval required of this action. If surface water intake is required, a permit could include specific provisions for cooling water intake design under Phase I of the CWA 316(b) provisions.	National Pollutant Discharge Elimination System (NPDES) Wastewater Discharge Permit	Kansas has an approved NPDES program, except for pretreatment, which remains under the authority of USEPA Region VII
Discharge of dredged or fill material into wetlands or water bodies	Requires that surface water quality standard be maintained.	Section 404 Permit from USACE	KDHE; USACE, Kansas City District
Change or diminish the course, current, or cross section of any stream		Permit to Construct Obstruction	KSDA, Division of Water Resources

Activity	Applicability	Permit	Agency
Development in a floodplain	Any building, storage of machinery, dredging, filling, etc.	Floodplain Development Permit	Local community official
Use of stream water for construction	Temporary use of stream water in construction projects; permit is basin-specific.	Basin Term Permit	KSDA, Division of Water Resources
Land			
Impact to cultural resources	Impact sites eligible for listing on the NRHP.	Section 106 of the NHPA of 1966 and 36 CFR 800	SHPO
Alteration of native woodlands, streams, wetlands, riparian areas or native prairie	Project disrupts habitat of a threatened or endangered species.	Permit required under K.A.R. 115-15-3 and U.S. Endangered Species Act	Kansas Department of Wildlife and Parks (KDWP); U.S. Fish and Wildlife Service (USFWS)
Tall structures (cooling towers, stacks, etc.)		Notice of Proposed Construction or Alteration	Federal Aviation Administration
Landfill disposal		Solid Waste Landfill Permit	KDHE, Bureau of Waste Management
Solid waste activities	Facilities for storage of solid waste, transfer stations, treatment, including incineration, etc.	Private Solid Waste Disposal Facility Permit	Labette County Board of County Commissioners
Additional Potential Permitting Requirements for Minor Source Ethanol Plants			
Ethanol Production	Operation of Ethanol Facility.	Spill Prevention Control and Containment Measures Plan, 40 CFR 112	USEPA, Oil Program
		Alcohol Fuel Providers Permit, 27 CFR 19.915	Bureau of Alcohol, Tobacco and Firearms
Use of Ammonia in Ethanol Production	Exceeding threshold levels.	Risk Management Plan, CAA, 112(r) (7)	USEPA, Air Program
Ethanol Production	Operation of Ethanol Facility.	Process Safety Management Standard, 29 CFR 1910.119	Occupational Health and Safety Administration (OSHA)

3.3.5 Reuse Alternatives Not to Be Evaluated in Detail

Medium Intensity Reuse (MIR). With an MIR FAR range of 0.1 to 0.3 (Table 3.3-1), reuse of KSAAP to a MIR level would involve the creation of over 14 million square feet of building space, over five times greater than present conditions. Furthermore, this would represent an employment base of over 25,000 employees. In light of the elements included in the reuse plan, as well as surrounding land use, this magnitude of redevelopment would represent an unrealistic outcome of reuse. Such an outcome would be unlikely, and therefore is not further evaluated.

Medium-High Intensity Reuse (MHIR). With an MHIR FAR range of 0.3 to 0.7 (Table 3.3-1), reuse of KSAAP to a MHIR level would involve the creation of over 33 million square feet of building space (over 100,000 employees), 13 times greater than present conditions. For reasons similar to those regarding MIR, this scenario represents an unrealistic outcome of reuse and is not further evaluated.

High Intensity Reuse (HIR). HIR of KSAAP property at a FAR of at least 0.7 would involve the use of approximately 46 million square feet of space (over 200,000 employees), 18 times greater than present conditions. For reasons similar to those regarding MIR, this scenario represents an unrealistic outcome of reuse and is not further evaluated.

3.4 NO ACTION ALTERNATIVE

Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those that occurred prior to the BRAC Commission's recommendations for closure and realignment. Implementation of this alternative is not possible, however, in light of the BRAC closure recommendations having the force of law. Nonetheless, inclusion of the no action alternative is prescribed by CEQ regulations implementing NEPA, and serves as a benchmark against which federal actions can be evaluated. Therefore, the no action alternative is evaluated in this EA.

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4 AFFECTED ENVIRONMENT AND CONSEQUENCES

4.1 INTRODUCTION

This section describes the current environmental conditions and potential effects of the areas that would be affected by implementation of the proposed action or an alternative. Descriptions of the affected environment represent baseline conditions, or the "as is" or "before the action" conditions, at the installation properties. The baseline for this document has been established as status quo environmental conditions assuming continuation of Army missions at the levels occurring in November 2005, the time that the BRAC Commission's decisions became final. This baseline is used to identify by comparison any changes in conditions that would result from disposal and reuse actions. The environmental consequences portion forms the scientific and analytic basis for the comparison of alternatives and presents an analysis of potential effects, as measured against the baseline that could arise from implementation of the proposed action. Environmental effects are characterized with respect to direct and indirect effects, as well as minor, moderate, or significant beneficial and adverse effects. Cumulative effects and mitigation are discussed at the end of this section.

For clarity, the environmental consequences associated with each alternative follows the discussion of the affected environment for each resource. The discussion of environmental consequences is divided into five sections for each of the alternatives evaluated in the EA: early transfer disposal, traditional disposal, caretaker status, no action, and reuse. Reuse is further divided into the effects associated with medium-low and low intensity reuse. As discussed in Sections 2 and 3, these reuse scenarios sufficiently bound the degree of redevelopment in the KSAAP LRPA reuse plan (KSAAP LRPA 2007).

In reviewing the discussion of environmental consequences, it is important to consider that effects for each alternative are characterized relative to the continuation of status quo Army operational and management regimes in November 2005, as defined by the no action alternative. The baseline conditions are described in the Affected Environment section for each resource. Beneficial or adverse effects are then estimated relative to the estimated condition expected of the resource under continuation of Army ownership (e.g., remediation programs were assumed to continue as is under no action). In addition, the effects associated with disposal (either early transfer or traditional disposal) are inherently linked to the effects that may occur under reuse. The effects of disposal are not simply the execution of a legal document, but the implications of the change in policies, regulations, management regimes, and goals that will guide future land development as it moves from federal to non-federal ownership. This change in ownership will also have reasonably foreseeable effects as a result of planned redevelopment after disposal. Although reuse is guided by decision-making authority beyond the control of the Army, the reuse scenarios (i.e., MLIR and LIR) evaluated in this EA capture the potential short- and long-term implications of disposal as formulated in the KSAAP LRPA reuse plan. Given that the

reuse plan can change, the reuse scenarios bound the higher end of potential development.

4.2 LAND USE

4.2.1 Affected Environment

This section discusses the regional geographic setting and location of KSAAP, existing land uses on and adjacent to the installation, and current and future proposed development within the Region of Influence (ROI) that is relevant to the cumulative impacts assessment.

4.2.1.1 Regional Geographic Setting and Location

KSAAP is located 2 miles east and a 1/2 mile south of the town of Parsons in Labette County, in southeastern Kansas. KSAAP is about 30 miles west of the Missouri border and 20 miles north of the Oklahoma border. Joplin, Missouri, is the nearest population center, about 50 miles east of KSAAP. The northern boundary of KSAAP is about 1.5 miles south of the U.S. Highway 400 bypass that was constructed in 2004. Figure 4.2-1 shows the location of KSAAP (Note: KSAAP also owns 6 acres of land on the Neosho River located approximately 1.5 miles to the east, as well as a right of way from this location to the installation for the water line).

4.2.1.2 Installation Land Use

The mission of KSAAP determines land use patterns in the vicinity of production and storage areas. Outlying lands are used for a variety of purposes including agriculture, wildlife habitat, and forest land. Table 4.2-1 shows primary land uses and acreage. An individual tract of land may have hay, crop production, and grazing in addition to wildlife habitat, protected riparian corridors, and production infrastructure. KSAAP vegetation coverage and land uses are highly variable, and uses overlap one another. Principal land use types are presented below.

Table 4.2-1 KSAAP Land Use Descriptions and Acreage

Primary Use	Acreage
Developed/Improved Areas (mainly buildings, roads, and railroads)	950
Agricultural Leases and Storage Areas	9,714 (1,200 acres of storage facilities)
Terrestrial Habitat Areas (wildlife habitat, forested areas, and open areas)	2,821
Waterbodies (ponds/impoundments, streams, and wetlands)	242
Total	**13,727**
Source: U.S. Army 2006a, U.S. Army 2005	

Figure 4.2-1 KSAAP Location

4.2.1.2.1 Developed/Improved Areas

There are approximately 950 acres of improved production lines on KSAAP, including all land inside the security fence surrounding each production line. In many cases, there is a considerable amount of acreage inside the fence of the production areas, but most of this acreage is open space. Some areas have fair-quality, native prairie. In the past, adjoining agricultural lessees were allowed to hay these areas annually. However, starting in 2006 all production areas were grouped and leased for haying.

4.2.1.2.2 Agricultural Leases and Storage Areas

Overall, KSAAP maintains 9,714 acres of land in an agricultural leasing program that supports grazing, farming, and hay production for area farmers. These areas include approximately 1,200 acres dedicated for ammunition and high explosive storage areas, which are also leased for grazing between the storage facilities. Specific uses are outlined below.

***Ammunition and High Explosive Storage*.** As previously discussed there are approximately 1,200 acres that include the high explosive magazines and ammunition storage facilities such as the earth-covered "igloos" and aboveground warehousing facilities. These facilities collectively contain over 600,000 square feet of storage capacity and include Areas 1500, 1600, 1700, 1800, and 1900.

***Cropland*.** There are about 938 acres in crop production; as much as half of the Plant was in crop production prior to construction of KSAAP. Many fields were sown to fescue or other cool season grasses in the 1950s and 1960s. Crop acreage has been fairly stable over the last 20 years.

***Grazing and Storage Areas*.** There are nearly 8,000 acres of land used for grazing on KSAAP (which include 1,200 acres of igloo-magazine areas discussed above). The stocking rate and seasons for grazing are established according to the existing vegetation and the potential for reclamation of native prairie. The 1,200 acres of ammunition storage are also used for seasonal spring and summer, or winter grazing. This grazing scheme has virtually eliminated an erosion problem that was evident when the areas were grazed year-around.

***Hay*.** There are 822 acres of native grass and fescue (about 400 acres of warm-season and 400 acres of cool-season hay meadows) cut annually on KSAAP. Lessees are allowed to cut and bale warm-season grass during 15 July to 20 July. Haying at this time allows the warm-season grass enough time to build root reserves prior to the start of dormancy. It is also a period where tonnage per acre and protein levels provide optimum yield. Cool-season grass may be cut at any time during spring or fall. The only variable for cutting cool-season grass is the protein level, and that decision is left to the lessee. All native hay meadows are burned two out of every five years and are left uncut once every five years.

4.2.1.2.3 Terrestrial Habitat Areas

There is approximately 2,800 acres of relatively undisturbed habitat areas that are not generally used for any other purpose than conservation and buffering. These areas comprise high quality forest or timber, high quality native prairie, or are inaccessible for agricultural use. These areas are maintained as wildlife habitat and buffer, although some agricultural use may be permitted, such as occasional haying and limited grazing.

4.2.1.2.4 Waterbodies

Waterbodies on KSAAP include 242 acres of ponds/impoundments, streams, and potential wetlands. Within the installation boundary there are 47 miles of rivers and streams, with most being intermittent streambeds that are seasonally flooded (see Section 4.7 for further discussion on water resources).

4.2.1.3 Overview of KSAAP Production Areas and Building Facilities

As shown in Table 4.2-2, The KSAAP facility has over 600 building structures and over 2.5 million square feet of facilities including production areas, storage, maintenance, and office/administrative space. Slightly over 1 million square feet is dedicated for storage including inert storage, high explosive magazine storage, and ammunition storage. Storage facilities consist of aboveground warehouse facilities and igloos. High-explosive magazine storage and ammunition storage areas are spaced to prevent chain reactions in the event of an explosion. Overall, there are over 190 ammunition storage igloos ranging from 1,200 to 1,800 square feet in size. There are also storage magazines that range from 11,000 to 21,000 square feet in size. As the facility is operating well below production capacity, many of these igloos are currently not being utilized. The location of production and storage areas 100 through 3000 are presented in Figure 4.2-2. An overview of KSAAP facility metrics is presented below.

- KSAAP has 624 buildings that total more than 2.5 million square feet of floor space.
- KSAAP has 8 separate production/loading areas.
- 48 percent of facilities are used for production (1.13 million square feet of floor space).
- Raw materials are stored west of the production area, finished goods to the east.
- Storage and warehousing account for another 1 million square feet, or 41 percent of total facility square footage.
- 80,000 square feet (3 percent) of administrative space is available.
- Maintenance shops account for 6 percent of facility space, or 150,000 square feet of floor space.
- 75 percent of all buildings are less than 3,000 square feet in size.

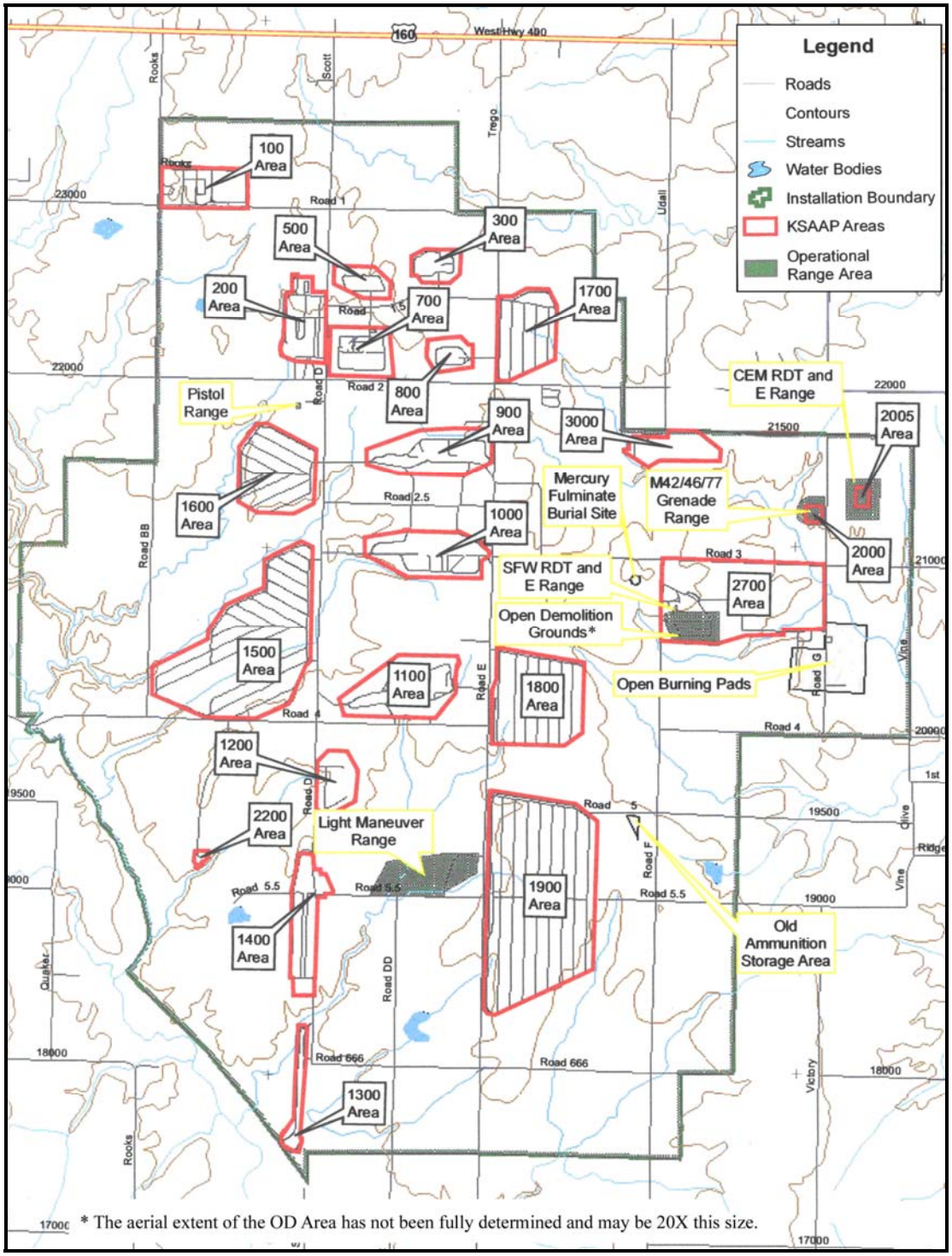


Figure 4.2-2 KSAAP Facility Areas

(Source: KSAAP LRPA 2007)

Table 4.2-2 KSAAP Buildings

Area	Primary Use	Buildings	Square Footage
100	Administrative Area	8	77,685
200	Maintenance Area	32	149,220
300	Production/Loading	19	164,498
500	Production/Loading	15	52,841
700	Production/Loading	50	95,561
800	Production/Loading	20	48,403
900	Production/Loading	57	256,311
1000	Production/Loading	55	206,707
1100	Production/Loading	45	277,684
1200	Production/Loading	14	26,625
1400	Inert Storage	25	395,697
1500	High Explosives Magazines/ Storage	57	78,349
1600	High Explosives Magazines/ Storage	26	50,560
1700	High Explosives Magazines/ Storage	22	32,432
1800	Ammunition Storage	28	296,590
1900	High Explosives Magazines/ Storage	90	173,593
2000	Explosive Test Area	9	1,849
2100	Water Supply	13	57,077
2200	Sewer System	6	1,157
3000	Lead Azide	33	76,074
	Total	624	2,518,913

Source: KSAAP LRPA 2007. DZI 1998

- Fewer than 7 percent of buildings are 20,000 square feet or larger.
- Utility systems/testing uses account for 60,000 square feet of facility space, or 2.4 percent of total floor space.
- Building 101, administrative, is a two-story, brick structure constructed in 1985.
- The maintenance shops include a number of warehouse and shop-style buildings, including warehouse-style buildings at each end of the production line – one that is used for raw materials and one that is used for the packing and crating of finished products. These buildings are constructed of concrete block, with concrete floors and blast walls in areas considered “high risk.” Roofs in the warehouse area are exposed wood trusses.
- The majority of the production facilities in the 3000 Area are pre-engineered metal panel buildings, with metal roof systems.
- KSAAP has two specialized facilities that were used to incinerate waste products, the CWP and EWI.
- KSAAP has two types of ammunition storage facilities:

- Storage igloos constructed of super-reinforced concrete, with a Quonset-style concrete roof, covered with earth, constructed in two sizes (1,200 square feet and 1,800 square feet); and
- Aboveground storage magazines made of brick with concrete floors.

- KSAAP has 19 cold storage warehouse buildings, each containing 21,389 square feet of floor space, constructed of red concrete blocks, with concrete floors and exposed wood truss roofs, with asbestos roof covering.

4.2.1.4 Hunting and Fishing Areas

Areas open to hunting on KSAAP are established annually depending on species management objectives. Fishing on KSAAP is limited to current employees, retired employees, and agricultural lessees who purchase an annual permit. Permitted fishermen may bring up to four guests. Upon arrival, fishermen must select three numbered ponds and fish only those ponds.

4.2.1.5 Surrounding Land Use

KSAAP lies wholly within Labette County, Kansas. The county has no zoning or land use regulations that could directly influence its pattern of future development. Since no land use planning guidelines or regulations exist, other indirect factors influence growth. These include highways and primary access ways, utility networks, and speculative land holdings that are presently undeveloped or less intensively used (e.g., agriculture).

Labette County encompasses approximately 649 square miles (415,360 acres) (U.S. Census Bureau 2000). Although most of the county is considered rural, some farmland is being converted for urban uses near KSAAP. The predominant land use in Labette County is agricultural. There are numerous scattered rural homesites on small acreages. Most of the actual farms do not have particularly large acreages and probably depend on some supplemental income from other employment sources (Parsons 2000). Large-scale encroachment, however, is not a problem for KSAAP since the greatest demand for residential development is generally confined to the northern suburban fringes of Parsons.

KSAAP is bounded on all sides by private property consisting of agricultural land and pasture. In addition, there is a 3,488 acre tract, originally part of KSAAP, which is now classified as a Formerly Used Defense Site. Scattered farmhouses are found within 1 mile of the property. The town of Labette City is about a half mile south of the southern boundary, and the town of Montana is adjacent to the east-central boundary. Parsons is the primary community in the immediate area, with an estimated 2000 population of 11,514 (U.S. Census Bureau 2000).

4.2.1.6 Current and Future Development in the Region of Influence (ROI)

All counties in the ROI, Labette, Crawford, Cherokee, Neosho and Montgomery, are primarily farm land (Table 4.2-3) with scattered small towns. Agriculture is the most

significant land use in the region and accounts for 77 percent to 93 percent of land use, though only about 5 percent of employment in the region (USDA 2006, Middleton 2002). Agriculture has grown significantly in the past several years, with the greatest increase of 9 percent occurring in Crawford County. Other significant uses include retail, manufacturing, and services (Middleton 2002).

Table 4.2-3 Total Farmland in the Region of Influence

County	Total Acres	1996		1999		2005	
		Farm Acres	Percent Farmland	Farm Acres	Percent Farmland	Farm Acres	Percent Farmland
Cherokee	375,680	276,000	73.5%	275,000	73.2%	290,000	77.2%
Crawford	379,520	304,000	80.1%	301,000	79.3%	337,000	88.9%
Labette	415,360	348,000	83.8%	344,000	82.8%	358,000	86.2%
Montgomery	412,800	325,000	78.7%	326,000	79.0%	342,000	82.9%
Neosho	366,080	328,000	89.6%	332,000	88.0%	341,000	93.2%
*Source: USDA 2006. National Agricultural Statistics Service							

Another significant land use in the ROI is coal-bed methane (CBM) production. The four-county area of Labette, Montgomery, Neosho, and Wilson in southeast Kansas is the center of CBM exploration and production (Carr 2004). In 2002, natural gas produced from coal-beds totaled 1,614 billion cubic feet (Bcf), representing 8.3 percent of total U.S. dry gas production (19,353 Bcf). The Energy Information Agency estimated that the 2002 proved gas reserves of fields identified as having CBM are now more than quadruple the volume reported in 1989 (Carr 2004), and this growth is expected to continue.

In addition, several large Montgomery County employers are considering expansion of operations, but currently have a shortage of workers. Amazon.com, Cessna in Independence, AIW in Coffeyville, and Spears Manufacturing in Caney are currently seeking additional employees to fuel future expansion and seasonal needs (Kurfiss 2006).

4.2.1.7 Airspace Use

There is no use of airspace by KSAAP. There is, however, civilian use of airspace in the region and over KSAAP. The nearest larger airports include Joplin, Missouri; Kansas City, Missouri, and Tulsa, Oklahoma. The nearest commercial passenger service is located in Joplin, Missouri, approximately 45 miles to the east of KSAAP. There are several small airfields in the vicinity of KSAAP. The City of Parsons operates a small airport in the area, Tri-City Airport, located about 18 miles to the west of KSAAP. There are also other small airfields near KSAAP operating out of Oswego, Independence, and Pittsburg.

Airspace restrictions within the vicinity of the installation are stipulated by a NOTAM (Notice to Airmen) filed by KSAAP with the Federal Aviation Administration (FAA). While this does not restrict air travel over the installation, it does request that the installation be avoided. As an alternative to avoidance, pilots are requested to increase altitude because of possible damage to aircraft from fragments projected by blast operations and

ammunitions testing (Vandenkoven 2006). There are no helipads located on the installation (Cramer 2006).

4.2.2 Consequences

4.2.2.1 Early Transfer Disposal Alternative

Direct. Minor to moderate long-term adverse effects are expected to occur. Existing land use patterns would change over time on the KSAAP property with the potential for increased incompatible land uses relative to industrial/commercial, residential, and public use of KSAAP principally associated with noise and safety concerns (see Section 4.2.2.5 for details regarding effects from reuse). No effects on the surrounding land uses or on airspace use are expected.

The early transfer disposal alternative would result in property transfer before all remedial action has been completed for contaminated sites at the properties. The early transfer disposal alternative could therefore result in short-term fragmentation of redevelopment. Orderly or rational redevelopment of the installation properties could be impeded under this alternative.

Indirect. Minor short-term adverse effects are expected. Disposal of KSAAP would result in non-federal ownership, which may result in reduced and fragmented implementation of regulatory controls for the protection of natural resources as required under the Sikes Act for federal property.

4.2.2.2 Traditional Disposal Alternative

Direct. Minor long-term beneficial and minor to moderate adverse effects are expected to occur. All areas on the installation property would be available for productive reuse after transfer, and orderly or rational redevelopment of the property could be assisted under this alternative, resulting in beneficial land use effects. Adverse effects associated with reuse are detailed in Section 4.2.2.5. No effects on surrounding land uses or on airspace use are expected.

Indirect. Minor short-term adverse effects are expected, similar to the effects outlined for early transfer. As compared to early transfer, remedial programs and redevelopment would occur later, but the effects would be similar.

4.2.2.3 Caretaker Status Alternative

Direct. Minor beneficial effects are expected. Under the caretaker status alternative, Army and DZI operations would cease. The elimination of military operations will reduce any minor land use incompatibilities with surrounding residents, such as noise propagation off KSAAP and traffic.

Indirect. Long-term minor adverse effects are expected. If the excess properties at KSAAP were to be maintained in caretaker status for an extended period, the condition of buildings, facilities, roadways, and utility system components could be expected to

decline. This deterioration could ultimately lead to a reduction in the suitability of these facilities to support uses similar to those associated with fully operational installation conditions. Additionally, if the caretaker period were to be extended, the excess areas would remain beyond the jurisdiction of Labette County and would represent a lost opportunity for raising tax revenues to fund orderly development within the county.

4.2.2.4 No Action Alternative

No direct or indirect effects are expected under the no action alternative. For this alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment, which would affect neither land use on KSAAP nor land use patterns external to the installation. No effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.2.2.5 Intensity-Based Probable Use Scenario

The Army's environmental restoration efforts for KSAAP will attempt to facilitate the land use and redevelopment needs stated by the community's reuse plan. As a component of remedy implementation, the Army may restrict certain types of future land use (e.g., residential use in certain areas), impose institutional controls, or take other actions affecting land use to protect human health and the environment. Such restrictions would be included in conveyance documents as restrictions on future land use.

Because no land use plans or zoning govern the use of the area of Labette County in which KSAAP is located, implementation of the reuse plan would not result in a conflict for any local land use plans or controls.

The habitat conservation area to be maintained by the KSAAP LRPA, historic resource protection, and compatible use encumbrances would limit development potential in these specific locations, although more than sufficient space is available for development outside of these areas, given the size of KSAAP. No effects on the surrounding land uses or on airspace use are expected.

***Medium-Low Intensity, Direct*.** Long-term minor to moderate adverse effects are expected, as well as some long-term minor beneficial effects. The KSAAP LRPA reuse plan envisions a mixed use of property, with reuse focusing primarily on industrial, business/commercial, and conservation uses that would include construction of new facilities. Reuse of the KSAAP property, including demolition of unusable buildings and construction of new structures, would increase the property values of the land on the installation. Under the MIR scenario, the intensity of reuse would be above the current use of the property and would thus change the land use patterns in the area being developed.

The increased worker presence (6,500 employees) and projected level of development in parts of KSAAP would alter land use patterns in those areas, but land use on the majority of the installation would remain functionally the same or similar to existing uses. Although some of the uses (e.g., business/commercial) proposed to be developed at the KSAAP

property are different from current and historic DZI operations, the character of new development would be essentially similar to past use of installation property relative to land use. In certain dedicated parcels, however, new land uses would be added to KSAAP including expanded office/business park space (1 million square feet), limited housing (520 units under the MLIR scenario), public education and training (783 acres), special events (484 acres), and public conservation area usage (3,881 acres). These areas would create an on-site population of 1,300 residents and much higher levels of public access to and occupation of these areas for various uses. To avoid significant adverse effects associated with land use incompatibility, it will be necessary to execute planning studies to ensure that noise propagation and safety arcs do not extend into these areas and that sufficient buffer zones are maintained. Furthermore, sufficient security measures will be required to prevent trespassing into dangerous areas.

Overall, there are three key factors that may result in adverse effects relative to land use compatibility. First of all, the intensity of redevelopment would be nearly three times the current facility infrastructure footprint (6 million square feet). Therefore, many of the buffer areas that surround many production and storage facilities would be reduced. Due to the mixed use, there is the increased potential for incompatible uses to arise between yet to be determined industries. Secondly, the continued existence of a large energetics activity (3,450 acres), along with increased industrial usage elsewhere on KSAAP (e.g., 2,561 acres of industrial/manufacturing and 1,145 acres of transportation/warehousing), will require careful planning and land use restrictions to ensure that proper safety arcs are maintained for both current and future redevelopment within the mixed-use environment (as previously discussed). This issue is acknowledged in the KSAAP LRPA reuse plan and over time more detailed study will be required to ensure that proper safety arcs are put in place around the OB/OD, storage areas, and production areas. Thirdly, redevelopment will increase the acreage disturbed at KSAAP (1,500 of additional disturbed habitat), which will reduce the amount of open space, buffer area, and natural prairie habitat that currently exists between many of the production and storage areas. In consideration of this issue, the KSAAP LRPA reuse plan sets aside over 3,881 acres of conservation and agricultural lands, which will preserve much of this area (further restrictions on this use are specified in Section 3.2.4). However, many high-quality habitat areas also exist outside of these areas between existing facilities. Through careful planning, these activities would not rise to the level of significance, but would collectively be considered a moderate adverse effect relative to land use compatibility within KSAAP. With respect to off-site locations, the large conservation buffer area, the rural nature of the surrounding area immediately adjacent to KSAAP and the focus of development toward the interior of KSAAP, would reduce the potential for adverse effects off site, although such effects could occur depending on the siting of specific projects and proximity to adjacent lands. In any event, the large expanses of KSAAP acreage would make it unlikely that development on KSAAP would result in land use changes on adjacent properties.

The proposed redevelopment would also likely have the effect of better integrating portions of the property at KSAAP into surrounding communities, because many of the proposed industrial/warehousing, business, and commercial uses associated with

redevelopment (i.e., non-ammunition activities) would be more consistent with the businesses of the surrounding community and counties. Therefore, redevelopment could result in certain beneficial effects, as well. As part of redevelopment, existing road networks on the installation properties would be improved to accommodate increased traffic associated with reuse.

On the other hand, some adverse impacts could be expected off site, because the intensity of this development could be much higher overall than in surrounding communities. The level of employment represented by the MIR scenario would not be consistent with the levels of employment in nearby communities such as Parsons or Altamont, for example. While the existing regional labor market would be able to supply some of the employees represented by this projection, it is likely that other employees would commute or relocate to the area. These employees could potentially increase demand for new housing and associated services and could place stress on existing infrastructure in the area. In addition, new building construction in KSAAP would not necessarily be consistent with development densities in the adjacent town of Parsons. These effects, however, would not rise to a level of significance, because this reuse scenario would be phased so that improvements or additions to the local housing market and infrastructure would likely keep pace with redevelopment.

Medium-Low Intensity, Indirect. Long-term minor beneficial effects are expected. Development of an MIR scenario would likely involve an increase of development and investment capital in the ROI. Implementation of the reuse plan may stimulate further development and alteration of land use in the Parsons area that could support economic growth and enhanced quality of life in the community. Also, the conservation area that would be located along Labette Creek would likely increase the attractiveness of the area.

Low Intensity, Direct. Long-term minor beneficial and adverse effects are expected. This intensity of reuse would be above the current use of the property; however, the effects would be less than those in the MIR scenario. Direct effects similar to but lesser in magnitude than those expected for the MLIR scenario would also occur in the LIR scenario. Overall, lower levels of development will help ensure continuation of land use compatibility.

Low Intensity, Indirect. Long-term minor beneficial effects are expected. Indirect effects similar to, but less than, those expected for the MLIR scenario would also occur in the LIR scenario.

4.3 AESTHETICS AND VISUAL RESOURCES

4.3.1 Affected Environment

KSAAP covers 13,727 acres on the Osage Plains, which is a region of transition from the deciduous forest to the east and the Flint Hills tallgrass prairie to the west. KSAAP comprises small industrial areas surrounded by pasture, cropland, and native prairie that serve as an explosive-safety buffer. As elsewhere in the region, forests occur along major waterways. Over 11,500 acres of the installation are agriculture or natural area. The remaining acres are used for manufacturing and storage of munitions.

Grasslands found on KSAAP are a matrix of native tallgrass prairie, early succession fields, and cool season grasses. Forested areas are primarily an oak-hickory association and are only found along narrow belts adjacent to streams and rivers and on north-facing slopes.

The architecture consists of brick manufacturing structures common on installations of this type and age. No structures on KSAAP are considered eligible for listing on the NRHP.

4.3.2 Consequences

4.3.2.1 Early Transfer Disposal Alternative

Direct. Minor long-term adverse and beneficial effects are expected. In the long term, disposal of KSAAP would result in non-federal ownership and potentially reduced emphasis on natural resource management and conservation governed by Integrated Natural Resources Management Plans (INRMP) and Army policies and regulations. Such a paradigm shift in land management may result in increased potential for tree removal and construction activities that may take place after disposal outside of the conservation area identified by the KSAAP LRPA. Although, sustainable timbering within the conservation area would be focused on preserving this habitat, some tree removal may also occur in this area. Such actions could adversely affect the existing visual quality of the landscape at KSAAP and may adversely affect viewsheds into KSAAP (see Section 4.3.2.5 for more details regarding aesthetic impacts from reuse). On the other hand, disposal and the change in ownership will ultimately result in the demolition and removal or renovation of unsightly deteriorating structures that would be replaced by more modern facilities. This could lead to the enhancement of the built landscape with newer buildings that are more attractive than current structures resulting in beneficial effects to aesthetics and visual resources from the removal of unsightly deteriorating buildings and their replacement with more attractive structures.

Indirect. No effects are expected.

4.3.2.2 Traditional Disposal Alternative

Direct. Minor long-term adverse and beneficial effects are expected. Effects would be similar to those described under the early transfer disposal alternative, but the changes in effects would take place further in the future.

Indirect. No effects are expected.

4.3.2.3 Caretaker Status Alternative

Direct. Minor adverse effects are expected. Under caretaker status, the appearance of buildings and grounds could decline and deteriorate over time, decreasing the aesthetic value of the installation properties.

Indirect. No effects are expected.

4.3.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.3.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Minor short- and long-term beneficial and adverse effects are expected. Increased construction, demolition, and site-clearing activities would result in a short-term adverse visual effect that would likely be contained within the KSAAP property. As redevelopment of the property proceeds, older facilities could be replaced by newer, more attractive buildings. Outside of the conservation area proposed by the KSAAP LRPA, tree removal and construction activities necessary to build up to 6 million square feet of facilities over the next 20 years could reduce the existing beneficial visual effects of woodland and open space areas on the landscape at KSAAP and may adversely affect views into KSAAP. In particular, development along the perimeter of KSAAP that lack adequate forest buffer (e.g., along the northern and northeastern boundaries), would have the potential to create unsightly industrial viewsheds into KSAAP that were once pastoral in nature. In addition, increased public use of KSAAP and residential development of up to 520 units (1,200 residents) in the northwestern corner of the property would create new viewsheds into the interior of KSAAP that may be more industrial in nature, rather than undisturbed pastoral landscapes. Continued conservation of existing forest and agricultural buffers along the boundary of KSAAP to the south, southwest, and east, could reduce the adverse effects to viewsheds into the installation from nearby residential homes and other vantage points. Given that the majority of the forests are located within the conservation area (used for habitat conservation) and forests outside of this area lie within riparian corridors with potential wetlands, it is likely that most of the forests will remain intact.

Medium-Low Intensity, Indirect*.* Minor long-term adverse effects are expected. Economic expansion caused by redevelopment at KSAAP could result in increased

development off site in surrounding communities, which would reduce the pastoral nature of viewsheds. Also, new sources of light and glare could, if not screened properly, affect nighttime views in communities adjacent to the installation properties.

Low Intensity, Direct. Minor short- and long-term beneficial and adverse effects are expected. Effects would be similar to those expected under the MLIR scenario, but to a lesser degree.

Low Intensity, Indirect. Minor long-term adverse effects are expected. Effects would be similar to those expected under the MLIR scenario, but to a lesser degree.

4.4 AIR QUALITY

4.4.1 Affected Environment

4.4.1.1 Local Meteorology

The climate of Labette County is a mix of continental and humid subtropical with long, hot summers and short, mild winters. Average high temperatures range from 42°F in winter to 92°F in summer, and average low temperatures range from 22°F in winter to 69°F in summer. Two air masses provide the dominant continental characteristics of the local climate. Masses of dry air frequently arrive from the north-northwest. In contrast, winds from the south-southwest often transport warm, humid air that has been conditioned by the Gulf of Mexico and adjacent subtropical waters (High Plains Regional Climate Center 2006).

Average annual precipitation is 40 inches per year, with 10 inches of snowfall. Most of the rain falls in the spring and summer months due to thunderstorms. On average, 53 tornadoes form in Kansas every year (NWS 2006).

4.4.1.2 Regulatory Authorities and Air Quality Attainment Status

KSAAP is located in Labette County, Kansas, under the jurisdiction of the KDHE Bureau of Air and Radiation and USEPA Region 7.

USEPA has divided the country into geographical regions, known as Air Quality Control Regions, to evaluate compliance with the National Ambient Air Quality Standards (NAAQS). There are NAAQS for each of the seven criteria pollutants (carbon monoxide, nitrogen dioxide, ozone, sulfur oxides, particulate matter measuring 10 micrometers or less in diameter (PM_{10}), particulate matter measuring 2.5 micrometers or less in diameter ($PM_{2.5}$) and lead). Criteria pollutants are those upon which USEPA has placed the greatest emphasis and has developed health-based concentration standards for ambient air. There are primary NAAQS for protection of public health and secondary NAAQS for the protection of public welfare (effects on soils, vegetation, climate, economic value, personal comfort, and welfare).

Compliance with the NAAQS is determined through the use of ambient-air monitoring stations located throughout the state, including monitors in the vicinity of KSAAP. Labette County and all surrounding counties are designated as in attainment for all criteria pollutants (USEPA 2008a). Table 4.4-1 shows both the primary and secondary NAAQS. Kansas maintains a State Implementation Plan (SIP) that contains regulations, control measures, and strategies to maintain the NAAQS.

Opacity is regulated at KSAAP by KDHE. Opacity is defined as the “degree to which an object seen through a plume is obscured, stated as a percentage.” The regulations state that it is unlawful to cause or allow the emission of any air contaminant (such as particulate matter [PM]) in excess of 20 percent visual density (opacity).

Table 4.4-1 National Ambient Air Quality Standards

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour[1]	None
	35 ppm (40 mg/m^3)	1-hour[1]	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	Revoked[2]	Annual[2] (Arithmetic Mean)	
	150 µg/m^3	24-hour[3]	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual[4] (Arithmetic Mean)	Same as Primary
	35 µg/m^3	24-hour[5]	
Ozone	0.08 ppm	8-hour[6]	Same as Primary
	0.12 ppm	1-hour[7] (Applies only in limited areas)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	-------
	0.14 ppm	24-hour[1]	-------
	-------	3-hour[1]	0.5 ppm (1300 µg/m^3)

Source: USEPA 2006a, 2008b
[1] Not to be exceeded more than once per year.
[2] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective 17 December 2006).
[3] Not to be exceeded more than once per year on average over three years.
[4] To attain this standard, the three-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.
[5] To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective 17 December 2006).
[6] To attain this standard, the three-year average of the fourth highest daily maximum eight-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[7] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
(b) As of 15 June 2005, USEPA revoked the 1-hour ozone standard in all areas, except in the 14 8-hour ozone nonattainment Early Action Compact areas.
Note: ppm = parts per million

4.4.1.3 Air Pollutant Emissions at Installations

KSAAP/DZI maintains a Title V Class I Operating Permit (Source ID No. 0990010) in compliance with KDHE regulations (KDHE 2004). Existing air emission sources at KSAAP include stationary boilers and heaters, painting operations, fuel oil tanks, chemical tanks, emergency electrical generators, OB/OD, laundry facilities, portable heaters and generators, waste water treatment systems, and CWP. The CWP currently does not operate because the unit does not meet emission monitoring requirements. KSAAP cannot emit more than 250 tons/year of SO_2. Table 4.4-2 lists the emissions for some of these sources for the year 2005, summarized from the 2005 Emissions Inventory submitted to KDHE by KSAAP. The remaining sources at KSAAP are assumed to have

zero or minor emissions. KDHE conducted an annual compliance inspection on 23 March 2006 and found KSAAP to be in compliance with their permit and KDHE regulations.

Table 4.4-2 KSAAP Air Emissions in Tons per Year

Source Type	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	VOC
#5 Fuel Oil Boilers	6.06	34.52	1.10	0.72	0.62	0.04
#2 Fuel Oil Boilers	3.75	12.40	0.15	0.03	0.94	0.06
#2 Fuel Oil Heating Units	0.19	0.65	0.00	0.00	0.05	0.00
Tanks	0.00	0.00	0.00	0.00	0.00	0.24
Commuting (Vehicle Emissions)[1]	1.32	0.01	1.34	0.26	11.08	1.07
Total	**11.32**	**47.58**	**2.59**	**1.01**	**12.69**	**1.41**
[1] Commuting emissions based on 167 employees, calculated with URBEMIS 9.2						

4.4.1.4 Regional Air Pollutant Emissions Summary

Labette County is predominantly rural, with a population of approximately 22,835 (U.S. Census 2000). There are no interstate highways that run through Labette County, only state and county roads. Nearby industrial facilities include Columbian TecTank, Parsons State Hospital and Training Center, and Grandview Products Company, all located in Parsons (NEI 2002). There are no air quality monitors in Labette County (USEPA 2006b). The nearest PM_{10} monitor is in Chanute, KS, approximately 25 miles northwest of Parsons. The nearest SO_2 monitor is in Coffeyville, KS, approximately 30 miles southwest of Parsons. The nearest NO_x, $PM_{2.5}$, Ozone, and CO monitors are in Miami, OK, approximately 40 miles southeast of Parsons. As shown in Table 4.4-3 monitored values are below the NAAQS.

Monitored values of SO_2, CO, NO_x, and 24-hour PM_{10} are well below the NAAQS. The annual PM_{10} and 24-hour $PM_{2.5}$ monitored values are approximately 50 percent of the NAAQS. The 8-hour Ozone and annual $PM_{2,5}$ monitored values are very close to the NAAQS.

Table 4.4-3 Air Quality Monitor Data, Highest Values (µg/m3)

Pollutant	Averaging Period	2003	2004	2005	Standard
PM_{10} (Chanute, KS)	24-hour	56	42	57	150
	Annual	24	21	25	50
$PM_{2.5}$ (Miami, OK)	24-hour(1)	32	36	33	65
	Annual	12	11.2	12.3	15
SO_2 (Coffeyville, KS)	3-hour	248.9	264.6	248.9	1300
	24-hour	89.1	78.6	62.9	365
	Annual	15.7	5.2	5.2	80
NO_x (Miami, OK)	Annual	15.0	13.2	15.0	100
CO (Miami, OK)	1-hour	2183.9	1379.3	3218.4	40,000
	8-hour	689.7	574.7	804.6	10,000
O_3 (Miami, OK)	8-hour(2)	156.8	152.9	154.8	157

Source: USEPA 2006b
(1) 98th Percentile value
(2) 4th Highest value

4.4.2 Consequences

4.4.2.1 Early Transfer Disposal Alternative

Direct. Short- and long-term minor to moderate adverse effects are expected on KSAAP. The boilers, heaters, and manufacturing operations at KSAAP listed under the current permits would continue to operate, but would not in themselves pose any adverse impacts. Long-term moderate adverse effects are expected as a result of increased activity at KSAAP, including operational emissions and increased traffic flow (see Section 4.4.2.5 for more details). In addition, short-term minor adverse effects from remediation equipment, dust, and exhaust emissions associated with demolition and construction vehicles are expected. USEPA's General Conformity Rule requires a formal conformity determination document for federal actions occurring in nonattainment or maintenance areas (former nonattainment areas), though transfers of ownership and leases for similar activities are exempt from the General Conformity Rule. However, Labette County is in attainment for all NAAQS; therefore, the General Conformity Rule does not apply. Thus, numerical emission calculations for activities (such as demolition, construction, non-road sources, and vehicles traveling on public roads) associated with disposal and reuse were not necessary.

Indirect. Long-term minor to moderate adverse effects are expected on KSAAP. In the long term, disposal of KSAAP may spawn additional economic growth in the region that could generate additional emissions from traffic and industry operations within the area.

4.4.2.2 Traditional Disposal Alternative

Direct. Short- and long-term minor to moderate adverse impacts are expected on KSAAP. Effects would be similar to those described under the early transfer disposal alternative, but the effects would take place further in the future.

Indirect. Long-term minor to moderate adverse effects are expected on KSAAP. Effects would be similar to those described under the early transfer disposal alternative, but the changes in effects would take place further in the future.

4.4.2.3 Caretaker Status Alternative

Direct. Short- and long-term minor beneficial effects are expected at KSAAP. At KSAAP stationary sources, such as boilers and heaters, would cease to operate, thereby reducing emissions. Furthermore, vehicle traffic and industrial operations would decrease on KSAAP, thereby reducing emissions.

Indirect. No effects are expected at KSAAP.

4.4.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.4.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity. Direct. Long-term minor to moderate adverse effects are expected as a result of increased employment and commercial/industrial activity, especially in regards to the establishment of the warehouse/distribution centerpiece of the reuse plan, relative to existing conditions on KSAAP. DZI operations at KSAAP would continue in some capacity, and reuse at KSAAP would encourage new commercial and industrial activity by new tenants. Overall, development would be assumed to increase to 6 million square feet of active industrial use, which could be five to ten times the current operational levels seen on KSAAP. Reuse of the KSAAP property for commercial, manufacturing, and industrial uses would result in a greater quantity of emissions as compared to current levels. This would be due to the overall greater level of activity occurring at the site. Boilers, heaters, and industrial equipment would potentially be used at higher rates, resulting in increased emissions. Additional air quality permits may be required for new and expanded operations, depending on the type of equipment installed at the site.

Any new stationary sources of air pollution that result from reuse would be required to comply with all federal and state air quality rules and regulations. Each tenant would be required, as appropriate, to obtain air quality permits from KDHE for each new and modified facility. The tenants (operators) would oversee day-to-day operations at each facility and thus would be considered individual sources, each requiring separate permits. The necessary preconstruction permits and approvals are summarized in Table 4.4-4.

The permit process is designed to regulate sources that might cause significant ambient air quality effects. Permits would specify emission limits and the types of APC equipment that would be necessary for each emission source. Adherence to these procedures would ensure that only minor to moderate adverse direct effects on air quality would result from the MLIR scenario.

Table 4.4-4 Air Quality Permits

Activity	Applicability	Permit	Agency
Air pollution emitting facilities	Assures compliance with national ambient air quality standards.	PSD Permit 40 CFR 52.21, K.A.R. 28-19-302(a), K.A.R. 28-19-350	KDHE
Air pollution emitting facilities	Required for major Hazardous Air Pollutant (HAP) facilities, facilities subject to Part 63, facilities subject to Part 61, incinerators.	State Construction Permit under K.A.R. 28-19-300(a)	KDHE
Air pollution emitting facilities	Assures compliance with national ambient air quality standards over short periods of time Facilities subject to Part 60, landfills, facilities subject to RACT.	State Construction Approvals under K.A.R. 28-19-300(b)	KDHE

The following issues would need to be addressed for a major source as part of the preconstruction permit process:

1. Nearby Class I areas. Sources subject to PSD review are required to include an evaluation of the project's impact on air quality related values (AQRVs) at Class I areas located within 300 kilometers (km) (186.2 miles) of the project site. There are two Class I areas located approximately 200 km (124.3 miles) to the southeast of the project site: the Hercules-Glades Wilderness Area (located in Missouri) and the Upper Buffalo Wilderness Area (located in Arkansas). The AQRVs that have the greatest potential for affecting the permittability of any project is regional haze. Depending on the outcome of the Class I modeling analysis, it might be necessary to decrease project emissions, offset the project's impacts by securing emission reductions from other facilities, or perform a cumulative impact analysis for any AQRV above the significance level.

2. Fugitive dust impacts. The Class II (local) dispersion modeling analysis must account for all sources of emissions from the project. Fugitive emissions from piles, material handling, and truck traffic on unpaved and paved roads can result in unacceptably high ambient inhalable particulate matter (PM_{10}) concentrations due to these ground-level sources. This issue is exacerbated if there is a too-small buffer area between the sources of fugitive dust emissions and the facility's fence.

Demolition activities associated with the MLIR scenario would create temporary sources of fugitive dust and vehicle emissions. Demolition-related emissions are not expected to create any significant ambient air quality effects due to the temporary nature of the

demolition and the fact that the demolition would be spread over a multiyear period. The exhaust emissions from a limited number of heavy equipment vehicles would not cause any violations of ambient air quality standards.

Construction activities associated with the MLIR scenario would also create temporary sources of fugitive dust and vehicle emissions that would primarily be confined to immediate project areas. These emissions are not expected to create any significant ambient air quality effects for reasons similar to those discussed for the demolition activities.

Medium-Low Intensity, Indirect. Long-term minor adverse effects are expected. Once the existing and new commercial and industrial-related spaces are occupied, associated economic development and additional vehicle traffic would generate additional emissions in the region.

Low Intensity, Direct. Long-term minor adverse effects are expected. Overall emissions are expected to increase from 2005 levels. This would be due to the greater level of activity occurring at the site. Effects from the LIR scenario are similar to, but less than, the effects from the MLIR scenario (could be half the level of intensity estimated for the MLIR scenario).

Low Intensity, Indirect. Long-term minor adverse effects are expected. The LIR scenario envisions more employees commuting to and from the installation, with associated vehicle emissions greater than 2005 levels. Effects from the LIR scenario are similar to, but less than, the effects from the MLIR scenario.

4.5 NOISE

4.5.1 Affected Environment

As previously discussed, the KSAAP region is principally agricultural in nature and therefore the residents of the region enjoy a relatively quiet environment. Due to the size of the KSAAP installation, large buffers surround current mission operations, so that noise is attenuated. Overall, KSAAP facility operations generate continuous noise from fans, pumps and boilers, as well as impulsive noise from quality testing of military explosives and a demolition ground.

Due to the technical nature of describing noise affects, a brief overview of the various noise descriptors and regulations relative to management of noise is provided below.

Noise Descriptors. The common unit of measure for noise is the decibel (dB). Three frequency weighting scales measure sound level: A-weighting captures the loudness of the least intense sounds; B-weighting captures the loudness of moderately intense sounds, and C-weighting captures the loudness of the most intense sounds that the human ear can withstand. Two weighting scales have been used to address noise generated at KSAAP installations: C-weighted sound (expressed as dBC) is used for the lower frequency sounds typically associated with demolition activities, while A-weighted sound (expressed as dBA) is used for assessing the noise effects of higher frequency sound-producing activities such as that from firing ranges, traffic noise, industrial noise, and aircraft noise (see Appendix D for further details on noise descriptors).

Noise that varies with time is quantified using several descriptors, and the choice of descriptors is dictated by the purpose for which the analysis is intended. Analyses conducted for NEPA documents and for land use planning employ averages based on measured or predicted sound exposure levels over “busy days” or annual number of operating days. Analyses conducted for the management of noise complaints employ measures of single events, such as the linear peak level used for the prediction of complaints about demolition noise. The peak noise level is generally defined as the maximum absolute value of the instantaneous sound pressure in a specific time interval during the specified monitoring period. The maximum level is generally defined as the highest noise level from some passing source integrated over some short interval, such as 1/10 second. The “equivalent noise level” (L_{eq}) is the average noise level during a specified monitoring period. The day-night noise level (DNL) is the average noise over a 24-hour period; the noise levels between 10:00 p.m. and 7:00 a.m. are adjusted upward by 10 dB to account for peoples’ sensitivity to nighttime noise. The DNL is the method of choice for the production of noise contour maps. As a general rule, DNL is calculated from A-weighted measurements, and for this reason, it is standard practice for Army documents to use the abbreviation C-weighted DNL for noise contour maps for explosive operations.

Vehicles associated with KSAAP (especially heavy trucks) traveling on public roads can cause noise impacts at homes close to the roadway. Traffic noise is generally quantified as the peak-hour L_{eq} during the hour of the day when traffic volumes are highest. There is

currently no state or local regulations governing traffic noise from vehicles traveling on public roads. The Federal Highway Administration (FHWA) regulates traffic noise impacts caused by vehicles on new federally funded roadway improvement projects near residential areas, but the proposed action would not require construction of new federal funded roadways near houses, so the FHWA regulations would not apply.

Existing Noise Studies

Noise studies prepared for KSAAP include blast noise contours prepared by the Army Construction Engineering Research Laboratory (CERL) for the Installation Environmental Impact Assessment in 1980 and an environmental noise assessment of explosive operations conducted by the U.S. Army Environmental Hygiene Agency in 1987 (DZI 1980, USAEHA 1987). Both reports showed the existing noise exposure from industrial operations to be negligible.

Existing Noise Producing Activities

Blast Noise at KSAAP

Demolition Operations. Deteriorated and rejected ammunition items are disposed of by pit detonation. Each detonation blast is limited to no more than 50 pounds of explosive and the work is scheduled only on days when the meteorological conditions meet the following criteria (based on burning operations):

- Burning operations shall not be initiated until at least one hour after sunrise. Addition of material to the fire shall be limited to periods of at least two hours prior to sunset;
- Burning shall not be carried out during inclement or foggy conditions or on cloudy days. Cloudy days are defined as overcast days (more than 70 percent cloud cover) with a ceiling of less than 2000 feet; and
- Burning shall be restricted to periods when surface wind speed is more than 5 mph and less than 15 mph and winds come from a direction that will not cause smoke over any occupied dwelling or public roadways or any airports within 2 miles of the burning site.

The nearest residence to the area where the detonation is accomplished is approximately two miles. Data relative to the demolition operations was supplied to CERL for preparation of blast noise contours. Based upon this evaluation, noise pollution, due to the demolition operations, is not a significant problem.

Testing Operations. Quality assurance testing of the M42 and M46 grenades and the M223 fuse is accomplished on a five-days-per-week, one-shift basis. Approximately 60 grenades and 20 fuses are tested each day. The grenades contain approximately 31 grams of Composition A-5 explosive and the testing produces a noise level of approximately 145 dBs in the immediate vicinity of the range. The fuses contain

approximately 85 milligrams of mixed explosives, and the testing produces a noise level similar to the level produced by a 0.22 caliber rifle. The nearest residence to the areas where this testing is accomplished is approximately 1.5 miles away. The noise pollution due to this testing operation is not a significant problem.

Considerations Related to Sound Path. In addition to quantifying the source of a sound and addressing the environment in which the receivers experience that sound, it is important to consider the path over which the sound propagates from the source to the receiver. At KSAAP, the relatively flat, sparsely-wooded terrain is more favorable to the propagation of sound than hillier, more forested land would be.

Existing Land Use Compatibility

There are no measurements of the existing ambient background noise (DNL) around KSAAP. In lieu of actual measurements, DNL for land reuse types can be estimated by using the following equation published by USEPA:

DNL or Ldn = $10 \log_{10}(p) + 22$ (dB) where p is the number of people per square mile.

According to the 2000 census, Labette County has 35.2 people per square mile with an area of 649 square miles (U.S. Census 2000). The City of Parsons, which is 5 miles away, accounts for just a little over half of the county population (11,514/22,835). This leaves an average density of 17.7 people per square mile in the rest of Labette County, yielding an estimated DNL of 34.5 dBs. This is the level associated with a very quiet rural area.

4.5.2 Consequences

4.5.2.1 Early Transfer Disposal Alternative

Direct. In the short term, no effects are expected, since previous analyses conducted in connection with the Army's Installation Compatible Use Zone program have shown that the noise from current DZI operations is compatible with residential and other noise-sensitive land uses. In the long term, minor to moderate adverse effects are expected. Disposal of KSAAP would lead to new industrial and commercial tenants that may use noise-generating equipment (e.g., fans, conveyors, loading docks). Noise-generating activities on KSAAP, however, would generally be sufficiently distant from adjacent residential areas and sensitive receptors, and it is unlikely that such activities would cause noise impacts to these areas. Adverse effects, however, are expected from noise impacts to residential areas located along public roads and railway serving KSAAP due to increases in employment and corresponding commuter traffic, delivery trucks, and rail car traffic associated with new development operations.

Indirect. Long-term minor adverse and beneficial effects are expected. Regional economic and population growth generated from redevelopment could increase traffic along existing roadways and regional noise associated with increased commercial/industrial operations in the region. On the other hand, beneficial effects would

occur for visitors to conservation and park land in the lowland areas at KSAAP. Many visitors to parks and wilderness areas place a high value on experiencing the natural soundscape devoid of detectable sounds of human origin. Therefore, more people will be able to experience the quiet wilderness areas around KSAAP under non-federal ownership.

4.5.2.2 Traditional Disposal Alternative

Direct. Minor to moderate, long-term adverse effects, similar to those described under the early transfer disposal alternative, are expected, but would occur further in the future.

Indirect. Minor long-term adverse and beneficial effects, similar to those under the early transfer disposal alternative, are expected, but would occur further in the future.

4.5.2.3 Caretaker Status Alternative

Direct. Minor beneficial effects are expected. Under this alternative, military missions would cease at KSAAP. Army missions would cease and new construction activities would be significantly reduced, thereby reducing noise generation at KSAAP. Accordingly, noise levels for this alternative would be lower than those for existing conditions or for other disposal alternatives.

Indirect. Minor beneficial effects are expected. Employee levels at KSAAP would be reduced under the caretaker alternative, which would result in fewer commute vehicle trips than current operations. Accordingly, traffic noise levels on public roads serving KSAAP would also be reduced.

4.5.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.5.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Minor to moderate, short-term and long-term adverse effects are expected at KSAAP. First of all, construction of 5 to 6 million square feet of facilities (depending on use of existing facilities) on KSAAP over the next 20 years would result in an increase in noise levels. Overall, development could increase industrial operations to five to ten times the current operational levels seen on KSAAP. Furthermore, the type of operations would be more varied and may include more intensive transportation components (rail and truck traffic), conveyors, heating systems, and unique waste generation and manufacturing processes. The increase in noise, however, is expected to cause only a minor adverse effect on surrounding communities due to the distance between the source and nearby residents, the presence of large buffer areas, and the short-term duration of the noise generated from construction. In the long term, new industrial and commercial tenants might use noise-generating equipment and noise-generating activities as part of facility operations. However, these activities

would generally be located in areas on KSAAP that are sufficiently distant from adjacent residential areas and sensitive receptors. It is unlikely that these activities would cause noise impacts to sensitive areas. Increases in energetics production and testing could cause moderate adverse effects to nearby residents (including on-site residents) and adjacent tenants, depending on the location and configuration of redevelopment and nature of the testing. Noise studies and planning will be required to ensure land use compatibility relative to noise levels for both on-site residents (520 units, 1,300 population), on-site tenants, and nearby residents. Furthermore, adverse effects are expected from noise impacts to residential areas located along public roads and railway serving KSAAP (both on- and off-site), due to increases in employment and corresponding commuter traffic, delivery trucks, and rail car traffic associated with new development operations.

Medium-Low Intensity, Indirect. Long-term minor adverse and beneficial effects are expected. First of all, regional economic and population growth generated from redevelopment could increase traffic along existing roadways and regional noise associated with increased commercial/industrial operations in the region. Also, long-term minor adverse effects could be experienced by employees if acoustic design and noise control engineering are not taken into account in the renovation and reuse of existing buildings. Three sources to be considered are occupational exposure to noise in excess of 85 dBs; dBA, heating, ventilation and air conditioning (HVAC) noise; and the sound of truck or rail traffic. Occupational exposures are regulated by the OSHA and need not be discussed further. HVAC noise should be considered in regard to the design of private office and conference areas. Ample guidance on controlling HVAC noise during the design of a system is available from the American Society of Heating, Refrigerating and Air-Conditioning Engineers. The sounds of traffic can be a problem for employees when offices with operable windows are located close to truck routes or railroad tracks, but this problem is easily avoidable through noise abatement methods.

Long-term beneficial effects would occur for visitors to conservation and park land in the lowland areas at KSAAP. Many visitors to parks and wilderness areas place a high value on experiencing the natural soundscape devoid of detectable sounds of human origin.

Low Intensity, Direct. Short-term and long-term adverse effects are expected, similar to those associated with the MLIR scenario; however, effects would be fewer and less intense. Development and operational activities responsible for noise generation would be about half the levels experienced from the MLIR scenario, but would exceed current baseline conditions.

Low Intensity, Indirect. Minor long-term adverse and beneficial effects are expected, similar to those associated with the MLIR scenario, although effects would be fewer and less intense.

4.6 GEOLOGY AND SOILS

This section describes the geologic setting and soils at KSAAP. The ROI for soils and geology includes the installation properties, geologic formations underlying these areas, and adjacent land.

4.6.1 Affected Environment

4.6.1.1 Physiography and Topography

KSAAP lies in the southeastern part of the Osage (Cuesta) Plains of the Central Lowlands physiographic province, which is generally the typically rolling prairie of eastern Kansas. The plant is constructed on a ridge lying in a north-south direction. The terrain is rolling and well sodded with prairie grass or seeded with cool season grasses. Except for locally steep slopes, most of the facility is fairly flat (U.S. Army 2005).

4.6.1.2 Structure and Subsurface Strata

The Osage Plains contain deeper soil and the Central Lowland physiographic province is characterized by low relief, interrupted at intervals by east-facing escarpments of limestone beds with relatively weaker beds of shale (USACE 1993). East facing slopes are generally steeper than west-facing slopes. The highest point on the KSAAP is the northeastern corner at 920 feet above mean sea level, and the lowest point is in the southwestern corner in Labette Creek at 780 feet above mean sea level (U.S. Army 2005).

The stratigraphic formations underlying the county from the oldest to youngest, of the Marmaton group, are the Fort Scott Limestone, Labette Shale, Pawnee Limestone, Bandera Shale, the Altamont Limestone, the Nowata Shale, and the Lenapah Limestone.

The Cherokee Group underlies the Marmaton Group and ranges in thickness from about 395-560 feet. The Cabaniss Formation is the first unit underlying the Marmaton Group. The shale and interbedded sandstone lenses of the Cherokee thicken toward the southwest in Labette County (U.S. Army 1998, 2005).

No distinct caves or identified cave networks have been identified in the area (U.S. Geological Survey (USGS) 1998).

4.6.1.3 Soils

The geologic map of Labette County prepared by USGS in 1998 and the Soil Survey of Labette County, Kansas, (USDA 1990) was used for information about soils occurring on KSAAP (U.S. Army 2005, 2006a). Overall, Labette County is located in the Chautauqua Arch, which is a westward uplift from the Ozark Plateau. Except for alluvial deposits, the entire installation is contained within the Marmaton group of the Pennsylvania system (USGS 1998).

There are five soil associations common to Labette County. Most of the installation is within the Parsons-Kenoma-Dennis Association, which is characterized as deep, nearly level and gently sloping, somewhat poorly drained to moderately well drained soils that have dominantly clayey subsoil. Surface area is silt loam or silty clay loam, and is mottled, dark brown (approximately 15-20 inches thick). Permeability is slow and run-off is medium. Shrink-swell potential is high throughout the soil profile and the pH is 5.5-6.0, slightly acidic (USDA 1990).

A small strip (>5 percent) of the Lanton-Osage Hepler Association occurs in the floodplain of Labette Creek (USDA 1990). Surficial deposits consist of Pleistocene terrace alluvium, Holocene floodplain deposits, and residuum from weathered bedrock, as well as a series of silt loam and clay soils.

4.6.1.4 Farmland Soil

Much of the KSAAP land is in agricultural production and will remain so for the foreseeable future. It is therefore important to consider the potential impact of development on the ability of the soils to support continued agriculture. The National Resources Conservation Service (NRCS) has adopted a farmland ranking system to assess the quality of farmlands, considering many other factors in addition to soil quality. The NRCS employs two kinds of criteria. The first is the “Land Evaluation Criteria - Relative Value” relating to the intrinsic value of the soil itself based on the soil’s relative value for agricultural production. The second type of criteria are the “Site Assessment Criteria” related to twelve factors such as the amount of urbanization within 1 mile and availability of farm services. This second group of criteria is not related to soil quality.

With respect to soil quality for agricultural production, the NRCS assigned a relative value of 63 out of 100 (See Appendix B, Farmland Conversion Impact Rating, Part V). It is noted that the total Farmland Conversion Impact Rating, as completed by the installation, exceeded the 160 threshold at which the Farmland Protection Policy Act would require consideration by a federal agency of reasonable measures to minimize the impact of farmland conversion resulting from federal or federally assisted programs. Land withdrawn from farmland inventory for military or national defense purposes, such as at KSAAP, is not subject to these considerations. Although the Farmland Protection Policy Act does not apply to military lands, the potential conversion from agricultural uses is considered in this EA.

4.6.1.5 Seismic Activity

Kansas does not have a history of frequent and destructive seismic activity but has undergone some infrequent strong earthquakes. The most recent was recorded in 1867. No further activity has been recorded. The closest fault line is located midway across the state in Ford and Meade Counties. The Crooked Creek fault is a Class B feature. This designation, however, is not certain due to the nature of the subsurface deformation. No exposures of the fault are known. The fault generally runs east to southeasterly in direction (USGS 1998).

4.6.2 Consequences

4.6.2.1 Early Transfer Disposal Alternative

Direct. Minor short- and long-term adverse effects are expected. Disposal of KSAAP would result in non-federal ownership and potentially reduced regulatory controls for the protection of natural resources as required under the Sikes Act for federal property. Thus, geologic and soil resources may not benefit from the many programs and policies set forth to protect these resources, such as implementation of the INRMP. Furthermore, disposal would ultimately lead to enhanced construction, demolition, and site-clearing activities that result in increases in erosion potential. If adequate erosion and sediment control practices are employed during construction, demolition, and renovation activities, then adverse effects could be minimized (see Section 4.6.2.5 for discussion of potential reuse impacts).

Indirect. Minor short- and long-term adverse and beneficial effects are expected. Although existing remedial actions would continue under either federal or non-federal ownership, under non-federal ownership additional resources may be available to renovate or remove facilities that are in disrepair and/or debris that may cause localized deterioration of soil resources. In addition, minor beneficial effects associated with non-federal control may result from increased renovation and upgrading of facilities to comply with current building codes and up-to-date designs that minimize storm water runoff and other effects adverse to soils. On the other hand, long-term minor adverse effects would also be expected, as disposal will invariably lead to economic expansion in the region and enhanced construction and site-clearing activities that result in increases in erosion potential. If adequate erosion and sediment control practices are employed during construction, demolition and renovation activities, then adverse effects could be minimized.

4.6.2.2 Traditional Disposal Alternative

Direct. Minor short- and long-term adverse effects are expected similar to the effects outlined for early transfer.

Indirect. Minor short- and long-term adverse and beneficial effects, similar to those described under the early transfer disposal alternative, are expected, but would occur further in the future.

4.6.2.3 Caretaker Status Alternative

Direct. Negligible adverse effects are expected. Under the caretaker status, natural resource management programs and objectives outlined in the INRMP for KSAAP may not be pursued to the same degree (U.S. Army 2005). This could result in low levels of erosion controls and vegetative controls that benefit geologic and soil resources.

Indirect. Long-term minor beneficial effects are expected. Military missions will cease, and new construction and ground disturbing activities will be significantly reduced. Thus,

land use intensity will be below levels assumed under current conditions, thereby resulting in long-term minor benefits to geologic resources relative to future conditions expected under baseline conditions.

4.6.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment, including implementation of INRMP measures and remedial programs required under CERCLA and RCRA. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.6.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Short- and long-term adverse minor effects are expected. Building construction involving soil excavation grading, soil removal, and vegetation clearing could result in short- and long-term minor adverse effects to soils, including increased erosion. The KSAAP LRPA reuse plan envisions a mixed use of property, focusing primarily on industrial, business/commercial, professional, and residential uses that would include construction of up to 5 to 6 million square feet of new facilities. Ultimately, as much as 1,500 acres of additional land space may be disturbed by construction activities, including demolition and redevelopment of portions of existing space. Furthermore, agricultural leasing and construction could lead to the removal of vegetation. Also, additional road construction could result in adverse impacts to soils from erosion activities. Phasing of such levels of redevelopment over a 20-year period, as well as application of Best Management Practices (BMP) to reduce erosion during construction, will reduce adverse effects to this resource.

Under worst case conditions, if all highly disturbed and redevelopment areas are in agriculture (roughly 1,500 acres) then the potential loss would represent approximately 0.1 percent of the farmland resources within the ROI, 0.4 percent in Labette County, and 15 percent on KSAAP. Given that 85 percent of the ROI consists of farmland, with the vast majority of the soils in the region being considered prime soil types, this potential loss of farmland (if it were to occur) would not rise to the level of significance.

Medium-Low Intensity, Indirect. Long-term minor adverse and beneficial effects are expected in localized areas. Long-term minor adverse effects are expected as disposal will invariably lead to economic expansion in the region and enhanced construction and site-clearing activities that result in increases in erosion potential. If adequate erosion and sediment control practices are employed during construction, demolition, and renovation activities, then adverse effects could be minimized. On the other hand, enhanced renovation and debris disposal of old production lines that contain residual contamination (U.S. Army 2006a) will reduce the potential for future degradation of soils from the leaching of residuals that may be present in the vicinity of concrete slabs, pipes, and other building materials that are in direct contact with soils.

Low Intensity, Direct. Short- and long-term minor adverse effects are expected. Effects similar to those discussed under MLIR are expected to occur, but to a lesser degree.

Low Intensity, Indirect*.* Long-term minor adverse and beneficial effects are expected. Effects similar to those discussed under MLIR are expected to occur, but to a lesser degree.

4.7 WATER RESOURCES

4.7.1 Affected Environment

This section includes a discussion of surface water, watersheds and drainage, groundwater hydrology and quality, floodplains, and water usage on KSAAP. The ROI for water resources comprises the area of the installation and areas immediately adjacent. Point and nonpoint sources of pollution on the installations are also discussed in this section. Storm water conveyance systems are addressed in Section 4.12, Utilities.

4.7.1.1 Surface Water and Drainage

Southeastern Kansas lies within the hilly Osage Plains that also cover west-central Missouri and most of central Oklahoma and extend into north-central Texas. Drainage throughout the Osage Plains is well-defined and characterized by dendritic river, stream, and creek patterns that are not conducive to the natural occurrence of large standing bodies of water (U.S. Army 2005).

Rainfall for Labette County is moderate at 42 inches per year, and average seasonal snowfall is about 12 inches. Monthly average rainfall, as reported by the U.S. Weather Service for Parsons, Kansas, is shown in Table 4.7-1 (U.S. Army 2005).

Table 4.7-1 Average Precipitation for Parsons, Kansas (inches)

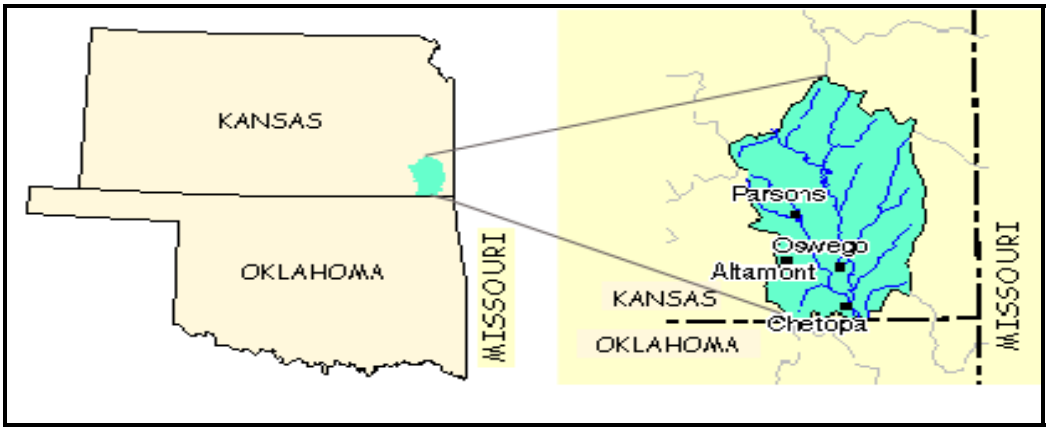
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Rainfall Equivalent	1.37	1.78	3.37	3.82	5.39	4.82	3.83	3.42	4.93	4.04	3.29	2.03

Note: Precipitation data collected for Parsons, Kansas, from the National Weather Service.
Source: U.S. Army 2005

The closest river to KSAAP is the Neosho River. It meanders southward in the vicinity of KSAAP and, at its nearest proximity, it lies approximately one mile to the east of the main installation. The Neosho River, a 460 miles long tributary of the Arkansas River, is also part of the Mississippi River watershed.

The drainage area of the Neosho River is 4,905 square miles. Average flow rate near KSAAP on the Neosho River in the past 20 years was 3,212 cubic feet per second (cfs). During years with average annual flow conditions, the Neosho River flow rate never fell below the regulated minimum daily flow designation of 50 cfs. The lowest annual average flow in the past 20 years was 389 cfs. During the year, the daily flow rate fell below 50 cfs on nearly 40 percent of the days, with 10 days of zero flow (USGS 2008). Peak discharge was during 1993, the year of the Great Midwestern Flood, when it was measured at 8,611 cfs.

KSAAP lies within the Middle Neosho River Basin. The location and range of the Middle Neosho Basin are shown in Figure 4.7-1.



Source: USEPA Surf Your Watershed: (http://cfpub.epa.gov/surf).

Figure 4.7-1 Middle Neosho River Basin

KSAAP has senior water rights to the Neosho River and maintains this right through annual usage. The installation's freshwater intake and treatment plant is on the banks of the Neosho River at the location where KSAAP is closest to the river (KSAAP owns 6 acres of land at this location, see Figure 4.2-1). Water is impounded by a concrete dam and treated at the water filtration plant. KSAAP is permitted to withdraw up to 1 million gallons per day (mgd) from the Neosho River, but actual withdrawal is far less; in the 180,000–200,000 gallons/day range. From the treatment plant, by way of its adjacent 1 million gallon covered reservoir, all potable water is supplied to the installation.

Regional trends in withdrawal from the Neosho River indicate a slow increase in water usage over the next 50 years, primarily due to projected industrial uses in Lyon County. Withdrawals in Labette County were projected to decline, although these projections did not account for planned redevelopment at KSAAP. Overall, water withdrawals were approximately 46 mgd in the Neosho River basin main stem in 2004. Water withdrawals are projected to increase to approximately 50 mgd in the next 50 years (KDHE 2007).

Labette Creek drains 211 square miles. No recent stream flow rates are available; these were last recorded during the period 1939–1945 when average discharge was approximately 215 cfs. Feeding Labette Creek from the northwest is Parsons Lake, which has a surface area of less than one square mile.

Figure 4.7-2 KSAAP Intermittent Streambed

Within the installation are 47 miles of rivers and streams, with most being intermittent streambeds that are seasonally flooded. Figure 4.7-2 shows a typical KSAAP intermittent streambed. Labette Creek and the Neosho River are the two primary drainages.

Included in the installation's 242 acres of aquatic habitat are 123 ponds that cover about 125 acres. The majority of these ponds, created for watering livestock, are scattered throughout the installation and range in size from 10 acres to less than one acre. Most average over one acre, and 40 of the installation's ponds are open to fishing. Many others are used for fish brooding.

Potential wetlands are widely scattered throughout the installation and account for the remaining aquatic habitat acreage. They are primarily adjacent to the ponds and drainage features and are most densely concentrated along the installation's western boundary, defined by Labette Creek.

Figure 4.7-3 shows KSAAP's surface water features (see Section 4.8 for discussion on wetlands). Creeks, streams, and rivers are indicated by purple lines, while ponds are shown in blue.

A well-developed surface water drainage system is present on the installation, as shown on Figure 4.7-3. A major drainage divide that trends southeasterly bisects the property. This divide extends from the Administration Area near the northern boundary to the east of the 1900 Area near the southeast boundary. In the northeastern part of the installation,

surface water drains east to the Neosho River, which is located about 1 mile east of the installation. In the southwestern portion of the installation, surface water drains westward into Labette Creek, which is located immediately west of the installation and coincides with the installation boundary in the vicinity of the sewage treatment plant. Labette Creek and the Neosho River both flow in a southerly direction and join about 15 miles south of the installation at the town of Chetopa.

Three of the installation's ponds are in abandoned quarries, 15 are associated with Plant production processes (oxidation ponds), and the remainder are located in the agricultural and woodland areas. Fifty-one ponds are stocked with fish. Many of the oxidation ponds were constructed within natural surface runoff drainages with the intent to allow natural flushing of the ponds to dissipate contamination. Three ponds at the installation are not part of the natural drainage pattern. These include two water treatment plant sludge lagoons (Solid Waste Management Units [SWMUs] 121 and 122) south of the 1700 Area and the evaporation pond for the 300 Area.

KSAAP operates under a Joint National and Kansas Pollutant Discharge Elimination System permit (Kansas Permit No. F-NE55-PO04, Federal Permit No. KS0029360), which regulates point source discharges and establishes limits of pollutants that may be discharged. The permit allows KSAAP to discharge from wastewater treatment facilities within effluent limitations and specifies monitoring requirements. Included in the permit are five industrial wastewater treatment facilities at five production facilities, the sanitary sewer treatment facility, and an oil/water separator in the maintenance area. Discharge from these units is through ditches that lead to Labette Creek. A Storm Water Pollution Prevention Plan, with additional monitoring requirements, has been implemented at KSAAP.

4.7.1.2 Groundwater Resources and Quality

On a regional basis, unconsolidated surficial deposits are potentially the best source of groundwater in Labette County, yielding as much as 100 gallons per minute (gpm). Two deep confined aquifers in the bedrock are less productive and more difficult to access than the shallower groundwater. The bedrock aquifers do not generally yield sufficient quantities of water to make them viable water sources, and the water tends to be hard and to contain excessive amounts of chloride, nitrate, and hydrogen sulfide.

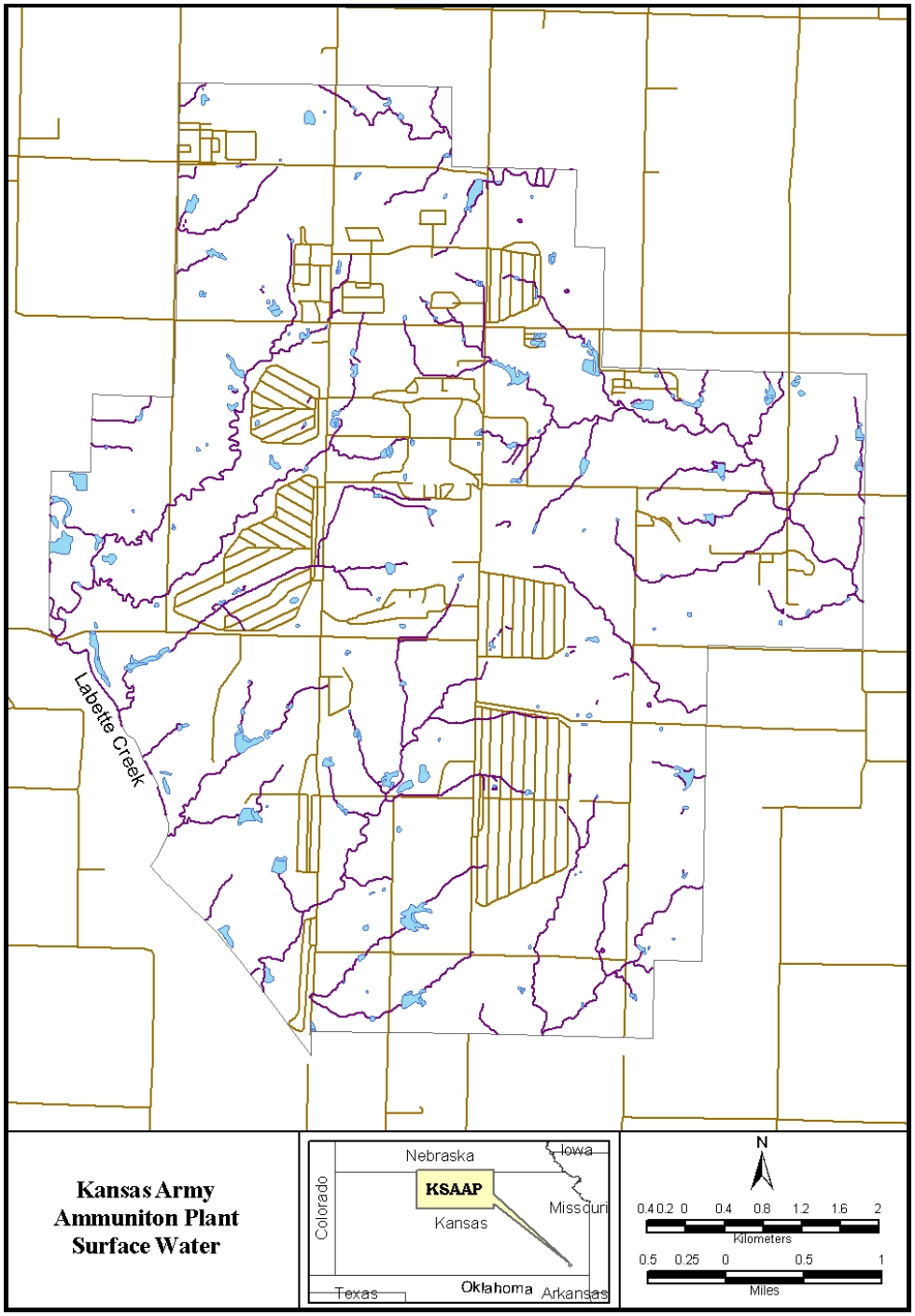


Figure 4.7-3 KSAAP Surface Water Features

The most extensive unconsolidated aquifer in Labette County is the Neosho River alluvium. It is about 35 feet thick and wells constructed in it range from 10 to 20 feet deep. These deposits have an average long-term yield of about 50 gpm, but may produce up to 100 gpm. Recharge is by direct infiltration of rainfall and spring run-off emanating from the consolidated rock bounding the valleys and by infiltration of waters during flooding. Potable water for local rural water districts is taken from these units near the Neosho River about 5 miles east of the installation.

Throughout the installation, water table depths vary from 1 to 20 feet below the ground surface. The water table is generally deeper in upland areas and generally shallower in small stream valleys and along Labette Creek and Neosho River. Artesian conditions were reported for monitoring wells near the active landfill in the east part of the installation. Based on groundwater levels measured at KSAAP, the following conclusions have been drawn:

- A north-south trending groundwater divide subdivides the facility into two groundwater flow systems. In the north part of the installation, this groundwater divide roughly coincides with the surface water divide that separates the Labette Creek and Neosho River watersheds.

- West of the divide, groundwater flows west-southwest toward discharge areas along Labette Creek. East of the divide, groundwater flows generally east toward discharge areas along Neosho River.

- South of the 1100 Area, groundwater flows south toward discharge areas near the quarries on Road 5.5, where a relatively major tributary of Labette Creek is located.

Local use of ground water aquifers is limited. Farms and residences located within a 1-mile radius of the installation receive potable water from rural water districts or from KSAAP. Surface water reservoirs located at least 7 miles north and west of the installation are also sources of water for rural water districts.

KSAAP has numerous groundwater monitoring wells. These wells were installed through IRP to determine groundwater contaminant levels. Under the IRP, all industrial areas and landfills are monitored.

Low-level Volatile Organic Compound (VOC) contamination of groundwater was found in the 700 Area, where an approved groundwater monitoring system is in-place for low level trichloroethene/tetrachloroethene contamination. The ongoing groundwater monitoring program has shown that natural attenuation is taking place.

Also under the IRP, periodic sampling over the rest of the installation is conducted for explosives. The KSAAP ECP (U.S. Army 2006a) states that the 1100 area is the only place where explosives have been detected. The 300 and 500 Areas' SWMUs 12 and 13

have been within regulatory limits and the 1100 Area has some low level contamination from the explosive RDX (Cyclotrimethylenetrinitramine). RDX was also detected in groundwater in the 1000 Area at levels greater than action levels.

Throughout the installation, groundwater contamination is limited to the upper aquifer (generally less than 30 feet) where flow is very slow due to the tight nature of the soil.

4.7.1.3 Floodplains

Floodplains are the typically flat areas adjoining surface waters, including, at a minimum, areas subject to a 1 percent or greater chance of flooding in any given year. Their size depends on numerous factors, including the volume of the watercourse, extent of the watershed, topography adjacent to the watercourse, soils and geology, and density of development in the watershed and adjoining the watercourse. Floodplains on KSAAP consist primarily of riparian areas associated with the installation's streams.

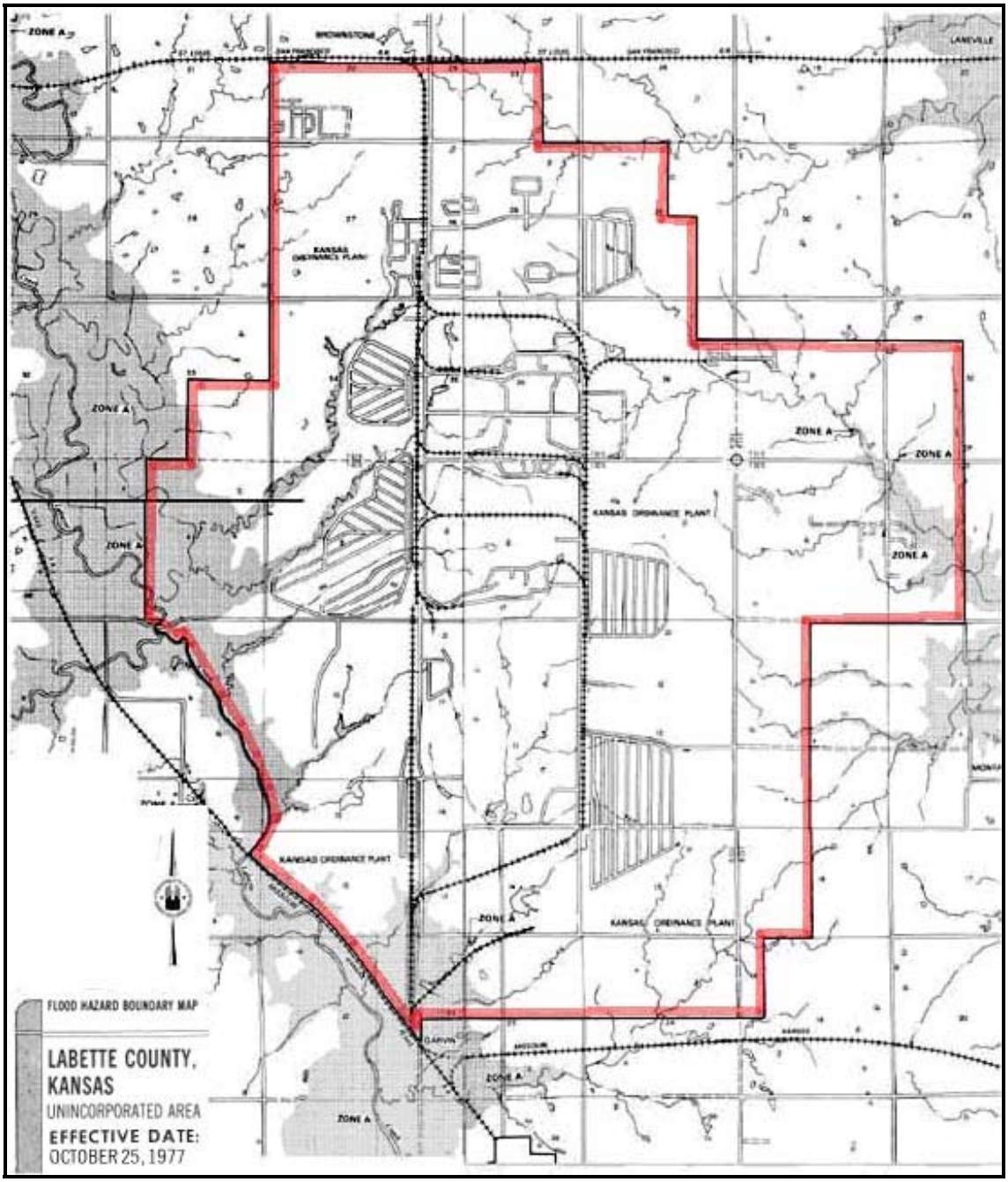
Construction of reservoirs on the upper Neosho River beginning in the 1950s has greatly reduced the potential for flooding at KSAAP. Occasional flooding, however, occurs for periods of up to four or five days. Within KSAAP, there are approximately 200 acres that occasionally flood for up to 24 hours during periods of heavy rainfall. These are mostly in open fields and buffer areas. Areas included in the 100-year flood plain are shown on Figure 4.7-4.

This flooding has not affected any of the buildings in the administration, production or storage areas. There are a couple of low spots in a couple of roads on the installation that have temporarily been blocked because of the runoff, but this is a rare and short lived occurrence.

In cases of moderate rainfall, the sewage treatment plant is routinely overloaded due to infiltration from severely degraded underground lines. The sewage treatment plant has been supplemented with a bypass because the old underground lines allow too much infiltration. However, even during the timeframe of the Great Midwestern Flood of 1993 there was no bypass being reported (although this may be due to further degradation of the lines). There is one reported instance of a railroad trestle sustaining washout damage that required repair, but installation staff is uncertain if that coincided with the 1993 event.

4.7.1.4 Water Usage

"Domestic" requirements account for two-thirds of all potable water usage at KSAAP; industrial usage accounts for the remaining one-third. Examples of the latter include filling boilers, cooling, cleaning, and preheating of components.



Source: Consolidated from map panels at FEMA Map Service Center, (http://www.fema.gov/).

Figure 4.7-4 100-year Flood Zone, KSAAP
(areas shaded gray)

4.7.1.5 Water Quality

4.7.1.5.1 Point Source Pollution

Point source pollution comes from specific, single locations, such as municipal sewage treatment plants, manufacturing plants and, particularly in Kansas, from large confined livestock feeding operations. Sources such as these are often easy to identify and control. Federal regulation of point source discharges began with the Water Pollution Control Act of 1972. This Act was amended by the CWA in 1977, which set the basic structure for regulating discharges of pollutants to surface waters of the United States. It is estimated that less than 20 percent of today's water quality problems in Kansas result from point sources.

KSAAP operates under a Joint National and Kansas Pollutant Discharge Elimination System permit (Kansas Permit No. F-NE55-PO04, Federal Permit No. KS0029360), which regulates point source discharges and establishes limits of pollutants that may be discharged. The permit allows KSAAP to discharge from wastewater treatment facilities within effluent limitations and specifies monitoring requirements. The permits include five industrial wastewater treatment facilities at five production facilities, the sanitary sewer treatment facility, and an oil/water separator in the maintenance area. Discharge from these units is through ditches that lead to Labette Creek.

4.7.1.5.2 Nonpoint Source Pollution

Nonpoint source pollution generally occurs over a large area, intermittently over a long period of time, and/or from diverse sources, such as farms, ranches, transportation corridors, and urban areas. It usually occurs sporadically and is often correlated with climatic events. Atrazine herbicide contamination of surface water is an example of nonpoint source pollution in Kansas and is the result of runoff from hundreds, possibly thousands, of farm fields within each watershed. Sometimes, after years of data collection, the problem can be pinpointed to specific fields. Often, many farms over an entire region must be targeted for use of a system of BMPs to reduce this nonpoint pollution source. After years of effort spent to effectively reduce point source pollution, many water quality specialists believe that most future improvements in water quality in the United States will be made by addressing nonpoint source pollution.

4.7.2 Consequences

4.7.2.1 Early Transfer Disposal Alternative

Direct. Minor short- and long-term adverse and beneficial effects may occur at KSAAP. Long-term minor beneficial effects to surface water are expected if early transfer results in new ownership that increases volumes being treated by the sewage treatment plant, as this will increase the treatment efficiency of the plant when operating at levels commensurate with its design. Current installation activities provide only marginal input and the plant was designed for maximum biodegradation efficiencies at input volumes approximately five times the present input of 100,000 gallons per day. With respect to

adverse effects, disposal of KSAAP may result in some reduction in regulatory requirements for the protection of natural resources as required under the Sikes Act for federal property. Thus, water resources may not benefit from the many Army programs and policies set forth to protect water resources, such as implementation of the INRMP. If adverse effects occur, they would be relatively minor, however, because remedial activities and many aspects of water resource protection would continue per state and federal requirements. In the long term, further development may adversely affect water quality by increasing the area of impervious surfaces (see Section 4.7.2.5 for further discussion of effects from reuse). Also, minor adverse effects could occur if demolition and site clearing activities took place and resulted in increased erosion and inputs of potentially contaminated materials to surface waters. These impacts would be minor because erosion and sediment control and other BMPs would be employed during construction, demolition, and renovation activities. Minor adverse effects associated with increased water usage and water discharge are described in Section 4.7.2.5.

Indirect. Minor long-term beneficial effects may occur at KSAAP. Under non-federal ownership, additional resources may be available to accelerate efforts to renovate and remove debris, buildings, and subsurface pipe networks, as well as upgrade wastewater treatment facilities, which will provide an indirect long-term benefit to water quality.

4.7.2.2 Traditional Disposal Alternative

Direct. Minor short- and long-term adverse and beneficial effects, similar to those described under the early transfer disposal alternative, are expected, but would occur further in the future.

Indirect. Minor long-term beneficial effects, similar to those described under the early transfer disposal alternative, are expected, but would occur further in the future.

4.7.2.3 Caretaker Status Alternative

Direct. Short- and long-term beneficial effects and minor short- and long-term adverse effects are expected at KSAAP. Under the caretaker status, natural resource management activities may not take place on KSAAP to the same degree, which would have an adverse effect on water resources. For example, many of the ponds are actively stocked with fish as part of the INRMP (U.S. Army 2005). The installation's environmental office uses the ponds for fish brooding, which maintains juvenile and adult populations in the brooding ponds and also serves to stock or restock other ponds on the installation. This activity not only enhances recreation but is also beneficial for the long-term health of the ponds. Under caretaker status, this may not occur and the quality of the ponds would be adversely affected.

On the other hand, reduction in facility operations could have a beneficial effect. Caretaker status would involve reduced wastewater discharge and water intakes, as well as fewer vehicles, which are potential sources of contaminants such as lubricants, coolants, and fuels that could be transported by storm water runoff. Likewise, caretaker

status would involve less use of fertilizers, fuels, pesticides and herbicides, and reduced warehouse and shop activities, which would also contribute to a reduction in storm water contaminant loads.

Indirect. No indirect effects are expected at KSAAP.

4.7.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for realignment and closure, including implementation of INRMP measures and remedial programs required under CERCLA and RCRA. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.7.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Short- and long-term minor adverse and beneficial effects are expected. Short-term and long-term minor beneficial effects to surface water are expected if redevelopment results in increased volumes being treated by the sewage treatment plant, as this will increase the treatment efficiency of the plant when operating at levels commensurate with its design. Current installation activities provide only marginal input and the plant was designed for maximum biodegradation efficiencies at input volumes approximately five times the present input of 100,000 gallons per day.

With respect to adverse effects, increased facility operations and construction, as well as increases in impervious surfaces, may adversely affect water quality. Although the increase in impervious surface is anticipated to be small relative to the existing conditions (about 2 percent of additional land area based on conservative assumptions for build-out, and nearly 4 percent total impervious surface when added to existing conditions), construction resulting from implementation of the MLIR scenario would increase the area of impervious surfaces such as those associated with new buildings, parking lots, loading docks, roads, railway, and walkways. Increased impervious surface area would result in increased storm water runoff, and therefore greater inputs of potential contaminants and sediments into surface water and ultimately groundwater, thus potentially adversely affecting water quality to a minor extent. Construction of storm water detention/retention systems would help reduce effects associated with storm water runoff from impervious surfaces.

The MLIR scenario at full build-out would also result in an increase in both passenger vehicles and vehicles associated with trucking activities, which would increase the amount of contaminants such as lubricants, coolants, and fuels that may be transported to the waterways over the same roadways and parking areas that are constructed for their benefit. BMPs employed during site construction and operation of new facilities at KSAAP, such as construction of suitable drainage and storm water treatment structures,

or business practices to prevent discharge of oil and other chemicals into storm drains, will be implemented for the MLIR scenario and will reduce the potential level of effect.

The addition of 5 to 6 million square feet of facilities on KSAAP will result in increased water withdrawals from the Neosho River, as well as increased discharge of effluents from treatment plants. As discussed in Section 4.13, Hazardous and Toxic Substances, increased generation of wastewater from new industrial processes envisioned in the reuse plan will require re-evaluation of the carrying capacity of the existing wastewater treatment plant and the receiving streams' assimilative capacity (including thermal and other water quality parameters). In particular, infiltration is a key problem with the current wastewater treatment plant (KSAAP LRPA 2007). Water consumption and wastewater infrastructure issues are further discussed in the Section 4.12, Utilities. Additional discharge of effluents into the Neosho River will require discharge permitting and modeling to assess the impacts to water quality. Through the permitting process, treatment technology standards, discharge limits, and monitoring will be required to ensure compliance with the CWA and state regulations, as well as ensure that receiving streams continue to meet their designated use for the protection of human health and the environment.

Under reuse total water volume requirements may be well above baseline conditions of 200,000 gd. It is estimated that the MLIR may require 3 mgd based on projected land and water usage (based on analysis of average industrial and nonindustrial water usage and projected build-out for the MLIR scenario) (USEPA 2008c, USGS 2008, BLS 2008), which is approximately 50 percent higher than estimated levels provided by the KSAAP LRPA (of 2 mgd). At this projected usage, the MLIR would require approximately 15 times the current baseline intake of water and three times the current permitted level of 1 mgd. During an average year, 3 mgd represents approximately 0.1 percent of the base flow of the river. Withdrawal at this rate, would not generate any additional low flow daily event episodes (either at 50 cfs or zero flow events). In consideration of the lowest average annual flow within the past 20 years, withdrawal up to 3 mgd represents less than 5 percent of base flow during the lowest year. It is estimated that during such a drought year, an additional six days of 50 cfs flow would occur, while there would be no additional days of zero flow events. During that same year there were over 140 days of flow already below 50 cfs. As such, operations at KSAAP would be unable to obtain water from the Neosho River when the flow drops below 50 cfs. Analysis of water availability in the Neosho River indicates that engineering solutions (such as construction of a 100-acre reservoir) and/or alternative sources of water would be required to support this level of water usage during low-flow events (covering approximately a 100 day continuous drought event as recorded during the lowest flow event in the past 20 years) in order to maintain minimum flow requirements in the Neosho River of 50 cfs and maintain operations at 3 mgd. Furthermore, very minor changes to these management measures (e.g., setting the minimum flow requirement above 55 cfs in the Neosho River and slightly expanding storage capacity) would ensure that no additional days of 50 cfs would occur within a 20 year period. In any event, withdrawal of water volumes above the present allowable limit of 1 mgd would be subject to permitting and review by KDHE and USFWS

(as discussed further in Section 4.8). As such, projected water withdrawals are expected to have a negligible effect on water levels further downstream.

Medium-Low Intensity, Indirect. Long-term minor adverse and beneficial effects are expected. Economic market forces generated by reuse would increase further infrastructure and development off the installation, thereby adding to the level of impervious surface within the watershed. Given the rural nature of the region and the low levels of development, only negligible adverse effects to recharge and water quality are expected. On the other hand, additional resources and market forces may accelerate efforts to renovate and remove debris, buildings, and subsurface pipe networks, as well as upgrade wastewater treatment facilities, which may provide an indirect long-term benefit to water quality.

Low Intensity, Direct. Short- and long-term minor adverse and beneficial effects are expected. Effects similar to those discussed under MLIR are expected to occur, but to a lesser degree. Under the LIR scenario, water usage are expected to be within the permitted limits established at KSAAP of less than 1 mgd (based on analysis of average industrial and nonindustrial water usage and project build-out for the LIR scenario [USEPA 2008c, USGS 2008, BLS 2008]), which is a third of the levels identified above for the MLIR scenario. Overall, the amount of impervious surface and operational and construction intensity would be about half of what is estimated for the MLIR scenario.

Low Intensity, Indirect. Long-term minor adverse and beneficial effects are expected. Effects similar to those described under MLIR are expected to occur, but to a lesser degree.

4.8 BIOLOGICAL RESOURCES

4.8.1 Affected Environment

4.8.1.1 Flora

4.8.1.1.1 Vegetative Community

Vegetative community types on KSAAP include bottomland hardwood forest, native prairie, mixed hardwood and prairie, hay meadow, and agriculture. Grasslands are a matrix of native tallgrass prairie, early succession fields, and cool season grasses. There are about 822 acres of native or fescue hay on KSAAP. Cropland occupies 938 acres. Nearly 8,000 acres of KSAAP (which include portions of the ammunition storage areas) are grazed by cattle. There are 242 acres of impoundments, potential wetlands, and streams, which support aquatic communities. Figure 4.8-1 shows vegetative types on KSAAP.

Forested areas are primarily an oak-hickory association occupying about 759 acres found primarily within and along riparian corridors. Principal tree species occurring in undisturbed forested areas include black walnut (*Juglans nigra*), red oak (*Quercus rubra*), green ash (*Fraxinus pennsylvanica*), pecan (*Carya illinoensis*), silver maple (*Acer saccharinum*), and bur oak (*Q. macrocarpa*).

4.8.1.1.2 Flora Inventory

The Kansas Biological Survey (KBS) conducted a survey for threatened and endangered species during 1994 and established a list of vascular plants for KSAAP. Specimens were collected and deposited in the R.L. McGregor Herbarium at the University of Kansas. A total of 501 vascular plant taxa, out of 820 documented for the county, were confirmed. An additional 68 taxa have been added to this list by KSAAP Natural Resources personnel. A list of vascular plants known to occur in Labette County and those confirmed on KSAAP is presented in Appendix E.

Heartland Forestry performed a forest inventory and prepared a management plan for KSAAP in 1992. Tetra Tech EM, Inc. (USACE 2003) conducted an invasive species survey of KSAAP in 2003. The survey focused on confirming known locations of invasive species, mainly sericea lespedeza (*Lespedeza cuneata*), and expanding on the knowledge of all invasive species on the installation. Six targeted species of invasive plants were encountered including: sericea lespedeza, Johnson grass (*Sorghum halepense*), musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), eastern red cedar (*Juniperus virginiana*), field bindweed (*Convolvulus arvensis*), and Bermuda grass (*Cynodon dactylon*). One nontarget species, white poplar (*Populus alba*), also was identified as a potential problem.

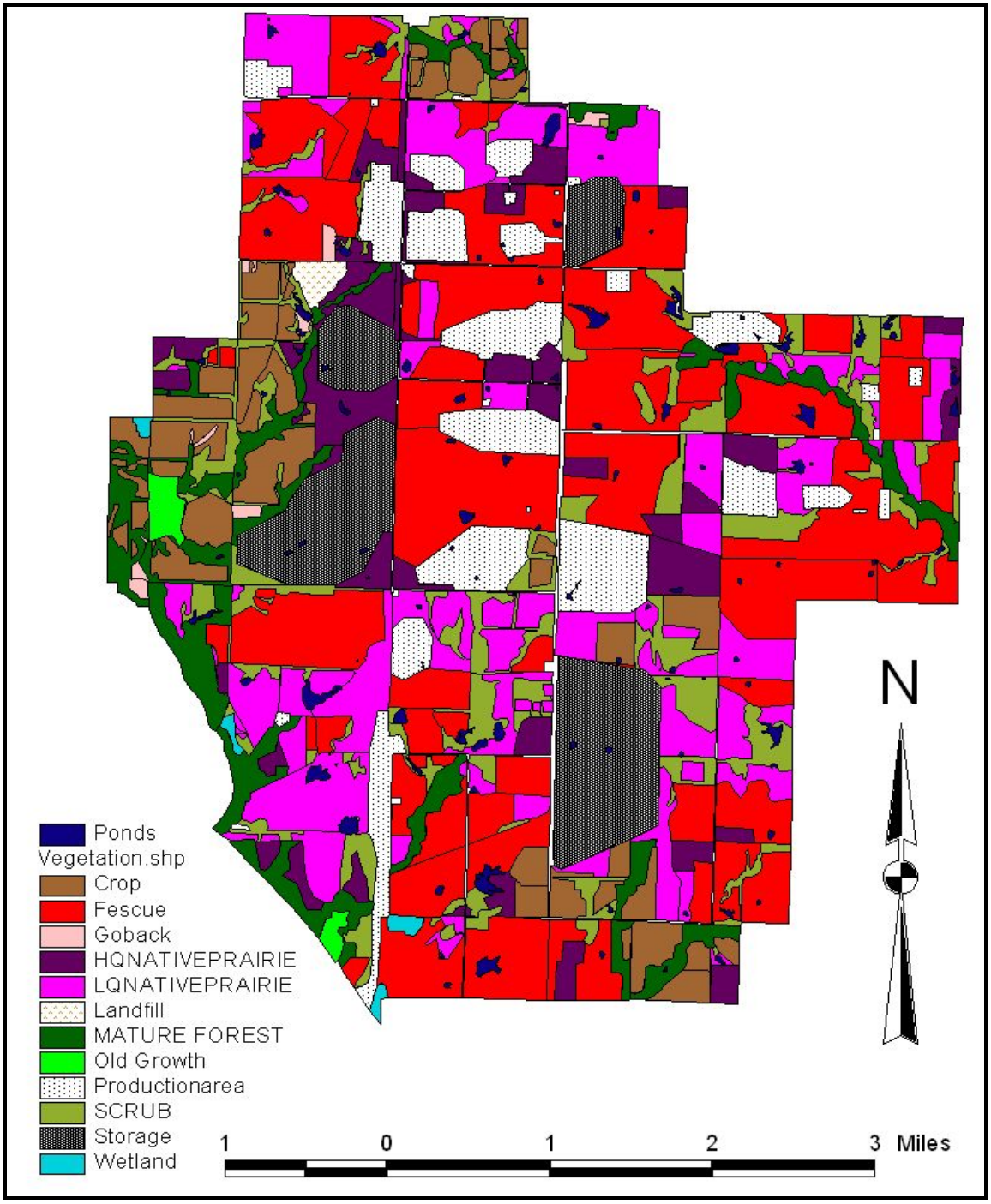


Figure 4.8-1 Vegetation Types on KSAAP

In 2004 and 2005 KSAAP and KDWP funded a Kansas State University study on plant and bird community responses to winter and riparian grazing by cattle (Johnson 2004). Winter grazing was conducted in pastures dominated by tall fescue. Preliminary results indicate a decreased abundance of tall fescue and an increased abundance of native grasses and forbs in pastures subjected to winter grazing. Preliminary results of the riparian grazing show a divergence of bird species between grazed and ungrazed riparian areas.

4.8.1.1.3 Special Status Flora

KSAAP surveyed for threatened and endangered species in 1994. The KBS searched for the federally threatened Meads milkweed (*Asclepias meadii*), and Natural Resources personnel surveyed for this species annually from 1996 to 1999. The KBS surveyed for the federally threatened western prairie fringed orchid (*Platanthera praeclara*) in 1994 and 1995. No threatened or endangered floral species, including Meads milkweed and western prairie fringed orchid, have been documented on KSAAP (Eifler et al. 1995).

4.8.1.2 Fauna

The KBS conducted initial fauna inventories in 1994. These surveys, however, were limited to federal- and state-listed species, but casual observations of non-listed species were noted. KSAAP fauna inventories began in 1996 with a breeding bird survey, a herpetofaunal survey, and fish and mussel surveys of Labette Creek. In 1999 an American burying beetle (*Nicrophorus americanus*) survey was performed as well as a fish and mussel survey in the Neosho River below the KSAAP Intake Facility. A total of 252 taxa of vertebrate wildlife and mussels have been confirmed on KSAAP. A list of fauna known to occur on KSAAP is presented in Appendix F.

4.8.1.2.1 Mammals

Mammals typically found on KSAAP include the white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), eastern fox squirrel (*Sciurus niger*), red fox (*Vulpes vulpes*), bobcat (*Lynx rufus)*, beaver (*Castor canadensis*), striped skunk (*Mephitis mephitis*), and opossum (*Didelphis virginiana*). Thirty-one mammal species have been confirmed on KSAAP (see Appendix F).

4.8.1.2.2 Invertebrates

A general invertebrate species inventory has not been performed on KSAAP. The exception is the American burying beetle, which is discussed in Section 4.8.1.3.7, Special Status Fauna. Various invertebrates, however, such as worms, beetles, and grubs, are likely common on KSAAP.

4.8.1.2.3 Birds

Breeding bird surveys were conducted annually on KSAAP from 1996 through 1998 and 2002 through 2004. Birds commonly found on KSAAP include the wild turkey (*Meleagris*

gallopavo), Northern bobwhite quail (*Colinus virginianus*), red-winged blackbird (*Agelaius phoeniceus*), great blue heron (*Ardea herodias*), ruby-throated hummingbird (*Archilochus solubris*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), American goldfinch (*Carduelis tristis*), rock dove (*Columba livia*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), horned lark (*Eremophila alpestris*), red-bellied woodpecker (*Melanerpes carolinus*), European starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*). Several species of migratory birds reside on KSAAP, including the Canada goose (*Branta canadensis*), wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), and mourning dove (*Zenaida macroura*). One hundred eighty-one bird species have been confirmed on KSAAP (see Appendix F). Many of these species are protected under MBTA and E.O. 13186.

4.8.1.2.4 Fish

Thirty-seven fish species have been confirmed in KSAAP and surrounding waters. Fish species commonly found on KSAAP include the yellow and black bullhead (*Ameriurus natalis, A. melas*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), warmouth (*Lepomis gulosus*), green sunfish (*L. cyanellus*), bluegill (*L. macrochirus*), flathead catfish (*Pylodictis olivaris*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), and black crappie (*P. negromaeulatus*). Aquatic surveys were conducted in Labette Creek in 1996, 1997, 1998, and 2002 and in Labette Creek and the Neosho River in 1999.

4.8.1.2.5 Mussels

Aquatic surveys in Labette Creek in 1996, 1997, 1998, and 2002 and the Neosho River in 1999 have confirmed the presence of 20 species of mussels. Confirmed species include threeridge (*Amblema plicata*), white heel-splitter (*Lasmigona complanata*), common pond mussel (*Ligumia subrostrata*), pink papershell (*Potamilus ohiensis*), pimpleback (*Quadrula pustulosa*), and pistolgrip (*Tritogonia verrucosa*). Three species on the Kansas Species-in-Need-of-Conservation list were documented in Labette Creek. They include the yellow sandshell (*Lampsilis teres*), washboard (*Megalonaias nervosa*), and fawnsfoot (*Truncilla donaciformis*).

4.8.1.2.6 Amphibians and Reptiles

Herpetological surveys were conducted on KSAAP in 1996, 1997, and 2000. Twenty-seven reptile species and nine amphibian species have been confirmed on KSAAP. Reptiles occurring on KSAAP include the snapping turtle (*Chelydra serpentina*), painted turtle (*Chrysemys picta*), rat snake (*Elaphe obsoleta*), common kingsnake (*Lampropeltis getula*), plainbelly water snake (*Nerodia erythrogaster*), brown snake (*Storeria dekayi*), and common garter snake (*Thamnophis sirtalis*). Amphibians occurring on KSAAP include the American toad (*Bufo americanus*), smallmouth salamander (*Ambystoma texanum*), great plains narrowmouth toad (*Gastrophryne olivacea*), western chorus frog (*Pseudacris triseriata*), and bullfrog (*Rana catesbeiana*).

4.8.1.2.7 Special Status Fauna

KSAAP surveyed for threatened and endangered species in 1994 (Eifler et al. 1995). The American burying beetle (federally endangered) was surveyed for in 1994, 1996, and 1999. The last observation of this species in the state of Kansas was in 1940 until a recent discovery in Wilson and Montgomery counties, west of KSAAP. No American burying beetles have been found on KSAAP; however, the most recent survey revealed a large (1,202 individuals) and diverse (seven species) carrion beetle community.

The Neosho madtom (*Noturus placidus*) (federally threatened), a small, mottled dark and light brown fish with dark bars on the tail fin, was documented within approximately 100 yards downstream of the KSAAP-owned dam on the Neosho River in 1999 near the KSAAP property line. The Neosho madtom is restricted to mainstreams of the Neosho and Spring River drainages in southeastern Kansas. It is highly unlikely that this fish occurs for any length of time on Army-owned property due to the effects of the low-water dam.

Currently, no federally listed threatened or endangered species have been documented on KSAAP, as denoted in the 1994 report by the KBS (KSAAP 2005). The bald eagle (*Haliaeetus leucocephalus*) (formerly federally threatened) was sighted in 1997, 1999, and 2004 passing overhead, but no bald eagles have been documented roosting or nesting on the installation. Although no survey has been done, USFWS has determined that the Indiana bat (*Myotis sodalis*), a federally listed endangered species, may occur in the project area. According to the USFWS, the large trees in the Labette Creek corridor could provide roosting sites for the Indiana bat if present. Unused buildings and large culverts may also provide roosting sites for the Indiana bat if present. The nearest location where Indiana bats have been found was approximately 50 miles from KSAAP (USFWS 2007). To this date, Indiana bats have never been found in the state of Kansas. Furthermore, historical and current range maps provided in the recovery plan for the Indiana bat do not show KSAAP as being within its historical or current range (USFWS 2007). In addition to the Indiana bat, the distribution range map for the gray bat (*Myotis grisescens*), another federally listed endangered species, indicates that the species may be found in southeastern Kansas, although KSAAP is not contained within its range.

Army regulations require consideration of state-listed species in all Army actions. Several state-listed species may be found on KSAAP. The butterfly mussel (*Ellipsaria lineolata*) (state-threatened) was documented at the intake facility on the Neosho River in 1994 and 1999. The species is found in the Neosho, Spring, Fall, and Verdigris Rivers in southeastern Kansas. Other state-listed threatened or endangered species with potential (albeit low) to occur on KSAAP include the endangered flat floater mussel (*Anodonta suborbiculata*), the threatened flutedshell mussel (*Lasmigona costata*), the endangered Neosho mucket mussel (*Lampsilis rafinesqueana*), and the endangered rabbitsfoot mussel (*Quadrula cylindrica*). There is potential for all but the rabbitsfoot to occur in Labette Creek. However, surveys have not revealed any specimens. The threatened Ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) is thought to be extirpated in the Neosho River and therefore unlikely to occur on KSAAP. The threatened broadhead skink (*Eumeces laticeps*), the threatened common map turtle (*Graptemys geographica*), threatened Snowy Plover (*Charadrius alexandrinus*), and the threatened Eastern spotted skunk (*Spilogale putorius*) have not been documented, but potentially could occur on KSAAP.

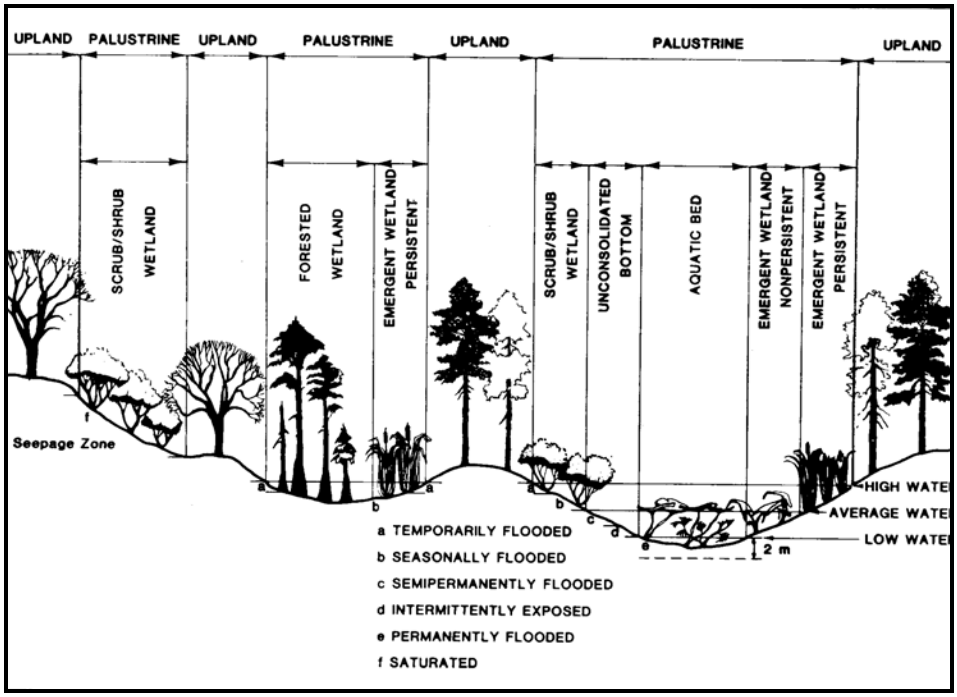
There are 12 species listed as Species In Need of Conservation by the state of Kansas known to occur on KSAAP. These species are denoted in Appendix F.

4.8.1.3 Wetlands

"WETLANDS are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of the year." (Cowardin et al. 1979)

USFWS completed a wetlands inventory of KSAAP in 1998 (USFWS 1999). This inventory identified 242 acres of potential wetland habitat on KSAAP. It should be noted, however, that this inventory does not constituent a jurisdictional wetlands determination in accordance with USACE guidelines. Thus, the habitat identified in this section should be considered potential wetlands habitat subject to formal boundary and classification in accordance with such guidelines. All potential wetlands identified on KSAAP likely fall into the Palustrine wetland type. Figure 4.8-2 depicts classification of potential wetlands on KSAAP. More than half of these (137 acres) are classified as permanent aquatic beds from watershed ponds. Of the remainder, 60 acres are potential emergent wetlands, 34 forested, 8 are scrub and 3 acres are unconsolidated shore. Figure 4.8-3 shows potential wetlands of KSAAP in blue and green. The majority of potential wetlands habitat runs along riparian corridors along the banks of streams of KSAAP (see blue-shaded potential wetlands in Figure 4.8-3). Creeks, streams, and rivers are indicated by blue lines and ponds are outlined in grey.

Aquatic beds include wetlands and deepwater habitats dominated by plants that grow principally on or below the water surface for most of the growing season. This wetland type represents a diverse group of plant communities that require surface water for optimum growth and are best developed in relatively permanent water or under conditions of repeated flooding (Cowardin et al. 1979). This wetland type is represented on KSAAP by the ponds scattered across the installation (Figure 4.8-3).



Source: Cowardin et al. 1979

Figure 4.8-2 Palustrine Wetland Types

Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes (excluding mosses and lichens) that are present for most of the growing season in most years. Perennial plants are usually dominant. These areas maintain the same appearance year after year. They are what most people would describe as a marsh and contain a vast array of grass-like plants such as cattail (Cowardin et al. 1979).

Forested wetlands are characterized by woody vegetation that is 6 meters tall or taller. They normally possess an overstory of trees, and an understory of young trees or shrubs. (Cowardin et al. 1979). This type of wetland most likely occurs along Labette Creek and in other forested areas.

Shrub wetlands include areas dominated by woody vegetation less than 6 meters tall. True shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included (Cowardin et al. 1979). Much of this type of

wetlands is likely found in areas where trees were harvested in the recent past. Others are found in old farm fields that have been allowed to revert to forest.

Unconsolidated shore wetlands are characterized by substrates lacking vegetation except for pioneering plants that become established on landforms produced by erosion and deposition, such as beaches, bars and flats, and during brief periods of favorable growing conditions (Cowardin et al. 1979). These wetlands are most likely found along Labette Creek and other streams on KSAAP.

4.8.1.4 Areas of Special Interest

Labette Creek Corridor. Labette Creek is a perennial stream that drains into the Neosho River about 30 miles south of KSAAP. The corridor is mostly timber with a few fragments of native tallgrass prairie and go-back land (prairie reintroduction area). Timber immediately adjacent to Labette Creek is high quality and is considered one of the best examples of an eastern floodplain forest in the state of Kansas. The corridor encompasses the entire riparian area adjacent to the creek, as well as associated drainages.

Most of the Labette Creek Corridor is either protected from livestock grazing or not within a grazing lease. Occasional floods may scour the area adjacent to the creek, but this is generally of short duration. In addition to native tallgrass prairie remnants, the corridor is an important neotropical bird migration stopover and breeding area.

Native Prairie. There are about 40 high-quality (approximately 1,000 acres) and 70 low-quality (approximately 2,000 acres) native prairie areas on KSAAP. Many of the high-quality areas are part of an experimental, rotational, grazing management scheme as a form of biological control for invasive and low-quality vegetative species. This management scheme has maintained high-quality native prairie species in these areas. Some low-quality native prairie areas have been included in the new grazing management scheme and appear to be undergoing a transition to a higher quality native prairie community.

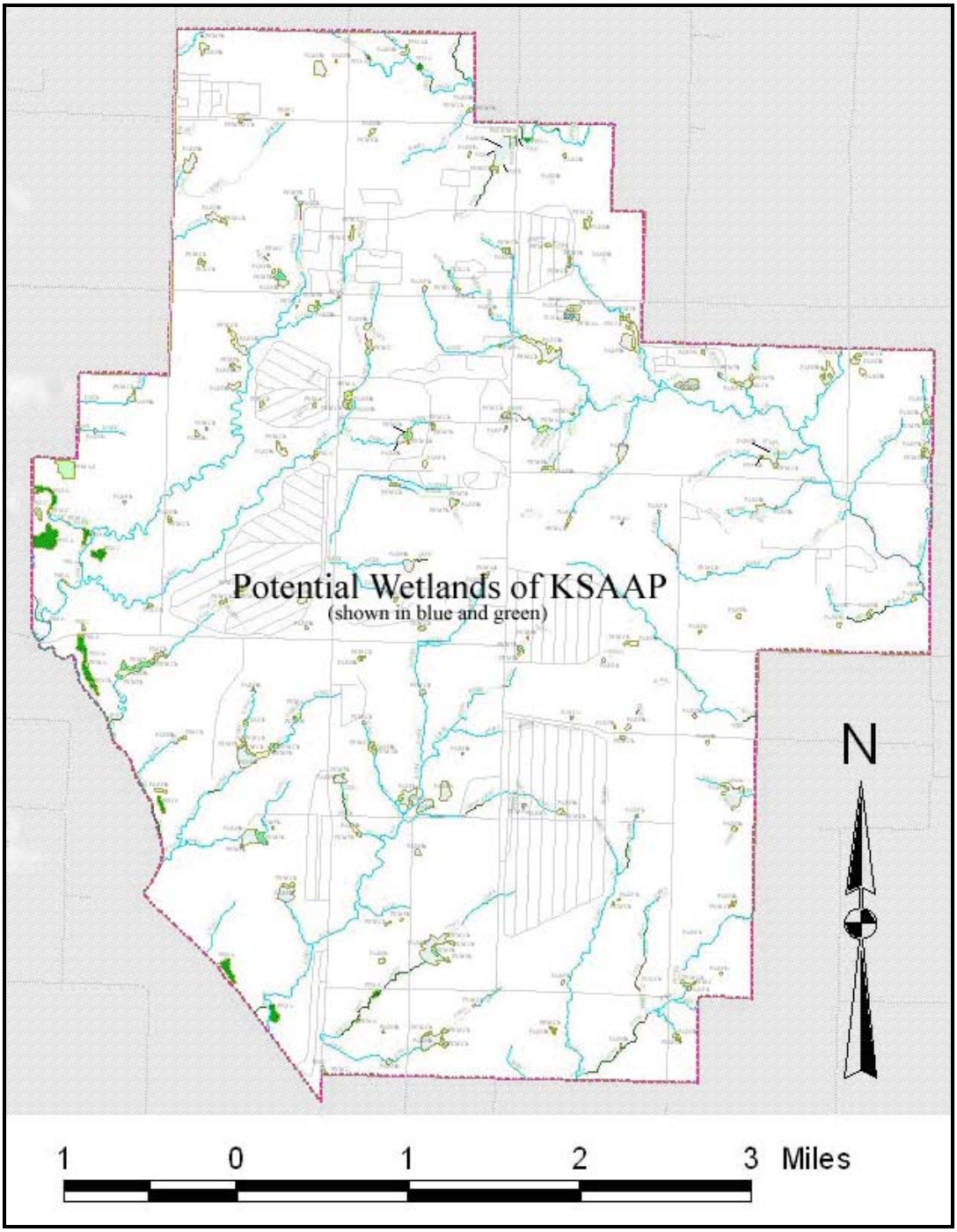


Figure 4.8-3 Potential Wetlands Features of KSAAP

4.8.1.5 Consequences

4.8.1.6 Early Transfer Disposal Alternative

Direct. Moderate adverse effects are expected. KSAAP conducts natural resource management for the installation through plans such as the INRMP. To be conservative, this EA assumes that the new owners would not continue the natural resource management programs at the current level. Even though the Army would notify new owners of their regulatory responsibilities under the CWA, ESA, and other federal regulations, future protection of sensitive habitats and species and continuation of these natural resource management programs would not be guaranteed following conveyance of the property to non-federal owners. However, in the case of invasive species, landowners will still be required to take steps to eradicate invasive species in accordance with state requirements. Compliance with Section 404 of the CWA for the protection of wetlands should mitigate significant adverse impacts to wetlands and riparian habitat. Such effects are further discussed in Section 4.8.2.5, Intensity-Based Probable Use Scenario.

It is also important to note that the change in ownership may alter the paradigm currently in effect for the management of natural resources, particularly prairie restoration and habitat management programs. Where existing federal programs are focused more on restoring and maintaining diverse ecosystems, the management paradigm instituted by private ownership may not emphasize ecosystem restoration to the same degree as outlined in the installation INRMP. As such, disposal could result in short- and long-term moderate adverse effects to native habitat, including some loss of high-quality, historically important communities such as tallgrass prairie that once were widespread across the region (see Section 4.8.2.5 for further discussion). Furthermore, disturbance of up to 1,500 acres of additional habitat over the next 20 years of build-out (which represents a conservative upper-bound estimate) could fragment and further reduce the quality of habitat. In addition, loss of this habitat could result in adverse impacts to migratory birds that use this habitat for nesting and foraging. Establishment of a conservation management area, as specified in the KSAAP LRPA reuse plan, will conserve high-quality habitat along the Labette Creek watershed (3,881 acres). In addition, adverse impacts to high-quality habitat that currently exist within the riparian corridors but outside of the designated conservation area would be reduced because of poor building site conditions and CWA Section 404 compliance requirements. Avoidance and conservation of riparian buffer zones for the conservation and protection of wetlands habitat will be required, along with wetlands delineation in consultation with the USACE, Kansas City District. Site-specific wetlands surveys and adherence to CWA Section 404 permitting processes requirements will result in there being only minor adverse affects to wetlands in small isolated locations (e.g., a new road crossing).

Indirect. Minor to moderate long-term adverse effects are expected. As previously discussed, disposal may result in a paradigm shift in natural resource management that has the potential to reduce resource protection and enhancement measures, as well as increase the rate of loss of important habitats. Furthermore, it is likely that disposal will

result in increased land use intensity and activity, which could increase soil loss, reduce water quality, and increase the likelihood of spills and other releases. Indirectly, such actions could adversely affect biological resources in the long term.

4.8.1.7 Traditional Disposal Alternative

Direct. Moderate adverse effects are expected, similar to the effects outlined for early transfer. However these effects would occur further in the future.

Indirect. Minor to moderate long-term adverse effects are expected, similar to the effects outlined for early transfer. However these effects would occur further in the future.

4.8.1.8 Caretaker Status Alternative

Direct. Minor adverse effects are expected. Under caretaker status, natural resource management programs and objectives, outlined in the INRMP for KSAAP, may not be pursued to the same degree. Some areas that are being actively managed would be adversely impacted as a result of halting these efforts relative to status quo operating conditions (e.g., native prairie habitat restoration and management, aquatic habitat management for ponds).

Indirect. Long-term minor beneficial effects are expected. Military missions will cease and new construction and ground disturbing activities will be significantly reduced under this alternative. Thus, land use intensity will be below levels assumed under current conditions, thereby resulting in long-term minor benefits to biological resources as compared to baseline conditions in November 2005. Furthermore, the decrease in human activity would reduce disturbance of wildlife species at KSAAP under caretaker status.

4.8.1.9 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment, including implementation of INRMP measures. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.8.1.10 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Long-term moderate adverse effects are expected due to redevelopment of the installation. Principal effects include adverse impacts to unique riparian forests and high-quality native prairie habitat, and other ecological communities, along with associated wildlife. Conservation and preservation of the Labette Creek corridor, as called for in the KSAAP LRPA reuse plan, will preserve most of the riparian forest habitat, but loss of some habitat may occur as outlined below.

Construction and expansion would remove limited vegetation and associated habitat. The footprint of such activities is unknown, but using conservative upper-bound assumptions it

is estimated that up to 1,500 additional acres could be highly disturbed under the MLIR scenario, which could impact 10 percent of additional lands (18 percent overall). Impervious surfaces may increase by about 2 percent across the landscape (for a total of about 4 percent of impervious surface). Given the size of KSAAP (over 13,000 acres), the level of disturbance necessary to accommodate a MLIR redevelopment scenario would still leave most of the parcels undeveloped. Yet, loss of some high-quality native prairie habitat (approximately 20 percent or 200 acres, based on conservative assumptions of the disturbance footprints and assuming no deliberate avoidance occurs which is unlikely to occur) and other important wildlife habitat (approximately 500 acres of low-quality prairie habitat, based on similar conservative assumptions outlined above) would occur. Furthermore, high-value forest habitat may be impacted by sustainable timbering within the conservation area (although the focus is for habitat conservation), as well as within riparian areas (most likely from road/rail corridors). It should be noted, however, that the vast majority of the oak forests lies within the planned conservation area. Therefore, it is estimated that only a small percentage of the forest habitat would be impacted (less than 10 percent). Loss of this habitat could result in adverse impacts to migratory birds who utilize this habitat for nesting and foraging.

Noise from construction, demolition, and renovation activities may disturb wildlife. Wildlife may return to habitat adjacent to disturbed areas (e.g., buffer areas) soon after construction is completed. Any new construction should be sited as far away from wetlands areas as possible, to avoid impacting the habitat and wildlife in these areas (as discussed below).

Across KSAAP there are just over 200 acres of potential wetlands, principally in lowland areas along drainage areas. As previously discussed, no formal jurisdictional wetlands delineation has been performed to date. To avoid or minimize adverse impacts to this resource, project-specific wetlands delineations, permitting, and wetlands avoidance and/or mitigation requirements will be necessary prior to redevelopment of specific parcels in consultation with the USACE, Kansas City District. Given the size of the developable land resources and the relatively small construction footprints, wetlands delineation, avoidance, and maintenance of proper buffer zones would typically be sufficient to reduce even minor adverse effects to wetlands. As required under Section 404 of the CWA, the sequencing of mitigation requirements will ensure that impacts will be avoided if possible, then minimized if unavoidable, and as a last resort mitigated through creation, restoration, banking and other means in consultation with the USACE, Kansas City District. Even if mitigation occurs off-site, the adverse effects to KSAAP wetlands would still only be minor.

As previously discussed, there are no known federally listed species that occupy KSAAP other than potential migrant or transient species. These parcels are not known to provide any nesting or important hunting areas for any federally listed species. Furthermore, no state-listed terrestrial species are known to occur on KSAAP (the butterfly mussel [*Ellipsaria lineolata*] identified at the water intake is state-listed and is discussed below as an indirect effect). It should be noted, however, that no bat surveys have been conducted

on KSAAP, as previously discussed. According to the USFWS, there is the potential for the Indiana bat (*Myotis sodalis*), a federally listed endangered species, to occur in the project area. However, there is no reasonable evidence that would indicate that Indiana bats have the potential to occur on KSAAP, as the bat has never been identified in the state of Kansas to date, and as part of the species recovery plan, the USFWS does not actively monitor or manage for this species in Kansas (USFWS 2007). Therefore, the Army has not surveyed for this species.

Medium-Low Intensity, Indirect. Minor to moderate adverse effects are expected. Construction activity and habitat disturbance could cause increased erosion adversely effecting aquatic resources, including mussel species that could potentially include state-listed species (the butterfly mussel [*Ellipsaria lineolata*] identified at the water intake). Furthermore, as previously discussed, the Neosho madtom (*Noturus placidus*) (federally threatened) was documented within approximately 100 yards downstream of the KSAAP-owned dam on the Neosho River in 1999 near the KSAAP property line. As detailed in Section 4.7, water withdrawals at 3 mgd, coupled with reasonably expected engineering solutions and permitting review, would have only a negligible effect on water levels of the Neosho. Therefore, no effects are expected to the Neosho madtom (*Norturus placidus*). In addition, under the states antidegradation policy and water discharge regulations, any future water discharges would be required to meet stringent requirements that ensure protection of water quality to meet water quality standards and designated uses, as well as ensure protection of listed species. Therefore, it is reasonable to expect that engineering solutions would be employed to ensure future protection of long-term water quality upon redevelopment, with no effect on listed species.

Low Intensity, Direct. Short- and long-term minor to moderate adverse effects are expected. Effects similar to those discussed under MLIR are expected to occur, but to a lesser degree. Overall, the amount of highly disturbed habitat may only increase by about 3 percent under the LIR scenario (about 10 percent overall), since a large portion of the existing infrastructure would be redeveloped under this scenario.

Low Intensity, Indirect. Long-term minor to moderate adverse effects are expected. Effects similar to those discussed under MLIR are expected to occur, but to a lesser degree.

4.9 CULTURAL RESOURCES

4.9.1 Affected Environment

The following federal statutes, regulations, E.O.s, and memoranda are applicable to the management of historic properties and operations of KSAAP.

Section 106 and Section 110 of the NHPA (Public Law 89-655) ensure that federal agencies consider cultural resources, defined as any prehistoric or historic district, site, building, structure, or object eligible for inclusion on the NRHP, in their proposed programs, projects, and actions prior to initiation. In August 2006, a PA between DoD and the ACHP was signed regarding compliance with Section 106 as it concerns World War II and Cold War Era Army Ammunition Production Facilities and Plants and Ammunition Storage Facilities. In addition, a PA concerning cultural resources at KSAAP is in progress and is currently being negotiated by the U.S. Army, the Kansas SHPO, and the ACHP. Coordination with all affiliated federally recognized tribes with an interest in KSAAP is ongoing and will continue until the Section 106 process is complete. The PA will provide deed restrictions requiring continued maintenance and protection of properties deemed eligible for inclusion in the NRHP, as well as require new owners to consult with the Kansas SHPO prior to soil disturbing activities or any actions affecting cultural resources and implementing appropriate mitigation, as necessary.

4.9.1.1 Prehistoric and Historic Background

Prehistoric Context. The prehistory of the area that is today KSAAP is divided by archeologists into three time periods: Paleo-Indian (11,000 B.C. to 7,000 B.C.), Archaic (7,000 B.C. to A.D. 1), and Ceramic (A.D. 1 to A.D. 1800). A protohistoric period has also been defined, dating to the period just before Europeans first appeared in the region.

The Paleo-Indian Period (ca. 11,000 B.C. to 7,000 B.C.). People that lived during this time period were nomads who relied on the wild plants and animals that lived during the terminal Pleistocene Period for subsistence. They most likely traveled in small kin-based groups. The earliest evidence for these people in Kansas are the Clovis spear points, although none have been found in Labette County to date.

The Archaic Period (7,000 B.C. to A.D. 1). This period is divided into three phases: Early, Middle and Late. Archaic sites are identified in part by the presence of side and corner-notched projectile points and plant processing implements such as grinding stones (Waite 1996). This period is the one in which people adapted to what was a climate similar to the present, and it represents a significant shift in adaptation. Many sites from this time period are deeply buried.

Ceramic Period (ca. A.D. 1 to ca. A.D. 1800). The Ceramic Period is identified by the widespread use of ceramic vessels and the introduction and spread of the bow and arrow. This period is divided into Early Ceramic, Middle Ceramic, and Late Ceramic. During this period there was an increased consumption of corn, beans, and squash. This period saw

a substantial population increase, based on the increase in size and number of archaeological sites. Large villages have also been identified for this time period. The Late Ceramic Period overlaps with the protohistoric and historic periods.

Protohistoric Period. The main Native American group that lived in what is now Labette County during this early historic period was the Osage. The Osage raised corn, beans, and squash and supplemented their diet with hunting and gathering wild animals and plants. At the same time, the impacts of European expansion appeared in the area even before the first Europeans actually arrived in Labette County. These impacts include the spread of infectious diseases, the introduction and adoption of the horse, and the migration of displaced Native American groups into the area.

Historic Context. The Historic Period in Kansas is dated to begin in 1541, with the arrival of Spanish explorers, led by Francisco Vasquez de Coronado. The next European explorers to enter the area were the French, who came to the region in the late seventeenth century, opening trade with the Osage and other Native Americans. In 1762 the Treaty of Fontainebleau returned the region to Spain, and the area switched back to France in 1800 under the Treaty of Ildefonso. The region was purchased by the United States in 1803 as part of the Louisiana Purchase. At this time Native Americans began moving from the east to settle, and numerous treaties between various tribes and the United States were signed. Indian lands were created in what is now eastern Kansas.

By 1825 the Osage had ceded their lands to the U.S. Government and had settled in southeast Kansas (Nickens and Associates 1984). Subsequent treaties continued to remove the Indian lands. The last treaty, the Osage Ceded Lands Treaty, was signed in January 1867 for the land that is now KSAAP and Neosho and Labette Counties (Waite 1996).

Kansas became a territory in 1854 and was admitted to the Union in 1861. The Homestead Act of 1862 and the Pacific Railroad Act of 1862 both encouraged settlement in the region. In the latter part of the nineteenth century the state was transformed from a frontier to an agricultural rural society and economy.

The area that is now KSAAP consisted of farms ranging from 80 to 160 acres in size prior to acquisition by the Army. The farms grew primarily corn, small grains, and hay, and land was also used for grazing livestock. There were two one-room schoolhouses (no longer standing) on the property, Liberty School, in the northwest corner of the plant, and Pleasant School, in the center of the plant. All the property, including houses, barns, schools, and churches, was purchased by the Army and either demolished or moved offsite, except for two cemeteries still on the installation (U.S. Army 1998).

Military History. KSAAP was established in 1941-42 during the buildup for World War II. The plant was originally called the Kansas Ordnance Plant. The Secretary of War authorized the project on 31 May 1940. Construction began in August 1941 and was completed in November 1942. The original construction included three load lines; four

component areas; an ammonium nitrate area; five explosive storage areas; an inert storage area; maintenance and administration area; and utilities, roads, and railroad tracks. Ammunition manufacturing for the war lasted from July 1942 to August 1945. KSAAP was on standby from September 1945 through August 1950. The plant was reactivated during the Korean conflict, from August 1950 through September 1957. It was again placed on standby from 1957 through 1967. During this second standby period, activities included maintenance and out-leasing to private companies for manufacturing.

The plant was again reactivated in early 1967 in support of the Southeast Asia Conflict, and was modernized during this period. When the Vietnam War ended, ammunition production was gradually decreased. KSAAP is now a GOCO installation under the jurisdiction of the Joint Munitions Command and is designated as active (U.S. Army 2006a). The current mission of the plant is to load, assemble, and pack ammunition items and to maintain active and laid-away facilities (U.S. Army 1998).

4.9.1.2 Status of Cultural Resource Inventories and Section 106 Consultations

This section provides a brief discussion of the prehistoric and historic cultural resources investigations, including management plans, architectural surveys, archaeological surveys, and archaeological excavations conducted at KSAAP to date.

Two integrated cultural resources management plans (ICRMPs) were completed for KSAAP. An archaeological overview and management plan was completed in 1984 (Nickens and Associates 1984), and an ICRMP was completed in 1996 (Waite 1996). Phase I and Phase II archaeological investigations of KSAAP were completed in September 2007 in compliance with Sections 110 and 106 of the NHPA. A total of 5,500 acres were examined. Seventeen new archaeological sites were identified and two existing sites were examined. Two previously identified sites, 14LT381 and 14LT382, were recommended as potentially eligible for the NRHP and Phase III investigations were recommended. One newly identified site, 14LT113, the Piper Mule Farm Site, was also recommended as potentially NRHP-eligible. The 16 remaining newly identified sites were recommended as ineligible for the NRHP (Olvey 2007).

Prehistoric and Historic Archaeological Resources. Three archaeological sites are recommended as potentially eligible for listing on the NRHP. There are no sites listed on the NRHP.

According to the 1996 ICRMP, historical maps suggest that approximately 126 potential historic period archaeological sites (mainly remains of farmsteads), one cemetery, and a historic trail segment may exist within KSAAP.

Historic Buildings and Structures. No KSAAP buildings, structures, or objects are eligible for or listed on the NRHP.

A Historic American Building Survey (HABS) was completed for KSAAP in 1982 (Burns and Mueller 1982). The survey examined all military-related buildings that postdate 1940

(562 buildings). The survey was part of the Army Historic Properties Report Series of the 1980s. In addition to the HABS, Historic American Engineering Record inventory cards were completed for 134 individual properties. The report found that, "Although the KSAAP as a whole possesses limited historical significance as a typical World War II-era facility, its individual buildings do not possess any special historical, architectural, or industrial significance at this time" (Burns and Mueller 1982). A Historic Properties Report was completed in 1984 (MacDonald and Mack Partnership 1984).

A PA among the U.S. Army Materiel Command, the ACHP, and Multiple State Historic Preservation Officers concerning a Program to Cease Maintenance, Excess, and Dispose of Certain Properties was executed on 22 January 1993. According to the PA, KSAAP is considered historically important due to its association with World War II. Under the PA, no further management actions are necessary for World War II and Cold War era buildings and structures (AMCCOM 1993, Waite 1996).

Cemeteries. Two cemeteries are located within KSAAP. These are the Franklin Cemetery, approximately one acre in size, and the Fairview Cemetery, approximately 1.5 acres in size. Both were in use between 1871 and 1941 (U.S. Army 1998). According to Nickens and Associates (1984), families still visit the two cemeteries on Memorial Day. The Fairview Cemetery is located in the central east section of the installation, near the 2000 Test Area. The Franklin Cemetery is located just north of the 1700 Area.

In 1989 Kansas passed the Unmarked Burial Sites Preservation Act (Kansas Code §75-2741, et seq.). This law states that no one without a permit may disturb an unmarked burial site and that anyone who discovers human skeletal remains must immediately notify the local law enforcement agency.

Although cemeteries are not usually evaluated for eligibility for NRHP listing, a cemetery can qualify for the NRHP if it is an integral part of a historic district or "derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events." The two cemeteries at KSAAP do not meet the criteria for eligibility to the NRHP.

Disposition of Archaeological Artifacts and Associated Documentation. There are no archaeological artifacts or associated documents held at KSAAP.

Paleontological Remains. There are no known paleontological localities at KSAAP.

Section 106 Consultation. The Kansas SHPO has been sent a letter describing this proposed BRAC action. In addition, a PA concerning cultural resources at KSAAP is in progress and is currently being negotiated by the U.S. Army, the Kansas SHPO, and the ACHP. Coordination with all affiliated federally recognized tribes with an interest in KSAAP is ongoing and will continue until the Section 106 process is complete. The PA will provide deed restrictions requiring continued maintenance and protection of properties deemed eligible for inclusion in the NRHP, as well as require new owners to

consult with the Kansas SHPO prior to soil disturbing activities or any actions affecting cultural resources and implementing appropriate mitigation, as necessary.

4.9.1.3 Native American Resources

No Traditional Cultural Properties or Native American sacred places are currently known to exist on KSAAP. The following tribes or Native American organizations have an interest in Labette County: the Osage Nation of Oklahoma, the United Keetoowah Bank of Cherokee, the Indians in Oklahoma, and the Wichita and Affiliated Tribes. While an interest in the county does not amount to an interest in the KSAAP property, all these tribes were contacted, in case they have an interest in the installation. Interested tribes will be signatories to the PA (Deurmyer 2006). Interested federally listed tribes and organizations have been sent a consultation letter regarding this proposed BRAC action (see Appendix B for an example of this letter). Consultation letters were sent to the Kickapoo Tribe in Kansas; the Kickapoo Tribe of Oklahoma; the Kiowa Indian Tribe of Oklahoma; the Miami Tribe of Oklahoma; the Omaha Tribal Council; the Osage Nation of Oklahoma; the Otoe-Missouria Tribe of Oklahoma; the Ottawa Tribe of Oklahoma; the Pawnee Nation of Oklahoma; the Peoria Tribe of Oklahoma; the Prairie Band of Potawatomi Indians; the Quapaw Tribal Business Committee; the Sac and Fox Nation of Oklahoma; the Sac and Fox Nation of Missouri; the Sac and Fox Tribe of Mississippi in Kansas; the Seneca-Cayuga Tribe of Oklahoma; the Stockbridge-Munsee Community of Wisconsin; the United Keetoowah Band of Cherokee Indians in Oklahoma; and the Wichita and Affiliated Tribes. The Delaware Nation was also contacted by email correspondence; they responded that they had no interest in KSAAP. The Kaw Nation, the Kickapoo Tribe of Oklahoma, the Kiowa Indian Tribe of Oklahoma, the Osage Nation, and the Quapaw Business Committee were contacted by telephone. Tribes responding with an interest in KSAAP include: the Omaha Tribal Council; the Pawnee Nation of Oklahoma; the Peoria Tribe of Oklahoma; the Prairie Band of Potawatomi Indians; the United Keetoowah Band of Cherokee Indians in Oklahoma; the Wichita and Affiliated Tribes; and the Tonkawa Tribe. The United Keetoowah Band of Cherokee Indians in Oklahoma responded that they desire to be a consulting party to the BRAC action, including for the proposed PA. The Peoria Tribe of Indians in Oklahoma responded that they have no objection to the proposed construction; however, should any items falling under the Native American Graves Protection and Repatriation Act be discovered, they request further notification and consultation, and that construction be halted immediately and appropriate persons notified. The remaining tribes that were contacted responded that they do not have an interest in KSAAP, except for the Kaw Nation; the Kickapoo Tribe of Oklahoma; the Kiowa Indian Tribe of Oklahoma; the Osage Nation; and the Quapaw Business Committee. These last named tribes did not respond.

4.9.2 Consequences

4.9.2.1 Early Transfer Disposal Alternative

Direct. Long-term minor to moderate adverse effects to cultural resources are expected. To be conservative, it is assumed that the goals and objectives, management programs,

and projects outlined in the ICRMP for KSAAP may not be fulfilled to the same degree once the parcels are disposed of and moved from federal to non-federal ownership. However, Section 106 of the NHPA and all Kansas state or local regulations would still apply. In addition, encumbrances that protect cultural resources would apply as further discussed in Section 4.9.2.5, Intensity-Based Probable Use Scenario. In any event, increased public access and the potential for reduced security under private ownership may reduce the protection of cultural resources relative to baseline conditions, resulting in the potential for increased vandalism or disturbance. Vandalism can occur when the location of an archaeological site or cemetery becomes known or otherwise attracts new attention. Furthermore, increased development will increase the potential for as yet unidentified cultural resources to be disturbed. In the long term, increases in soil disturbance could be caused by new buildings and road construction, or trench excavation for underground pipes, cable lines, and similar infrastructure projects.

To reduce potential effects to cultural resources, site surveys of potential archaeological resources at KSAAP have been completed, and Section 106 consultations concerning the disposal of eligible properties are ongoing. Negotiated terms of transfer or conveyance will result in requirements for the new owners to maintain the status quo of archaeological sites, and will impose a requirement for consultation with the Kansas SHPO prior to any actions affecting these resources. Additional information regarding these encumbrances is discussed in Section 4.9.2.5, Intensity-Based Probable Use Scenario.

Indirect. Minor adverse effects are expected. The new owners of the properties at KSAAP might seek to lessen or remove deed restrictions addressing cultural resources after disposal, resulting in a degradation or loss of properties eligible for the NRHP. If the properties cannot be preserved intact, the preservation deed restriction would require the new owner to consult with the SHPO and to undertake recordation of the properties, in accordance with the Secretary of the Interior's standards for recordation and any applicable standards. Such recordation would mitigate any potentially adverse effects of such an undertaking.

4.9.2.2 Traditional Disposal Alternative

Direct. Long-term minor to moderate adverse effects to cultural resources are expected. Effects would be similar to those described under the early transfer disposal alternative; but the changes in effects would occur further in the future. In addition, the conditions and terms of transfer would be similar to those discussed above for the early transfer disposal alternative.

Indirect. Minor adverse effects are expected, as described above for the early transfer disposal alternative.

4.9.2.3 Caretaker Status Alternative

Direct. Minor adverse effects to cultural resources are expected. Under this alternative, access to KSAAP would be very limited, and maintenance levels would be low. The goals

and procedures outlined in the ICRMP would be suspended, and maintenance would be reduced from the standards set forth in the ICRMP. Archaeological sites that are eligible for listing on the NRHP would not be disturbed because no new soil disturbance would occur; however, the sites and the cemeteries might be subject to vandalism or deterioration because of limited presence of maintenance personnel. Sections 106 and 110 of the NHPA, and any Kansas state or local regulations regarding cemeteries, would still apply.

Indirect. No indirect adverse effects are expected.

4.9.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment, including implementation of ICRMP measures. Environmental remediation that might occur under this alternative would also have no effects, because the ICRMP measures would remain in effect. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.9.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Long-term minor to moderate adverse effects to cultural resources are expected. As previously discussed, the USACE, Mobile District is completing extensive cultural resource surveys of KSAAP properties. Currently, the Army is documenting and coordinating its findings and recommendations with the Kansas SHPO. As part of the Section 106 consultation process, a PA concerning cultural resources at KSAAP is in progress and is currently being negotiated by the U.S. Army, the Kansas SHPO, and the ACHP. Coordination with all affiliated federally recognized tribes with an interest in KSAAP is ongoing and will continue until the Section 106 process is complete. The PA will provide deed restrictions requiring continued maintenance and protection of properties deemed eligible for inclusion in the NRHP, as well as require new owners to consult with the Kansas SHPO prior to soil disturbing activities or any actions affecting cultural resources and implementing appropriate mitigation, as necessary. If any NRHP eligible properties are found to be present at KSAAP, the encumbrances requiring the protection of listed sites will be placed upon the property itself in accordance with the PA (i.e., deed restrictions, building restrictions, historic easements, etc.) and remain as a restriction on the land, regardless of property ownership. Property disposal and reuse would not occur until the PA has been ratified by all parties. If the new owners desire to lessen or remove the deed restrictions requiring preservation, the deed will delineate a process for the new owners to consult with the Kansas SHPO to arrive at mutually agreeable and appropriate measures for mitigating the adverse effects of their proposed undertaking. Such actions will reduce potential adverse effects associated with increased development at KSAAP. In any event, the potential for disturbance of unknown resources during new construction is possible, as well as adverse effects to known resources from vandalism and/or neglect. Soil disturbance from construction of new facilities, roads,

railways, and infrastructure expansion could occur over 1,500 acres of additional lands. Also, increased public access and the potential for reduced security requirements may increase the potential for vandalism. Vandalism can occur when the location of an archaeological site or cemetery becomes known or otherwise attracts new attention.

A PA among the U.S. Army Materiel Command and Multiple SHPOs concerning a Program to Cease Maintenance, Excess, and Dispose of Certain Properties was executed on 22 January 1993. According to the PA, KSAAP is considered historically important due to its association with World War II. Under the PA, no further management actions are necessary for World War II and Cold War era buildings and structures (AMCCOM 1993, Waite 1996).

In August 2006, the ACHP issued two Program Comments regarding compliance with Section 106. One addresses World War II and Cold War Era (1939-1974) Army Ammunition Production Facilities and Plants, and the other addresses World War II and Cold War Era (1939–1974) Ammunition Storage Facilities. These two documents should facilitate agreements with the Kansas SHPO and make it easier to redevelop lands and buildings at KSAAP.

To ensure continued public access to the two cemeteries, the Franklin Cemetery and the Fairview Cemetery, both of which continue to be visited by family members, the Army would include in conveyance documents, as a condition of acceptance of title, an affirmative obligation on the part of the transferee to provide public access to these cemeteries.

Medium-Low Intensity, Indirect. Minor adverse effects are expected. As previously discussed, if the new owners of the properties at KSAAP seek to lessen or remove deed restrictions addressing cultural resources after disposal in consultation with the SHPO, then further degradation or losses may occur. Such recordation, however, would mitigate any potentially adverse effects of such an undertaking to an insignificant level.

Low Intensity, Direct. Long-term minor to moderate adverse effects to cultural resources are expected. Conditions and potential impacts would be similar to those described under the MLIR, but to a lesser degree.

Low Intensity, Indirect. Minor adverse effects are expected, similar to indirect effects described for the MLIR reuse scenario.

4.10 SOCIOECONOMICS

This section discusses the existing socioeconomic environment for KSAAP with respect to economic activity, population demographics, housing, and quality of life (including education, public health and safety, recreation, environmental justice, and protection of children). The setting provides a frame of reference for determining the potential socioeconomic effects of alternative uses of KSAAP.

4.10.1 Affected Environment

KSAAP is located in Labette County, Kansas, in the southeast corner of the state along the border with Oklahoma. Labette County, along with the adjacent counties Crawford, Cherokee, Neosho, and Montgomery, have been identified as KSAAP's ROI in which potential impacts related to 2005 BRAC actions at KSAAP would most likely occur. These five counties are the residences of 89 percent of the current contract employees of the installation. Two of the counties, Labette and Neosho, are the residences of all government employees working on the installation (see Table 4.10-1). In addition to being home to KSAAP, Labette County is home to the greatest number of government and contractor residents.

Table 4.10-1 County of Residence of KSAAP Employees

County of Residence	Contractor Employees		Government Employees	
	Number	Percentage	Number	Percentage
Labette	150	53	7	88
Crawford	35	12	0	0
Cherokee	27	10	0	0
Neosho	23	8	1	12
Montgomery	15	5	0	0
Sub-Total	250	89*	8	100
Other Counties	32	11	0	0
Total	282	100	8	100

*Numbers do not total due to rounding
Source: DZI Employee Data, residence by zip code as of 5/17/2005

4.10.1.1 Economic Development

Regional Economic Activity. The total civilian labor force within the ROI was approximately 66,993 in 2000 (demographicsNow.com 2006), which made up approximately 4.8 percent of the entire Kansas labor force. The average annual unemployment rate in the ROI in 2000 was 4.7 percent, slightly higher than the statewide average of 4.2 percent for Kansas. Per Capita Personal Income throughout the ROI is generally comparable, at around $24,071, but is somewhat lower than that of the Kansas as a whole. The ROI saw an average annual growth rate in personal income of 3.7 percent from 1994-2004. These figures are shown in Table 4.10-2.

Table 4.10-2 KSAAP ROI Labor Force, Unemployment, and Personal Income

ROI Counties	Labor Force 2000	Unemployment Rate 2000 (Percent)	Per Capita Personal Income		
			2004	State Rank	1994-2004 Avg. Annual Growth Rate (Percent)
Labette	11,176	3.6	$24,443	59th	4.1
Crawford	19,326	4.9	$24,075	69th	3.6
Cherokee	10,852	5.5	$23,592	77th	4.4
Neosho	8,366	4.9	$23,542	79th	2.9
Montgomery	17,273	4.7	$24,704	55th	3.7
ROI Total	66,993	4.7	$24,071	n/a	3.7
Kansas Total	1,389,423	4.2	$31,078	n/a	4.0
Data Sources: (www.DemographicsNow.com) 2006, U.S. Department of Commerce 2007					

Total employment within the ROI was approximately 63,747 in 2000, according to U.S. Census data (2000). Local and regional employment trends reflect national trends as the services, government, and retail trade sectors account for two thirds of the regional employment. Services and government account for a greater relative portion of employment in Labette County (where KSAAP is located).

Within the total ROI, the largest employment industry was manufacturing, employing over 22 percent of the working population. Following manufacturing, the health care and social assistance industry employed nearly 9,000 individuals in 2000, about 14 percent of the employed population. Educational services, retail trade, and construction also employed a significant portion of the ROI population. When comparing employment by industry in Labette County with the ROI, it can be seen that Labette County had slightly more of its workforce employed in Healthcare and Social Assistance, and in Public Administration, than the ROI (Table 4.10-3).

Table 4.10-3 Employment by Industry (2000)

Industry	ROI		Labette County	
	Number	Percentage	Number	Percentage
Manufacturing	14,216	22.3	2,336	21.7
Healthcare and Social Assistance	8,797	13.8	1,798	16.7
Educational Services	6,948	10.9	1,077	10.0
Retail Trade	6,757	10.6	1,130	10.5
Construction	3,825	6.0	506	4.7
Accommodation and Food Services	3,697	5.8	603	5.6
Other Services (NOT public administration)	3,251	5.1	614	5.7
Public Administration	2,295	3.6	614	5.7
Transportation and Warehousing	2,295	3.6	441	4.1
Agriculture, Forestry, Fishing, Hunting	1,849	2.9	431	4.0
Total	53,930	84.6	9550	88.7
Data Source: (www.DemographicsNow.com) 2006				

The largest employers within Labette County, as of December 2005, include a mixture of private companies and public agencies. The Parsons State Hospital and Training Center is the largest employer in the county, employing 525 individuals. Labette County Medical Center is the second largest employer, employing 500 individuals. Major private sector employers include Grandview Products (355 employees); Flesh Business Forms (290 employees); Power Flame (250 employees); USD 503 (225 employees); and Ruskin Manufacturing (220 employees). DZI, the KSAAP contractor, employs 204 individuals and is one of the top 10 largest employers in the county.

KSAAP's Contribution to the Regional Economic Activity. KSAAP is a small contributor to the regional economy, employing less than 1 percent of the total labor force for the ROI. However, wages of the government workforce tend to be much higher than wages received by most workers in the ROI. In 2005, the average KSAAP salary for federal workers was $70,803 compared to the average wage of $29,203 for workers in

southeastern Kansas. In comparison, the average salary for a contract employee in manufacturing, the most common occupation on KSAAP, is $28,100. This reflects a more accurate comparison between the salaries of KSAAP workers compared to those in similar occupations in southeastern Kansas. Annual KSAAP expenditures going into the ROI include the approximately $8 million dollars in wages paid to contract employees and the approximately $100,000 in local goods and services purchased in the ROI, out of a total of $2.5 million of such purchases (DZI Employee and Income data). In comparison to this amount of economic activity, the ROI's economy generated approximately $1.3 billion in sales in 2004.

4.10.1.2 Regional Demographics

Regional Population. Table 4.10-4 depicts the population distribution and trends within the ROI. In general, the ROI has been characterized by little or no growth over the past decade, and is forecast to continue to show little or negative growth. The population of the ROI increased by 0.3 percent from 136,487 in 1990 to 136,931 in 2000; however, between 2005 and 2010 the ROI is predicted to see a 3.10 percent decrease in population, to 128,939. In contrast the state of Kansas saw an 8.5 percent growth in population between 1990 and 2000 and is projected to grow by 1.9 percent from 2005 to 2010. The county with the largest growth between 1990 and 2000 (7.5 percent), and the only county in the ROI to experience growth between 2005 and 2010 (0.1 percent), was Crawford County. In contrast, Montgomery County saw a 6.6 percent decrease in population between 1990 and 2000, and another 5.4 percent decrease is predicted for 2005 to 2010. Population projections for the ROI predict a decrease in population in both 2010 and 2020; however, the state of Kansas is expected to continue growth at about 1 percent annually.

Table 4.10-4 Population Growth in the KSAAP ROI

County	Population				Projected (from 2000)		
	1990	2000	2005	Percent Change 1990-2000	Percent Change 2005-2010	2010	2020
Labette	23,692	22,835	22,056	-3.60	-3.20	21,354	21,878
Crawford	35,568	38,242	38,315	7.50	0.10	38,359	38,782
Cherokee	21,374	22,605	21,481	5.80	-4.90	20,430	20,596
Neosho	17,037	16,997	16,369	-0.20	-3.50	15,792	14,943
Montgomery	38,816	36,252	34,297	-6.60	-5.40	32,458	31,124
ROI Total	136,487	136,931	132,518	0.30	-3.10	128,393	127,323
Kansas	2,477,573	2,688,418	2,746,171	8.50	1.90	2,799,691	2,936,670

Data Sources: (www.DemographicsNow.com) 2006
(http://www.ipsr.ku.edu/ksdata/ksah/population/2pop17.pdf) 2020 Projections

Table 4.10-5 compares the ROI and Kansas on a number of population metrics. As can be seen, the median age of the ROI (37.1 years) is slightly higher than the median age of the state of Kansas (35.20 years). In addition, the percentage of the minority population is less in the ROI (9.3 percent) than the state of Kansas (13.9 percent). There is a higher percentage of individuals living in rural areas (43.94 percent) compared to the state of Kansas (28.58 percent).

Table 4.10-5 Selected ROI and State Population Characteristics (2000)

County	Median Age	Percent White	Percent Black	Percent Other	Percent Urban	Percent Rural
Labette	38.00	89.3	4.7	9.2	48.8	51.2
Crawford	33.70	93.3	1.8	4.8	63.49	36.51
Cherokee	37.10	92.3	0.6	7.1	49.01	50.99
Neosho	38.40	94.9	0.9	4.3	54.90	45.09
Montgomery	39.10	85.8	6.1	8.1	57.74	42.26
ROI Total	37.10	90.7	3.1	6.2	56.06	43.94
Kansas	35.20	86.1	5.7	8.2	71.42	28.58
Data Source: (www.DemographicsNow.com) 2006						

KSAAP Population. No military or civilians live on KSAAP. The government workforce of eight persons lives within the ROI (specifically, in Labette and Neosho Counties). The large majority of the contractor workforce lives in the community surrounding KSAAP. As described previously, based on information provided by the contractor for the workforce at KSAAP, it is estimated that 89 percent of that workforce resides within the ROI.

4.10.1.3 Housing

In 1999 there were a total of 62,226 housing units within the ROI, according to the 2000 U.S. Census (Table 4.10-6). Approximately 54 percent of the total housing units within the region are in Crawford County and Montgomery County, and the other 46 percent are distributed throughout Labette, Cherokee, and Neosho Counties. According to the 2000 U.S. Census, single-family residential is the dominant housing type, comprising approximately 69 percent of the total housing units in Kansas (U.S. Census 2000).

Selected housing characteristics related to occupancy status, median value, vacancy rate and median household income are shown in Table 4.10-6. As indicated, the owner-occupancy rate ranges from 58 percent in Crawford County to 67 percent in Cherokee County, demonstrating that home ownership rates are relatively consistent throughout the ROI and similar to the Kansas average (63.5 percent). The median value of owner-occupied housing in the ROI in 2000 was $46,196 and was significantly lower than the Kansas median of $83,504. Median home values ranged from $39,572 in Labette County to $53,737 in Crawford County (Table 4.10-6). Approximately 11 percent of the housing units within the ROI were vacant in 2000.

Table 4.10-6 Selected Housing Characteristics, KSAAP ROI (2000)

County	Total Housing Units	Percent Owner Occupied	Percent Renter Occupied	Percent Vacant	Median Value Owner Occupied	Median Rent Renter Occupied
Labette	10,306	65.3	23.9	10.8	$39,572	$273
Crawford	17,221	58.0	32.1	10.0	$53,737	$336
Cherokee	10,031	67.3	21.2	11.5	$46,657	$271
Neosho	7,461	67.4	23.0	9.7	$44,671	$270
Montgomery	17,207	62.0	24.6	13.4	$43,910	$297
ROI Total	62,226	62.9	25.8	11.3	$46,196	$297
Kansas	1,131,200	63.5	28.2	8.3	$83,504	$397
Data Sources: (www.DemographicsNow.com) 2006						

4.10.1.4 Personnel Housing

There is no active housing on KSAAP. In 2006 more than half of the 290 employees lived in the same county in which KSAAP is located.

4.10.1.5 Quality of Life

Education. There are 19 public school districts within the ROI, four of which are located in Labette County, where KSAAP is located and where 54 percent of contractor and government workers reside. The average student-to-teacher ratio for the five-county ROI is 14.6 to 1, which is slightly lower than the 15 to 1 for the state of Kansas. Average enrollment has decreased by about 4 percent over the past 10 years; Labette County has seen a decrease in 5 percent compared with 10 years ago. Within the 19 school districts there are 81 schools, including elementary, middle, and high schools. In addition, there are four higher-education institutions within the ROI: three two-year public community colleges and a four-year public university. Labette Community College, located in Parsons, offers night programs as well as online degrees, as does Independence Community College (Montgomery County) and Neosho Community College. Pittsburg State University is located in Crawford County, and in addition to their numerous

undergraduate programs they offer masters degrees in arts and sciences, business, and education.

Shops and Services. There are no shops or retail services on KSAAP. The town of Parsons, located 2 miles west of KSAAP, would provide shops and services as needed. The nearest population center, Joplin, Missouri, (50 miles east of KSAAP) would provide a larger selection of shops and services than Parsons.

Law Enforcement. Although there are not any military police units stationed on post, KSAAP partners with the Labette County Sheriff's office and the Federal Bureau of Investigation (FBI) for police protection. In addition, DZI, the primary ammunition contractor, hires private security personnel.

Off-site agencies that provide law enforcement services to the community and to the installations, if needed, include the Labette County Sheriff's Department and the FBI.

Fire Protection. KSAAP has partnering agreements for fire protection with two local fire departments in Neosho Township and Labette County District #9.

Recreation. At the installation, KSAAP has opportunities for the public to participate in hunting activities at certain times throughout the spring and fall. The general public can contact the base directly to obtain applications for an archery deer hunt, quail hunt, and turkey hunt. In addition, there are numerous options for indoor and outdoor recreational activities within the ROI, including parks, lakes, public pools, bowling allies, and movie theaters. At 58 acres, Forest Park is the largest park in Parsons and offers visitors basketball courts, a swimming pool, volleyball courts, disc golf, ball fields, and tennis courts. Other nearby parks contain access to wetlands, boat launches, and beach areas. In addition to the recreation opportunities in Parsons, similar recreational outlets can be found throughout the ROI.

Health/Medical. In every county within the ROI there is a least one major medical center, usually located within the limits of the largest city in the county. In addition, there are numerous small community hospitals located in many of the smaller outlying towns in the ROI. The closest city to KSAAP is Parsons, located in Labette County, which is home to the Labette County Medical Center, which features 59 beds. KSAAP is located approximately two miles from the Parsons city limits. The nearby city of Pittsburg, Kansas, has the largest hospital in the ROI, with over 100 beds. Pittsburg is about 40 miles northeast of KSAAP.

4.10.1.6 Environmental Justice

On 11 February 1994, President Clinton issued E.O. 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The purpose of the order is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal policies and actions on minority and low-income populations.

It is the Army's policy to fully comply with E.O. 12898 by incorporating environmental justice concerns in decision-making processes supporting Army policies, programs, projects, and activities. The initial step in the environmental justice analysis process is identification of minority and low-income populations that might be subject to actual or potential health, economic, or environmental threats arising from implementation of the proposed actions or alternatives. Low-income, or the poverty threshold, is defined by the U.S. Census Current Population Reports, Series P-60 on Income and Poverty, as the weighted average annual income, which for a family of four in 2000 correlated to $17,603; by 2005 the threshold had risen to $19,971 (U.S. Census 2002). Minority individuals are defined as people of American Indian or Alaska Native, Asian or Pacific Islander, African American (but not of Hispanic origin), or Hispanic origin. Minority populations are identified where minorities comprise more than 50 percent of the population in the affected area or where this percentage is "meaningfully greater" than the percentage in the general population (CEQ 1997). This section identifies minority or low-income communities that could be adversely affected by the implementation of actions or alternatives on KSAAP.

Low-income and minority population data was compared for the five counties in the KSAAP ROI, the ROI totals, and the state of Kansas. This comparative analysis is summarized in Table 4.10-7. Based on 1999 U.S. Census estimates, the percentage of low-income persons are higher for the KSAAP ROI (13.4 percent) than for the state of Kansas (10.4 percent). However, the percent of minority population is lower for the ROI (9.3 percent) than for Kansas (13.9 percent).

Table 4.10-7 Minority and Low-Income Populations (2000)

County	Total Populations (2000)	Percent Minority Population (2000)	Median Household Income (1999)	Persons Below Poverty (1999)	Percent Persons Below Poverty (1999)
Labette	22,835	13.9	$30,875	2,799	12.7
Crawford	38,242	6.6	$29,409	5,823	16.0
Cherokee	22,605	7.7	$30,505	3,175	14.3
Neosho	16,997	5.2	$32,167	2,104	13.0
Montgomery	36,252	14.2	$30,997	4,432	12.6
ROI Total	136,931	9.3	$30,790	18,333	13.4
Kansas	2,688,418	13.9	$43,113 (2003)	279,595 (2003)	10.4 (2003)
Data source: U.S. Census 2000					

Montgomery County has the highest percentage of minority population (14.2 percent) in the ROI; however, the county has the lowest percentage of persons living below the poverty level (12.6 percent). Neosho County has the lowest minority percentage (5.2 percent), the highest median household income ($32,167), and has a slightly lower percentage of persons living below the poverty level (13.0 percent) than the average for

the ROI (13.4 percent). Crawford County has the highest population below the poverty level (16.0 percent), followed by Cherokee County (14.3 percent), the highest percentages in the ROI. The percentage of minority population in Labette County, which includes the City of Parsons and KSAAP, is the same as in the state of Kansas (13.9 percent); however, the median household income of Labette County is less than the state of Kansas ($30,875 for Labette County compared to $43,113 for the state of Kansas).

4.10.1.7 Protection of Children

On 21 April 1997, President Clinton issued E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks. A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks due to their physiology and their behavior. Federal agencies are required to give high priority to identifying and assessing environmental health risks and safety risks that might disproportionately affect children and to ensure that its policies, programs, activities, and standards address these risks. To fully comply with E.O. 13045, the Army ensures that it would identify, disclose, and respond to potential adverse health and safety risks to children within the area affected by a proposed Army action.

4.10.1.8 Homeless, Special Concerns

Pursuant to the Base Closure Community Redevelopment and Homeless Assistance Act of 1994, property that is surplus to the federal government's needs is to be screened by means of a LRA's soliciting NOIs from state and local government, representatives of the homeless, and other interested parties. The LRA's outreach efforts to potential users or recipients of the property include working with HUD and other federal agencies that sponsor public benefit transfers under the FPASA. The reuse authority has completed this outreach as a part of the reuse planning process; no homeless assistance providers have expressed interest in reuse of KSAAP. The closest shelter to Parsons is located in Topeka, with others in Wichita and Salina.

4.10.2 Consequences

4.10.2.1 Early Transfer Disposal Alternative

Economic Development

Direct: Long-term moderate beneficial effects are expected (see Section 4.10.2.5, Intensity-Based Probable Use Scenario, for further discussion of modeling results). The early transfer of KSAAP would enable immediate initiation of redevelopment activities, and therefore new job creation, increased local sales volume, possible industrial diversification in the local and regional economies, and expansion of the tax base. Ongoing remediation activities would generate additional employment, expenditures, and economic diversification, with similarly positive impacts on the local economy. Deed restrictions requiring continued remediation activities at the installation properties could preclude some uses of certain parcels, but this would not impede the potential for economic development.

Indirect. Long-term minor beneficial and adverse effects are expected. Increased employment and expenditures from closure and redevelopment and remediation activities would generate indirect increases in jobs, local sales volume, income, and tax revenues in the regional economy. Disposal could also saturate the local real estate market with low-cost commercial and industrial vacancies. This effect would be localized and short-term and would not affect the entire ROI equally.

Sociological Environment (Including Environmental Justice and Protection of Children)

Direct. Long-term minor beneficial and adverse effects are expected. Increased employment resulting from early transfer would result in increased housing demand earlier than would happen under traditional disposal. Low-income populations would benefit from the creation of low-skill and unskilled jobs associated with economic redevelopment of the properties, as well as experience increased household incomes. Early transfer is not expected to create impacts that disproportionately affect homeless programs or minority communities in the ROI. Redevelopment, however, may increase the risks to children and trespassers, as industrial activities would likely increase on KSAAP.

Indirect. Short- and long-term minor adverse effects are expected. Employment growth under early transfer would lead more quickly to increased demand for public services, schools, and infrastructure.

Quality of Life

Direct. Short-term and long-term negligible adverse effects are expected. The impact of increased direct employment at the KSAAP property could expand the population of local school systems during peak construction years. These impacts will likely be localized rather than taking place throughout the ROI in the long term. In addition, when considering the overall trend in population decline in the region, increases in employment associated with KSAAP redevelopment would likely have negligible effect on the student population over time.

Indirect. Long-term negligible adverse effects are expected. Adverse impacts could result from induced regional economic growth from redevelopment activities within the region. For example, induced growth may increase regional population levels and school enrollment. Adverse effects to quality of life may occur if school infrastructure is not sufficient to accommodate these increases. Given the continued decrease in population in the ROI, however, this effect is considered to be negligible.

Installation Agreements

Direct. No direct effects are expected.

Indirect. Short-term minor adverse effects are expected. Transfer of the installation properties to the community would create expanded responsibilities, and possibly minor delayed response times during certain events, for local fire departments, law enforcement agencies, and emergency medical care providers.

4.10.2.2 Traditional Disposal Alternative

Economic Development

Direct. Long-term moderate beneficial impacts are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Long-term minor beneficial and adverse effects are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Sociological Environment

Direct. Long-term minor beneficial and adverse impacts are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Short- and long-term minor adverse effects are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Quality of Life

Direct. Short-term and long-term negligible adverse impacts are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Short-term negligible adverse impacts are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Installation Agreements

Direct. No direct impacts are expected.

Indirect. Short-term minor adverse impacts are expected. Impacts are similar to those described under the early transfer disposal alternative, but would occur over a longer period.

4.10.2.3 Caretaker Status Alternative

Economic Development

Direct. Short-term and long-term minor adverse effects are expected for KSAAP. Closure of KSAAP and DZI under caretaker status would result in the direct loss of 328 jobs and loss of $8.5 million in employment income, as well as a loss of $6.7 million in sales volume in the ROI economy (See Appendix G for a description of the Economic Impact Forecast System [EIFS] model analysis and results). Given the size of the economy within the ROI, the economic impact of these direct changes is not predicted to exceed historical thresholds for socioeconomic change in the ROI (less than 0.4 percent of the ROI labor income).

Indirect. Short-term and long-term minor adverse effects are expected. Under caretaker status, the loss of KSAAP and DZI indirect employment and expenditures would translate to a loss of 59 additional indirect jobs and more than $10 million in sales volumes. The economic impact of these indirect changes is not predicted to exceed historical thresholds for socioeconomic change and sustainability in the ROI. Caretaker status would also represent foregone economic opportunity (e.g., job creation, sales and expenditures, and tax revenues) until KSAAP is conveyed to the community. Additionally, depending on how long the properties remain under caretaker status and the level of dilapidation the infrastructure suffers, facilities and local infrastructure could degrade over time, increasing costs for future development. The socioeconomic impact of these total (direct and indirect) changes, however, is not predicted to exceed historical thresholds for socioeconomic change and sustainability in the ROI and can be expected to be reversed when the property enters into redevelopment.

Sociological Environment

Direct. Long-term minor adverse effects are expected. Depending on how long the property remains in caretaker status and the ability of KSAAP employees to find other work, as many as 387 individuals and their families may move from the area, resulting in a contraction in the population. However, this population change is not expected to exceed historical thresholds for socioeconomic change and sustainability within the ROI.

Caretaker status is not expected to create impacts that disproportionately affect homeless programs, or minority or low-income communities within the ROI. Furthermore, access control and security measures will continue under caretaker status; therefore, no disproportionate risks to children are expected.

Indirect. Short-term and long-term minor adverse effects are expected. Although security access would be controlled, reduced employee presence on KSAAP may reduce the level of on-site security to prevent trespassers on the site. This could create potentially hazardous conditions for the safety and well-being of children and hunters who may trespass in areas formerly used for ammunition storage, testing, and demolition.

In addition, departure of KSAAP employees from the community could result in a short-term reduction of housing demand, with a corresponding increase in the number of residential vacancies in the local real estate market. This effect would be localized and not affect the entire ROI equally.

Quality of Life

Direct. Short-term minor adverse effects are expected. Discontinuation of the daily presence of the installation workforce at KSAAP could potentially create increased opportunity for vandalism, property theft, and other criminal activity such as poaching (animals or timber). Reduced staffing could also result in less timely discovery of fire and longer fire-fighting response times, as well as longer response times for medical emergencies for the caretaker force or visitors to the properties. Together these could result in adverse impacts for human safety and natural resources on the properties.

Caretaker status may also result in discontinued recreational hunting and fishing opportunities for military personnel and their families.

Indirect. No indirect impacts are expected.

Installation Agreements

Direct: No direct impacts are expected.

Indirect. No indirect impacts are expected.

4.10.2.4 No Action Alternative

No direct or indirect effects are expected under the no action alternative. For this alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment, which would have no effect on any socioeconomic metrics in the immediate vicinity of KSAAP, nor within the ROI. Overall, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.10.2.5 Intensity-Based Probable Use Scenario

Socioeconomic Impact Assessment Method of Analysis

To determine the secondary socioeconomic effects of the implementation of the two reuse scenarios for KSAAP, the U.S. Army's EIFS model was used. The EIFS model is a computer-based economic tool that calculates multipliers to estimate the direct and indirect impacts resulting from a given action. The model requires input data for: the names of counties comprising the ROI, the number and income of civilian and military personnel affected by the action and reuse scenarios, change in local expenditures due to the action and reuse scenarios, the number of civilians expected to relocate, and the number of military personnel who live on base. Changes in employment and spending represent direct effects resulting from the action and reuse scenarios. Forecast changes in ROI sales volume, employment, income, and population represent indirect effects and are based on the input data and calculated multipliers within the model.

For the purposes of analysis, a change is considered significant if it falls outside the normal range of ROI economic variation. To determine normal variability, the EIFS model calculates a rational threshold value (RTV) profile for the ROI based on historical fluctuations in sales volume, employment, income, and population patterns. The historic extremes for the ROI become the threshold of significance for social and economic change. If the calculated effect of a reuse scenario falls outside the RTV, the impact is considered significant. Appendix G describes the EIFS model in detail as well as the calculation of input parameters and presents model input and output tables and RTV parameters for both reuse intensity scenarios considered.

For the two LIR and MLIR scenarios, the years of expected maximum economic change in the ROI economy were modeled over the 20-year phased build-out period on an annualized basis. The year(s) of maximum economic change is expected to occur after KSAAP closure during which construction and increased operations may occur, with the attendant short-term pulse in employment and expenditures. Expected impacts of the reuse scenarios during the year(s) of maximum economic change are discussed below along with their EIFS output reports. Table 4.10-8 presents model input assumptions and projected outputs and change for both the LIR and MLIR reuse scenarios during the assumed maximum year build-out, over the 20-year phased build-out period. EIFS analysis input and output tables for peak construction years and the total change over the 20-year build-out phase are presented in Appendix G.

Table 4.10-8 EIFS Model Output: KSAAP Reuse Intensity Scenarios

ANNUAL INPUT PARAMETERS [1]		
Reuse Intensity Scenario	**Low Intensity**	**Medium-Low Intensity**
Change in Local Expenditures (max annual)	$10,000,000	$20,000,000
Net Change in Civilian Employment (max annual)	500	1,100
Change in Military Employment	-8	-8
Average Income of Affected Civilian	$28,100	$28,100
Average Income of Affected Military	$70,800	$70,800
Percent Expected to Relocate	50	50

ANNUAL FORECAST OUTPUT					
	LIR		**MLIR**		**RTV Range (percent)**
	Projected Change	**Percent Change**	**Projected Change**	**Percent Change**	
Sales Volume					
Direct	$17,143,260		$36,822,740		
Indirect	$27,086,350		$58,179,920		
Sales Total	$44,229,610	1.38	$95,002,650	2.96	-6.8-7.96
Employment					
Direct	588		1,298		
Indirect	151		325		
Employment Total	739	0.93	1,623	2.05	-3.61–3.43
Income					
Direct	$14,628,450		$32,633,300		
Indirect	$5,063,628		$10,876,380		
Total (place of work)	$19,692,080	0.75	$43,509,680	1.67	-7.3–7.3
Population					
Total Population Change*	603	0.44	1,350	0.98	-0.62–2.2

[1] Sources and calculations of input parameters are presented in Appendix G

* Population levels will continue to decline in the ROI at a rate of -3 percent in the next five years, as well as in the future. Population increases due to the proposed action would reduce this rate of decline.

Economic Development

Medium-Low Intensity, Direct. Long-term moderate beneficial impacts are expected. A MLIR scenario during a year of maximum economic change could create beneficial impacts for long-term job creation, income generation, sales and expenditures, and tax revenues. Table 4.10-8 shows that an estimated 1,298 direct jobs could be created during a peak year of growth, generating direct increases of more than $32 million in income and $37 million in sales volume each year. The economic impact of these direct changes during peak construction years is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

Medium-Low Intensity, Indirect. Long-term moderate beneficial impacts are expected. Direct job creation, income generation, and spending related to reuse could also result in secondary job creation (325 jobs), income generation ($11 million), sales and expenditures ($58 million), and tax revenues, including economic activity from building construction and infrastructure redevelopment, such as roads, utilities, schools, etc. The economic impact of the indirect changes during the peak year(s) is predicted to fall within historical thresholds of sustainable economic change in the ROI.

Medium-Low Intensity, Direct plus Indirect. Table 4.10-8 shows that during the peak construction year(s), an estimated total of 1,623 jobs could be created (direct and indirect), which represents an increase of more than 2 percent in the ROI. The short-term infusion of jobs could help to reduce regional and local unemployment to the extent that local skills match the needs of plant construction and associated employment demands. Total income generation (direct and indirect) could increase by about $43.5 million, or 1.67 percent, and total sales volumes (direct and indirect) could increase by more than $95 million, or 2.96 percent. The economic impact of total changes in sales volume and employment during the peak construction year(s) is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

Low Intensity, Direct. Long-term minor beneficial impacts are expected. An LIR scenario could create a beneficial impact on long-term job creation, income generation, sales and expenditures, and tax revenues. Table 4.10-8 shows that during the peak construction year(s), an estimated 588 direct jobs could be created as well as more than $17 million in sales volume. The economic impact of the direct changes in employment during peak construction years is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

Low Intensity, Indirect. Long-term minor beneficial impacts are expected. Direct job creation, income generation, and spending related to reuse could also result in secondary job creation (151 jobs), income generation ($5 million), sales and expenditures ($27 million), and tax revenues, including economic activity from building construction and infrastructure redevelopment, such as roads, utilities, schools, etc. The economic impact of the indirect changes during the peak year(s) is predicted to fall within historical thresholds of sustainable economic change in the ROI.

Low Intensity, Direct plus Indirect. Long-term minor beneficial impacts are expected. Table 4.10-8 shows that during the peak construction year(s), an estimated total of 739 jobs could be created (direct plus indirect), which represents an increase of 0.93 percent. The short-term infusion of jobs could help to reduce regional and local unemployment to the extent that local skills match the needs of plant construction and associated employment demands. Total income generation (direct and indirect) could increase by about $19.7 million, or 0.75 percent, and total sales volumes (direct and indirect) could increase by $44 million, or 1.38 percent. During the peak construction years, the pulses in total employment and sales volumes (direct and indirect) are not expected to exceed thresholds for economic sustainability in the ROI.

Sociological Environment (Including Environmental Justice and Protection of Children)

Medium-Low Intensity, Direct. Long-term moderate beneficial impacts are expected. The direct jobs created under this scenario (1,298 in a peak year) could attract individuals from within the ROI and may offset some of the regional loss in population. This scenario predicts that the increase in population during the year of maximum change would be 1,350 people. Population projections within the ROI predict that the population will decrease by about 5,200 between 2005 and 2020 (an average of 345 people annually). The MLIR scenario is expected to help offset this declining population with the population increases within given years.

The MLIR scenario for KSAAP property would not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations of the surrounding communities. Low-income populations could benefit from the creation of low-skill and unskilled jobs. No impacts are expected for environmental justice or homeless and other special programs.

With respect to public safety (as well as protection of children), industrial operations and continued energetics manufacturing involves the use of harmful, flammable, irritating, and explosive substances. The presence of these hazards on the site would contribute to the inherent hazards, particularly to workers. Safe operations would require implementation and enforcement of stringent OSHA-compliant safety protocols and careful planning and studies to ensure adoption of sufficient explosive-safety arcs. These types of operations (particularly energetics production and storage) are inherently dangerous, but not too unlike the risks associated with the transport, storage, and handling of other hazardous substances, such as truck and rail tankers carrying bulk quantities of gasoline on area interstates and railway. With respect to plant operations, workers would be at risk from accidents, including explosions and fire risks. Risks would be reduced through implementation of high safety standards, control equipment, and handling procedures that are dictated by federal, state, and local requirements for the safe handling of such materials.

Energetics activities and other hazardous industrial activities are planned to be located within the interior of the property, while limited residential development and other uses by the general public are envisioned for other parcels. Sufficient planning studies and buffer safety zones will be required to minimize risks to the general public and other industrial tenants. Beyond chemical handling, there are also risks posed by transport operations associated with large increases in train and truck traffic, which may pose a risk to the general public, workers, and children in the region, particularly related to an increased potential for automobile accidents at crossings. Trespassing risks to children and hunters within the industrial and energetics parcels would also be a safety concern. Sufficient security measures (well maintained fences, video cameras, and other surveillance and barrier mechanisms) will be necessary to ensure public safety in a mixed-use plan envisioned by the KSAAP LRPA. As specific projects are proposed as part of redevelopment in the future, additional planning studies are required to design sufficient buffer zones and security measures between land use parcels in order to ensure that noise propagation, safety arcs, or other safety concerns do not create incompatible land use conditions (as discussed in Section 3.2.4).

Medium-Low Intensity, Indirect. Long-term minor beneficial and adverse effects are expected. Indirect jobs created under this scenario (approximately 325 additional jobs during the peak construction year(s)) could attract individuals from within the ROI to the local economy and increase the local population and demand for public services, creating both beneficial and adverse effects. Overtime, public support services should be able to adapt to the demands of any short-term or localized increase in population base, funded by new property tax revenue and sales taxes.

Low Intensity, Direct. Long-term beneficial and adverse effects are expected. The direct jobs created under an LIR scenario (588 per year during the peak construction year(s)) could attract individuals from within the ROI, increasing the local population with beneficial impacts on the local economy. The intensity of effects to the sociological environment would be similar to those described for the MLIR scenario, but to a lesser degree.

The LIR scenario for KSAAP would not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations in surrounding communities. Low-income populations could benefit from the creation of low-skill and unskilled jobs. No effects are expected for environmental justice or homeless and other special programs.

Public health and safety risks would be similar to those described for the MLIR scenario, but to a lesser degree.

Low Intensity, Indirect. Long-term minor beneficial and adverse impacts are expected. Indirect jobs created under this scenario (about 150 additional jobs during the peak construction year (s)) could attract individuals from within the ROI to the local economy and increase the local population. Indirect effects would be similar to those described for the MLIR scenario, but to a lesser degree.

Quality of Life

Medium-Low Intensity, Direct. Long-term minor adverse effects are expected. The impact of an expanded population on the local school system during peak construction years could result in increased student populations and localized resource shortages. Long-term annual average increases in the population over the 20-year build-out period will likely have less adverse impacts, as the time frame will allow for local and regional planning to address the needs of any localized growing student population. At the regional level, however, continued regional trends in population loss will likely minimize any effects.

Medium-Low Intensity, Indirect. Long-term minor adverse effects are expected. The pulse in induced indirect employment could cause minor, short-term, localized increases in population, student population levels, and social infrastructure needs. At the regional level, these effects would be minimized, given the continued regional trends in population loss within the ROI.

Low Intensity, Direct. Short-term minor effects and no long-term effects are expected. The impact of an expanded population on the local school system during peak years could result in short-term increases in student populations and localized resource needs. On average per year over the 20-year build-out period, changes in the demand on the public school system and social infrastructure, however, would likely be within the economic and institutional capacities of the local school district (particularly given the regional trends in population loss).

Low Intensity, Indirect. Short-term minor adverse effects and no long-term effects are expected. Short-term effects would be similar to the MLIR scenario but less intense.

Installation Agreements

Medium-Low Intensity, Direct. No effects are expected. Installation agreements between the Army and local agencies for the provision of various services would be continued until disposal of the installation properties was complete. Those services are presently provided, and would continue to be provided by local agency suppliers outside the boundaries of KSAAP.

Medium-Low Intensity, Indirect. No effects are expected.

Low Intensity, Direct. No effects are expected. Installation agreements between the Army and local agencies for the provision of various services would be continued until disposal of the installation was complete. Those services are presently provided, and would continue to be provided, by local agency suppliers outside the boundaries of KSAAP.

Low Intensity, Indirect. No effects are expected.

4.11 TRANSPORTATION

4.11.1 Affected Environment

4.11.1.1 Roadways and Traffic

U.S. Highway 400 runs about a half mile to the north of KSAAP. Primary access to the installation is via Scotts Road. U.S. Highway 59 runs parallel to the western boundary of the installation. Average daily traffic counts on these roadways near Parsons, Kansas, for 2006 were 4,280 vehicles per day and 1,010 trucks per day for U.S. 400; and 4,850 vehicles per day and 640 trucks per day for U.S. 59 (KSDOT 2006). The nearest interstate highway is I-44, which is about 40 miles to the southeast. County roads border portions of the installation boundaries. Figure 4.11-1 shows the locations of major roadways in and around KSAAP.

4.11.1.2 Installation Transportation

KSAAP has 106 miles of roads within its boundaries. This includes 26 miles of paved roads and 80 miles of unpaved roads. The former are ageing but somewhat maintained bituminous asphalt. The latter range from gravel surfaced to tire ruts. A few less traveled roads are of crushed rock. There are several access roads across KSAAP that are used primarily for agricultural purposes. Most of these are impassable during wet conditions.

Less than 300 personnel are employed at KSAAP. They work in two shifts that are nearly equal in size. There are no traffic counts for the installation, but current estimates are approximately 125 to 130 cars on the installation at any time during the 16 hours that the shifts are working. During working hours, there is no traffic. The entrance/exit gate is somewhat congested during the transition from the day shift to the night shift because cars need to be checked both entering and exiting. At the beginning of the day shift and closing of the night shift, traffic flows more smoothly. Shift start/stop times at various work areas are staggered by approximately 10 minutes to help avoid backups (Vandekoven 2006).

4.11.1.3 Public Transportation

The installation is not served by public transportation.

4.11.1.4 Rail

The Union Pacific Railroad parallels a portion of the southwest and the southern boundaries. KSAAP is serviced by Union Pacific and has 33 miles of track, in various states of repair, within its boundaries. The KSAAP railway system is extensive and on-site tracks consist of lines, spurs, and sidings. The majority of the lines are below current specified rail standard requirements (thereby requiring some upgrades). However, most of the rail track itself is in good condition (KSAAP LRPA 2007) and is a valuable asset that is part of the infrastructure distinguishing KSAAP. The 1300 Area is the railroad exchange

area and is in good repair (U.S. Army 2006a). Rail tracks on the facility are seldom used except for movement and storage of old railcars waiting to be refurbished or to be scrapped (Parish 2006). A contractor currently leases tracks for storage of railcars.

Figure 4.11-1 Map of KSAAP and Surrounding Area

4.11.1.5 Air Traffic and Airspace

There has never been airspace utilization originating from KSAAP. Airspace restrictions within the vicinity of the installation are stipulated by a NOTAM filed by KSAAP with the FAA. While this does not restrict air travel over the installation, it does request that the installation be avoided. As an alternative to avoidance, pilots are requested to increase

altitude because of possible damage to aircraft from fragments projected by blast operations and ammunitions testing (Vandenkoven 2006). There are no helipads located on the installation (Cramer 2006).

Airports within the vicinity of the installation include the Tri-Cities Airport located approximately 20 miles west of KSAAP and the Joplin Regional Airport located in Joplin, Missouri, approximately 45 miles southeast of the facility. Most visitors to the installation use the Tulsa, Oklahoma, airport located approximately 112 miles south of the installation.

4.11.2 Consequences

4.11.2.1 Early Transfer Disposal Alternative

Direct. Short- and long-term minor adverse and beneficial effects to transportation infrastructure are expected on KSAAP. For off-site transportation networks, minor short- and long-term adverse effects are expected. It is anticipated that early transfer would result in increased traffic and increased usage of transportation infrastructure both on and off the installation. This increase would cause greater wear and tear on existing roadways and possibly other transportation infrastructure such as the rail lines, thereby causing short- and long-term minor adverse effects both on and off the installation. Off-site, area roads are operating well below design capacities; therefore, only minor adverse effects are expected. On site, this minor adverse effect would be offset to some degree, as existing transportation infrastructure would be better maintained and possibly upgraded under this alternative. Thus, beneficial effects would also be expected on KSAAP at particular locations.

Indirect. Long-term minor adverse effects are expected near KSAAP. In the long term, disposal of KSAAP may spawn additional economic growth in the region that could generate additional residential and commercial traffic within the area and adversely affect traffic flow. However, road networks are operating well below their design capacities; therefore, only minor effects are expected.

4.11.2.2 Traditional Disposal Alternative

Direct. Short- and long-term minor adverse and beneficial effects to transportation infrastructure are expected on KSAAP. For off-site transportation networks, minor short- and long-term adverse effects are expected. Effects would be similar to those described under the early transfer disposal alternative, but the effects would occur further into the future.

Indirect. Long-term minor adverse effects are expected near KSAAP. Effects would be similar to those described under the early transfer disposal alternative, but the effects would occur further into the future.

4.11.2.3 Caretaker Status Alternative

Direct. Long-term minor adverse and beneficial effects are expected. Caretaker status would result in fewer demands on roads and other transportation elements. Roads would receive less use, and therefore less wear and tear, and traffic would be reduced. Reduced use and maintenance over a prolonged period of caretaker status would result in gradual deterioration of roads. No effects on regional traffic patterns are expected.

Indirect. No effects are expected.

4.11.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment, including implementation of road and other infrastructure maintenance. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.11.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Long-term minor adverse and beneficial effects are expected at KSAAP. Medium-low intensity reuse of KSAAP would result in an estimated increase in employees from 200 as of November 2005 to 6,500. Also, construction of 5 to 6 million square feet of facilities (depending on use of existing facilities) on KSAAP over the next 20 years would result in an increase in facility traffic. Overall, development could increase industrial operations to five to ten times the current operational levels seen on KSAAP under baseline conditions. In the short term, increased demands on the installation's transportation infrastructure could cause greater wear and tear on available infrastructure both on and off the installation. As these figures represent long-term build-out of the facility, infrastructure investments commensurate with this growth would minimize adverse effects to transportation. Also, off-site roads are operating well below their design capacity and could accommodate increased traffic.

Furthermore, construction associated with reuse could result in short-term adverse impacts by affecting traffic on the installation properties. Off-site, road networks are currently operating at levels well below carrying capacity; therefore, this increase in employment at KSAAP would only cause minor adverse effects to regional infrastructure. Furthermore, this increase in traffic would likely spur long-term improvements to infrastructure, resulting in some beneficial effects. In addition, depending on the types of uses established, improvements to some of the transportation infrastructure, such as the rail network and gate access and intersection upgrades, may be required.

The reuse plan calls for increased use of the existing rail lines and cold storage warehouses as well as devoting additional land to the construction of new warehouse facilities and the repair and storage of railcars (KSAAP LRPA 2007). Although the majority of the rail lines are below current rail standards, most of the track is in good condition. The rail lines are currently operating below capacity, so increased usage will not have major

impacts. Furthermore, redevelopment would result in upgraded rail infrastructure to service demand as necessary, which would include better access and connections.

***Medium-Low Intensity, Indirect*.** Long-term minor adverse effects are expected near KSAAP. This reuse scenario will generate additional economic growth in the region, which could result in additional residential and commercial traffic beyond the levels specifically addressed in the reuse plan. This added growth could adversely affect traffic as well. However, road networks are operating well below their design capacities therefore, only minor effects are expected.

***Low Intensity, Direct*.** Long-term minor adverse and beneficial effects are expected. Low intensity reuse of KSAAP would result in an estimated increase in employees from 200 to 2,000. Although this increase is less than that predicted for the MLIR scenario, this increase would still result in greater demands on the installation's transportation infrastructure, but to a lesser degree.

***Low Intensity, Indirect*.** Long-term minor adverse effects are expected. Effects from the LIR scenario are similar to, but less than, the effects from the MLIR scenario.

4.12 UTILITIES

4.12.1 Affected Environment

4.12.1.1 Potable Water Supply

The KSAAP maintains and operates its own water supply treatment and distribution system. Installation water supply is drawn from the Neosho River. Water is impounded by a concrete dam and then treated by the Water Filtration Plant located on the west bank of the river, approximately two miles east of the installation. The water supply system is in poor condition and does not fully operate at capacity levels. Water is pumped into a 1 million gallon capped concrete reservoir that supplies all potable and industrial water needs to the installation. Sludge from the filter bed of the Water Treatment Plant is transported by truck and is dumped into two ponds along 2 Road, south of the 1700 Area. These sludge-drying beds were specifically constructed for this purpose in 1977 and were designed to meet USEPA's criteria for suspended solids. Effluent from the treatment plant is covered under a NPDES permit (see U.S. Army 2006a for further information on permits).

Two-thirds of the installation's water requirement is for normal potable usages. Industrial usage includes boiler supply, cooling, preheating components, and clean-up and accounts for the remaining one-third of the total need. The plant drains to the Labette Creek on the west and the Neosho River in the east.

The water filtration plant, which is located on the Neosho River in the 2100 Area, consists of two buildings – Facility 2106, the filtering facility for filtering, treatment, and pumping, and Facility 2106-A, for pumping water from the KSAAP Neosho River Dam. Facility 2106 also contains an office and laboratory. There are also settling basins associated with the filtering facility and a 1 million gallon storage reservoir for storage of potable water.

In the past, the water filtration plant was able to treat 1 million gallons of water per day, however average drawdown is between 180 and 200 thousand gallons per day, or less than 25 percent of capacity, due to decreased activity at the installation (McReynolds 2006). Furthermore, the system is in poor operational condition (e.g., pumps inoperable, storage tank capacity not fully operational). In addition to the KSAAP, several residents, a school, and Westar Energy receive potable water from the KSAAP water system.

Potable water is treated in accordance with drinking water permit 4796, which was issued on 1 January 1980. Water permit 1388 provides KSAAP with water rights to the Neosho River. Quarterly water quality reports are submitted to KDHE. In the past, KSAAP had a difficult time meeting the new Total Organic Carbon limits imposed by the 2005 Long Term 1 Enhanced Surface Water Treatment Rule. Additionally, the potable water from the water filtration plant has exceeded limits for haloacetic acids and trihalomethanes in the past as a result of the disinfection process. The water filtration plant has since converted from a chlorination process to a chlorine dioxide system in November 2005 to meet the new treatment requirements.

There are four 250,000 gallon water towers at KSAAP. Tower One is located on 1 Road east of the 100 Area, Tower Two is west of the 1700 Area, Tower Three is near the intersection of 4 Road and D Road, and Tower Four is northwest of 1800 Area. Due to the decreased activity at the installation, Towers Two and Three are the only active towers.

Photos presented in Figure 4.12-1 show the potable water storage tower, the settling ponds, and one of two aerators.

All water-related equipment is from original construction, which is approximately 65 years old. Since 1993, negligible upgrades have been made to the water distribution system. The operating contractor has reported no major water line leaks; however, the age of the system, lack of adequate pipe bedding during the original construction, shifting building foundations, and lack of protective pipeline coatings could contribute to potential leaks. Residual chlorine in the water system is also a problem during the summer months and often requires system flushing (KSAAP LRPA 2007). Overall, water-related infrastructure is in fair condition but requires some upgrading, repair, and preventive maintenance (Cramer 2006).

4.12.1.2 Wastewater System

Sanitary wastes on KSAAP are treated by the plant sanitary wastewater treatment system which consists of a wastewater treatment plant (WWTP) and wastewater collection system. The wastewater treatment system is located in the 2200 Area in the southwest portion of the installation and occupies approximately 3.76 acres. The treatment system had a capacity of 1 mgd but due to reduced flows at the plant, the capacity of the WWTP has been curtailed to about 500,000 gallons per day. KSAAP manages wastewater under a NPDES permit.

The wastewater collection system consists of 6- to 12-inch diameter cast iron sewer lines (SWMU 86) that run from the administrative area southward through the center of the plant. A network consisting of approximately 20.7 miles of sewer lines ties into all production areas before entering the treatment system (DZI 1998). Wastewater enters the treatment system at the grit chamber (SWMU 87) where large solids are removed. Effluent from the grit chamber is discharged into two rectangular primary settling tanks (SWMUs 88 and 89), a dosing tank (SWMU 90), two circular rock-media trickling filters (SWMU 91 and 92), a rectangular secondary settling tank (SWMU 93), a rectangular final clarifier (SWMU 94), an anaerobic sludge digester (SWMU 95), and two sludge drying beds (SWMUs 96 and 97).

Figure 4.12-1 Potable Water Storage Tower, Settling Pond, and Aerator

Wastewater flows by gravity through the system. Solids and sludges are pumped from the grit chamber, primary settling tanks, and secondary settling tanks to the anaerobic digester. Sludge from the anaerobic digester is allowed to dry in the drying beds before

being disposed on site. Liquids are allowed to infiltrate the soil beneath the drying beds. Sludge treated in the drying beds is then transferred to the Sanitary Landfill Area #4 (SWMU 146). Treated wastewater is discharged through NPDES Outfall 004 to a drainage ditch tributary to Labette Creek through NPDES Federal Permit No. KS0029360 and Kansas Permit No. F-NE55-PO04. This permit expires on 31 December 2008.

Table 4.12-1 provides capacities of the industrial wastewater treatment system (U.S. Army 2006a).

KSAAP's Sanitary Sewage Treatment System/Plant, Outfall 004, has the following system outflows and treatment capabilities:

- Peak Monthly Outflow/Treated million gallons per month: 8.074
- Maximum Peak Daily Outflow/Treated million gallons per day: 0.86
- Permitted Daily Treatment/Processing Capacity million gallons per day: 0.92
- Maximum Daily Treatment/Processing Capacity (Design) million gallons: 1

Table 4.12-1 Capacities of the Industrial Wastewater Treatment System

Name/ Production Line (System Identifier)	Peak Monthly Outflow/Treated (Million Gallons per Month)	Maximum Peak Daily Outflow/ Treated (Million Gallons per Day)	Permitted Daily Treatment System Capacity (Million Gallons)	Maximum Daily Treatment System Capacity (Design) (Million Gallons per Day)
Outfall 003 (300 Area)	0.04541	0.0137	0.0073	0.0288
Outfall 007 (700 Area)	0.004	0.004	0.0024	0.0072
Outfall 009 (900 Area)	0	0	0.0096	0.0288
Outfall 010 (1000 Area)	0	0	0.0096	0.0288
Outfall 011 (1100 Area)	0.098982	0.043601	0.0028	0.0864

Some modifications have occurred to the sewage treatment system since its construction in the 1940s. The sludge beds were rehabilitated in 1985 and 2001. In 2001, KSAAP installed a UV system at the plant to complete treatment of wastewater for fecal coliform to comply with new NPDES standards.

A full inspection of the wastewater collection system has not been undertaken. Based on the type of material and the age of the system, infiltration is a problem. A portion of the system has been upgraded to 15-inch PVC lines that generally run from the 1200 Area to the treatment plant. Sewer lines have been plugged and sealed with various materials at manhole connections to reduce the amount of infiltration.

Overall, water treatment infrastructure is in fair condition and is capable of treating flows currently received at the facility but requires some upgrading, repair, and preventive maintenance (Cramer 2006).

4.12.1.3 Storm water System

Storm water at KSAAP has never appeared to be a problem, based primarily on the fact that all chemicals, explosives, and other materials that could readily mix with and contaminate storm water are handled, stored, and utilized in controlled activities (SWPPP 2005). KSAAP has developed a Storm Water Pollution Prevention Plan (SWPPP) that contains a discussion of all storm water run-off pollutant sources and the BMPs that are incorporated as methods of controls in specific areas on the installation.

An organized storm sewer system is not present at KSAAP and storm water is managed through surface runoff and infiltration. A single storm water drain is located on the southern side of the 200 Area near the fueling area and is connected to a nearby oil/water separator and Outfall 002.

In addition, KSAAP has a storm water collection system that is constructed on a ridge laying in a north-south direction. Drainage to the east flows into the Neosho River and to the west flows into Labette Creek. With the exception of the drainage course leading from the 1300 Area, surface water flows through ponds varying in size from 2 to 10 acres prior to leaving installation property.

The terrain on the installation is rolling and well sodded with prairie grass or seeded with cool season grasses. Surface water runoff is over grasslands; erosion problems are negligible. Some drainage courses could be classified as wet weather ditches since they are dry a portion of the year. The drainage area ranges from 250 acres to 2 square miles and, in general, the slope ranges from 0.5 percent to 1.0 percent (U.S. Army 2006a).

4.12.1.4 Energy Sources

Electricity. Electricity for KSAAP is purchased from Westar Energy (formerly Western Resources). Westar is the largest electric energy provider in Kansas and provides electrical power to 650,000 customers (www.wr.com). The installation's main substation belongs to Westar and is located on post near the east boundary of the installation. This metered substation receives three phase, 60 cycle, 60 KV primary power. The Wolf Creek Power Generating Plant at Burlington, Kansas (45 percent ownership by Westar) is the primary supplier of KSAAP power. The primary electrical distribution system at KSAAP consists of overhead lines with some underground lines.

This plant is interconnected with the Westar plant at Wichita, Kansas, and the Westar plant located five miles east of the KSAAP boundary (standby service; 24-hour availability). Westar can supply 100 percent of required power to KSAAP from any one of these sources. KSAAP receives power form the Westar substation by two 3-phase, 4-wire circuits and it is transmitted to load centers throughout the plant at 7200/12470 volts, 3-phase, grounded Y connections (McReynolds 2006).

The entire KSAAP overhead distribution system is owned by the Army and served and maintained by the operation contractor. The following table summarizes the KSAAP electrical power system.

Table 4.12-2 KSAAP Electrical Power System

Utility	Electrical Supply KW	Steam British Thermal Unit
On Plant Daily Capacity	0	539398000
Off Plant Daily Capacity	1982	0
Normal Steady State Daily Load	1720	475000000
Peak Daily Demand for FY 03	1982	539398000
Peak Daily Demand for FY00 to FY03	1782	500935
On Plant Daily Capacity	0	539398000

KSAAP maintains 17 emergency generators at 17 fixed locations as listed in Table 4.12-3 (U.S. Army 2006a).

Fuel. Liquefied Petroleum Gas tanks are strategically placed on base to supply fuel needs. Underground lines are not available. There is no infrastructure for fuel oil.

Boilers. Table 4.12-4 lists the locations of boilers on the installation. All boilers are oil-fired (DZI 1998).

4.12.1.5 Communications

The telephone service at KSAAP consists of underground and overhead cable. Telephone service was previously provided by Southwestern Bell, which turned the system over to the Army due to its relative poor condition. The telephone service originates at the administrative area and is distributed throughout the site. Maintenance, upgrades and other improvements were funded by DZI (Helms 2006).

Table 4.12-3 KSAAP Emergency Generators

Emergency Generator Location Building Number	Capacity (KW)
52	30
101	250
107	160
112	25
202	15
314	75
315	150
511	15
750	125
902	75
1002	75
1006	75
1105W	25
1105E	60
1109	100
1123	100
2106	45

Table 4.12-4 Location of Boilers at KSAAP

High Pressure Boilers			
Boilers House	**Quantity**	**H.P.**	**Steam (pounds/hour)**
314	2	200	13,800
509	2	217	14.972
750	2	300	18,008
902	3	261	27,012
1002	3	217	22,458
1105E	2	350	24,150
1105W	2	200	13,800
Low Pressure Boilers			
52	1	34.4	1,187
53	1	34.4	1,187
58	1	19.2	662
112	1	150	5,175
808	1	26.1	900
1207E	1	22.6	780
1207W	1	26.1	900
1414	2	19.2	1,324
2106	1	34.4	1,187
52	1	34.4	1,187

4.12.1.6 Solid Waste

KSAAP has a Solid Waste Management Program that includes treatment of both hazardous and nonhazardous waste. Nonhazardous solid waste generated at the installation includes paper, glass, metals, plastics, rubber, food, yard wastes, etc. Nonhazardous solid waste generated at KSAAP is transported off-site and disposed of in the Resource Recovery Landfill located in Cherryvale, Kansas, and operated by Allied Waste (Cramer 2006). The installation produces on average nearly 200 tons of solid waste per year to be disposed of in the landfill (Cramer 2006). Most hazardous waste produced on-site is sent to a licensed Defense Reutilization and Marketing Organization (DRMO) facility for treatment and disposal. The installation has one permitted industrial landfill that is used for the disposal of debris such as concrete rubble, broken tiles, and construction and demolition (C&D) waste. Approximately three tons of waste was disposed of in the KSAAP Industrial Landfill in 2006 (Cramer 2006).

4.12.2 Consequences

4.12.2.1 Early Transfer Disposal Alternative

***Direct*.** No short-term effects, but minor to moderate long-term adverse and minor beneficial effects to utilities are expected on KSAAP. Under the early transfer alternative, the ownership of the property would change, but the activities and utility consumption would not change in the short term on KSAAP, resulting in no effects. In the long term, minor beneficial and minor to moderate adverse effects to the utility systems may occur. Minor beneficial effects will occur as private ownership and market forces enable badly needed upgrades to utility systems, including upgrading sewer lines, WWTP facilities, electrical systems, storm water systems, and telecommunications systems. On the other hand, minor to moderate adverse effects may occur if market forces and redevelopment outpace to some degree infrastructure upgrades that are needed. Through careful planning by LRPA and others, stressors to system capacity will be minimized to ensure that sufficient utility service is provided to current and new tenants into the future. Some of the infrastructure concerns that will require upgrades in the long term are outlined below.

Most of the utility infrastructure on KSAAP was constructed in the 1940s. These systems have been repaired and upgraded to some extent and most systems are adequate for current uses. However, certain systems are badly in need of upgrading or entire replacement, particularly with a large increase in users.

One concern is the degree of infiltration impacting the WWTP that services KSAAP. Although the existing WWTP is worth keeping and incorporating into the future reuse of the facility, existing sewer lines are old and in poor condition, with infiltration creating the potential for additional problems in the future. These lines should be replaced as the site is redeveloped (KSAAP LRPA 2007). Even though existing water systems appear to be adequate, a large growth in the number of tenants could result in a corresponding increase in the level of maintenance required to keep the system operational. The present configuration of the KSAAP telephone system is adequate for the existing level of activity, however, the system will not sustain any increased usage and will require upgrading (KSAAP LRPA 2007).

The KSAAP LRPA or other property recipient would become responsible for maintenance of all utility systems. Any additional utility upgrades necessary for reuse would be the responsibility of the future property owner and would occur after disposal.

***Indirect*.** No effects are expected.

4.12.2.2 Traditional Disposal Alternative

Direct. No short-term effects, but minor to moderate long-term adverse and beneficial effects to utilities are expected on KSAAP. Effects would be similar to those described under the early transfer disposal alternative, but the effects would be reduced and would occur further into the future. Under traditional disposal, there would be more time to

assess the exact condition of utilities and any necessary repairs or upgrades to existing utilities could be performed with limited impact to on-site owners and tenants.

Indirect. No effects are expected.

4.12.2.3 Caretaker Status Alternative

Direct. Minor long-term adverse effects are expected on KSAAP. Caretaker status would result in decreased demands on installation infrastructure, which could extend the life of some utility systems. Most utility systems (water treatment, wastewater treatment, electricity distribution), however, are designed to be continually used over the life of the system and suspending use of the system would likely do more harm than good. Reduced use and maintenance of utility systems could result in gradual deterioration over time, resulting in a long-term adverse effect.

Indirect. No effects are expected.

4.12.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment; thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.12.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. Long-term minor beneficial and minor to moderate adverse effects are expected on KSAAP. Under MLIR, construction of 5 to 6 million square feet of facilities (depending on use of existing facilities) on KSAAP over the next 20 years would result in an increase in utility consumption and needs. Overall, development could increase industrial operations to five to ten times the current operational levels seen on KSAAP under baseline conditions, thereby increasing demand. Most of the utility systems serving KSAAP were constructed in the 1940s. These utilities have been repaired and maintained as needed, but utility infrastructure is generally in poor condition (KSAAP LRPA 2007). Overall, substantial new utility work would be required to accommodate reuse, as further described below.

The water, sewer, electrical, and communications systems are in a state of decay and in many cases antiquated (KSAAP LRPA 2007). For example, the WWTP is currently operating at approximately 25 percent capacity and could theoretically accommodate treatment of additional effluent. Aging, cracked sewer lines allow storm water inflow and infiltration resulting in increased peak flow rates during rain events. Although the existing treatment plant is worth incorporating into the future reuse of the facility, the redevelopment alternative ultimately selected will result in sewage flows that exceed the capacity of the existing treatment plant. Therefore, expansion of the plant will be necessary. An upgrade or replacement of the WWTP would result in beneficial impacts to site utilities in that the potential for Infiltration/Inflow will be reduced. The water pumping

station and storage areas are also not functioning properly and will require renovation and upgrades. Furthermore, as discussed in Section 4.7, an increase in water demand to 3 mgd would likely require expansion of the water storage systems (e.g., 100-acre storage pond) or alternative sources during low-flow events in the Neosho River due to low-flow conditions (~ 50 cfs or less).

Implementation of the MLIR scenario would result in increased demand for electricity on KSAAP. The Westar Energy substation could be used to serve existing customers; however, future development of the site may require expansion of the substation or construction of a new one (KSAAP LRPA 2007). The majority of the active overhead electrical lines and power line poles could be used to serve existing and future customers.

The current communications system at KSAAP is adequate for the existing level of activity but will not sustain any increased usage and would require upgrading (KSAAP LRPA 2007).

KSAAP operates a permitted industrial landfill that is used for the disposal of debris such as concrete rubble, broken tiles, and C&D waste. The reuse plan includes proposed construction of an on-site landfill that could accept special wastes, particularly those associated with demolition of facilities on-site and waste generated by redevelopment (KSAAP LRPA 2007).

Medium-Low Intensity, Indirect. No indirect effects to utility systems are expected. Economic growth generated from redevelopment at KSAAP could generate additional infrastructure and utility demands for the areas, but the long-term change and capacity of the regional systems are expected to be sufficient to address growing needs.

Low Intensity, Direct. Minor beneficial and adverse effects are anticipated. The low intensity reuse of KSAAP would result in additional development and increased employment on the installation. This would result in an increase in utility usage; however, the usage would be less than that under the MLIR scenario. Existing utility systems would be able to better accommodate this scenario because utility demand would be less than under the MLIR scenario. Most utility distribution systems, however, would still require repairs, upgrades, and possible replacement to accommodate the anticipated demand.

Low Intensity, Indirect. No indirect effects to utility systems are expected.

4.13 HAZARDOUS AND TOXIC SUBSTANCES

4.13.1 Affected Environment

Information in the following section is largely based on information contained in the ECP prepared for the KSAAP (U.S. Army 2006a).

4.13.1.1 Environmental Condition of Property Designation

The ECP identified 49 parcels for KSAAP in accordance with the criteria described in the ASTM 5746-98 Standard Classification of ECP Area Types for Defense Base Closure and Realignment Facilities (U.S. Army 2006a). CERFA legislation directs federal agencies to evaluate all property on which federal government operations will be terminated to identify uncontaminated parcels. CERCLA allows the transfer of remediated parcels when the successful operation of an approved remedy has been demonstrated. Of the approximately 13,727 acres, 10,646.17 were designated as Categories 1, 2, 3, or 4 at the time of the Final ECP (U.S. Army 2006a); the remaining 3,080.83 acres were designated as Categories 5, 6, or 7. Areas that were designated as Categories 1, 2, 3, or 4 were considered suitable for transfer or lease, subject to the applicable qualifiers. Areas that were designated as Categories 5, 6, or 7 may not be suitable for transfer by deed for early transfer. Table 4.13-1 shows the breakdown of acreage and category definitions at the time of the Final ECP (U.S. Army 2006a). The location of these areas is presented in Figure 4.13-1 (note: the aerial extent of the OD Area has not been fully delineated and thus the actual area of impact from this site is larger than what is depicted in the figure below). The acreages and delineations shown in Table 4.13-1 and Figure 4.13-1 are being updated and refined subsequent to the release of the Final ECP.

Hazardous, Toxic, and Radioactive Waste (HTRW) Permits. KSAAP has managed hazardous waste for decades and currently generates hazardous waste in accordance with RCRA Permit 4799. The plant is a large quantity generator generating more than 2,200 pounds of hazardous waste per month and may accumulate up to 13,200 pounds of hazardous waste at one time. Other operational waste streams and permits are presented in Table 4.13-2.

4.13.1.2 Storage and Handling Areas

KSAAP is a non-NPL installation. It currently operates with a RCRA Part B Permit (KS0213820467) issued by USEPA Region VII in August 1989. It originally identified 160 SWMUs and 9 Areas of Concern (AOC). This permit also required the RCRA Facility Investigations (RFI) to assess the conditions of surface water, groundwater, surface and subsurface soils. Areas of investigation included production areas, landfills, open burning cages, open burning pads, open detonation area, and maintenance and support areas. The number of SWMUs was later consolidated to 25 groups based on the associated areas or use. There is also a RCRA Part A Subpart X permit for the operation of the OB/OD grounds. It was originally issued in 1991.

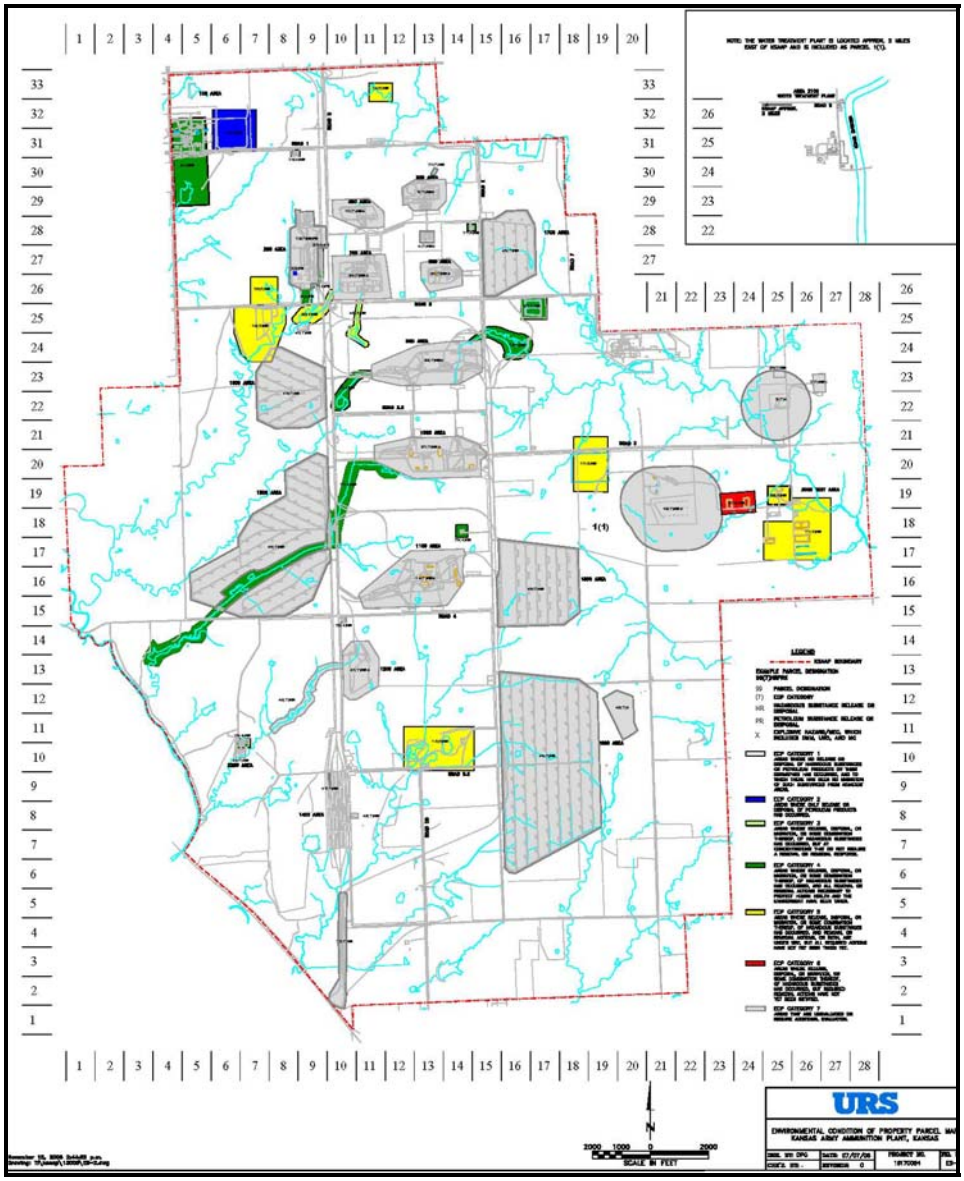


Figure 4.13-1 Environmental Condition of Property Classifications for KSAAP

Table 4.13-1 Environmental Condition of Property Classifications for KSAAP*

Category 1 (White) Definition: Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.	**10,319.17 acres**
Category 2 (Blue) Definition: Areas where only releases or disposal of petroleum products has occurred.	**49.96 acres**
Category 3 (Light Green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.	**0 acres**
Category 4 (Dark Green) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken.	**277.04 acres**
Category 5 (Yellow) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred and removal or remedial actions are under way, but all required remedial steps have not yet been taken.	**366.03 acres**
Category 6 (Red) Definition: Areas where release, disposal, and/or migration of hazardous substances has occurred but required actions have not yet been implemented.	**19.47 acres**
Category 7 (Grey) Definition: Areas that are not evaluated or require additional evaluation.	**2,695.33 acres**

Source: U.S. Army 2006a. Facilities constructed prior to 1985 are assumed to have ACM unless an ACM survey or ACM remediation has been conducted. Facilities constructed prior to 1978 are assumed to contain LBP unless a LBP survey or LBP remediation has been conducted. Parcels were qualified for ACM, LBP, PCBs, and MEC based on information from record reviews, interviews, and visual inspections.
* Note that this information is currently being updated.
Total acreage of KSAAP: 13,727 acres

The Part B permit covers all the typical hazardous waste operations, including the EWI, 18 igloos, and one magazine. The igloos are hemispherical, reinforced concrete vaults. The sides and floor are concrete with a door at one end covered with two feet of earthen material on all sides. The floors are sloped toward the sides such that channels around the inside perimeter can collect spilled materials. Facility 1813 (SWMU 77) is an additional hazardous waste storage facility (not included in the Part B Permit) that is a warehouse with concrete floors and tile walls. Materials in all buildings are stored on pallets.

The current Industrial Landfill Area (SWMU 146) is issued a solid waste permit for nonhazardous waste disposal. It is also referred to in previous documents as the Current Sanitary Landfill Area 4. Waste handling includes uncontaminated trash such as office waste, construction debris, fly ash from coal-fired boiler operations, and nonhazardous

CWP (SWMU 102-104) thermal treatment residue from Area 2700. This permit is renewed annually.

Table 4.13-2 Operational Waste Streams

HTRW Operational Type	Uses	Waste Stream
RCRA Part B	KDHE wanted one permit to cover all hazardous waste operations. Permit covers treatment operations, SWMUs, AOC, and implementation status of corrective measures.	Hazardous Waste
RCRA Part A	Hazardous waste codes permitted for storage and treatment	Hazardous Waste
Solid Waste	Office and administrative municipal, demolition and construction, and hazardous – not included in RCRA permit	Hazardous and nonhazardous waste paper, wood, food collected by American Disposal Services
Landfill 1 active -original use modified 3 closed	Unlined permitted industrial solid waste (SWMU 146)	Uncontaminated construction and demolition waste excluding wood (since 2001) Includes open asbestos pit
USTs	No active USTs 26 were registered 5 were not registered	All USTs removed
ASTs	40 Aboveground Storage Tanks (AST) on property Nine not in use	Diesel, gasoline, kerosene, No.2 Fuel Oil, emergency generator power source
Oil/Water Separator	1 in south 200 Area	Oil and grease captured by separator. Cleaned semi-annually
Septic Tanks	7 active tanks	Waste water sent to leach field from laundry areas, showers, and general cleaning
NPDES	7 outfalls monitored 2 of these idle from idle production areas 3 historic (not used) Monthly Discharge Monitoring Reports	Treated waste water discharge into Neosho River and Labette Creek
Air	Title V Class I Air Emission Source Operating Permit	Fuel oil powered boiler emissions Emergency generator emissions
NRC License	Facility 1019 Quality Assurance and X-Ray Analysis Laboratory scheduled for upgrade	Contained depleted uranium
Source: U.S. Army 2006a		

Other Landfill and Burial Sites (SWMU 139-145, 147-160) have been identified as SWMUs. None of these areas have received wastes since 1980, except for the former Demolition Landfill (SWMUs 149-160). This area last received waste in 1981. The wastes included scrap metals and burn residue. The residue was not tested for hazardous constituents.

There are 242 explosive storage igloos-magazines located on the installation. Approximately 5 to 10 are currently used for short-term hazardous waste storage. Several of the igloos-magazines are leased to area companies, most recently, Dyno Nobel Inc. for storage of explosives (U.S. Army 2006a).

4.13.1.3 Hazardous Waste Disposal

KSAAP does not have a DRMO. The Fort Riley DRMO provides all hazardous waste management contracts. KSAAP has utilized the following thermal treatment units to destroy explosive contaminated material and reject munitions in Area 2700:

- *Open Burning Area.* The Burning Pad (SWMU 108) and the Flash Pad (SWMU 109) were bermed areas used to dispose of reactive wastes such as “off-spec” and scrap explosives. The wastes were burned in these areas in metal pans on the unlined soil. Burn residue was then tested for EP toxicity. Nonhazardous residue was disposed of at the current Industrial Landfill Area. Hazardous residue would have been taken off-site to a permitted facility, but no residue tested hazardous.

- *Open Detonation Area*. Reject munitions and components are disposed of at KSAAP by open detonation at the Demolition Grounds (SWMU 114). Items to be disposed of are buried in a pit and remotely detonated.

- *Burning Cages (SWMUs 115-117)*. Trash and process waste generated at the plant that had been potentially contaminated by explosives was burned in one of the three large wire cages. The residue tested nonhazardous and was disposed of in the Industrial Landfill Area (SWMU 146).

- *Explosive Waste Incinerator (EWI).* The EWI (SWMUs 105-107) was used to dispose of “off-spec” explosives and unusable munitions and components. The residue was tested for reactivity and EP toxicity and regularly failed due to cadmium washers on some grenades. Later, these washers were removed prior to burning. The residue was transported off-site for disposal. The fly ash, also a hazardous waste, was stored in the Hazardous Waste Storage Igloos before being transported off site for disposal.

- *Contaminated Waste Processor (CWP).* The CWP (SWMU 102- 104) burned potentially explosive nonhazardous waste. Bottom ash and fly ash are stored

in Facility 1813 Hazardous Waste Storage Area (SWMU 77) prior to disposal off site. This facility is not included in the RCRA Part B permit.

There were five thermal treatment areas that are now closed. These include the four former Hazardous Waste Burning Pads (SWMUs 110-113) and the Former Open Burning Area (SWMU 118). The burning pads were closed in 1985 and managed USEPA listed wastes. The former Open Burning Area was closed in 1986 and managed similar wastes (U.S. Army 2006a).

4.13.1.4 Site Contamination and Cleanup

Contaminated Sites. The Installation Action Plan (IAP) outlines the multiyear restoration program for a facility. It is focused on contamination resulting from past activities. As indicated in the 2006 IAP for KSAAP, there are 15 active IRP sites, which are presented in Table 4.13-3 (active monitoring ongoing) (U.S. Army 2006c). Sites considered response complete are presented in Table 4.13-4. Most of the active IRP sites are related to SWMUs or AOCs identified in the Corrective Action Requirements of the RCRA Part B Permit. Primary contamination of concern in the production areas and open burning areas are explosives and metals. Explosives in groundwater have been detected in some production areas. Contamination in the production areas was generally highest near the sumps and production facilities. Some dioxins/furans in soils were found at open burn pads. Some contamination was detected at all landfill areas. Two closed landfill areas had VOCs and Semivolatile Organic Compounds and metals in surface soils and groundwater. Some dioxin /furans were found in surface soils and pond sediments at the 200 area closed Landfill and Burn Pits (U.S. Army 2006c).

The full facility RFIs Phase I (Radian Corporation 1994) and Phase II (Radian Corporation 1998) studies were conducted as per RCRA requirements and finalized in 1994 and 1998, respectively. The Human Health Risk Assessment and Ecological Risk Assessment were completed in 1999. A Corrective Measures Study (CMS) was completed that identified corrective actions for all sites identified. Removal actions were conducted in the 900, 1000, 1100 Areas. The open burn areas for explosive contamination and metals-contaminated soils have also completed remediation.

Table 4.13-3 IAP Sites with Ongoing Monitoring

Site Designations	Current Status	Description	Investigation History
KAAP -01 SWMU-12	Statement of Basis conducted (i.e., documentation of planned corrective measures for the site) Ongoing groundwater monitoring	Solid waste landfill North boundary KSAAP Later determined surface disposal area 4 acres	RFI Phase I RFI Phase II Data gap study Removal of metal pile
KAAP -02 SWMU-13	Ongoing groundwater monitoring	Closed landfill in south – central KSAAP 0.4 acres	Site investigation Data gap study Corrective Measures Study Removal of landfill materials
KAAP-03 SWMU-14	Statement of Basis conducted Ongoing groundwater monitoring	Closed landfill and Burn Pits 2.5 acres	RFI Phase I RFI Phase II Data gap study Corrective Measures Study
KAAP -04 SWMU-16	Ongoing groundwater monitoring	Closed landfill 12 acres	Preliminary Assessment/Site Investigation (PA/SI) RFI Phase I RFI Phase II Data gap study Corrective Measures Study Landfill Cover Investigation
KAAP -05 SWMU - 15	Ongoing groundwater monitoring Landfill cover upgrade	Inactive landfill 12 acres	RFI Phase I RFI Phase II Data gap study
KAAP-09 SWMU-23	Statement of Basis conducted Groundwater monitoring after removal of berms and cages	Burning Cages	PA/SI RFI Phase I RFI Phase II Data gap study
KAAP – 10 SWMU-24	Ongoing sampling	Open Burning Pads	RCRA Facility Assessment (RFA) RFI Phase I RFI Phase II
KAAP – 16 SWMU-5	Statement of Basis conducted Ongoing groundwater sampling	300 Area Washwater sumps and discharge points	RFA RFI Phase I RFI Phase II CMS
KAAP- 17 SWMU - 6	Ongoing groundwater sampling	500 Area Washwater sumps and discharge points	RFI Phase I Data gap study CMS
KAAP – 18 SWMU - 25	Consent Agreement for groundwater Ongoing groundwater monitoring	700 Area Washwater sumps and discharge points	Interim Remedial Action for Soil Monitored Natural Attenuation Report
KAAP – 19 SWMU - 7	Ongoing groundwater monitoring	800 Area Washwater sumps and discharge points	PA/SI RFI Phase I RFI Phase II Soil removal Data gap study CMS

Site Designations	Current Status	Description	Investigation History
KAAP – 20 SWMU - 8	Statement of Basis conducted Ongoing groundwater monitoring	900 Area Washwater sumps and discharge points	RFA RFI Phase I RFI Phase II CMS
KAAP – 21 SWMU - 9	Statement of Basis Ongoing groundwater monitoring	1000 Area Washwater sumps and discharge points	RFA RFI Phase I RFI Phase II CMS
KAAP – 22 SWMU - 10	Ongoing groundwater monitoring	1100 Area Washwater sumps and discharge points	PA/SI RFI Phase I RFI Phase II Soil removal
KAAP – 43	Statement of Basis Ongoing groundwater monitoring	1200 Area Ammonium nitrate production facility	Relative Risk Site Evaluation PA/SI RFI

Table 4.13-4 Sites Considered Response Complete in the IAP (2006)

Site Designation	Descriptions
KAAP – 11	Old Pesticide Storage Building
KAAP – 12 SWMU -21	Hazardous Waste Storage Igloos
KAAP – 13	PCB Storage Area 1400
KAAP – 15	STP Sludge Drying Beds – Area 2200
KAAP – 23	Waste Analysis Chemistry Lab
KAAP – 24 SWMU - 20	Incinerator Explosive Waste
KAAP–25 SWMU - 3	Oil Spill Residue Land Farm
KAAP – 26 SWMU - 2	Washrack Discharge Point Area 200
KAAP – 27	Mercury Fulminate Burial Site
KAAP – 28 SWMU– 19	Coal Pile Runoff
KAAP – 29	Particulate Emission Control for Coal Fired Boiler
KAAP – 35 SWMU – 1	100 Area Laundry Sump and Pond
KAAP – 36	200 Area Paint Booth Waterfall System
KAAP – 37 SWMU– 13	Demolition Grounds
KAAP – 38 SWMU-22	Contaminated Waste Processor
KAAP – 39 SWMU-4	Hazardous Waste UST
KAAP – 40	Pistol Range
KAAP – 41	Water Towers
KAAP – 42	Water Detention Basin

Range Inventory and Military Munitions Response Program (MMRP). DoD established the MMRP under the Environmental Restoration, Army Program and Defense Environmental Restoration Program to address unexploded ordnance, discarded military munitions, and munitions constituents located on current and former military installations where suspected releases occurred prior to 30 September 2002. Operational military ranges, permitted munitions disposal facilities, or operating munitions storage ranges are not MMRP eligible. There are six ranges listed on the Active/Inactive Range Inventory and one MMRP site on KSAAP, as listed in Table 4.13-5.

Table 4.13-5 Range Inventory

Range Designation/ Size	Uses	Status
Light Maneuver Range 73.84 acres	National Guard used for field exercises – no ammunition fired.	Remediated under IRP as landfill. Landfill was removed and groundwater monitoring wells installed.
Pistol Range 0.49 acres	Berm used a gunnery target backstop, and may contain projectiles from the ammunition used at the range. Assumed .22 caliber, .38 caliber, .45 caliber, and 9mm ammunition used.	Still in use. Site investigation for subsurface soil not complete.
Sensor-Fused Weapon (SWF) RDT&E Range Facility #02716. 0.64 acres	Site (2700 area) is a 200 foot Research, Design, Testing, and Evaluation (RDT&E) range. SWF warhead testing is conducted at a static metal frame test fixture.	Still in use. Area surrounding is swept annually; debris found outside kick-out area may be from Open Demolition Grounds.
Combined Effect Munitions (CEM) RDT &E Range Facility #02014 29.93 acres	In addition to the CEM testing, sectioning of 60mm, 81mm and 155mm, M795 TNT projectiles to determine cast quality and base separation were reported to occur at this test site.	Still in use. Area includes observation shelter, penetration test barricade, test area, and storage facilities.
M42/46/77 Grenade Range Facility #02716 15.92 acres	Located within the 2000 area. Submission penetration test and spin-aiming test are conducted at this site.	Still in use. Area includes control structures, penetration test barricade, and storage facilities.
Open Demolition Grounds (Open Detonation Area) Facility #02715 35.87 acres	SWMU Group 17 -This site is the open detonation grounds. The open demolition field is a RCRA-regulated unit. The demolition grounds have been used since 1942 for the detonation of rejected and loaded explosive items to render them safe for disposal.	Still in use. Long-term groundwater monitoring is expected to continue and soil clean-up may be necessary.
Old Ammunition Storage Area 26.76 acres	Used as storage area for munitions returned after WWII. Contents decomposed; types were not identified.	MMRP Site. Preliminary Investigation initiated.
Source: U.S. Army 2006c		

4.13.1.5 Special Hazards

- *Asbestos.* It is estimated that 98 percent of the buildings on KSAAP contain suspect ACM. Transite is a common siding material. An asbestos survey and asbestos abatement of friable materials was reportedly performed, although no summary report was available during the 1998 Environmental Baseline Survey records review. No follow-up surveys have been done during the ECP, only records searches. During the July 2005 ECP Workshop, KSAAP personnel confirmed the following status for past asbestos abatement: *removed friable asbestos from the following production lines or Areas as of July 2005 - Areas 200, 300, 500, 900, 1000, 3000, and 1414S Boiler House* (although, it should be noted that nonfriable ACM still remains throughout these areas). The 1200 Area is free of friable asbestos with the exception of the 1206 Attic, which was found to contain friable asbestos. Asbestos, some in friable condition, still needs to be abated from the 50 series buildings and the 1100 line. The asbestos siding and transite roofs have not been addressed by abatement projects (U.S. Army 2006a).

- *Lead and Lead-Based Paint (LBP).* No LBP survey has been performed at KSAAP with the exception of the water towers. It is assumed that facilities constructed prior to 1978 contained LBP. The water towers were built in 1941. As part of routine maintenance, they were sandblasted and repainted possibly accumulating paint residue at the base of the towers. Surficial lead-contaminated soils were removed from the base of each tower in 2002. Confirmation sampling following the removal action indicates the soil at the base of each water tower has lead concentrations less than 1,000 mg/kg, allowing for industrial use (USAEC 2006).

- *Polychlorinated Biphenyls.* All transformers at KSAAP have been sampled for PCBs. Thirty four were identified as having concentrations of PCBs > 50 ppm. Excess PCB-contaminated capacitors and transformers are stored on-site prior to off-site disposal, in the Facility 1406 PCB Storage Area (SWMU 70) – regulated under the TSCA program (U.S. Army 2006a). No incidences of spills were reported in the ECP. However, sampling was done in the 1200 Area with 16 of 48 samples testing positive for PCBs thereby indicating a release (U.S. Army 2006a). A soil removal is planned for locations with PCBs above action levels for industrial use (U.S. Army 2006a). PCB can also be found in other types of equipment including hydraulic fluids of presses and elevators, although no equipment samples were available.

- *Radon.* KSAAP conducted monitoring of indoor air for radon in 72 buildings in May-August 1990. All results were less than 4.0 picocuries per liter of air (pCi/L air) (U.S. Army 1998).

- *Storage Tanks Underground and Aboveground.* There are no USTs in use at KSAAP. A total of 26 registered USTs and 5 unregistered were removed. The 5 unregistered USTs were removed prior to the promulgation of KDHE UST closure

regulations, and thus did not receive state-approved closures. However, the areas were still evaluated in accordance with KDHE requirements. None of the registered USTs inventoried showed any signs of apparent leakage. The registered USTs received KDHE approved closures. In addition, all of the former USTs are classified as "closed" on the KDHE database. There are 40 permitted ASTs, 31 in use and 9 empty. These contain diesel fuel, gasoline, and kerosene. The ECP lists the location, capacity, contents, and construction information for each AST. The permit for the ASTs is renewed annually and leak testing began in 2006 (U.S. Army 2006a).

- *Pesticides and Herbicides.* Pesticides are used and stored at KSAAP. There is an Integrated Pest Management Plan in place. In the developed areas, pesticide application is done by hand and mostly around building perimeters, fence lines and parking areas. Agricultural leaseholders are responsible for pest control on leased property and utilize pesticides and herbicides to that end. DZI, tenants and agricultural lessees conducting pest management operations are required to adhere to the conditions in the KSAAP Integrated Pest Management Plan (U.S. Army 2006a).

- *Medical and Biohazardous Waste.* There was a Health Clinic facility on KSAAP that performed employee physicals and monitoring. That facility was demolished in 1989 (U.S. Army 2006a).

- *Radionuclides.* KSAAP (DZI) holds an NRC License Number SUB -1283, expiration May 2013, for depleted uranium (DU) used in Building 1019 for x-ray equipment. This equipment is scheduled for upgrade and will no longer utilize DU. KSAAP has no record of radiological commodities. No DU munitions are stored on KSAAP (U.S. Army 2006a).

- *Spills.* KSAAP has a Spill Prevention, Control and Countermeasure plan in place. Training for spill response is given to facility personnel on an annual basis. Spill clean-up materials have generally been treated at the OB/OD locations. A land farm operation was being used at the facility to provide treatment for oil-contaminated soil from spill cleanups and oil residues from old storage tanks. The Oil Landfarm (SWMU 6) consists of three cells and was last used in 1993. Contaminated soils were placed in the treatment cells and were regularly tilled and/or aerated to enhance the treatment (U.S. Army 2006a).

4.13.1.6 Ongoing Remedial Actions

As a condition of the RCRA Part B Permit, site closure requirements are addressed. These include, but are not limited to, the decommissioning of the production facilities and associated infrastructure. Site Assessments would need to be conducted on range locations upon closure. Ongoing monitoring commitments, some long-term and periodic

review of monitoring data would also need to be addressed and conveyed to state and federal regulators. Other areas that will need to be addressed are outlined below.

Explosives Residues. The physical structures that were used in the load, assembly and packing of explosives into munitions may have explosive residue embedded in the walls, ceilings, duct work, sewer lines and equipment located within the building. Additionally, the concrete slab areas around expansion joints in the floors, piping and/or utilities located on or under the slab, and the area under the slab itself may contain residual explosives that present a potential explosive hazard. All of these materials should be evaluated during building renovation or demolition and prior to disposal of any materials.

Mercury in Facilities/Construction. No evaluation has been done on mercury in facilities and construction components such as vapor lights mercury switches.

4.13.2 Consequences

The Army has characterized the existing environmental conditions at KSAAP in the ECP report (U.S. Army 2006a) and is currently updating this information. The facility was divided into 49 parcels and then further evaluated and assigned a score of one through seven based on standard ECP types. Category 1 is assigned to an area where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). Categories 1 through 4 are considered suitable for transfer. Category 7 is assigned to areas that have not been evaluated or that require additional evaluation.

CERCLA 120(h) requires that, prior to transfer, necessary remedial actions be completed or in place and proven to be operating properly and successfully. Under the ETA in CERCLA 120(h)(3)(C), property can be transferred before all necessary remedial actions have been completed (Categories 5, 6, and 7). The CERCLA covenant deferral request must be approved by the state governor for sites not listed on the NPL.

Regardless of the type of disposal, the Army is under a mandate to characterize contamination, define the appropriate remediation in coordination with regulatory agencies, and conduct required remediation. The new use must be consistent with the remedial constraints, land use restrictions, and the protection of human health and the environment. The new owner may agree to perform all environmental remediation and monitoring, waste management, and environmental compliance activities required, or the Army may choose to continue to conduct or contract remedial and other activities. The Army will provide notification on hazardous substances that were stored, released, or disposed of on the property in excess of the 40 CFR Part 373 reportable quantities. MEC-contaminated property could be transferred to non-federal entities prior to the completion of remedial activities under the early transfer alternative (in that case, LUCs would be employed until remedial activities are complete); otherwise, MEC-contaminated property can only be transferred after remedial activities have been completed. If additional remedial actions are needed beyond the transfer date, the government is responsible for only those that are attributable to activities of the federal government prior to transfer.

DoD policy with regard to LBP and ACMs is to manage these substances in a manner protective to human health and the environment and in compliance with all applicable laws. DoD will manage LBP at KSAAP in accordance with the provisions of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of Public Law 102-550). These laws require federal property constructed between 1960 and 1978 that is being transferred for residential use to be inspected for LBP and related hazards and the results of such inspections to be provided to prospective purchasers or transferees. Before transfer or conveyance, the Army would remove or encapsulate all friable asbestos that posed a risk to human health per Army policy (Office of the Under Secretary of Defense 1994). Transfer or conveyance documents would notify owners or lessees of the property that they would be responsible for any future ACM remediation found to be necessary.

4.13.2.1 Early Transfer Disposal Alternative

Direct. No effects are expected. Remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Necessary land use restrictions will be put in place to ensure protection of human health and the environment as remediation efforts continue in accordance with regulatory agencies. Furthermore, parcel-specific land use restrictions will be placed on parcels that are still under investigation and cleanup.

Indirect. Minor long-term beneficial and adverse effects may occur, as well as short-term minor to moderate adverse effects. Although existing remedial programs will continue under either federal or non-federal ownership, under non-federal ownership it is conceivable for additional resources to be made available to renovate or remove facilities that are in disrepair, as well as for demolition of old production lines, removal of debris and cracked subsurface pipes. Thus, market forces may provide indirect beneficial effects from the removal of residual sources of contaminants and enhance environmental quality in the long term as compared to the status quo conditions. On the other hand, increased demolition of old production lines may result in minor to moderate adverse effects due to increased waste handling, disposal, and remediation during demolition activities in the short term. Furthermore, long-term minor adverse effects may occur as enhanced industrial use of KSAAP may lead to the increased potential for incidental spills and/or releases of hazardous substances, which could have localized adverse effects.

4.13.2.2 Traditional Disposal Alternative

Direct. No effects are expected. This alternative is similar to early transfer and would require the continuance of ongoing remedial and monitoring actions; however, because of the additional time for transfer, additional monitoring and closure will be completed. The long-term remedies must continue to be monitored and shown to be operating properly and successfully. Until that determination is made and agreed to by all parties, the property cannot be transferred. This alternative would require the disclosure and commitment of ongoing remedial actions. The Army would take the necessary remedial action(s) to protect human health and the environment in accordance with all applicable

federal, state, and local laws. Future site assessment, closure, and decommissioning of production, treatment, and storage and disposal areas would be negotiated.

Before transfer or conveyance, the Army would remove or encapsulate all friable asbestos that posed a risk to human health and include language in conveyance documents to notify owners or lessees of the property that they would be responsible for any future ACM remediation found to be necessary, as described above under the early transfer disposal alternative.

Indirect. Minor long-term beneficial and adverse effects may occur, as well as short-term minor to moderate adverse effects. As compared to early transfer disposal, remedial programs and redevelopment would occur over a longer period, but the effects would be similar.

4.13.2.3 Caretaker Status Alternative

Direct. Minor beneficial and adverse effects would occur. Remedial efforts would continue to occur during caretaker status. The decrease in baseline operations however, would reduce the generation and storage of wastes resulting in a minor beneficial effect. In any event, remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Furthermore, ACMs, LBP, PCB equipment, and radiological materials would be subject to Army policies and requirements.

Indirect. Negligible adverse effects are expected. ACM, LBP, PCB equipment are still located in structures. Certain studies and renovations that would have otherwise taken place may not be initiated for idle production and support facilities, resulting in long-term adverse effects relative to status quo operating conditions.

4.13.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at KSAAP at the level similar to those occurring prior to the BRAC 2005 Commission's recommendations for closure and realignment, including implementation of ongoing remedial programs required under CERCLA and RCRA. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.13.2.5 Intensity-Based Probable Use Scenario

Medium-Low Intensity, Direct. No effects are expected. Remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Necessary land use restrictions will be put in place to ensure protection of human health and the environment (e.g., encumbrances to restrict use of contaminated groundwater in certain locations, restrictions on soil disturbance activities in specified areas) as remediation efforts

continue in accordance with regulatory agencies. Furthermore, parcel-specific land use restrictions will be placed on parcels that are still under investigation and cleanup.

Medium-Low Intensity, Indirect. Long-term minor beneficial and adverse effects may occur, as well as minor to moderate short-term adverse effects. Construction, demolition, renovation, and enhanced operational activities will increase the potential for releases or minor spills of petroleum products, including fuels and oils. Overall, construction of 5 to 6 million square feet of facilities (depending on use of existing facilities) on KSAAP over the next 20 years would result in an increased potential for spills and releases of hazardous substances. In general, development could increase industrial operations to five to ten times the current operational levels seen on KSAAP under baseline conditions. Implementing a spill prevention program would minimize this potential. Furthermore, increased volumes of hazardous wastes would be generated by renovating or demolishing buildings that contain ACM, LBP, PCBs, or other hazardous substances (e.g., explosive dusts that have accumulated over the years in production areas). Use of buildings and structures on the property would require minor quantities of hazardous wastes, such as cleaning products and fuels. In any event, federal, state, and local regulations will govern all aspects of demolition and future use of hazardous substances, thereby minimizing the potential for further contamination of environmental media and ensuring the protection of human health and the environment.

As previously discussed, the physical structures that were used in the load, assembly and packing of explosives into munitions may have explosive residue embedded in the walls, ceilings, duct work, sewer lines and equipment located within the building. Additionally, the concrete slab areas around expansion joints in the floors, piping and/or utilities located on or under the slab, and the area under the slab itself, may contain residual explosives that present a potential hazard. Enhanced redevelopment of KSAAP may increase the rate of demolition activities in the short term. As a result, increased demolition and restoration of the old production lines may result in short-term minor to moderate adverse effects due to increased waste handling, disposal, and remediation during demolition activities. Long-term beneficial effects may occur, as this effort will reduce residual contamination in these areas.

Low Intensity, Direct. No effects are expected.

Low Intensity, Indirect. Long-term minor beneficial and adverse effects are expected, as well as short-term adverse effects. Effects would be similar to those discussed under MLIR, but of a lesser degree.

4.14 CUMULATIVE EFFECTS SUMMARY

4.14.1 INTRODUCTION

In this section, the cumulative effects of the proposed alternatives are identified. Cumulative impacts are considered those that result from the incremental effects of an action when considering past, present, or reasonably foreseeable future actions, regardless of the agencies or parties involved. In other words, cumulative impacts can result from individually minor, but collectively significant, factors occurring over time as they may relate to the installation properties and the entire ROI.

This section summarizes potential cumulative impacts for each alternative and within each resource area as appropriate. For most resources, the analysis area is the same as introduced in the resource-specific consequences section. The geographic boundaries of the analysis vary, depending on the resource and potential effects. If different, the analysis area is specifically defined under each resource section. Cumulative impacts are considered for the 20-year period of the KSAAP LRPA's time frame for implementing redevelopment at KSAAP.

4.14.2 CUMULATIVE ACTIONS

Planned and ongoing development in the ROI includes limited regional development including planned expansions at TecTank, Cessna, Amazon.com, AIW, Spears Manufacturing, and continue retail expansion along Main Street Parsons, as well as continued agricultural activities. Although most of the land in the county is rural and agricultural, some farmland is being converted for urban uses in cities near KSAAP, specifically in Parsons. In any event, the KSAAP LRPA reuse and redevelopment actions comprise the largest proposed or planned development currently in the ROI. The large size of the property at KSAAP likely exceeds the ROI's capacity to absorb the land for job-generating purposes. As a result, KSAAP will be marketed to a larger set of end users who may not be in the ROI, but who would consider the site a positive business location.

4.14.3 ALTERNATIVES OVERVIEW

4.14.3.1 Early Transfer Disposal

Under the early transfer alternative, cumulative minor beneficial and adverse effects are anticipated for land use, aesthetics and visual resources, noise, water resources, socioeconomics, and transportation. Moderate adverse cumulative effects are anticipated for air quality and biological resources; moderate beneficial effects are noted for socioeconomics. No cumulative effects are anticipated for geology and soils, cultural resources, utilities, and hazardous and toxic substances.

Land Use. Long-term minor beneficial and adverse cumulative effects are anticipated for land use under the early transfer alternative. Land use patterns in the areas of the installation would be altered, and the integration of the installation properties with the

surrounding communities would result in more wide-ranging and regional land use changes. These changes would likely stimulate economic growth and enhanced quality of life in the community.

Minor adverse effects could also be expected because the intensity of this development scenario could be higher overall than that in surrounding communities. An influx of new employees associated with construction and new developments in the area of the installation could result in an increased demand for new housing and associated services, and could place minor temporary stress on existing infrastructure in the area.

Aesthetics and Visual Resources*.* Short- and long-term minor adverse cumulative effects are also expected for visual and aesthetic resources under early transfer disposal. Preservation of the scenic landscape and natural aesthetics at KSAAP would depend on, for example, the number of mature trees preserved and the amount of surface disturbance.

Air Quality. Short-term moderate adverse cumulative effects are expected under the early transfer alternative. Cumulative air quality impacts occur when multiple projects affect the same geographic areas at the same time or when sequential projects extend the duration of air quality impacts on a given area over a longer period. For further details, see the discussion of potential cumulative air quality impacts related to implementation of the reuse scenarios below.

Noise. Minor long-term adverse cumulative effects are expected for the early transfer disposal alternative from increased traffic and construction noise in the region due to long-term induced economic development to the area after disposal. Also, the acoustic environment at KSAAP falls into the category of “very quiet rural area”, thus certain types of industrial equipment could be audible at night at residential locations far removed from these activities.

Geology and Soils. No cumulative effects are expected to geology and soils.

Water Resources. Minor short- and long-term cumulative adverse effects are expected under the early transfer alternative. These effects would occur as a result of direct and induced economic growth and development that will generate increased construction within the watershed, increases in impervious surface within the watershed, increased water usage from key regional water sources within the Neosho River basin, and increased wastewater discharge. These impacts would have the potential to affect areas beyond the installation property boundaries at the watershed and river basin level. However, the effects are expected to be minor, because erosion and sediment control and other BMPs would routinely be employed during construction, demolition, and renovation activities, and because the impacts would be small and spread over a very large land mass over many years. See Section 4.14.3.5 for further discussion of long-term cumulative effects associated with water resources.

Biological Resources. Short- and long-term moderate adverse cumulative impacts are expected to occur as a result of early transfer disposal. Redevelopment could result in moderate adverse effects to high quality habitat resources (e.g., native prairie grasses) and associated ecological communities, including potential loss of some high quality, historically important communities that once were widespread across the region. For further details, see the discussion of potential cumulative biological resources impacts related to implementation of the reuse scenarios below (see Section 4.14.3.5).

***Cultural Resources*.** No cumulative effects are expected.

Socioeconomics. Long-term minor to moderate beneficial and minor adverse cumulative effects on the sociological environment and economic development are expected to occur under early transfer. Direct jobs would be created through implementation of reuse objectives, generating new income and increasing personal spending. Such spending generally creates secondary jobs, increases business volume, and increases revenues for schools and other social services. Minor adverse effects may occur when the social service infrastructure does not anticipate the short-term increases in demands.

Transportation. Long-term minor adverse cumulative effects are expected near KSAAP as a result of the early transfer disposal alternative. Disposal of KSAAP and reuse may stimulate additional economic growth in the region, generating additional residential and commercial traffic within the area, which may adversely affect traffic flow and may result in some deterioration of road networks. Road networks are currently operating well below their design capacities, however; therefore, only minor cumulative effects are expected.

Utilities. No cumulative effects are expected.

Hazardous and Toxic Substances. No cumulative effects are expected.

4.14.3.2 Traditional Disposal

Under the traditional disposal alternative, cumulative impacts would be very similar to those described above for the early transfer alternative, but would occur further into the future.

4.14.3.3 Caretaker Status

Under caretaker status, long-term minor cumulative beneficial effects would occur with respect to land use, aesthetics and visual resources, air quality, noise, water resources, biological resources, certain elements of the sociological environment, utilities, and transportation. Reduced facility operations will result in decreases in mission activities, resulting in fewer point and nonpoint emissions, reduced water usage, and reduced wastewater generation within the watershed and region. On the other hand, reduced management of native prairie grasses and invasive species would result in minor cumulative adverse effects, as regionally these habitats have diminished. Reduced management programs (such as prescribed in the INRMP for KSAAP) may further reduce

the acreage of these habitats at a regional level in the long term. With respect to economic development, caretaker status would result in minor adverse cumulative effects within the ROI, as job loss and decreased expenditures associated with closure would have some effect on the overall economy and economic development. This reduction will in turn result in long-term beneficial cumulative effects to transportation and utilities, as demand will decrease slightly within the region.

4.14.3.4 No Action Alternative

The no action alternative would result in no cumulative effects. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.14.3.5 MLIR and LIR Reuse Scenarios

Under MLIR and LIR scenarios, cumulative effects are expected for land use, aesthetics and visual resources, air quality, noise, water resources, biological resources, socioeconomics, and transportation. No cumulative effects are expected for geology and soils, cultural resources, utilities, and hazardous and toxic substances. In general, effects that would take place under the LIR scenario would be less intense than those under the MLIR scenario.

Land Use. Under the reuse scenarios, long-term minor beneficial and adverse cumulative effects are expected. Under reuse, the intensity of redevelopment would be above the current use of the property, and thus would change the land use patterns in the region being developed. Development of the LIR as well as MLIR scenarios would likely involve an increase of development and investment capital in the ROI. Implementation of the reuse plan may stimulate further development and alteration of land use in the area that could support economic growth and enhanced quality of life in the community. The proposed redevelopment would also likely have the effect of better integrating the property at KSAAP into surrounding communities, because the proposed industrial/warehousing, business and commercial uses associated with redevelopment would be more consistent with surrounding land uses than the existing ammunition manufacture and associated operations.

Minor adverse impacts could be expected under the LIR and MLIR reuse scenarios because the intensity of development could be higher overall than in surrounding communities. The level of employment represented by the LIR and MLIR scenarios would not be consistent with the levels of employment in nearby communities such as Parsons or Altamont, for example. While the existing regional labor market would be able to supply some of the employees represented by this projection, it is likely that other employees would commute or relocate to the area; these employees could potentially increase demand for new housing and associated services, and could place temporary stress on

existing infrastructure in the area. However, these effects would be offset given the regional decline in population levels in the ROI.

Aesthetics and Visual Resources. Short-term minor adverse cumulative effects are expected on visual and aesthetic resources as a result of implementation of either the LIR or MLIR reuse scenarios. As redevelopment occurs, the built environment surrounding KSAAP would noticeably increase due to induced growth. Preservation of the scenic regional landscape and natural aesthetics at KSAAP would depend on, for example, the number of mature trees preserved, the amount of surface disturbance, and the design of new facilities. These cumulative effects would be long-term and minor.

Air Quality. Long-term moderate adverse cumulative effects are expected for either the LIR or MLIR reuse scenarios. Cumulative air quality impacts occur when multiple projects affect the same geographic area at the same time or when sequential projects extend the duration of air quality impacts on a given area over a longer period. Ozone precursor emissions associated with engine exhaust from construction equipment and vehicles would contribute slightly to area-wide and regional air quality conditions. These cumulative effects are not expected to rise to the level of significance, given the status of the ROI as an attainment area for air emissions, and given that any new sources will be regulated and permitted by the KDHE. Disposal of KSAAP may also stimulate economic growth in the ROI, which could generate additional emissions from traffic and industry operations within the regions.

Noise. Minor long-term adverse cumulative effects are expected as a result of implementation of either of the reuse scenarios. These effects would be due to increases in employment and corresponding commuter traffic and delivery trucks associated with redevelopment and economic development that may be induced within the immediate vicinity of the property and surrounding area. Because the acoustic environment at KSAAP falls into the category of “very quiet rural area,” certain types of industrial equipment could be audible at night at some distance from operations. Experience has shown that such cumulative effects can be avoided through proactive acoustical engineering during the planning stage.

Geology and Soils. No cumulative effects are expected on geology and soils.

Water Resources. Minor short- and long-term minor to moderate cumulative adverse effects are expected under either the LIR or the MLIR reuse scenario. These effects would occur as a result of direct and induced economic growth and development that will generate increased construction within the watershed, increases in impervious surface within the watershed, increased water usage from key regional water sources within the Neosho River basin, and increased wastewater discharge. In particular, increased water usage and discharges within the Neosho River Basin is a concern, given the projected long-term demand and continued use of this resource (e.g., 844 EPA regulated sites within the Middle Neosho River Basin, with over 180 sites within Labette County alone, including the Wolf Creek Nuclear Generating Station 80 miles to the north and many

waste water discharges; Kansas Water Office projections showing that the carrying capacity of the Neosho River Basin may require identification of alternative sources and water management strategies to enhance supply) (KDHE 2007). Overall, regional water demand is expected to slowly climb from 46 mgd to 50 mgd in the next 50 years (KDHE 2007) without redevelopment at KSAAP. Adding the water needs at KSAAP of 3 mgd sometime in the next 20 years, will raise basin-level demand by about 6 percent. Although the Neosho River basin can support this increase during average flow events, the water demand in the Neosho River basin exceeds its capacity during low flow events (e.g., as modeled for the lowest flow year from the past 20 years) (see Section 4.8 for further details). These findings suggest that engineering solutions and/or alternative sources of water may be required at KSAAP during low flow events within the Neosho River, in order to maintain intake levels and minimum flow requirements. In any event, permitting requirements for future increased water intake and waste water discharge, engineering solutions, alternative sources, and maintaining required minimum flow within the Neosho River will ensure long-term sustainable water use in the region and at KSAAP.

With respect to redevelopment activities, impacts would have the potential to affect areas beyond the installation property's boundaries at the watershed and river basin levels. However, these effects are expected to be minor because erosion and sediment control and other BMPs would be employed during construction, demolition, and renovation activities, and because they would be minor and spread over a very large land mass over many years.

Biological Resources. Short- and long-term moderate adverse cumulative impacts are expected to occur as a result of implementation of either the LIR or the MLIR reuse scenario. Redevelopment could result in moderate adverse effects to regional high-quality habitat (e.g., native prairie grasses) and associated ecological communities, including loss of a small portion of high-quality historically important communities that once were widespread across the region (see Section 4.8 for estimates of habitat loss at KSAAP). Furthermore, increased long-term water demands within the Neosho River Basin (as previously discussed) may reduce flows within the river to some extent. During low-flow conditions, engineering solutions and/or alternative sources of water may be required to ensure the required continuous minimum flow of the Neosho River. Overall, permitting requirements for both water intake and waste water discharge within the basin, and minimum flow requirements within the Neosho River itself, will ensure long-term sustainable use of this resource.

Cultural Resources. No cumulative effects are expected.

Socioeconomics. Long-term minor to moderate beneficial and minor adverse cumulative effects on the sociological environment and economic development are expected to occur as a result of implementation of the LIR or MLIR scenarios. Direct jobs would be created through implementation of reuse objectives, generating new income and increasing personal spending. Such spending generally creates secondary jobs, increases business volume, and increases revenues for schools and other social services. Minor adverse

cumulative effects may occur if the social service infrastructure does not anticipate the short-term increases in demands.

Transportation. Long-term minor adverse cumulative effects are expected near KSAAP as a result of implementation of either the LIR or the MLIR reuse scenarios. Disposal of KSAAP and reuse may stimulate additional economic growth in the region, which could generate additional residential and commercial traffic within the area, which may adversely affect traffic flow and result in some deterioration of road networks. Road networks are currently operating well below their design capacities, however. Therefore, only minor cumulative effects are expected.

Utilities. No cumulative effects are expected.

Hazardous and Toxic Substances. No cumulative effects are expected.

4.15 MITIGATION AND RECOMMENDATIONS FOR PLANNING AND MANAGEMENT

No specific mitigation is required of the Army to reduce or avoid effects below levels of significance. Furthermore, federal, state, and local regulations and policies by entities who receive properties at KSAAP will govern to a large extent the proper use and conservation of the environment, including air quality, wetlands resources, water quality, cultural resources, and other resources. Beyond such measures, certain management measures may be implemented by the Army or the KSAAP LRPA to successfully manage the disposal and redevelopment of KSAAP according to the principles of sound and sustainable planning. Furthermore, specific encumbrances detailed in Section 3.2.4 are required for the protection of cultural resources, land use compatibility, and other resource areas. Additional management measures for reducing adverse effects to resources are outlined below.

Early Transfer/Traditional Disposal. No specific mitigation is required of the Army to avoid significant adverse effects. To avoid, reduce, or compensate for minor or moderate adverse effects that might occur as a result of early transfer or traditional disposal, the Army would:

- Impose in the transfer or conveyance of BRAC property appropriate encumbrances to avoid potential adverse effects on a variety of environmental resource areas, as outlined in Section 3.2.4.2. Conveyance documents would provide notification on hazardous substances that were stored, released, or disposed of on the property in excess of the 40 CFR Part 373 reportable quantities;

- Continue to work with the KSAAP LRPA to ensure that disposal transactions are consistent with the adopted community reuse plan;

- Continue to manage BRAC property in accordance with Army policies that require the identification, delineation, and, where appropriate, abatement of hazardous conditions; and

- Until final disposal, maintain installation buildings, infrastructure, and natural resources in caretaker status to the extent provided by Army policy and regulations.

Caretaker Status Alternative. Beyond adherence to Army policy and procedures relative to long-term caretaker conditions, no specific mitigation is required of the Army to avoid significant adverse effects. The longer KSAAP remains in caretaker status, the greater the potential would be for adverse effects on various resources. The Army would implement the following measures to reduce or avoid adverse effects associated with caretaker status as they might occur:

- Conduct installation security and maintenance operations to the extent provided by federal policies and regulations;

- Identify clean or remediate portions of the installation excess properties for disposal and reuse and prioritize restoration and cleanup activities; and

- Recycle solid waste and debris where practicable.

No Action Alternative. Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005. Therefore, no mitigation or management measures would be necessary to reduce effects.

***MLIR and LIR Reuse Scenario*s.** Under the MLIR and LIR reuse scenarios, non-Army entities would assume reuse planning and execution of redevelopment actions. Recommended measures for intensity-based reuse scenarios, except for those related to federally protected interests, remediation, or other Army concerns, is not the responsibility of the Army. Other than adherence to specific encumbrances imposed by the Army and compliance with federal, state, and local regulations and policies, no specific mitigation actions are required to reduce adverse effects below levels of significance. Management measures that are most important for reducing adverse effects from reuse are outlined below.

- *Land Use*. Adverse effects associated with development of the BRAC properties at KSAAP to a level of intensity equal to the MLIR or LIR scenario could be at least partially reduced through sound site planning and the design and creation of appropriate buffer zones (noise and explosive safety arcs), and on-site security measures (e.g., to prevent trespassing into dangerous areas). Furthermore, the Army may restrict certain types of future land use, impose institutional controls, or take other actions affecting land use to protect human health and the environment. Restrictions such as those on the use of groundwater, provisions against disturbing soils in certain locations (landfills, active IRP sites), and access controls for certain parcels would be included in conveyance documents as restrictions on future land use. Furthermore, as specific projects are proposed as part of redevelopment in the future, additional planning studies are required to design sufficient buffer zones and security measures between land use parcels in order to ensure that noise propagation, safety arcs, or other safety concerns do not create incompatible land use conditions.

- *Aesthetics and Visual Resources*. Similar to land use, adverse effects to aesthetics and visual resources at KSAAP associated with the level of development representative of the MLIR or LIR scenarios could be at least partially reduced through location of industrial facilities on interior parcels,

establishment and maintenance of adequate buffers between industrial uses and adjacent viewsheds, and screening of potential sources of light and glare.

- *Air Quality*. The permit process established by the CAA provides effective controls over potential stationary air emission sources. Adherence to the SIP's provisions for mobile sources could address that source category. Additional mechanisms, such as the application of traffic controls to minimize mobile air emission sources and BMPs to control fugitive dust during C&D, could be used to control airborne contaminants.

- *Noise*. Measures to reduce potential impacts related to noise include the establishment of buffers around noise-producing uses, or between the installation properties and surrounding uses. Special planning consideration needs be given to reduce potential conflicts between on-site residential and office/professional land uses relative to the location of noisy operations in parcels dedicated to industrial operations, energetics, and warehousing, as well as transportation corridors providing ingress and egress via rail and roads. Noise studies and careful planning would allow for the creation of sufficient buffers and proper placement of facilities. Conflicts can be avoided through a proactive collaboration between the architects for any new industrial construction and a qualified acoustical engineer. Special attention should be given to any process in which large fans are located on top of multistory buildings or high chimneys. The noise of large fans has the greatest potential for community annoyance when operated at night in very quiet rural areas, such as KSAAP.

- *Geology and Soils*. Conservation of farmland soils and continuation of agricultural areas will ensure long-term protection of this valuable resource. Relative to construction activities, disturbance of erodible soils should be avoided wherever possible. Should soil be disturbed, erosion control measures should be implemented. Geotechnical studies required prior to construction could also result in fewer potential impacts.

- *Water Resources*. Application of BMPs to reduce sediment loading to surface waters could aid in reducing effects on water quality. Construction of storm water retention systems could help mitigate impacts associated with storm water runoff from impervious surfaces. Business operational practices designed to reduce potential effects on water resources, such as measures to prevent the release of engine oil into storm drains, or oil-water separators built into the storm drains, could also be implemented at the installation properties during and after redevelopment. Engineering solutions (e.g., construction of water storage ponds) and alternatives sources of water should be evaluated to address growing water demands, as the Neosho River is not a reliable daily water source during low-flow events.

- *Biological Resources.* Disposal could result in the loss of a portion of remnant high-quality communities and historically important communities that once were widespread across the region. Several conservation measures are recommended to preserve this habitat.

  Establish Habitat Conservation Areas. The KSAAP LRPA proposes to establish and maintain a dedicated conservation area (i.e., the 3,881 acre Conservation/Agriculture identified in the KSAAP LRPA reuse plan) for the protection of high-quality, sensitive habitat, which includes the old-growth forest habitat and native prairie grass habitat within these areas. Sustainable timber harvest strategies will be used to preserve this unique habitat. These areas would be managed for conservation, enhancement, management, and nonconsumptive recreational use of this habitat (e.g., bird watching, hiking, photography, horseback riding), controlled hunting and fishing, and agriculture, as well as access. To ensure long-term protection, it is recommended that a conservation easement be established for this area. For habitat outside of this area, which includes the majority of prairie grass habitat and a smaller percentage of riparian forest habitat, it is recommended that development footprints and other disturbances avoid riparian buffer areas and native prairie grass habitat. Avoidance of riparian buffer areas will also ensure better site development for drainage, as well as avoidance of wetlands as specified under the Section 404 of CWA. Furthermore, since expansive buffer areas will be required as part of future redevelopment at KSAAP, existing native prairie habitat identified in Figure 4.8-1 should be planned as part of these buffer systems, to the extent possible, to ensure long-term preservation of this habitat. Given that site development at even the MLIR will likely only require disturbance of a small percentage of KSAAP land surface, there is ample opportunity to ensure long-term preservation of this habitat, while still achieving development and conservation goals specified in the KSAAP LRPA reuse plan.

  Wetlands Protection. USFWS completed a wetlands inventory of KSAAP in 1998 (USFWS 1999). This inventory identified 242 acres of potential wetland habitat on KSAAP. More than half of this habitat (137 acres) is permanent aquatic beds from watershed ponds. After further investigation, if this habitat is found to be jurisdictional wetlands, then they are protected under Section 404(b)(1) of the CWA. Project-specific wetlands delineations, permitting, and wetlands avoidance and/or mitigation requirements will be necessary prior to redevelopment of specific parcels in consultation with USACE, Kansas City District, as required under Section 404 of the CWA. As required under Section 404 of the CWA, the sequencing of wetlands mitigation requirements would ensure that impacts would be avoided if possible, or minimized if unavoidable. As a last resort, wetlands mitigation, such as creation, restoration, banking, and other means would be required, in consultation with USACE, Kansas City District.

  Threatened and Endangered Species Protection. At this time, no current federally listed species have been identified within KSAAP property. However, according to

USFWS, forest along the creek may provide habitat for the Indiana bat (*Myotis sodalis*), a federally listed endangered species. Furthermore, the Indiana bat may occupy unused buildings. However, there is no reasonable evidence to indicate that Indiana bats have the potential to occur on KSAAP, as the bat has never been identified in the state of Kansas to date, and as part of the species recovery plan, the USFWS does not actively monitor or manage for this species in Kansas (USFWS 2007). Therefore, the Army has not surveyed for this species.

The Neosho madtom (*Noturus placidus*) (federally listed), a small, mottled dark and light brown fish with dark bars on the tail fin, was documented within approximately 100 yards downstream of the KSAAP-owned dam on the Neosho River in 1999 near the KSAAP property line. Also, a state-listed species, the butterfly mussel (*Ellipsaria lineolata*) has been identified near the water intake. Future permitting and implementation of water management strategies, engineering solutions, and/or development of alternative sources of water will enable sufficient flow in the Neosho River such that effects to water levels and water quality would be negligible (i.e., no increase in the incidence of 50 cfs or zero flow days and typically less than 1 percent loss in water levels).

Invasive Species Control. In accordance with state law, future landowners will still be required to take steps to eradicate invasive species.

- *Cultural Resources.* The KSAAP LRPA and others will take measures to protect and preserve existing and potentially eligible cultural resources at KSAAP. These measures would include:

    - Consistent with the NHPA and PAs, continue to maintain and protect properties deemed eligible for inclusion in the NRHP; and

    - Consult with the Kansas SHPO prior to soil disturbing activities or any actions affecting cultural resources and implement appropriate mitigation, as necessary.

- *Transportation*. Redevelopment of the BRAC properties under the MLIR or LIR scenarios would require sound planning to meet increased traffic and raw material hauling needs using rail, including improvements to roads and railway access to and within the BRAC properties over the 20-year redevelopment horizon.

- *Utilities.* Redevelopment will require renovation of many utilities at KSAAP. As outlined in the reuse plan (KSAAP LRPA 2007), the LRPA will exercise careful planning to minimize system capacity stress, to ensure that sufficient utility service is provided to current and future tenants. Specific measures that would be taken by the KSAAP LRPA to reduce adverse effects include:

    - Reconstruct and upgrade some portions of the existing water systems;

- Upgrade the WWTP and related infrastructure at KSAAP;
- Replace/upgrade the existing sewer lines and construct new sewer lines to accommodate future development;
- Upgrade the current telephone system along with redevelopment; and
- Replace or expand/upgrade the electrical distribution system.

- *Hazardous and Toxic Substances*. Continue ongoing remedial and monitoring programs for existing property. Coordination with regulatory agencies will be required under CERCLA and RCRA to show that remedial actions are continuing to be effective.

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5 FINDINGS AND CONCLUSIONS

5.1 INTRODUCTION

This EA has been prepared to evaluate the potential effects on the natural and human environment from the disposal and subsequent reuse of KSAAP (13,727 acres). The EA has examined five types of actions: early transfer disposal, traditional disposal, caretaker status, no action, and reuse (redevelopment of the available property by the KSAAP LRPA at a medium-low or low intensity level). The no action alternative is prescribed by the CEQ regulations to serve as the baseline against which the proposed action is analyzed. The proposed action in this case is the disposal of the excess property by the Army to another entity. Subsequent to disposal is reuse of the property by the community. The following sections provide the findings and conclusions of this EA.

5.2 FINDINGS

The following subsections summarize the potential effects on the human and natural environment resulting from implementation of each type of action: no action, disposal, and reuse. Table 5.2-1 summarizes the potential environmental and socioeconomic effects of the early transfer disposal alternative, traditional disposal alternative, caretaker status alternative, and two intensity-based reuse scenarios (the no action alternative is not included in this table because no effects were identified). For a more detailed discussion of the analyses, refer to the appropriate subsections in Section 4, Affected Environment and Consequences.

5.2.1 Consequences of the Early Transfer Disposal Alternative

For early transfer disposal, minor or moderate adverse effects would occur for all resource areas. Moderate adverse effects would occur in the areas of land use, air quality, noise, utility systems, cultural resources, biological resources, and hazardous and toxic substances. Minor beneficial effects would occur for land use, aesthetics and visual resources, noise, geology and soils, water resources, transportation, utilities, socioeconomics, and hazardous and toxic substances. Minor adverse or beneficial cumulative effects would occur in the context of land use, aesthetics and visual resources, noise, water resources, socioeconomics, and transportation. Moderate adverse cumulative effects are expected to occur in the context of air quality and biological resources, while moderate beneficial cumulative effects would occur in the context of socioeconomics.

Table 5.2-1 Summary of Effects from Disposal and Reuse of KSAAP

RESOURCE AREAS	CARETAKER STATUS			EARLY TRANSFER DISPOSAL			TRADITIONAL DISPOSAL			REUSE SCENARIOS				
	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Medium-Low Intensity Direct	Medium-Low Intensity Indirect	Low Intensity Direct	Low Intensity Indirect	Cumulative
Land Use	○	◘	○	◘⬔	◘	◘○	◘⬔○	◘	◘○	◘⬔○	○	◘○	○	◘○
Aesthetic/Visual Resources	◘		○	◘○		◘	◘○		◘○	◘○	◘	◘○	◘	◘
Air Quality	○		○	◘⬔	◘⬔	⬔	◘⬔	◘⬔	⬔	◘⬔	◘	◘	◘	⬔
Noise	○	○	○	◘⬔	◘○	◘	◘⬔	◘○	◘	◘⬔	◘○	◘	◘○	◘
Geology and Soils		○		◘	◘○		◘	◘○		◘	◘○	◘	◘○	
Water Resources	◘○		○	◘○	○	◘	◘○	○	◘	◘○	◘○	◘○	◘○	◘⬔
Biological Resources	◘	○	◘○	⬔	◘⬔	⬔	⬔	◘⬔	⬔	⬔	◘⬔	◘⬔	◘⬔	⬔
Cultural Resources	◘			◘⬔	◘		◘⬔	◘		◘⬔	◘	◘⬔	◘	
Socioeconomics	◘	◘	◘○	◘○⊕	◘○	◘○⊕	◘○⊕	◘○	◘○⊕	◘⊕	◘○⊕	◘○	◘○	◘○⊕
Transportation	◘○		○	◘○	◘	◘	◘○	◘	◘	◘○	◘	◘○	◘	◘
Utilities	◘		○	◘⬔○			◘⬔○			◘⬔○		◘○		
Hazardous/Toxic Substances	○◘				◘⬔○			◘⬔○			◘⬔○		◘○	

○ Beneficial Effect (Minor)
⊕ Beneficial Effect (Moderate)
● Beneficial Effect (Significant)
[BLANK] No Effects Expected

◘ Adverse Effects (Minor)
⬔ Adverse Effects (Moderate)
■ Adverse Effects (Significant) NOTE: No significant adverse effects have been identified.

5.2.2 Consequences of the Traditional Disposal Alternative

For traditional disposal, minor or moderate adverse impacts would occur for all resource areas. Moderate adverse impacts would occur in the areas of land use, air quality, noise, utility systems, cultural resources, biological resources, and hazardous and toxic substances. Moderate beneficial effects would occur in the context of socioeconomics. Minor adverse or beneficial cumulative effects would occur in the context of land use, aesthetics and visual resources, noise, water resources, socioeconomics, and transportation. Moderate cumulative adverse effects are expected to occur in the context of air quality and biological resources.

5.2.3 Consequences of the Caretaker Status Alternative

For the caretaker status alternative, minor adverse or beneficial effects would occur for all resource areas. Minor beneficial cumulative effects would occur for most resource areas. In addition, adverse cumulative effects would occur for socioeconomics and biological resources.

5.2.4 Consequences of the No Action Alternative

Under the no action alternative, the Army would continue operations at KSAAP at levels similar to those occurring prior to the BRAC Commission's recommendations for closure. Analysis of the no action alternative is included in this EA as a basis for comparing the effects of disposal and reuse. No beneficial, adverse, or cumulative effects were identified for the no action alternative, as this alternative represents status quo conditions relative to the continuation of Army missions in November 2005 (i.e., baseline operating conditions).

5.2.5 Consequences of the Medium-Low and Low Intensity Reuse Alternatives

The MLIR scenario for KSAAP would result in short-term minor adverse effects to all resource areas. Minor beneficial effects would occur for land use, aesthetics and visual resources, noise, geology and soils, water resources, socioeconomics, transportation, utilities, and hazardous and toxic substances. In addition, moderate adverse effects to land use, air quality, noise, utility systems, cultural resources, biological resources, and hazardous and toxic substances would occur. Moderate beneficial effects to socioeconomics would also occur under the MLIR scenario.

Reuse of the installation at low intensity would result in effects identical to those under the MLIR scenario on all resource areas, but the LIR scenario would result in lower levels of effects overall as compared to the MLIR scenario.

Cumulative effects related to reuse would be most noticeable with respect to achievement of the MLIR scenario. Minor adverse cumulative effects would occur in the context of land use, aesthetics and visual resources, noise, water resources, socioeconomics, and transportation. Moderate adverse cumulative effects are expected to occur relative to air quality and biological resources. Beneficial cumulative effects could occur for land use

(minor) and socioeconomics (minor to moderate). Cumulative effects under the LIR scenario would be similar to those under the MLIR scenario.

5.3 CONCLUSIONS

Analysis in the EA shows that implementation of the proposed action would not result in significant adverse environmental effects. Thus, issuance of a FNSI would be appropriate, and an EIS is not required prior to implementation of the proposed action.

A Notice of Availability of the EA and Draft FNSI was published in the local newspaper inviting the public and all interested or affected parties to provide comments during the 30-day review period of the EA and Draft FNSI. During this time, the EA was available for review on the Web (http://www.hqda.army.mil/acsimweb/brac/env_ea_review.htm), as well as at libraries identified in Section 7.

6 PREPARERS LIST

Key personnel involved in the development of this EA are presented below.

Name	Education and Experience	Primary Responsibilities
Sean Donahoe	B.S. Mathematics and Biology, summa cum laude; M.S. Biology; 20 years experience in NEPA, natural resource management, and risk assessment; conducted over 100 NEPA studies primarily for Army actions including BRAC.	Project Manager; Description of Proposed Action and Alternatives; Alternatives Analysis; Technical Approach and Review.
Elizabeth Copley, AICP	B.A. Urban Studies; M.U.P. Urban Planning; certified planner with over 25 years experience in federal and state environmental planning and impact assessment, particularly associated with BRAC actions.	Resource Area Leader - Land Use and Visual Impact Assessment.
Sharon Crowland	B.S. Civil and Environmental Engineering; 15 years experience in environmental engineering, environmental planning, and project management including 11 years experience with the federal government.	Resource Area Leader - Transportation and Infrastructure.
Mary Kaplan	B.S. Meteorology; M.S. Environmental Science (Atmospheric Concentration); 7 years experience in Air Quality modeling and emissions inventories.	Resource Area Leader - Air Quality.
George Luz	Ph.D. Psychology; 36 years experience with the effects of military noise on health, safety and welfare of individuals, animals and communities. Luz Social & Environmental Associates.	Resource Area Leader - Noise.
Darlene Stringos-Walker	B.S. Civil/Mining Engineering; M.S. Environmental Engineering; 22 years experience in environmental engineering, site assessments and investigations, remedial design of waste sites, ISO 14001 Lead Auditor Certified.	Geology and Hazardous, Toxic, Radioactive Waste Sections. Review of previous environmental documentation and site visit.

Rich Muller	B.S. Biology; M.S. Oceanography; 36 years experience in environmental impact assessment and environmental management for all branches of the military, FEMA, NOAA, and FBOP.	Water Resources Lead. Data gathering, analysis, report writing, response to comments and support the preparation of Land Use, Transportation and Utilities sections.
Jerry Thompson	B.S. Environmental Studies; M.S. Natural Resources Management; 21 years experience assessing and managing endangered and other species on public and private land for DoD, and federal, state and tribal governments.	Biology/Wetlands Lead. Data gathering, analysis, and report writing. Land Use/Aesthetics Lead.
Paula Bienenfeld	B.A. Anthropology; M.A. Anthropology; Ph.D. Anthropology; 26 years experience in cultural resources management; 13 years experience in NEPA and Army planning, including BRAC ’95.	Resource Area Leader - Cultural Resources.
Mark Dunning	Ph.D. Sociology; 31 years experience in social effects analysis, water resources planning, regional economics, and NEPA analysis.	Resource Area Leader - Socioeconomics.
Holly Bisbee	B.A. Anthropology; 11 years experience in archaeological field work; 6 years experience in cultural resources management; and 3 years experience in environmental analysis, including BRAC ’05.	Support/ Cultural Resources and Socioeconomics, data collection, preparation of sections, and document production.
Leigh Goldstein	B.A. Environmental Biology and Anthropology; M.S. Health Evaluation Sciences; 6 years experience in environmental and land use issues, including those related to BRAC properties.	Support/ preparation of supporting sections.

Paul Holland	B.A. History; M.S. Nature, Society, and Environmental Policy; 5 years research and consulting experience in environmental and social public policy.	Support/ Noise, review and preparation of noise analysis.
Elizabeth Pratt	B.S. Business Administration; 3 years experience in socioeconomic data gathering and environmental analysis including BRAC properties.	Support/ Socioeconomics, review and preparation of socioeconomic analysis.
Randall Farren	B.S. Environmental Science and Spanish; 2 years experience in Brownfields-related research and data gathering.	Support/ document compilation and supplemental data.

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7 DISTRIBUTION LIST

Federal Officials & Agencies

U.S. Senate

Honorable Sam Brownback
303 Hart Senate Office Building
Washington, DC 20510

Honorable Pat Roberts
109 Hart Senate Office Building
Washington, DC 20510

U.S. House of Representatives - 2nd Congressional District

Congresswoman Nancy Boyda
1711 Longworth House Office Building
Washington, DC 20515

Federal Agencies

U.S. Department of the Interior
Fish and Wildlife Services
1849 C Street NW
Washington, DC 20240

U.S. Department of the Interior
Fish and Wildlife Services
Kansas Ecological Services Field Office
Michael J. LeValley, Field Supervisor
2609 Anderson Avenue
Manhattan, Kansas 66502-6172

Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW
Suite 809
Washington, DC 20004

U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue NW
Washington, DC 20460

U.S. Environmental Protection Agency
Region VII
John B. Askew, Regional Administrator
901 N. 5th Street
Kansas City, KS 66101

U.S. Environmental Protection Agency
Region VII
Ken Herstowski, ARTD/RCAP
901 N 5th Street
Kansas City, KS 66101

U.S. Department of Agriculture
1400 Independence Avenue SW
Washington, DC 20250

State Officials & Agencies

State Senate- District 14

Senator Dwayne Umbarger
1585 70th Road
Thayer, KS 66776

State House of Representatives – Districts 7 & 8

Representative Richard Proehl
510 Pine Ridge Road
Parsons, KS 67357

Representative Jerry Williams
21225 Kiowa Road
Chanute, KS 66720

Governor

Governor Kathleen Sebelius
Office of the Governor
Capitol, 300 SW 10th Avenue
Suite 212S
Topeka, KS 66612-1590

State Agencies

Kansas Department of Wildlife and Parks
Mike Hayden, Secretary
1020 S. Kansas Avenue, Room 200
Topeka, KS 66612-1233

Kansas Department of Agriculture
Adrian Polansky, Secretary
109 SW 9th Street, 4th floor
Topeka, KS 66612-1280

Kansas State Historical Society
Cultural Resources Division
Jennie Chinn, SHPO
6425 SW 6th Avenue
Topeka, KS 66615-1099

Kansas State Historical Society
Cultural Resources Division
Patrick Zollner, Deputy SHPO
6425 SW 6th Avenue
Topeka, KS 66615-1099

Kansas State Conservation Commission
Greg Foley, Executive Director
109 SW 9th Street
Suite 500, Mills Building
Topeka, KS 66612

Kansas Forest Service
Ray Aslin, State Forester
2610 Claflin Road
Manhattan, KS 66502

Kansas Department of Health and Environment
The Division of Environment/ Bureau of Environment Field Services
John Mitchell, Interim Director
1000 SW Jackson, Suite 400
Topeka, KS 66612-1367

Kansas Department of Health and Environment
The Division of Environment/Bureau of Environmental Remediation
ATTN: Jorge Jacobs
1000 SW Jackson Street, Suite 410
Topeka, KS 66612-1367

Interested Tribes and Tribes of Unknown Interest

Kaw Nation
Guy Munroe, Chairman
Drawer 50
Kaw City, OK 74641

Kaw Nation
Crystal Douglas, Archaeologist
Drawer 50
Kaw City, OK 74641

Kickapoo Tribe of Oklahoma
Marlon E. Frye, Chairman
P.O. Box 70
McCloud, OK 74851

Kickapoo Tribe of Oklahoma
Kent Collier, Tribal Historic Preservation Officer
P.O. Box 70
McCloud, OK 74851

Kiowa Indian Tribe of Oklahoma
Billy Evans Horse, Chairman
P.O. Box 369
Carnegie, OK 73015

Kiowa Indian Tribe of Oklahoma
Raymond Pena, Tribal Administrator
P.O. Box 369
Carnegie, OK 73015

Omaha Tribal Council
Mitchell Parker, Chairman
P.O. Box 368
Macy, NE 68039

Omaha Tribal Council
Tony Provost, Mni Sose President
Tribal Environmental Protection Office
P.O. Box 368
Macy, NE 68039

Osage Nation of Oklahoma
Principal Chief James R. Gray
P.O. Box 779
Pawhuska, OK 74058

Osage Nation of Oklahoma
David Conrad, Tribal Historic
Preservation Officer
P.O. Box 779
Pawhuska, OK 74056

Pawnee Nation of Oklahoma
Robert Chapman, President
P.O. Box 470
Pawnee, OK 74058

Pawnee Nation of Oklahoma
Alice Alexander, Tribal Historic
Preservation Officer
P.O. Box 470
Pawnee, OK 74058

Peoria Tribe of Oklahoma
John P. Froman, Chief
118 S. Eight Tribes Trail
P.O. Box 1527
Miami, OK 74355

Prairie Band of Potawatomi Indians
Badger Wahwasuck, Chairman
16281 Q Road
Mayette, KS 66509

Prairie Band of Potawatomi Indians
Rey Kitchkumme, Council Member
16281 Q Road
Mayette, KS 66509

Quapaw Tribe of Oklahoma
Chairman John Berrey
P.O. Box 765
Quapaw, OK 74363

Quapaw Tribe of Oklahoma
Carrie V. Wilson, Cultural Resources
Director
P.O. Box 765
Quapaw, OK, 74363

Tonkawa Tribe of Oklahoma
Anthony E. Street, Tribal President
1 Rush Buffalo Road
Tonkawa, OK 74653

Tonkawa Tribe of Oklahoma
Joshua Waffle, Director of Environmental
Department
1 Rush Buffalo Road
Tonkawa, OK 74653

United Keetoowah Band of Cherokee
Indians in Oklahoma
Chief George G. Wickliffe
P.O. Box 746
Tahlequah, OK 74465-0746

United Keetoowah Band of Cherokee
Indians of Oklahoma
Ms. Lisa Stopp, Cultural Site
Investigations Office
P.O. Box 746
Tahlequah, OK 74465-0746

Wichita and Affiliated Tribes
Mr. Gary McAdams, President
P.O. Box 729
Anadarko, OK 73005

Wichita and Affiliated Tribes
Stratford Williams, THPO, Head of
Transportation Department
P.O. Box 729
Anadarko, OK 73005

Local Government Officials & Agencies

Local Government

Mayor Tom Shaw
City of Parsons
112 South 17th Street
Parsons, KS 67357

William Wheat, Commissioner
City of Parsons
112 South 17th Street
Parsons, KS 67357

Robert O'Kelly, Commissioner
City of Parsons
112 South 17th Street
Parsons, KS 67357

Robert Bartelli, Commissioner
City of Parsons
112 South 17th Street
Parsons, KS 67357

Tommey McLarty
Commissioner (At-Large)
City of Parsons
112 South 17th Street
Parsons, KS 67357

Tom Shaw, Commissioner (At-Large)
City of Parsons
112 South 17th Street
Parsons, KS 67357

Fred Gress, Manager, City of Parsons
112 South 17th Street
Parsons, KS 67357

Carolyn Kennett, Economic
Development Director, City of Parsons
112 South 17th Street
Parsons, KS 67357

Lonie Addis, County Commissioner
Labette County Courthouse
501 Merchant, PO Box 387
Oswego KS 67356

Jerry Carson, County Commissioner
Labette County Courthouse
501 Merchant, PO Box 387
Oswego KS 67356

Brian Kinzie, County Commissioner
Labette County Courthouse
501 Merchant, PO Box 387
Oswego KS 67356

Lary Eller, Community Development
Director, City of Parsons
112 South 17th Street
Parsons, KS 67357

Martha Wilkerson, Planning & Zoning,
City of Parsons
112 South 17th Street
Parsons, KS 67357

Organizations

Parsons Historical Society
401 South 18th Street
Parsons, KS 67357

City of Parsons Chamber of Commerce
Kanak Patel, President
1715 Corning
Parsons, KS 67357

Local Redevelopment Authority

Dan Goddard, Executive Director
KSAAP - LRPA
1209 Corporate Drive, Number 6
Parsons, KS 67357

Libraries

State Library of Kansas
Capitol Building, Room 343-N
300 SW 10th Avenue
Topeka, KS 66612-1593

Parsons Public Library
311 South 17th Street
Parsons, KS 67357

Media

Parsons Sun
Darren Werth, Editor
220 South 18th Street
P.O. Box 836
Parsons, KS 67357

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8 REFERENCES

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10 ACRONYMS AND ABBREVIATIONS

AAP	Army Ammunition Plant
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Material
AOC	Area of Concern
APC	Air Pollution Control
AQRV	Air Quality Related Value
AST	Aboveground Storage Tank
Bcf	Billion cubic feet
BMP	Best Management Practice
BRAC	Base Realignment and Closure
C&D	Construction and Demolition
CAA	Clean Air Act
CBM	Coal-Bed Methane
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CERL	Construction Engineering Research Laboratory
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMS	Corrective Measures Study
CWA	Clean Water Act
CWP	Contaminated Waste Processor
dB	Decibel
dBA	A-Weighted Sound
dBC	C-Weighted Sound
DBCRC	Defense Base Closure and Realignment Commission
DNL	Day-Night Noise Level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Organization
DU	Depleted Uranium
DZI	Day & Zimmermann, Inc.
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECP	Environmental Condition of Property
EDC	Economic Development Conveyance
EIFS	Economic Impact Forecast System
E.O.	Executive Order
ER,A	Environmental Restoration, Army
ESA	Endangered Species Act
ETA	Early Transfer Authority
EWI	Explosive Waste Incinerator

FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FBI	Federal Bureau of Investigation
FHWA	Federal Highway Administration
FNSI	Finding of No Significant Impact
FPASA	Federal Property and Administrative Services Act
GOCO	Government-Owned, Contractor-Operated
gpm	Gallons per minute
HABS	Historic American Building Survey
HIR	High Intensity Reuse
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation and Air Conditioning
IAP	Installation Action Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
KBS	Kansas Biological Survey
KDHE	Kansas Department of Health and Environment
KDWP	Kansas Department of Wildlife and Parks
KSAAP	Kansas Army Ammunition Plant
KSDA	Kansas Department of Agriculture
KSDOT	Kansas Department of Transportation
LBP	Lead-Based Paint
L_{eq}	Equivalent Noise Level
LIR	Low Intensity Reuse
LRA	Local Redevelopment Authority
LRPA	Local Redevelopment Planning Authority
LUC	Land Use Controls
MBTA	Migratory Bird Treaty Act
MEC	Munitions and Explosives of Concern
mgd	Million gallons per day
MIR	Medium Intensity Reuse
MLIR	Medium-Low Intensity Reuse
MMRP	Military Munitions Response Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Interest
NOTAM	Notice to Airmen
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Registry of Historic Places
OB/OD	Open Burning/Open Detonation
ODG	Open Demolition Grounds

OSHA	Occupational Health and Safety Administration
PA	Programmatic Agreement
PA/SI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated Biphenyl
PM	Particulate Matter
PM_{10}	Particulate Matter Measuring 10 Micrometers or Less in Diameter
$PM_{2.5}$	Particulate Matter Measuring 2.5 Micrometer or Less in Diameter
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethylenetrinitramine
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
ROI	Region of Influence
RTV	Rational Threshold Value
SHPO	State Historic Preservation Office/Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWMU	Solid Waste Management Unit
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

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APPENDIX A COMPREHENSIVE REUSE PLAN

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Comprehensive Master Redevelopment Plan

Kansas Army Ammunition Plant

Prepared for the
KSAAP Local Redevelopment
Planning Authority

August 2007

KSAAP

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KANSAS ARMY AMMUNITION PLANT

COMPREHENSIVE MASTER REDEVELOPMENT PLAN

AUGUST 2007

Prepared for the:

Kansas Army Ammunition Plant
Local Redevelopment
Planning Authority
Parsons, Kansas

Prepared by:

RKG Associates, Inc.
Economic, Planning and Real Estate
Consultants
Durham, New Hampshire

In association with

Jeffrey Donohoe Associates, LLC
CH2M HILL
Black & Veatch Special Projects Corp.

This study was prepared under contract with the Kansas Army Ammunition Plant Local Redevelopment and Planning Authority (KSAAP LRPA) with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the KSAAP LRPA and does not necessarily reflect the views of the Office of Economic Adjustment.

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FORWARD

Kansas Army Ammunition Plant
Local Redevelopment Planning Authority
1209 Corporate Drive #6
Parsons, KS 67357
Telephone: (620) 421-1228
Fax: (620) 421-1205

August 16, 2007

I am pleased to forward the Comprehensive Master Redevelopment Plan for the excess property at the Kansas Army Ammunition Plant, Parsons, Kansas.

The Kansas Army Ammunition Plant (KSAAP) Local Redevelopment Planning Authority (LRPA) was established by resolution of the Labette County Commissioners on October 31, 2005, and recognized by the Department of Defense on February 7, 2006. RKG Associates, Inc., Jeffrey Donohoe Associates, LLC, CH2M Hill, and Black & Veatch Special Projects Corporation were contracted on October 19, 2006, to assist the KSAAP-LRPA in developing the Comprehensive Master Redevelopment Plan. The KSAAP-LRPA approved the Plan and the Homeless Assistance Submission on August 16, 2007. The Redevelopment Plan analyzes existing conditions at the KSAAP, identifies redevelopment goals, and presents a preferred land use plan. The preferred use plan identifies a variety of redevelopment proposals and options: Conservation/Agriculture, Commercial Energetics & Munitions Storage, Industrial/Manufacturing, Transportation & Warehousing, Energy Production, Public Education & Training, Special Events, Housing, and Hazardous Materials Treatment.

The Kansas Army Ammunition Plant Local Redevelopment Authority appreciates the active involvement of the local community, the collaborative efforts of the Department of Defense and the Army, the local Army staff, and the KSAAP operating contractor in the redevelopment planning process. We are looking forward to working with the Department of Defense and Army team as we progress through the property transfer process and the early successful implementation of this plan.

Questions concerning the contents of this Comprehensive Master Redevelopment Plan may be directed to KSAAP-LRPA Executive Director, Mr. Daniel W. Goddard at (620) 421-1228.

Sincerely,

Brian C. Kinzie, Chairman
KSAAP-LRPA

KANSAS ARMY AMMUNITION PLANT

LOCAL REDEVELOPMENT PLANNING AUTHORITY MEMBERS AND STAFF

Members

Brian Kinzie
LRPA Chairman and Executive Committee Member
Labette County Commissioner, Chairman
Oswego, Kansas

Lonnie Addis
Executive Committee Member
Labette County Commissioner
Oswego, Kansas

Jerry Carson
Executive Committee Member
Labette County Commissioner
Parsons, Kansas

Don Cawby
Steering Committee Member
Parsons, Kansas

Ann Charles
Steering Committee Member
Parsons, Kansas

Carolyn Kennett
Steering Committee Member
Parsons, Kansas

Steve Lewis
Steering Committee Member
Oswego, Kansas

Dan Peterson
Steering Committee Member
Mound Valley, Kansas

Montie Taylor
Steering Committee Member
Parsons, Kansas

Bill Wheat
Executive Committee Member
Parsons City Commissioner
Parsons, Kansas

Robert C. Wood
Steering Committee Member
Parsons, Kansas

Staff

Daniel W. Goddard
Executive Director

Paul Bryant
Deputy Director

Virginia Downey
Executive Administrative Assistant

EXECUTIVE SUMMARY

INTRODUCTION

This Comprehensive Master Redevelopment Plan for the Kansas Army Ammunition Plant (KSAAP) is the result of a nine-month planning process that was designed to identify a practical reuse strategy for the redevelopment of the KSAAP site. The plan was prepared between December 2006 and July 2007, and officially adopted by the KSAAP Local Redevelopment Planning Authority on August 16, 2007.

LOCATION AND DESCRIPTION

The Kansas Army Ammunition Plant (KSAAP) is located in Labette County, Kansas approximately 30 miles west of the Missouri border and 20 miles north of the Oklahoma boarder. The KSAAP site is about two (2) miles east of Parsons, Kansas. KSAAP contains 13,727 acres and has approximately 624 buildings that total more than 2.5 million square feet of floor space. Surrounding land uses are primarily agriculture.

HISTORY

Construction activities at the Kansas Ordnance Plant, the original name for KSAAP, were initiated in August 1941 and completed in November 1942. During World War II, employment peaked at about 6,700 and production efforts focused on artillery shells and bombs, as well as components for artillery shells such as fuzes, boosters, detonators, relays and primers.

KSAAP was placed on standby status from September 1945 to August 1950. During this period, operations at the site primarily involved the receipt, storage and issuance of ammunition and explosives, as well as site maintenance and preservation. All available land was out-leased for agricultural purposes during this period.

Beginning in August 1950, KSAAP was reactivated and all production lines were in use by September 1954. Production diminished after the Korean War and ceased by 1957. From 1957 to 1967, the plant was in a standby status and some idle facilities were leased to the U.S. Bureau of the Census and several manufactures.

The plant was reactivated in 1967 during the Vietnam War. At the conclusion of the war, five of the eight operating lines were laid away, and in 1993 the plant was placed on inactive status. The operating contractor at KSAAP was not directly assigned a workload by the Department of the Army, but the contractor was able to compete for U.S. or foreign material defense and commercial contracts. Approximately 250 individuals were employed at KSAAP in 2007.

In 2005, the Defense Base Closure and Realignment Commission concurred with the recommendations of the U.S. Secretary of Defense to close the Kansas Army Ammunition

Plant. The Labette County Commission, in 2006, established the Kansas Army Ammunition Plant Local Redevelopment Planning Authority (KSAAP LRPA) to undertake planning for the eventual reuse of the KSAAP site.

THE PLANNING PROCESS

In November 2006, the LRPA initiated the preparation of a Comprehensive Master Redevelopment Plan for the Kansas Army Ammunition Plant. An important consideration in preparing the Redevelopment Plan was public comments, suggestions and direction. During the planning process, ten (10) public meetings were held, including four (4) public forums. At the public forums, specific elements related to the planning process were reviewed and written summaries of project activities were distributed for discussion purposes.

The planning process began with an evaluation of existing facilities at KSAAP including buildings, utility systems and transportation assets. A review of natural, environmental and historic conditions was also conducted, including an examination of data and information relating to hazardous wastes and explosive hazards at KSAAP. In addition, a regional real estate market and economic analysis was prepared in order to identify possible private sector uses for property at KSAAP. Once these steps were completed two different redevelopment alternatives were identified for the site. After a careful public review of these alternatives, a preferred land use plan for the redevelopment of KSAAP was identified by the LRPA.

EXISTING CONDITIONS AT KSAAP

- KSAAP has approximately 2.5 million square feet of floor space in more than 600 buildings. About 1.2 million square feet of floor space is associated with the production of munitions, and an additional one million square feet is used for warehouse and storage. Approximately 300,000 square feet of building space is dedicated to other types of usages.
- Due to the historic use of the property for the manufacture of munitions, it is anticipated that many of the production-related facilities will have environmental and contamination issues that may render these facilities unusable, except for continued munitions manufacturing. Since facilities in the production area account for more than 1.2 million square feet of floor space at KSAAP, almost 50% of existing buildings may be impaired from a general reuse perspective.
- There are almost 250 warehouse type structures at KSAAP with a combined floor space of more than one million square feet. While the overall average building size is less than 4,200 square feet, this average is heavily impacted by existing storage igloos, which typically range from 1,200 to 1,800 square feet each. However, aboveground storage magazines, depending on location, range from an average of 11,000 to 21,000 square feet.
- Shop space at KSAAP has some reuse potential. These facilities, in general, are flexible in terms of the types of activities they could accommodate including manufacturing, warehouse and light industrial uses.

- The administrative headquarters building, constructed in 1985, contains almost 68,000 square feet and has very good reuse potential.
- The Contaminated Waste Processor (CWP) may have reuse potential as a commercial processing center for the incineration of hazardous materials.
- The utility infrastructure at KSAAP is in generally poor condition. The water, sewer, electrical and communications systems are in a state of decay and in many cases antiquated. The transportation infrastructure, including the existing rail lines, is generally in better condition than the utility system, but will also need to be upgraded.
- Any redevelopment within the boundaries of KSAAP will likely be expensive, due to the poor condition of water and sewer lines, as well as the electrical and communications systems. In addition, initial and probably long-term redevelopment should be limited to the area within KSAAP where utility and transportation systems are easily accessible.
- The KSAAP site contains 13,727 acres that are relatively flat in the north, and with gently rolling terrain in the south.
- No threatened or endangered floral species have been identified at KSAAP. However, there are two areas of special interest: the Labette Creek Corridor and the Native Prairie. The Labette Creek Corridor contains high-quality timber and is one of the best examples of an eastern floodplain in Kansas. The native grass prairie habitat is also considered unique for the southeastern portion of the state.
- There are 47 miles of rivers and streams, 123 ponds and 212 acres of wetland habitat located at KSAAP.
- Over 9,700 acres of land are outleased for agricultural purpose at KSAAP.
- All existing buildings, structures or objects at KSAAP are considered ineligible for inclusion on the National Register of Historic Places.
- KSAAP has senior water rights to the Neosho River and maintains this right through annual use.
- The Department of the Army's environmental management activities, under the Defense Environmental Restoration Program, is referred to as the Installation Restoration Program (IRP). The purpose of the IRP is to identify, investigate, and cleanup contamination at active Army facilities. Under the IRP, 17 sites at KSAAP are designated as Response Complete and 16 are active sites. The active sites involve landfill covers at two sites, soil removal at two sites, monitored natural attenuation of groundwater at four sites, and long-term monitoring of groundwater at several other sites.
- There are no significant implications for the reuse of KSAAP based on evaluated natural and cultural resources.
- The Department of the Army anticipates completion of all environmental remediation work by 2037.

- More than 10,300 acres at KSAAP are available for reuse with no environmental restrictions.
- Cleanup standards for many locations at KSAAP have been based on industrial uses. Consequently, without additional cleanup, the major types of land use at KSAAP will likely be limited to industrial applications.
- Past use of portions of the KSAAP site will require long-term monitoring of wells and groundwater use restrictions.
- The KSAAP site has been properly managed and has minimal explosives contamination to interfere with future redevelopment.
- Explosive residues may be present in production areas (buildings, ventilation systems, vacuum systems, sewer lines and dispensing lines), but have not yet been characterized or quantified.
- The population of Labette County has declined since 1940. The U.S. Census reported a population of 22,835 in 2000. However, the number of housing units within the county has increased since 1940. At the time of the 2000 Census, 10,306 housing units were identified in Labette County.
- KSAAP is located in close proximity to U.S. Highway 400, which runs east to west, and U.S. Routes 59 and 69, which run north and south. Although these roadways are not Interstate quality roadways, the road network does provide reasonably quick access to other locations.
- Labette County is very business-friendly and has an impressive record of business development.
- Due to the extensive history of KSAAP as a munitions manufacturing location, reuse of the site for the manufacture of munitions, ammunition and/or other commercial explosives is a realistic possibility.
- Other potential uses for property at KSAAP include agricultural, recreation/conservation, rail-related commerce, manufacturing, bioenergy production, electrical power production, and oil refinery.

REDEVELOPMENT GOALS

Based on comments made by the general public, discussions among the members of the LRPA and a recently completed (2006) economic development strategy for Labette County, several specific goals were identified for the redevelopment of KSAAP. While these goals may never be completely achieved, their delineation establishes priorities for redevelopment, as well as a basis for determining the merit and success of future redevelopment activities.

- Stabilize the existing employment base and grow area businesses.
- Position KSAAP redevelopment as a catalyst for long-term economic expansion – minimize impediments for reuse of the facility.

- Broaden the type and quality of available jobs.
- Prepare a realistic reuse and implementation plan for KSAAP that supports the long-term economic growth of the region.
- Evaluate the potential for an "Energy Park."
- Develop a reuse plan for the Kansas Army Ammunition Plant that is environmentally sensitive to the high-value habitat located on the site.
- The acquisition of property at KSAAP should be accomplished in a fiscally responsible manner.
- Reuse efforts should focus on those portions of the KSAAP site that offer the greatest potential for successful redevelopment.
- The redevelopment of KSAAP should be undertaken in a manner that ensures that the environmental cleanup of hazardous waste sites is effective, efficient and relates to the redevelopment needs identified in the reuse plan.
- Redevelopment efforts should encourage the retention of existing private sector employment opportunities currently at KSAAP.
- The continued use of property at KSAAP for agricultural purposes should be encouraged.
- The organization responsible for implementing the reuse plan should work with federal, state and local agencies in establishing conservation and/or recreation areas at KSAAP.

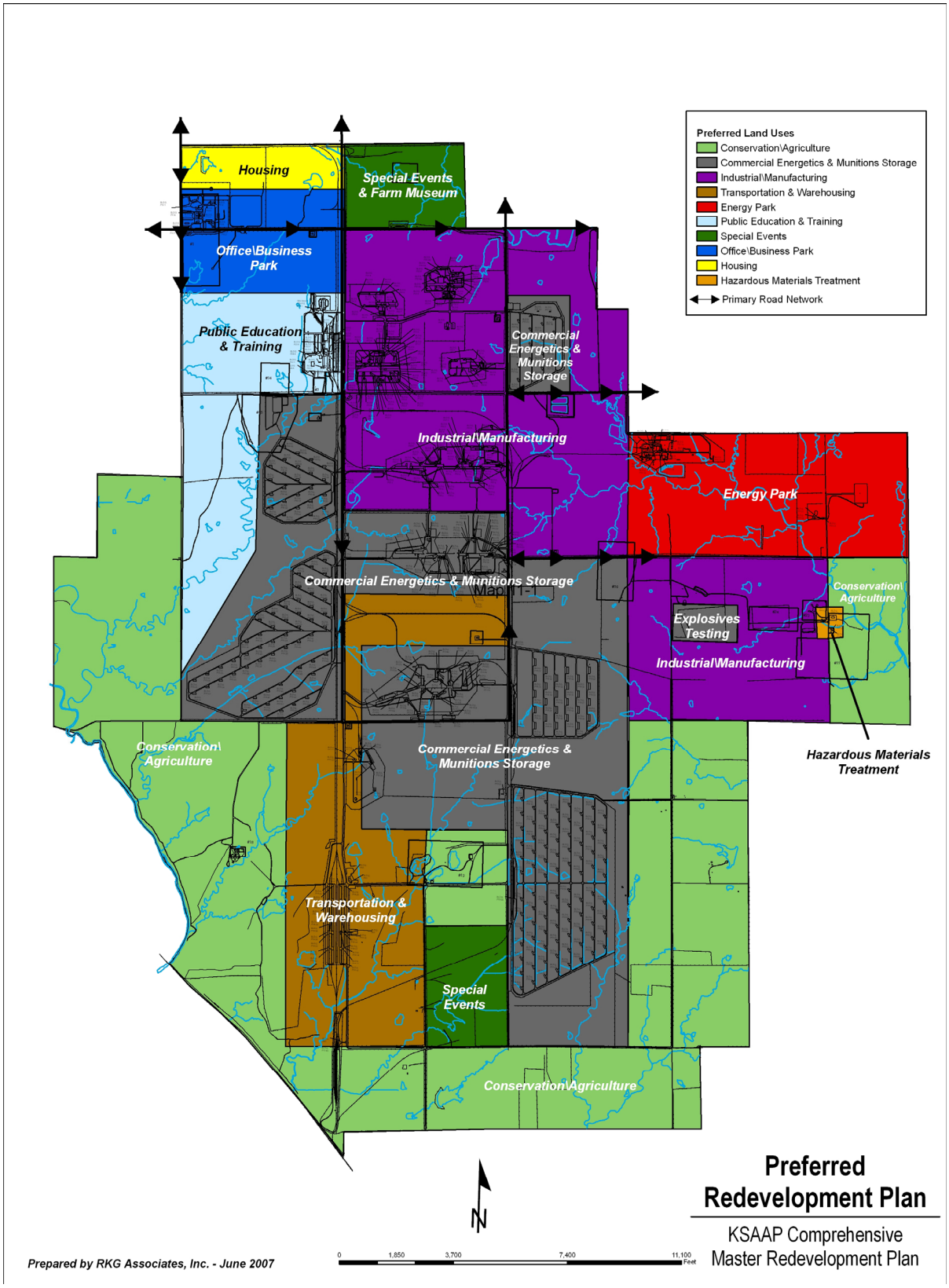
THE KSAAP PREFERRED LAND USE PLAN

The preferred land use plan for the Kansas Army Ammunition Plant was influenced by several key factors:

- The poor condition of existing buildings and structures;
- The extensive use of existing facilities (almost 50%) for the production of munitions;
- The high percent of building space (approximately 41%) devoted to storage and warehouse uses; and
- The location of infrastructure (primarily water and sewer lines) in the middle portion of the site.

Due to these site characteristics, and other factors, the redevelopment of KSAAP is primarily a land development initiative. It is also important to understand that the land use plan has been prepared to be flexible during the redevelopment process. This flexibility provides local officials and residents the latitude to respond to changes in the market and to better meet the needs of potential tenants as the redevelopment process unfolds.

Key land uses at KSAAP include the following (See Preferred Redevelopment Plan Map).


Preferred Land Uses
Conservation\Agriculture
Commercial Energetics & Munitions Storage
Industrial\Manufacturing
Transportation & Warehousing
Energy Park
Public Education & Training
Special Events
Office\Business Park
Housing
Hazardous Materials Treatment
Primary Road Network
Housing
Special Events & Farm Museum
Office\Business Park
Public Education & Training
Commercial Energetics & Munitions Storage
Industrial\Manufacturing
Energy Park
Commercial Energetics & Munitions Storage
Conservation\ Agriculture
Explosives Testing
Industrial\Manufacturing
Hazardous Materials Treatment
Conservation\ Agriculture
Commercial Energetics & Munitions Storage
Transportation & Warehousing
Special Events
Conservation\Agriculture
N
Preferred Redevelopment Plan
KSAAP Comprehensive Master Redevelopment Plan
Prepared by RKG Associates, Inc. - June 2007
0 1,850 3,700 7,400 11,100 Feet

- **Conservation and Agriculture** – Approximately 3,881 acres (28 percent of the site) has been designated for conservation and agricultural purposes. This type of use will protect a wide range of natural resources and provide significant opportunities for a variety of outdoor activities for the general public.
- **Commercial Energetics and Munitions Storage** – About 3,450 acres, (28 percent of the site) has been identified for commercial energetics and munitions storage. This area includes several existing production lines, as well as existing storage igloos and magazines.
- **Industrial/Manufacturing** – This use involves 2,618 acres (19 percent of the site). It is anticipated that a significant period of time will be required to redevelop this portion of the site due to the need to demolish existing munitions production facilities (load lines), possible environmental remediation efforts, and existing market conditions.
- **Transportation and Warehousing** – These types of activities would involve an estimated 1,145 acres (8 percent of the site). Key development initiatives would include railcar storage and use of existing cold storage warehouses.
- **Energy Park** – Approximately 826 acres (6 percent of the site) could be used for a variety of possible energy production efforts including bio-fuel facilities (ethanol), oil refinery and/or a coal-fired power plant.
- **Public Education and Training** – A small portion of the site, about 783 acres (6 percent of the land area), is recommended as a location for the training and education of fire, rescue, police and emergency responders.
- **Special Events** – Two sites containing approximately 484 acres (4 percent of the land area) have been identified for special events. One site would involve the establishment of a farm museum, along with related activities, while the other location would support adjacent conservation activities.
- **Office/Business Park** – Approximately 405 acres (3 percent of the site) adjacent to the existing administrative office facility at KSAAP, have been designated as an office/business park.
- **Housing** – About 173 acres have been reserved for housing if the need for this type of development occurs over the next 10 to 15 years.
- **Hazardous Materials Treatment** – The existing Contaminated Waste Processor facility and a small amount of land, about 19 acres, has been designated as a hazardous waste treatment facility.

INFRASTRUCTURE IMPROVEMENTS

Redevelopment of KSAAP for industrial and business related uses will require a functional utility system, especially water and sewer. However, the utility infrastructure at KSAAP is in generally poor condition. Specifically, the water, sewer, electrical and communications

systems are in a state of decay and in many cases antiquated. In addition, almost no studies or evaluations of system operations or conditions have been prepared during the past twenty years.

Due to this lack of information about the existing systems, it is critical that key infrastructure at KSAAP be evaluated in terms of operational condition and capacity, as well as a determination of estimated improvement costs. Outlined below are key infrastructure systems that should be evaluated.

- **Sanitary Sewer** – The key focus should involve an evaluation of existing sewer lines and lift stations in terms of condition and potential for inflow/infiltration. Although the existing treatment plant is worth retaining, capacity and operating condition should be examined.
- **Water System** – Existing water lines and towers should be inspected and evaluated for leakage and overall condition. Portions of specific water lines may have to be replaced and water towers repaired or demolished.
- **Electrical** – Although the existing substation is considered adequate, distribution and power lines need to be evaluated and designated for replacement if necessary.
- **Telecommunications** – The existing telephone and communications systems, including the PBX, are inadequate and should be replaced. The evaluation of these systems should focus on alternatives for creating a reliable and functioning telecommunications system.
- **Stormwater Management** – The flow of stormwater at KSAAP, especially in the areas designated for development, should be evaluated and options for managing stormwater run-off identified.
- **Transportation** – Existing roadways are adequate, but a management and improvement plan should be prepared in order to support long-term development. The same type of undertaking should also focus on the existing on-site railway system.
- This evaluation of KSAAP infrastructure is critical to the future redevelopment of the site. Although some interim reuses could continue at the site for a few years, improvements will be needed quickly, especially with the water and sewer systems. Consequently, the identification of key improvements, along with cost estimates, should be completed as soon as possible.

IMPLEMENTING THE REDEVELOPMENT PLAN

Once the initial planning for the redevelopment of KSAAP has been completed, the LRPA is expected to finalize its recommendations, including a decision about the creation of an implementation Local Redevelopment Authority (LRA). In order for the implementation LRA to meet the challenges and responsibilities associated with redevelopment, a number of factors need to be considered. These include financial capability, local representation, regional representation and state representation. It is important to recognize that the

determination of a reuse and redevelopment approach, the acquisition strategy for the property, and the level of investment necessary could all affect the eventual make-up of an implementation LRA. Therefore, it is recommended that strong consideration be given to local and regional issues and conditions in determining the eventual membership of the implementation LRA.

The KSAAP LRPA has a number of other important issues facing them in implementing the redevelopment plan. Issues such as whether to acquire the entire KSAAP site, whether to pursue early transfer, and what conveyance method to pursue are all critical to the future redevelopment of the site. Related to these issues are the procedures that the implementation LRA will use to operate and maintain the site, and when marketing efforts should be initiated.

- **Amount of Property to Acquire** – The implementation LRA needs to closely evaluate whether they want to acquire property at KSAAP, and how much property is appropriate to acquire. While acquisition of the entire site seems to offer the highest level of control over the future redevelopment of the property, it also comes with significant financial responsibilities. Acquisition of lesser amounts of property could reduce operation and maintenance costs, but the loss of control could affect the implementation LRA's ability to pursue an integrated plan, and could create "competitors" for potential users/employers.

- **Conveyance Method** – A final decision on the appropriate conveyance method will affect how the implementation LRA acquires the property, as well as how property can be used and/or disposed of in the future. While the LRA needs to make a decision on how it wants to approach the conveyance, the Army will also have a say in how the property is transferred, since it must approve and document the conveyance. While it is recommended that the implementation LRA request transfer of the entire property via a no-cost EDC, the Army may balk at transferring the entire site via an EDC. In the event that the Army counteroffers with either a request for an EDC with a cost, or with a partial EDC and other approaches for non-EDC parcels, the implementation LRA will have to consider the overall impact of the Army's response on their long-term plan.

- **Early Transfer** – The decision regarding an early transfer will also be affected by others. It is recommended that a request for early transfer of the KSAAP property be submitted in order to expedite environmental remediation efforts and allow the implementation LRA to prioritize cleanup consistent with its development objectives and marketing plans. The Army must agree to the early transfer and provide necessary funding to resolve environmental issues. In addition, the Governor of Kansas will also have to approve deferral of the covenant regarding environmental remediation for the KSAAP site. While the Governor's concurrence on this issue is not expected to be problematic, it is one more layer of complexity in completing the transaction.

- **Staff vs. Contractor** – Assuming that the implementation LRA acquires property at KSAAP; there will be a number of issues associated with the ongoing operation, maintenance, management and marketing of the property. Among the chief concerns

will be what functions to provide with direct staff resources, and what functions should be provided via contract agreements with service providers in the region. It is likely that the implementation LRA will have to use some blend of staff and contracted services to operate, market and maintain the property, but consideration will have to be given to what specific functions should be performed with internal staffing.

- **Early Marketing Efforts** – Typically, LRAs have benefited from "marketing while planning," which provides real world feedback on plans for redevelopment of properties. In the case of KSAAP, there is uncertainty relative to when the property might be available due to existing facility use agreements between the Army and its operating contractor. Since the operating contractor has some ongoing contracts with the Department of Defense (DoD), it is unknown whether the facility will be available after completion of these contracts, or whether DoD will seek to accelerate or terminate the contracts. This uncertainty could make it difficult for the implementation LRA to market facilities (or land) at KSAAP, since they cannot specify to a user when they might be able to begin utilizing a specific facility. The implementation LRA must work with both the operating contractor and the Army to gain an understanding of when specific facilities and/or areas of the plant will be available for use by others.

- **Phasing Plan for Development** - In terms of an asset that can readily be used and generate immediate cash flow for the implementing LRA, the portions of the property that can support agricultural uses and grazing will need to be an early focus. These lands, which include significant portion of land identified on the Preferred Redevelopment Plan as Conservation/Agriculture, can begin generating immediate revenue to support the activities of the implementation LRA.

  In terms of phasing, it is anticipated that the munitions storage facilities, including igloos and magazines, will be an early focus for the implementation LRA. Given the fact that these facilities were primarily used to store finished products, it is anticipated that the majority of these facilities will be available for reuse during the early stages of redevelopment. Other key redevelopment activities, by phase and year, are noted below:

Phase I	**Years 1-5**
	Conservation and Agriculture Special Events and Farm Museum Administrative Headquarters Transportation and Warehousing Commercial Energetics and Munitions Storage
Phase II	**Years 6 – 10**
	Hazardous Waste Disposal 20% of Office /Business Park Special Events Portion of Conservation Area Public Education and Training Site Energy Park
Phase III	**Years 11+**
	Industrial/Manufacturing Remainder of Office/Business Park Housing

Source: RKG Associates, Inc.

11. RECOMMENDED LAND USE PLAN AND IMPLEMENTATION STRATEGY

A. Introduction

This chapter describes the recommended land use plan for the redevelopment of the Kansas Army Ammunition Plant (KSAAP). The land use plan is based on an examination of key site characteristics, existing market conditions, and the financial implications of various development options. Direction provided by the KSAAP Local Redevelopment and Planning Authority (LRPA), as well as comments made during numerous public meetings, influenced the preparation of this land use plan. In addition to land use recommendations, information is provided about property acquisition, property disposal, the phasing of redevelopment efforts, and the creation of an implementation Local Redevelopment Authority (LRA).

It is important to understand that this land use plan has been prepared to maintain flexibility during the redevelopment process. This flexibility provides local officials and residents the latitude to respond to changes in the market and to better meet the needs of potential tenants at KSAAP as the redevelopment process unfolds.

B. Summary of Major Findings and Conclusions

- Future redevelopment of KSAAP will be strongly influenced by the condition of existing buildings on the site and infrastructure limitations.
- It is recommended that 28 percent of KSAAP (approximately 3,881 acres) be designated for conservation and agricultural purposes. This type of use will protect a wide range of natural resources and provide significant opportunities for a variety of outdoor activities for the general public.
- Approximately 3,450 acres, or about 25 percent of the KSAAP site, have been identified for commercial energetics and munitions storage. This area includes several existing production lines, as well as all of the existing storage igloos and magazines.
- Industrial and manufacturing uses have been designated for an estimated 2,561 acres, or approximately 19 percent of the land area at KSAAP. It is anticipated that a significant period of time will be required before this type of development can be initiated, due to demolition requirements and market conditions
- Transportation and warehousing activities would involve an estimated 1,145 acres or approximately 8 percent of the site. Key development initiatives would include railcar storage and use of existing cold storage warehouses.

- Approximately 826 acres, or 6 percent of the site, have been designated as an energy park. Types of possible uses include bio-fuel facilities (ethanol), an oil refinery and/or a coal-fired power plant.
- A small portion of the site, about 783 acres (6 percent of the land area), is recommended as a location for the training and education of fire, rescue, police and emergency responders.
- Two sites containing approximately 484 acres, or almost 4 percent of the land area, have been identified for special events. One site would involve the establishment of a farm museum, along with related activities, while the other portion would support adjacent conservation activities.
- Approximately 405 acres, adjacent to the existing administrative office facility at KSAAP, have been designated as an office/business park.
- A small portion of the site, about 173 acres, has been reserved for housing if the need for this type of development occurs over the next 10 to 15 years.
- The existing Contaminated Waste Processor facility and a small amount of land, almost 19 acres, has been designated as a hazardous material treatment site.
- Water, sewer, electrical and communications systems are in a state of decay and in many cases are considered antiquated. In addition, almost no studies or evaluations of system operations or conditions have been prepared during the past twenty years.
- An implementation LRA should be created to meet the challenges and responsibilities associates with the redevelopment of KSAAP. Key issues that will need to be addressed include:
  - Financial resources
  - Local representation
  - Regional representation
  - State representation
- It is critical that key infrastructure at KSAAP be evaluated in terms of operational condition and capacity, as well as estimated improvement costs.
- Basic land use and development standards need to be identified for KSAAP in order to effectively manage future reuse of the site.
- Due to the nature of contamination at KSAAP and the likelihood that an Army-led cleanup could delay implementation of the redevelopment plan, it is recommended that an early transfer of the site be pursued.
- It is recommended that the LRPA, or its successor organization the implementation LRA, seek a no-cost economic development conveyance (EDC) for the KSAAP site.

- The implementation LRA should use a variety of approaches for property disposal at KSAAP.
- Key decisions during the next several years involve:
  - Amount of property to acquire
  - Method of property acquisition
  - Use of the early transfer option
  - Staffing size and duties
  - Early marketing efforts
- Early phasing efforts should focus on property that can generate a cash flow.

C. Preferred Land Use Plan

The preferred land use plan for the Kansas Army Ammunition Plant (KSAAP) site represents a synthesis of the two alternative land use plans discussed earlier in this report. As noted in Chapter 10 (Redevelopment Goals and Reuse Alternatives), the redevelopment of KSAAP will be influenced by several key factors:

- The poor condition of existing buildings and structures;
- The extensive use of existing facilities (almost 50%) for the production of munitions;
- The high percent of building space (approximately 41%) devoted to storage and warehouse uses, and
- The location of infrastructure (primarily water and sewer lines) in the middle portion of the site.

Outlined below are descriptions of ten (10) key land use parcels (See Map 11-1).

1. Conservation and Agricultural

As discussed in Chapter 4 (Natural Environment and Historic Features) the KSAAP site includes a wide diversity of natural features that provide unique opportunities for a range of conservation, recreation and agricultural activities. Over 47 miles of rivers and streams, as well as 123 ponds, are located on the site. There are also over 212 acres of wetland habitat and over 1,000 acres of critical forest resources that are managed as part of a wildlife habitat. KSAAP also has a variety of wildlife including deer, turkey, quail and fish that are harvested as part of a hunting and fishing program managed by the Department of the Army. In addition, 9,700 acres are currently leased for agricultural activities including farming and grazing.

The Conservation and Agricultural portion of the site includes approximately 3,881 acres (nearly 28% of the site) and represents the largest reuse of land at KSAAP. This use is located in a continuous strip in the western, southern and eastern portions of the site. It is

anticipated that the preservation of this large conservation area would provide opportunities for a variety of public outdoor uses such as self-guided tours, nature trails, access to the Neosho River, managed horseback riding, and controlled hunting and fishing. Stewardship of riparian timber, including a sustainable timber harvest strategy, will also be important in preserving this unique habitat. In addition, agricultural property within this area, as well as other portions of KSAAP, could be leased for agricultural and grazing purposes in order to generate needed cash flow for the Reuse Authority.

Disposition - It is anticipated that the Reuse Authority would acquire the KSAAP site under an Economic Development Conveyance (EDC). Property involved in outdoor recreation and conservation purposes could then be leased at no cost to a state agency for management and operation purposes. Agricultural land could also be leased to users in a manner similar to the approach currently employed by the Department of the Army.

2. Commercial Energetics and Munitions Storage

One of the key elements of this redevelopment plan involves the continuation of the manufacturing and storage of munitions on a portion of the KSAAP site. Under the preferred land use plan, approximately 3,450 acres (25% of the site) would be dedicated to the manufacturing and storage of munitions, as well as other types of explosives. Existing load lines (1000, 1100 and 1200 areas) would be reused as existing structures, or demolished and new manufacturing facilities constructed. The existing storage igloos and magazines would be used by on-site manufacturers or leased on a contractual basis for storing munitions, explosives or products manufactured at other locations. It is expected that portions of existing north-south roads (D Road and E Road) may be made available to other tenants on the site.

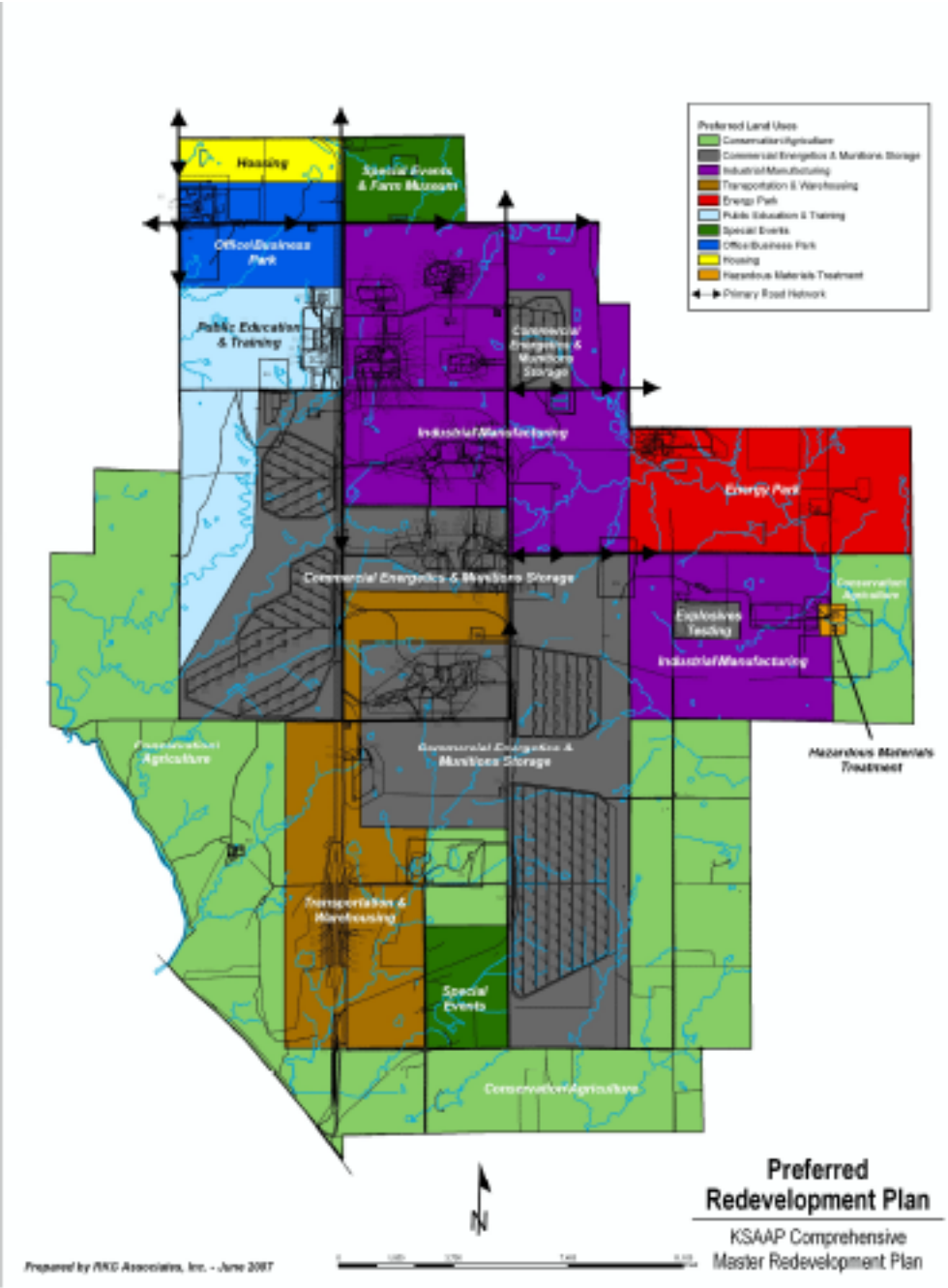
As noted earlier, this use is located in the central core of the site (See Map 11-1) with access to existing roads, water and sewer lines. It is also assumed that new fencing and access control measures would be required for security purposes.

Disposition - Due to environmental issues associated with the production of munitions and explosives, it is recommended that the Reuse Authority transfer the ownership of property that would be used for manufacturing directly to the end user. However, it is also recommended that the Reuse Authority maintain ownership of the ammunition storage igloos and bunkers, and that these facilities be marketed through short- and long-term leases.

3. Industrial/Manufacturing

As discussed previously in this document (Chapter 8 – Market Potential of Land and Facilities), because of its size and location, KSAAP has the opportunity to attract industrial and manufacturing uses that may have difficulty finding an appropriate development site. Under the preferred land use plan, approximately 2,561 acres (nearly 19% of the site) have been identified in the northeast and eastern portions of KSAAP for industrial and manufacturing uses. This location has access to the existing on-site rail line as well as internal roadways (Roads E and G) that would provide a rapid connection to U.S. Route 400.

Map 11-1 - Preferred Redevelopment Plan



Redevelopment of this portion of KSAAP would require the demolition of existing munitions production facilities (load lines), as well as the remediation of the open burning pads. Once these improvements are completed, it is anticipated that large land parcels (200 to 300 acres) would be available for redevelopment.

Disposition - Due to the expected lengthy time period required for remediation, it is recommended that the Reuse Authority reserve this site for large-scale industrial and/or manufacturing uses that require at least 200 acres. Transfer of the property to a user, by sale or long-term lease, should also include specific performance requirements related to the initiation of construction activities and the number of jobs created.

4. Transportation and Warehousing

This portion of KSAAP contains approximately 1,145 acres (about 8% of the site) and includes 19 cold storage warehouse buildings with nearly 400,000 square feet (1400 Area). Each of the buildings also has access to a rail siding, allowing materials and supplies to be off-loaded from railcars directly into the warehouse.

Due to the location of the warehouses and the rail tracks on the site, it is recommended that this area be designated for transportation and warehouse uses. Due to the configuration of the site, it is expected that additional land could be devoted to the construction of new warehouse facilities as well as the repair and storage of railcars. Access to the site would be provided by Scott Road and Road D.

Disposition - It is recommended that the Reuse Authority lease the rail line to a private operator in order to generate the cash flow required to fund other related site development activities. The rail use agreement should also include provisions for maintenance of the tracks and other rail related activities. Warehouse space should also be leased to individual users.

5. Energy Park

Due to existing demand for sites relating to the construction of energy production facilities, approximately 826 acres (about 6% of the site) have been identified as an energy park. This type of use, located in the northeastern portion of KSAAP, could support the development of one or more bio-fuel facilities (ethanol) as well as a more traditional oil refinery. In addition, this site has been identified as attractive for the development of a coal-fired power plant due to its proximity to a water supply, as well as its access to rail lines for coal delivery.

Disposition - It is expected that the land required for a coal-fired power plant, an oil refinery or a bio-fuel refinery would have to be transferred by deed to the user/developer. The Reuse Authority should have a recoupment provision in any transfer documents that requires that the land be returned to the Authority without cost or penalty in the event that the planned power plant and/or refinery are not developed.

6. Public Education and Training

Approximately 783 acres (nearly 6% of the site) have been identified on the northwest portion of the site for training and education of fire, rescue, police and emergency responders. It is anticipated that this area could also be used as a location for state and federal government training needs related to various first responders and homeland security needs. Although the use of this site will require the construction of new buildings and structures, supporting infrastructure (e.g. water and sewer) exists on-site.

Disposition - This portion of site could be retained by the Reuse Authority or transferred to an appropriate governmental organization.

7. Special Events

Two sites, containing approximately 484 acres (nearly 4% of the site), have been identified for special events types of uses. The northern site (about 249 acres) could host a number of limited or one-time events relating to agriculture and recreation activities. Specifically, this site would be the location for a proposed regional farm museum with equipment, artifacts and programs about farm history. Space could also be made available for the construction of a limited number of permanent structures for meetings and display purposes, as well as outdoor locations for specific activities and parking. The site could also be used for other regional activities such as auctions, domestic animal exhibits and private sector functions. Access to the site would be provided by Scott Road.

The southern special event site (containing approximately 242 acres) would be used for activities related to adjacent conservation areas. One activity could involve the construction of cabins related to the Kansas Wildscape Project. This endeavor involves donations that are used to fund the construction of cabins at state parks that are then managed by the Kansas Department of Wildlife and Parks. The cabins would also provide access to other portions of the site designated for conservation purposes.

Disposition - As discussed under the Conservation and Agricultural section, it is expected that this property would be leased to end users by the Reuse Authority.

8. Office/Business Park

This northwestern portion of the KSAAP site, containing approximately 405 acres (nearly 3% of the site), would be used to support the development of office and business park types of uses. The key anchor would be the existing administration building, which contains approximately 70,000 square feet of space. Also, due to existing utility systems in the area, the development of additional office and flex-type buildings could be completed with a reduced level of investment, as compared with other sites at KSAAP that do not have access to required infrastructure.

Based on the size of the site, it is projected that at 5,000 square feet per acre, this portion could support approximately two million square feet of floor space, although this type of density is probably not realistic. It is anticipated that this portion of the property would have minimal access controls, similar to other industrial/business parks in the area,

notably the Parsons Industrial and Business Park. Access to this site could be obtained via Scott Road from the north, or 23000 Road from the West.

Disposition - It is recommended that the Reuse Authority consider the model used by the City of Parsons in creating its industrial and business parks. The city typically installs necessary infrastructure and utilities in order to have an inventory of available sites that can be developed with a minimum of delay. In many cases, companies are attracted to sites that are "shovel-ready," meaning that construction can begin almost immediately. This approach would also allow the Reuse Authority to develop infrastructure using a phased approach in order to conserve capital investment dollars.

Once the necessary infrastructure development has been completed and/or upgraded, the Reuse Authority could subdivide lots for initial phases. This would permit the Authority to transfer title for industrial properties, while maintaining control over uses that are allowed at the business park.

9. Housing

A small area, containing approximately 173 acres (nearly 1% of the site), has been identified for housing construction. This is a long-term type of use that would be implemented only if substantial economic activity occurred at the KSAAP site. This housing type of use is envisioned as a smart growth, mixed-use development where people could live, work and play. This area was also selected because of access to on-site infrastructure at KSAAP and the developability of the property in terms of limited constraints. Road access would be via Scott Road, which connects to U.S. 400.

Disposition - It is recommended that the Reuse Authority hold this property for ten to fifteen years in order to evaluate the progress of implementing other aspects of the reuse plan. At that time, the Authority can identify a phased development approach for required infrastructure, and determine the mix of unit sizes, styles and types that are appropriate for the marketplace.

10. Hazardous Material Treatment

A small portion of the KSAAP site, approximately 19 acres (about 0.1% of the site), has been identified for the treatment of hazardous materials. This eastern portion of the site contains both the Contaminated Waste Processor (CWP) and the Explosive Waste Incinerator (EWI) facilities. Wastes at both the CWP and EWI were only treated at this location. Both buildings are adjacent to the Open Burning Grounds.

It is expected that the Explosive Waste Incinerator building will be demolished. However, the Contaminated Waste Processor facility is a high-temperature incinerator that was last used in 2005 and could be reactivated with a minimum of effort. Under this land use, the site would be used to process and treat hazardous materials.

Disposition - Operation of the facilities envisioned in this area of the site is a highly regulated undertaking. However, this type of use could generate significant cash flows, after up-front capital investments have been recouped. It is recommended that the Reuse

Authority identify one or more companies that could operate this type of facility as partners with the Reuse Authority. This will allow the Reuse Authority to participate in the available revenue streams associated with this type of activity, while benefiting from the experience and credibility of one or more companies that are active in similar types of enterprises.

Table 11-1 - Preferred Land Use Plan Acreage

Land Use	Estimated Acres	Percent of Total
Conservation and Agriculture	3,881	28.3%
Commercial Energetics and Munitions Storage	3,450	25.1%
Industrial/Manufacturing	2,561	18.7%
Transportation & Warehousing	1,145	8.3%
Energy Park	826	6.0%
Public Education & Training	783	5.7%
Special Events	484	3.5%
Office/Business Park	405	3.0%
Housing	173	1.3%
Hazardous Materials Treatment	19	0.1%
Total	**13,727**	**100%**

Note: Acreage estimate is approximate

Source: RKG Associates, Inc.

D. Creation of an Implementation LRA

Once the initial planning for the redevelopment of KSAAP has been completed, the LRPA is expected to finalize its recommendations, including a decision about the creation of an implementation Local Redevelopment Authority (LRA). In order for the implementation LRA to meet the challenges and responsibilities associated with the redevelopment, a number of factors need to be considered. These include financial capability, local representation, regional representation and state representation. It is important to recognize that the determination of a reuse and redevelopment approach, the acquisition strategy for the property, and the level of investment necessary could all affect the eventual make-up of an implementation LRA. Therefore, it is recommended that strong consideration be given to local issues and conditions in determining the eventual composition of the implementation LRA.

1. Financial Capability

In order to redevelop KSAAP effectively, the implementation LRA will have to be able to support redevelopment over the long term. While the goal of the project is to be self-sustaining, it is likely that the LRA will require some outside funding, including grants, loans and/or special appropriations. In many cases, grant funds and special appropriations are restricted to public or quasi-public agencies, such that the implementation LRA would have to be related to the local or county government. Further, DoD will seek to determine whether the LRA has the financial capacity to implement the plan for KSAAP as recommended in the reuse plan. In many cases, the ability to infuse money into the project (if necessary) is considered a critical component

of a financing plan for the redevelopment of a site. In most cases, this means the ability to access funds through taxation, which would require that the implementation LRA be affiliated with state, county or local governments.

2. Local Representation

The LRPA currently includes an executive committee and a steering committee, and was established by the Labette County Commissioners in response to the BRAC recommended closure of KSAAP. It is anticipated that the implementation LRA will also be established by the County Commissioners, due to the need to potentially have access to funding for redevelopment activities, while maintaining local control of the redevelopment of the site. It is anticipated that the implementation LRA will have broad-based representation from citizens of Labette County, appointed by the Labette County Commissioners.

However, because of the anticipated length of time required to redevelop KSAAP, the implementation LRA should be created with the goal of maintaining stability of membership, even during election years. Therefore, it is recommended that the LRA include the representatives appointed by the three County Commissioners, but also representatives from the community-at-large. Further, it is important that the terms of all representatives be staggered, such that during a single year the LRA Board experiences no more than a one-third turnover of its members. Each County Commissioner should have a maximum of three appointments to the implementation LRA.

Consideration should also be given to the creation of an implementation LRA with a mix of skills consistent with a project of this nature. Key disciplines that could be considered for membership on the implementation LRA include individuals with experience and training in banking, real estate, environmental issues, education, accounting/finance, governmental operations, economic development and/or agriculture.

3. Regional Representation

During public meetings regarding the reuse plan, there were comments from the public that the implementation LRA should reflect the larger region, because of the potential significance of the redevelopment within the context of the region's economy. The need for broader representation must be weighed against the anticipated costs of redevelopment, and more specifically, the anticipated source of public monies used to implement the redevelopment program. While the larger region may experience positive benefits from the redevelopment at KSAAP, it is not realistic to expect that the citizens of Neosho, Montgomery, Cherokee or Crawford Counties will provide funding for a redevelopment project in Labette County. Therefore, it is recommended that the implementation LRA include representation from the surrounding counties, but as non-voting or ex-officio members.

4. State Representation

The redevelopment of KSAAP is expected to be long, complex and expensive. As part of the redevelopment process, it is very likely that State participation will be sought, either through direct financial support, or indirectly, possibly through the location of one or

more state agencies/offices at the site. As part of this process, it is considered critically important that the State of Kansas (via the Governor) have representation on the implementation LRA through the appointment of up to two representatives to the implementation LRA. While the specific individuals to be nominated to the implementation LRA are open to discussion, the LRA may want to consider recommending an appointment from the Kansas Department of Commerce, the Kansas Department of Revenue or the Governor's Military Council. In particular, these organizations should have an understanding of the costs associated with redeveloping military properties, and the types of state assistance that could be beneficial to the long-term reuse of KSAAP.

E. Infrastructure and Roadways

Redevelopment of the Kansas Army Ammunition Plant (KSAAP) for industrial and business related uses will require a functional utility system, especially water and sewer services. However, as noted in Chapter 3 (Major Utilities), the utility infrastructure at KSAAP is in generally poor condition. Specifically, the water, sewer, electrical and communications systems are in a state of decay and in many cases antiquated. In addition, almost no studies or evaluations of system operations or conditions have been prepared during the past twenty years.

Due to this lack of information about the existing system, it is critical that key infrastructure at KSAAP be evaluated in terms of operational condition and capacity, as well as a determination of estimated improvement costs. Outlined below are key infrastructure systems that should be evaluated in the next 9 to 12 months.

- **Sanitary Sewer** - Key focus should be on existing sewer lines and lift stations that should be evaluated in terms of condition and potential for inflow/infiltration. Although the existing treatment plant is worth retaining, capacity and operating condition should be evaluated.
- **Water System** - Existing water lines and towers should be inspected and evaluated for leakage and overall condition. Portions of specific lines may have to be replaced and water towers repaired or demolished.
- **Electrical** - Although the existing substation is considered adequate, distribution and power lines need to be evaluated and designated for replacement if necessary.
- **Telecommunications** - The existing telephone and communications systems, including the PBX, are inadequate and should be replaced. The evaluation of these systems should focus on alternatives for creating a reliable and functioning telecommunications system.
- **Stormwater Management** - The flow of stormwater at KSAAP, especially in the areas designated for development, should be evaluated and options for managing stormwater run-off identified.

- **Transportation** - Existing roadways are adequate, but a management and improvement plan should be identified for support of long-term development. The same type of undertaking should also focus on the existing on-site railway system.

This evaluation of KSAAP infrastructure is critical to the future redevelopment of the site. Although some interim reuses could continue at the site for a few years, improvements will be needed quickly, especially with the water and sewer systems. Consequently, the identification of key improvements, along with cost estimates, should be completed as quickly as possible.

F. Early Transfer

As discussed in Chapter 9 (Property Transfer Process), the Department of Defense (DoD) can transfer property prior to completion of environmental remediation activities on-site. Although the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires federal agencies to include a covenant in any deed conveying real property to a nonfederal party that provides representations and warranties regarding completion of environmental remediation, CERCLA also authorizes a procedure for the deferral of this covenant (known as 'early transfer'). This allows for the conveyance of property before environmental remediation has actually been completed.

In recent years, the early transfer process has been used as a method to accelerate environmental remediation activities, as well as provide LRAs the ability to schedule their cleanup efforts in order to make the most desirable properties available in a timely manner. Typically, this has taken the form of an Environmental Services Cooperative Agreement (ESCA), as described in Chapter 9. An ESCA generally provides funding to state or local entities (including LRAs) that can contract with private sector firms for investigation and cleanup.

Given the nature of environmental contamination at KSAAP, and the likelihood that an Army-led cleanup would delay implementation of the Reuse Plan, it is recommended that the KSAAP LRPA (or its successor the implementation LRA) pursue early transfer of the KSAAP site. This will provide the implementation LRA with the opportunity to focus cleanup efforts on those parcels that it considers most marketable. In addition, local control of the remediation effort may also provide a greater level of support from both state regulators and local residents and businesses. Ultimately, this strategy is also expected to complete the cleanup much more quickly as compared to a cleanup approach that must count on annual appropriations, and therefore, the implementation LRA should be able to market and redevelop the property on a much faster timetable.

G. Property Acquisition

From the perspective of acquisition, it is considered important for the KSAAP site to be viewed in its entirety. This is due to the size of the property (almost 14,000 acres), and the presence of extensive infrastructure, including roadways, the water system, the sewer system and the rail lines, among others. This section provides specific recommendations for acquiring the KSAAP property in a manner consistent with the preferred reuse plan for the site.

The Department of Defense (DoD) published the Base Redevelopment and Realignment Manual (BRRM) on March 1, 2006. The BRRM prescribes procedures for the reuse and redevelopment of military bases. The BRRM applies to DoD and its component parts, including the Office of the Secretary of Defense and the Military Departments, among others.

The BRRM defines a variety of property transfer options that can be used for property at KSAAP. Among the transfer options outlined in the BRRM are:

- Public benefit conveyances
- Homeless assistance conveyance
- Negotiated sale to public entities
- Advertised public sales
- Environmental responsibility transfer
- Economic development conveyance
- Military construction exchange
- Conservation conveyance

Many of these alternatives were discussed in Chapter 9 of this report (Property Transfer Process). From the perspective of the acquisition of KSAAP, the size of the facility, together with the anticipated operating costs for the property, make consideration of the potential revenues from the property an important consideration in evaluating how the property can and should be acquired.

As discussed later in this chapter, the projected operating and management costs for the KSAAP facility could be in the range of $500,000 to $750,000 annually. In order for the Reuse Authority to support this type of cost structure, it will be critically important for the Authority to acquire the facility at little or no cost. In addition, it will also be important for any revenues generated on-site to be available to support the long-term operation, management, marketing and redevelopment of the site.

Considering these factors, it is recommended that the KSAAP LRPA, or implementation LRA, request the entire KSAAP facility under a no-cost economic development conveyance (EDC). As described in the BRRM, an EDC requires that the implementation LRA agree that the proceeds of sale or lease of the property received during at least the first seven years after the initial conveyance shall be used to support the economic redevelopment of, or related to, the installation. The BRRM indicates that an implementation LRA can use proceeds from sales or leasing of property in support of economic redevelopment for the following purposes:

- Road construction and public buildings
- Transportation management facilities

- Storm and sanitary sewer construction
- Police and fire protection facilities and other public facilities
- Utility construction
- Building rehabilitation
- Historic property preservation
- Pollution prevention equipment or facilities
- Demolition
- Disposal of hazardous materials generated by demolition
- Landscaping, grading, and other site or public improvements
- Planning for, or the marketing of, the development and reuse of the installation

One of the key factors in the redevelopment of KSAAP will be the availability of revenues from agricultural and grazing leases. This is an established revenue stream at KSAAP, and consistent within the Southeast Kansas marketplace. Agricultural leases are projected to generate approximately $175,000 annually, or almost 25% of the projected operating and maintenance costs for the facility.

Other potential sources of revenues include rental/lease revenue from the munitions storage facilities, lease revenues from the on-site rail system, building rents from the administrative building, and lease or sale revenues from a portion of the existing munitions production lines. In addition, some level of user fees may also be generated for water and sewer services. Potential revenues and operating costs are discussed in more detail in the Implementation section of this chapter.

1. Alternative Acquisition Scenarios

A number of alternative approaches could be considered for the acquisition of specific parcels at KSAAP. These include:

a) Public Benefit Conveyances

The utility systems at KSAAP could be acquired via public benefit conveyance (PBC) for public health and safety. These conveyances have historically been sponsored by the U.S. Department of Health and Human Services, and typically require that all revenues generated be reinvested into system operations and maintenance. In the context of KSAAP, use of an economic development conveyance (EDC) will provide a greater level of flexibility in funding operations and maintenance.

The KSAAP LRPA, or implementation LRA, may also be able to acquire the land area identified for public education and training via a PBC. This would require sponsorship of the conveyance by the U.S. Department of Education (DOE). Typically, DOE requires that the organization acquiring the property have an

established budget to support the long-term operation and maintenance of the facility. Since a specific user-organization has not been identified for this parcel, it is unlikely that DOE would support transfer.

b) Conservation Conveyance

The conservation/agricultural property could be acquired via a conservation conveyance. The Army is permitted to transfer property that is suitable and desirable for conservation purposes to states, political subdivisions of states, or nonprofit organizations that exist for the primary purpose of conservation of natural resources. However, in the case of KSAAP, a transfer of the conservation lands via this approach would limit the implementation LRA's ability to use funds generated from agricultural leasing activities. Specifically, these funds could not be used for operations and maintenance of other portions of the site.

c) Negotiated Sale

The implementation LRA could acquire all or a portion of the KSAAP property via a negotiated sale. This approach could make sense for a small portion of the KSAAP property. In particular, the housing parcel and the farm museum/special events parcel could be considered for acquisition through negotiated sale, as this approach would offer enhanced flexibility over an EDC.

The principal benefit of the negotiated sale approach is that it provides the implementation LRA with additional flexibility in its ability to use proceeds from the sale or lease of property at KSAAP – the proceeds would not necessarily have to be "reinvested" in the site for the first seven years. However, a negotiated sale also requires payment of fair market value for the property, in contrast to the EDC, which has provisions for transfer of property at below market value or no cost. It should be noted that an evaluation of KSAAP, prepared by the Staubach Companies for the Army, indicated a range of value of $7.2 to $25 million for KSAAP, or approximately $500 to $1,800 per acre. It is also important to consider that negotiated sales typically restrict the ability to re-sell ("flip") property in the first three years after transfer, and that the DoD typically includes a recoupment provision, allowing DoD to recover excess profits generated through flipping a property.

d) Advertised Public Sales

The implementation LRA could recommend that some parcels be sold directly by the Army to third parties by advertised public sales. This could include the office/business park property, the energy park site, the transportation/warehousing parcel and the industrial/manufacturing site. In recent years, the majority of sales of this type have been conducted via internet auction.

Use of this approach would represent a significant risk for the implementation LRA and the county. Specifically, since Labette County does not have zoning in place, use of this approach would leave implementation of the reuse plan and job recovery in the hands of private sector developers. Moreover, there would be a substantial risk that buyers would simply "land bank" properties and not encourage job creation activities

on the site. Finally, this approach could also affect cash flows to the implementation LRA. While maintenance responsibilities could be reduced, revenues from agricultural and grazing activities could also decline, since these activities partially take place on some of these sites.

e) Environmental Responsibility Transfer

The federal property transfer regulations also allow for the transfer of property at fair market value, with some (or all) of the purchase price offset by the buyer's willingness to perform environmental remediation activities. This is similar to the Early Transfer Process outlined in Chapter 9, and requires the concurrence of the Governor before any transfer can be finalized.

This approach would be considered most appropriate for those areas where the environmental contamination can be remediated. In the case of KSAAP, the production lines and hazardous materials areas are considered to be most affected. However, this acquisition approach is generally used in areas where the property can be converted to a higher and better use after remediation. This creates an "upside" incentive to invest private funds in the remediation effort. In the case of KSAAP, these properties would be expected to have minimal upside potential after cleanup, such that private investment for cleanup would not be justified, except by an end-user that had the ability to use a specific site.

H. Property Disposal/Development Strategies

Once the property has been acquired from the Army, the implementation LRA will have the responsibility for its operations and maintenance, as well as marketing. In order to implement the reuse plan, the LRA will have to use a variety of approaches, depending on the specific land use target. It is important to note that agricultural and grazing uses (on a leased basis) have traditionally crossed many of the land use categories discussed below, and these uses would be expected to continue across much of the site until individual parcels are developed.

1. Conservation/Agricultural

It is anticipated that the implementation LRA will hold these sites for the long-term benefit of the project and the citizens of Labette County. No sale/disposal of these sites is anticipated, though the implementation LRA may consider use agreements and/or management agreements for portions of this property. As discussed above, agricultural and grazing uses are anticipated for these sites and others throughout the KSAAP property. However, a variety of factors should be considered in preparing these management agreements, including quality of life considerations.

2. Commercial Energetics and Munitions Storage

The majority of this area of the property is expected to be held by the LRA over the long term. In particular, the majority of the storage bunkers and magazines are expected to be held by the implementation LRA and marketed for short-term and long-term storage. Other existing buildings within these areas will be marketed for reuse in the short term, though it is anticipated that these buildings will be demolished in the longer term in favor

of new construction. Available development sites within these areas will be marketed to companies within the energetics and munitions sectors, and it is anticipated that the implementation LRA would transfer fee-title to these parcels to end users.

3. Industrial/Manufacturing

This portion of the site is designed to support industrial and manufacturing uses and is expected to be developed over the long term. Demolition of most existing structures will likely be required in this area. This could take a number of years to complete, due to environmental issues associated with existing structures.

Once remediation efforts have been completed, the implementation LRA can develop conceptual plans for this portion of the property that capitalize on the availability of existing infrastructure that can support a variety of large-scale and small-scale uses. Marketing efforts in this area are expected to include commercial real estate brokers, as well as LRA staff. It is recommended that LRA staff focus on recruiting efforts on a larger scale (national marketing efforts) to both small and large users. Property is expected to be sold and developed on a lot-by-lot basis, possibly for limited cash consideration.

4. Transportation & Warehousing

Property is this area includes the existing rail yard, the 1400 area warehouse buildings and some vacant land, which could be used to develop additional storage capacity. It is recommended that the implementation LRA maintain ownership of all rail lines, and that any use of the rail lines be via a license or lease. At the LRA's discretion, the existing buildings can be sold or marketed on a lease basis. The vacant land should be marketed for development to users that can benefit from the location of the property.

5. Energy Park

The ability to support energy-related uses will require direct marketing to companies in the field of traditional and renewable energy. In order to attract a power plant, ethanol facility, traditional refinery or another related entity, the implementation LRA will have to compete against other locations. Ultimately, it is anticipated that an appropriate amount of land would be transferred by deed to the developer of a facility or facilities of this type, possibly for little or no cash consideration. Marketing to users of this type will be very competitive, as jobs of this type are highly sought-after.

6. Public Education & Training

The education and training section of the property is expected to be marketed for the creation of a training center for first-responders. Because of the nature of this type of project, it is anticipated that this portion of the property will be developed by a state government agency, or through an agreement among regional governmental entities. The implementation LRA should work with appropriate political resources to identify necessary funding for this project, and maintain flexibility in terms of necessary ownership to get the project completed.

7. Special Events & Farm Museum

It is recommended that the implementation LRA negotiate to sell a portion of this property to an end user with the capability and capacity to implement the plan to create a farm museum on the site. In addition, the LRA should also begin marketing efforts to sell the remainder of this section of the site to an end user that is committed to using the site for special events with the goal of enhancing tourism and visitation to the site and the larger region. As an alternative, the LRA could maintain ownership of the property, and lease the site on an event-by-event basis.

8. Office/Business Park

The office/business park parcel offers some significant opportunities for the implementation LRA. The existing administrative headquarters for the property is located in this area, and could offer the LRA a potential source of cash flow. It is recommended that the LRA market the property with a commercial real estate broker who can offer the property for lease or sale. The building has the ability to support two or more separate users, based on its layout. Assuming an average net lease rate of $6.00 per square foot per year, the building could generate almost $400,000 in revenue on an annual basis at full occupancy. This cash flow has obvious benefits for the LRA in terms of the operations, management, maintenance and marketing of the property.

Once the administrative building has been marketed, the implementation LRA can consider developing conceptual site plans for the remaining land in this parcel. Site plans should be developed that can capitalize on the availability of existing infrastructure systems, and accommodate a variety of end users (i.e. sizes and types). These plans can be developed both for marketing purposes, and to inform/influence potential subdivision approaches for the site. Once the concept plans have been developed, and the LRA has an understanding of cost issues associated with the infrastructure necessary to support development, the parcels can be marketed to local and regional developers by commercial real estate brokers in the region, and by LRA staff.

9. Housing

The housing parcel is considered a longer-term development option for the site. Therefore, it is recommended that the implementation LRA maintain ownership of this parcel for ten to fifteen years, until substantial job creation activity has occurred on the site. At that time, the LRA can evaluate whether the property should be subdivided or sold in its entirety to a housing developer.

10. Hazardous Materials Treatment

It is anticipated that the implementation LRA will have to maintain ownership of these parcels over the long term. Disposal is not anticipated.

I. Land Use Controls

Most communities involved in redeveloping a closed military installation eventually adopt zoning ordinances and development controls (e.g. subdivision and site plan review regulations) to manage the long-term redevelopment of the facility. Generally, these types of

regulations provide potential reusers with an understanding of how the entire property will be developed over the long term and serves as a valuable tool for marketing the site.

However, Labette County, where KSAAP is located, does not currently have a zoning ordinance. In order to manage eventual reuse of the site, the Redevelopment Authority may want to establish some development standards that provide guidance about site redevelopment.

This type of approach would involve compliance with specific development standards if another organization acquires the property through a lease or deed transfer. Responsibility for compliance could be part of the lease agreement or covenants within the deed. These standards could involve a variety of property development activities including:

- Building siting and layout
- Parking requirements
- Environmental Restrictions/Land Use Controls
- Grading and drainage
- Stormwater management
- Building height
- Safety standards
- Location of utilities
- Lighting
- Signage
- Rights-of-way and access
- Location of storage areas
- Construction standards

The implementation LRA would be the organization assigned responsibility for managing compliance with identified standards. In essence, this process would operate in conjunction with the lease or sale of property and could be flexible in order to meet the unique needs of a specific developer.

J. Strategic Implementation Strategy

In order for the KSAAP LRPA (and/or its successor implementation LRA) to effectively operate, manage and redevelop the KSAAP site, it is important to recognize some of factors that have to be considered in moving forward with the project. Specifically, the implementation LRA needs to understand some of the key decisions that will have to be made in the coming year, and how these decisions will affect the ability to initiate redevelopment, as well as timing for redevelopment.

To some extent, the ability to reuse the site will be influenced by the implementation LRA's approach to redevelopment, their risk tolerance, the availability of funding, and the influence of the marketplace. These issues are examined below.

1. Key Decisions

The KSAAP LRPA has a number of important issues facing them before the end of the current year. Issues such as whether to acquire the entire KSAAP property, whether to pursue early transfer, and what conveyance method to pursue are all critical to the future redevelopment of the site. Related to these issues are the methodology that the LRPA, or its successor implementation LRA, will use to operate and maintain the site, and when marketing efforts should be initiated.

Amount of Property to Acquire - The implementation LRA needs to closely evaluate whether they want to acquire property at KSAAP, and how much property is appropriate to acquire. While acquisition of the entire site seems to offer the highest level of control over the future redevelopment of the property, it also comes with significant financial responsibilities. Acquisition of lesser amounts of property could reduce operation and maintenance costs, but the loss of control could affect the implementation LRA's ability to implement an integrated plan, and could also create "competitors" for potential users/employers.

Conveyance Method – A final decision on the appropriate conveyance method will affect how the implementation LRA acquires the property, as well as how it can be used and/or disposed of in the future. While the LRA needs to make a decision on how it wants to approach conveyance, the Army will also have a say in how the property is conveyed, since it must approve and document the conveyance. While it is recommended that the LRA request transfer of the entire property via no-cost EDC, the Army may balk at transfer of the entire site via an EDC. In the event that the Army counteroffers with either a request for an EDC with a cost, or with a partial EDC and other approaches for non-EDC parcels, the LRA will have to consider the overall impact of the Army's response on their long-term plan. If the Army's proposal does not meet the needs of the LRA and the larger community, it may be necessary to consider implementing municipal land use controls on the property and allowing the Army to sell off the property via advertised public sales.

Early Transfer – The decision regarding early transfer will also be affected by others. It is recommended that the implementation LRA request early transfer of the KSAAP property in order to expedite environmental remediation efforts and to allow the LRA to prioritize cleanup consistent with its development objectives and marketing plans. The Army must agree to the early transfer and provide necessary funding to resolve environmental issues. In addition, the Governor of Kansas will also have to approve deferral of the covenant regarding environmental remediation for the KSAAP site. While the Governor's concurrence on this issue is not expected to be problematic, it is one more layer of complexity in completing the transaction.

2. Staff vs. Contractor

Assuming that the LRPA (or the implementation LRA) acquires property at KSAAP, there will be a number of issues associated with the ongoing operation, maintenance, management and marketing of the property. Among the chief concerns will be what functions to provide with direct staff resources, and what functions should be provided via contract agreements with service providers in the region. It is likely that the implementation LRA will have to use some blend of staff and contracted services to operate, market and maintain the property, but consideration will have to be given to what specific functions the LRA wants to perform with internal staffing.

3. Early Marketing Efforts

Typically, implementation LRAs have benefited from "marketing while planning," which provides real world feedback on plans for redevelopment of properties. In the case of KSAAP, there is uncertainty relative to when the property might be available to the LRA, because of the existing facility use agreement between the Army and its operating contractor. Since the operating contractor has some ongoing contracts with DoD, it is unknown whether the facility will be available after completion of these contracts, or whether DoD will seek to accelerate or terminate the contracts. This uncertainty makes it difficult for the LRA to market facilities (or land) at KSAAP, since they cannot specify to a user when they might be able to begin utilizing a specific facility. The implementation LRA must work with both the operating contractor and the Army to gain an understanding of when specific facilities and/or areas of the plant will be available for use by others.

K. Phasing Plan and Development Approach

In terms of an asset that can readily be used and generate immediate cash flow for the implementation LRA, the portions of the property that can support agricultural uses and grazing will need to be an early focus. These lands, which include the majority of land identified on the Preferred Reuse Alternative Map as Conservation/Agriculture, can begin generating immediate revenue to support the activities of the LRPA.

In terms of phasing, it is anticipated that the munitions storage facilities, including igloos and magazines, will be an early focus for the implementation LRA. Given the fact that these facilities were primarily used to store finished products, it is anticipated that the majority of these facilities will be available for reuse during the early stages of redevelopment. However, the *Environmental Condition of Property (ECP) Report* indicates that these facilities are unevaluated, or require additional evaluation.

The ECP also indicates that the existing rail yard is unevaluated, or requires additional evaluation. However, the majority of the land area identified for transportation and warehousing uses is considered environmentally "clean" (as are the majority of the 1400 Area warehouse structures). This property is also expected to be an early focus of the implementation LRA, given the attractiveness of the rail assets, and market data that indicates significant increases in rail traffic. This area of the site could support substantial

development of new warehousing uses, exterior storage and shipment of bulk materials, and expanded railcar storage.

The existing administrative headquarters building is also expected to be an early focus of the implementation LRA. Leasing of this facility could generate $300,000 or more for the LRA at full occupancy, and marketing of this facility is considered critical in terms of helping the LRA to meet the financial costs associated with the KSAAP site.

Table 11-2 provides a summary of activity by phase, and Map 11-2 provides a graphic representation of the phasing of redevelopment.

Table 11-2 – Phasing Schedule by Land Use Area

Phase I	Years 1-5
	Conservation and Agriculture Special Events and Farm Museum Administrative Headquarters Transportation and Warehousing Commercial Energetics and Munitions Storage
Phase II	**Years 6 – 10**
	Hazardous Waste Disposal 20% of Office /Business Park Special Events Portion of Conservation Area Public Education and Training Site Energy Park
Phase III	**Years 11+**
	Industrial/Manufacturing Remainder of Office/Business Park Housing

Source: RKG Associates, Inc.

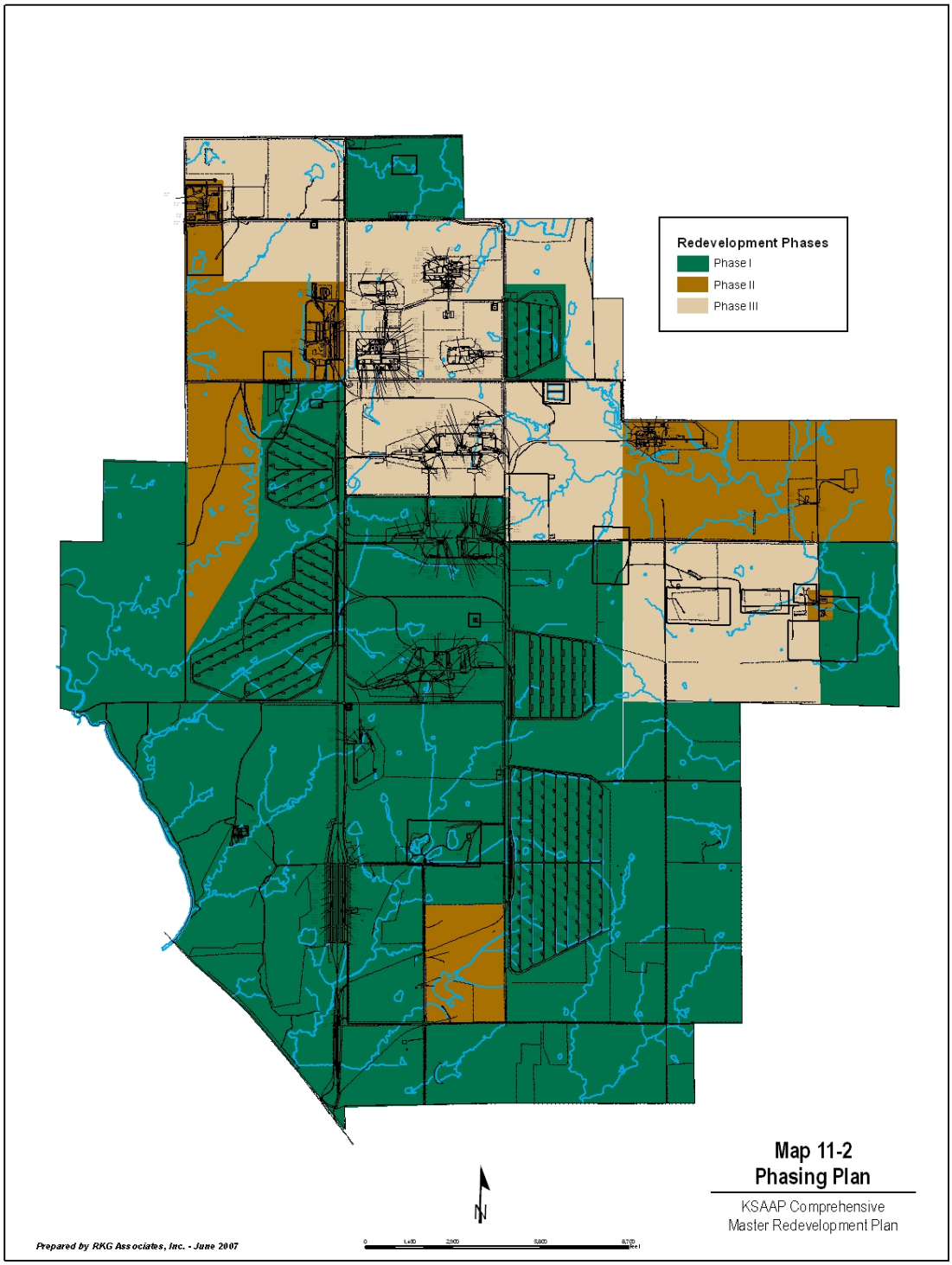
The second phase of KSAAP redevelopment is expected to begin in Year 6. At that time, it is anticipated that the implementation LRA will have interest, and the associated sponsor and funding, for the development of the public education and training facility.

The energy park parcel is also expected to see some activity during Phase II. While the implementation LRA had early interest in this site for the development of a coal-fired power plant, the project has been put on hold. However, it is anticipated that the project, or a similar project, will be attractive due to the proximity to the rail lines and the availability of water.

The special events portion of the conservation area is also expected to see development during Phase II. It is anticipated that it will require several years before funding can be secured to develop the facilities envisioned for this portion of the property.

Some additional development in the office/business park is anticipated during Phase II. It is expected that approximately 20% of the site could be developed during Phase II, including the existing administrative headquarters building.

Map 11-2 – Phasing Plan



Finally, the hazardous materials disposal site is expected to be used during Phase II, primarily for disposal of demolition debris from the Plant.

The final phase of KSAAP redevelopment includes development from Year 11 forward. The focus of this portion of the project will involve attraction of users for the industrial and manufacturing portions of the site. Given the availability of more than 2,000 acres for industrial and manufacturing uses, redevelopment of this portion of the property could require decades to experience significant progress or achieve build-out.

Similarly, the redevelopment of the office/business park property is expected to continue during Phase III. Redevelopment of this property could include one million square feet or more of total floor space, and achieving build-out could require 20 years or more.

Finally, the housing area is expected to be developed during Phase III. At that time, it is anticipated that the KSAAP site will have achieved a "critical mass," and established itself as one of the major employment centers in Southeast Kansas.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-7000

OFFICE OF COMMUNITY PLANNING
AND DEVELOPMENT

DEC 19 2007

Mr. Daniel W. Goddard
Executive Director
Kansas Army Ammunition Plant
Local Redevelopment Planning Authority
1209 Corporate Drive #6
Parsons, KS 67357

Dear Mr. Goddard:

I am pleased to inform you of the Department of Housing and Urban Development's final determination that the *Kansas Army Ammunition Plant (KSAAP) Comprehensive Master Redevelopment Plan and Homeless Assistance Submission* (the Plan), dated August 24, 2007, with supplemental information dated October 30, 2007, complies with the requirements of the Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (Act), as amended, and its implementing regulations found at 24 CFR Part 586. The Local Redevelopment Planning Authority (LRPA) may move forward with implementing the reuse plan, including pursuing the acquisition of the property for economic redevelopment as industrial, manufacturing, and other business uses; conservation and agriculture purposes; and expanding current commercial energetics and munitions storage operations. The basis for HUD's determination is discussed below.

HUD determined that the Plan appropriately balanced the needs of the communities in the vicinity of the installation for economic redevelopment and other development with the needs of the homeless in the community. The basis for this determination was the fact that despite the LRPA having carried out the required outreach to homeless assistance providers, no notices of interest to obtain property for use to assist the homeless were submitted. The Kansas City Army Ammunitions Plant is located in an isolated rural section of Kansas with no established local Continuum of Care system. No homeless assistance providers expressed an interest in receiving base property, even for free, to operate a project to serve the homeless.

HUD notes that the NOI requirements for representatives of the homeless imposed restrictions, such as the disqualification of tenants for previous assault convictions in the last five years, which are not required by law. These restrictions may cause a chilling effect on interest in the property from representatives of the homeless. In this instance, HUD concludes that the needs of the homeless were appropriately balanced with economic and other development needs because of the completion of required outreach by the LPRA, the previous use of the property for the storage and manufacture of munitions, the lack of overall interest by homeless service providers and the property's rural location.

Under the Act, the purpose of HUD's review of base closure plans is to make certain enumerated determinations "with respect to the expressed interest and requests of representatives of the homeless" 10 U.S.C. 2687 note (b)(7)(H)(i). Where representatives of the homeless do not express interest in obtaining base property and where HUD is satisfied that the LRA's outreach to the representatives of the homeless was in the manner dictated by the Act and its regulations, HUD will conclude that a base reuse plan appropriately balances the needs of the community for economic and other redevelopment with the needs of the homeless in the community.

Congratulations on your success in effectively carrying out the military base reuse planning process. I wish you continued success in implementing the reuse plan for the Kansas Army Ammunition Plant. HUD stands ready to assist you in your efforts. If the Department can provide any further service please contact Ms. Marie T. Rudler, Community Planning and Development Representative, in HUD's Kansas City regional office at 400 State Avenue, Room 200, Kansas City, KS 66101. Ms. Rudler can be reached at (913) 551-5569.

Sincerely,

Mark Johnston
Deputy Assistant Secretary
for Special Needs

cc:
Mr. David Reed, DASA (I&H)
Mr. Patrick O'Brien, OEA

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APPENDIX B AGENCY CONSULTATION LETTERS

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December 18, 2006

Mr. Bill Busby
Kansas Biological Survey
2101 Constant Ave., Higuchi Hall
Lawrence, KS 66047-3759

Dear Mr. Busby,

As we discussed in September, the Kansas Army Ammunition Plant (KSAAP) is slated for closure under the Base Realignment and Closure Act (BRAC) of 2005. In compliance with the National Environmental Policy Act, the Department of the Army is preparing an Environmental Assessment (EA) for the disposal and reuse of KSAAP. This EA will address the environmental and socioeconomic effects of the disposal of real property interests at KSAAP. Various property disposal alternatives are being evaluated in the EA. Specific plans for reuse are currently being developed by the Local Redevelopment Authority. Future redevelopment of KSAAP is considered a secondary action resulting from disposal.

KSAAP consists of 13,727 acres plus 111 acres of easement right-of-way. The installation is currently used for the production of military munitions that support the Army. KSAAP is located three miles east and ½ mile south of the town of Parsons in Labette County, in southeastern Kansas. KSAAP is about 30 miles west of the Missouri border and 20 miles north of the Oklahoma border. Joplin, Missouri is the nearest population center, about 50 miles east of KSAAP. A map showing the location of the installation is included for your reference.

Army regulations require consideration of state-listed species in all Army actions. KSAAP was surveyed for threatened and endangered species in 1994 by KBS (*A Survey for Rare and Protected Species and Exemplary Natural Areas on the Kansas Army Ammunition Plant in Labette County, Kansas*, final report May 10, 1995). KBS also searched for the federally-threatened Meads milkweed (*Asclepias meadii*) and the federally-threatened western prairie fringed orchid (*Platanthera praeclara*) in 1994 and 1995.

The Kansas Department of Wildlife and Parks has suggested we contact your agency for any new information that may have been acquired since these surveys. Of particular interest is any data on the presence of the Indiana bat, though information on any species or habitats of interest to KBS would be appreciated. Furthermore, the Army invites comment from your Department on the conservation of the unique and rare areas such as the Labette creek corridor, native prairie and rare species that occur there.

If your office has any information available on this issue, please send it to:

Marstel-Day, LLC
(Attn: Jerry Thompson)
509-1 Jackson Street
Fredericksburg, Virginia 22401

Thank you in advance for your assistance in this matter. If you have any questions, or require additional information, please contact me at (210) 363-8772, or by email at jt@marstel-day.com

Sincerely,

Jerry Thompson
Biologist

509-1 Jackson St., Fredericksburg, VA 22401 540-371-3338
218 North Lee Street, Suite 300, Alexandria, VA 22314 703-519-3777
1736 Franklin Street, Suite 500, Oakland, CA 94612 510-663-0936

-----Forwarded message from wbusby@ku.edu------
Date: Thu, 18 Jan 2007 12:02:59 -600
From: Bill Busby <wbusby@ku.edu>
Reply-To: wbusby@ku.edu
Subject: Response to letter of December 18, 2006
To: jt@marstel-day.com
Cc: “Jennifer Delisle \\(E-mail\\) <jdelisle@ku.edu>, “Ed Miller \\(E-mail\\)” <ejm916@yahoo.com>

Dear Mr. Thompson,

I am writing in response to your letter of December 18, 2006 regarding the Kansas Army Ammunition Plant (KSAAP). To my knowledge, the Kansas Biological Survey has collected no new biological information on the site since our 1995 report, A Survey for Rare and Protected Species and Exemplary Natural Areas on the Kansas Army Ammunition Plant in Labette County, Kansas, was completed. However, the Kansas Natural Heritage Inventory (KSNHI), a program of KBS, maintains a conservation database for the State of Kansas that tracks rare species and noteworthy natural sites. We have received some limited additional data from KSAAP from other sources since our study was completed and can provide this information to you. Sources of this data included records reported by the former Land Manager, Alan Hynek, and a stream survey by Ed Miller, Kansas Department of Wildlife and Parks. I will have Jennifer Delisle, KSNHI data manager; contact you about providing this data in a format suitable for your needs.

I know of no records of Indiana bat, Myotis sodalis, anywhere in Kansas. Given that the species does occur in adjacent areas in Missouri, it is a possibility that Indiana bats do occur in Kansas. However, detection of this species is unlikely without targeted bat surveys. Such surveys have been conducted at Fort Leavenworth, Kansas, and no Indiana bats were found.

Regarding your request for recommendations on future use of the site, I can offer a few general comments. KSAAP contains a few high quality natural features that are worthy of conservation, specifically the remnant tallgrass prairies identified in our report and the riparian corridor along Labette Creek. Both these areas support high quality natural communities and rare plant and animal species. These areas are discussed in our 1995 report. As we discussed earlier, the US Fish and Wildlife Service has previously looked into acquiring KSAAP property along Labette Creek, but apparently, no action was taken. Some of the remnant prairies are of excellent quality, but they are also small in size and spatially isolated by agricultural land.

If these areas were to be conserved it would be best to restore some surrounding land to prairie as a means of providing a buffer to the native prairie. I know that some grassland restoration has occurred on the site since our study and it would be desirable to consider these areas in planning any land conservation efforts. I realize these are only general comments. If you have additional questions about these sites or conservation planning, please don’t hesitate to contact us again.

Sincerely,
Bill Busby
Zoologist, Kansas Natural Heritage Inventory;
and
Associate Scientist, Kansas Biological Survey
2101 Constant Avenue
Lawrence, KS 66047
Ph: 785-864-1530

-----End forwarded message-----

MARSTEL DAY
CONSERVATION & CONSULTING
FROM SEA TO STARS

www.marstel-day.com

September 18, 2006

Mr. Mike LeValley
US Fish and Wildlife Service
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502

Dear Mr. LeValley:

In compliance with the National Environmental Policy Act, the Department of the Army is preparing an Environmental Assessment (EA) for the disposal and reuse of the Kansas Army Ammunition Plant (KSAAP), slated for closure under the Base Realignment and Closure Act of 2005. This EA will address the environmental and socioeconomic effects of the disposal of real property interests at KSAAP. Various property disposal alternatives are being evaluated in the EA. Specific plans for reuse are currently being developed by the Local Redevelopment Authority. Future redevelopment of KSAAP is considered a secondary action resulting from disposal.

KSAAP consists of 13,727 acres plus 111 acres of easement right-of-way. The installation is currently used for the production of military munitions that support the Army. KSAAP is located three miles east and ½ mile south of the town of Parsons in Labette County, in southeastern Kansas. KSAAP is about 30 miles west of the Missouri border and 20 miles north of the Oklahoma border. Joplin, Missouri is the nearest population center, about 50 miles east of KSAAP. A map showing the location of the installation is included for your reference.

We are requesting a list of federally listed threatened, endangered, or candidate species, as well as sensitive species known to occur, or potentially occurring on or in the vicinity of KSAAP. Also, we would appreciate information on any other sensitive natural resources that could be impacted by the proposed action.

If your office has any information available on this issue, please send it to:

Marstel-Day, LLC
(Attn: Jerry Thompson)
509-1 Jackson Street
Fredericksburg, Virginia 22401

Thank you in advance for your assistance in this matter. If you have any questions, or require additional information, please contact me at (210) 363-8772, or by email at jt@marstel-day.com

Sincerely,

Jerry Thompson
Biologist

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218 North Lee Street, Suite 300, Alexandria, VA 22314 703-519-3777
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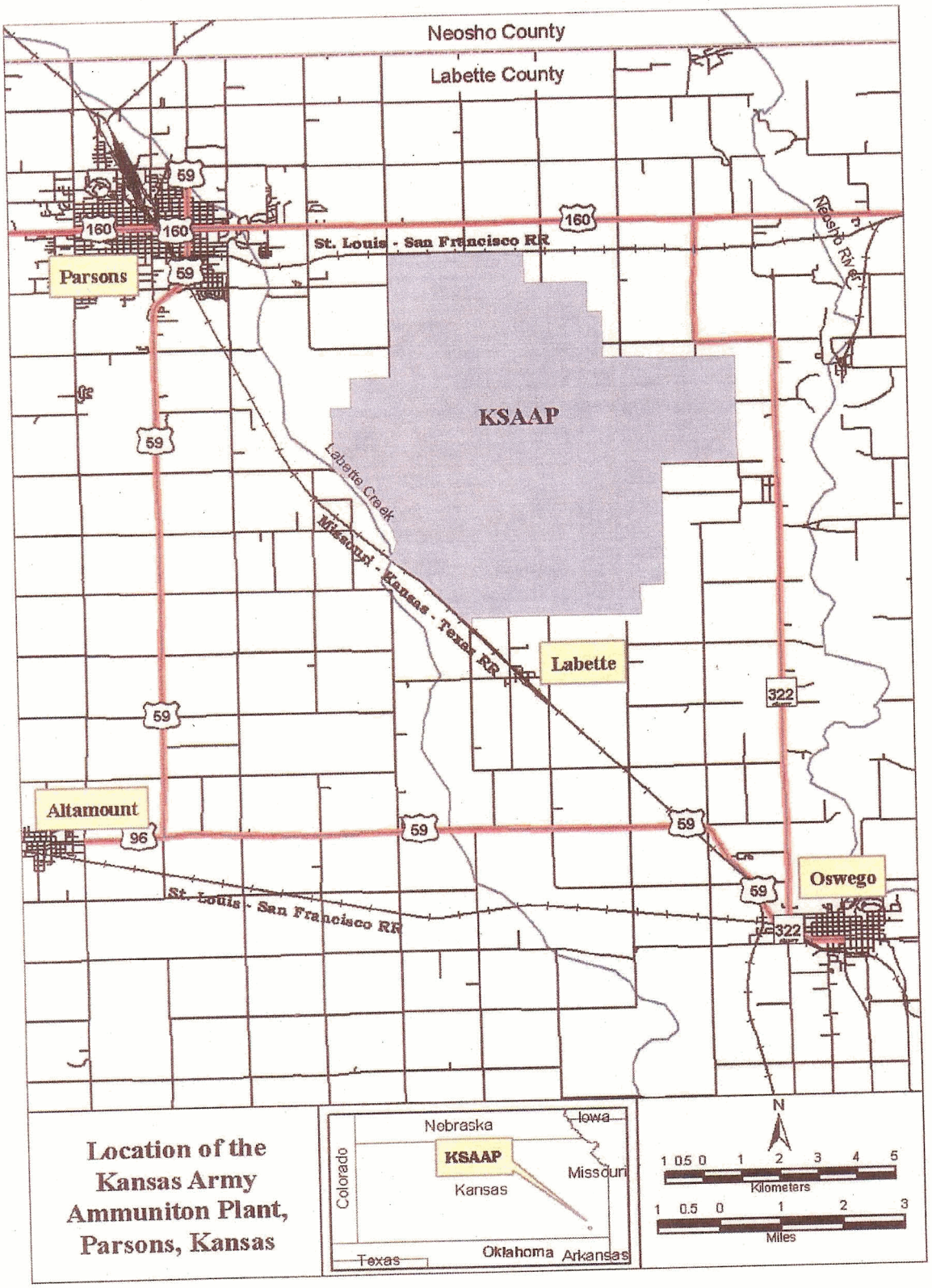

Location of the Kansas Army Ammuniton Plant, Parsons, Kansas

509-1 Jackson St., Fredericksburg, VA 22401 540-371-3338
218 North Lee Street, Suite 300, Alexandria, VA 22314 703-519-3777

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, Kansas 66502-6172

November 9, 2006

Jerry Thompson
Marstel-Day, LLC
509-1 Jackson Street
Fredericksburg, VA 22401

RE: Kansas Army Ammunition Plant FWS Tracking # 2006-P-0594

Dear Mr. Thompson:

In accordance with our responsibilities under section 404(b) of the Clean Water Act (33 U.S.C. 1344); the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 *et seq.*); the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*); and executive orders 11990 (wetland protection), 11988 (floodplain management) and 13112 (invasive species), we are providing scoping comments for the development of an environmental assessment (EA) for the proposed disposal and reuse of the Kansas Army Ammunition Plant (KSAAP), slated for closure under the Base Realignment and Closure Act of 2005.

The U.S. Fish and Wildlife Service (USFWS) appreciates the coordination between the Service, the Department of the Army and the consultant Marstel-Day, LLC in the development of an EA, and values efforts made to address our concerns.

In accordance with section 7(c) of the Endangered Species Act (ESA), we have determined that the federally-listed threatened bald eagle (*Haliaeetus leucocephalus*), the threatened Neosho madtom (*Noturus placidus*) and the endangered Indiana bat (*Myotis sodalist)* may occur in the project area. If the project may affect a listed species, the Department of the Army should initiate formal section 7 consultation with this office. If there will be no effect, or if the Fish and Wildlife Service concurs in writing there will be beneficial effects, further consultation is not necessary.

In Kansas, both nesting and migrating populations of bald eagles occur. Eagles use areas where large trees provide perch sites in proximity to open water, where they feed on fish and waterfowl. Bald eagle nesting sites have steadily increased in Kansas since 1989, now numbering 23, with the closest to KSAAP being in Neosho County, near the Neosho River. If any reasonably foreseeable action caused by the proposed project or alternatives, result in

any trees at least 50 feet tall and/or 24-inches diameter at breast height (dbh) within 100 feet of the water's edge being removed, or if 10 or more trees greater than 12 inches dbh within 100 feet of the water's edge are removed, the action may adversely affect this species.

The Neosho madtom is a small, mottled member of the catfish family restricted to the mainstream of the Neosho and Spring River drainages in southeastern Kansas. This species is generally found in stream sections with moderate gradients, permanent flow and abundant gravel and cobble. They live at the bottom of the stream under rocks, often moving between the spaces in the gravel and cobble in riffles or runs. The KSAAP owned and operated low water dam on the Neosho River may adversely affect this species, which has been documented within 100 meters downstream of the dam.

The Indiana bat may occur in the project area. During the spring and summer, Indiana bats utilize living, injured (e.g. split trunks and broken limbs from lightening strikes or wind), dead or dying trees for roosting. Indiana bat roost trees tend to be greater than 9-inches dbh (optimally greater than 20 inches dbh) with loose or exfoliating bark. Preferred roost sites are located in openings, at the forest edge or where the overstory canopy allows some sunlight exposure to the roost tree, which is usually within 1 km of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests. Therefore, the Department of the Army should identify the extent of suitable habitat in the area, and evaluate potential effects to that habitat. If suitable roost trees have the potential to be removed, the USFWS recommends a survey, to determine the presence or absence of Indiana bats. Survey efforts should include using a combination of mist nets and bat detection devices [e.g., "Anabat" (© Titley Electronics, Ballina, New South Wales, Australia)]. If it is determined that a survey for Indiana bats is needed, please contact the Kansas Ecological Services Field Office to obtain specific information regarding survey protocol. If surveys indicate that Indiana bats are using trees that may be removed during their breeding season (April 1 to September 30) further consultation with the USFWS under Section 7 of the ESA will be required.

The federal-candidate Neosho mucket (*Lampsilis rafinesqueana*) occurs in the project area. This freshwater mussel occupies areas of fast and slow currents in small to medium-sized rivers with gravel and mixed substrates. A live specimen was documented in recent surveys of the Neosho River within 400 meters of the low water dam owned by KSAAP. Relic shells of the species are common in the area of the low water dam.

Candidates are those species for which the USFWS has on file substantial information on biological vulnerability and threats to support proposals to list them as endangered or threatened species. Development and publication of proposed rules to list candidate species as threatened or endangered may occur at some point in the future. The USFWS is concerned for their conservation due to their uncertain status.

In addition to evaluating the potential effects of the disposal and reuse of KSAAP on federally-listed species, the Draft EA should evaluate potential effects to other ecologically important resources that represent biological diversity that is rare elsewhere. These resources include the Labette Creek corridor, native prairies, wetlands, and the Neosho River. The

Draft EA should address reasonably foreseeable effects of disposal and reuse which may cause or contribute to environmental impacts to these unique resources. The effects may be direct, indirect or cumulative and result from changes in current land-use on the KSAAP.

KSAAP lies in the Osage Plains, which is a region of transition from the deciduous forest to the east and the tallgrass prairie to the west. Historically, the area was as much as 80% tallgrass prairie and 20% riparian hardwood forests. Less than 1% of the original, deep soil, tallgrass prairie remains. Native prairies and riparian hardwood forests on KSAAP represent the most biologically diverse habitats remaining in the area. These types of habitats are critical to both Neotropical and upland bird species for migration and breeding areas. A wetland inventory in 1998 identified 212 acres of wetland habitat on KSAAP.

The Labette Creek corridor is mostly timber with fragments of native prairie and go-back land (prairie reintroduction area). Approximately 759 acres of the riparian oak-hickory forest adjacent to Labette Creek is high quality and is considered one of the best eastern floodplain forests in the state of Kansas.

There are about 40 high quality and 70 low quality native prairies on KSAAP. Many of the high quality areas are part of a grazing management program that is used as a form of biological control for invasive and low quality vegetative species. Some low quality areas have been included in the program and appear to be undergoing a transition to a higher quality prairie community.

Wetlands are also found on KSAAP adjacent to streams and rivers. Wetlands are primary habitat for many species of waterfowl and shorebirds as well as many other bird, mammal, reptile, amphibian and insect species.

Because of the value of these habitats to fish and wildlife, we recommend that alternatives that protect and conserve these areas be included in the Draft EA. Conservation easements could be established to protect these unique habitats using the Conservation Conveyance Authority of 2003 (Title 10 U.S.C. Section 2694A). Easements should protect the existing ecological value and be consistent with the current Integrated Natural Resource Management Plan (INRMP) of KSAAP. The Kansas Department of Wildlife and Parks, the Nature Conservancy, the Kansas Land Trust or other conservation organizations could be potential easement holders. Other alternatives to consider for the preservation of these sensitive sites may include, but are not limited to carbon sequestration credit programs for riparian forests and native prairies, and/or wetland mitigation bank opportunities.

The water supply for KSAAP is drawn from the Neosho River at a five-acre site along the west side of the river. The intake structure, water treatment facility and a low water dam are owned and operated by the facility. KSAAP also operates its own wastewater treatment facility, which consists of a two-stage high rate trickling filter plant with a capacity of 1M gallons per day, this facility discharges into a tributary of Labette Creek.

The low-water dam may be adversely affecting the federally-listed Neosho madtom and the federal-candidate Neosho mucket. Overflow (low water) dams result in upstream and

downstream changes in a river channel. Upstream a backwater pool is created, the depth and extent depends on the height of the dam and the slope of the channel. Within this backwater, the decrease in velocity may result in deposition of material on the channel bed, which may affect preferred habitat for both the Neosho madtom and the Neosho mucket. Downstream effects include increased channel bed and bank erosion, development of plunge pools with the formation of depositional bars just downstream as the river loses its ability to transport the scoured bed load, diversion of flows, and channel widening. Low water dams act as physical barriers that may affect mussels by restricting the dispersal and distribution of their host fish and impeding upstream dispersal of small fish such as the Neosho madtom.

The Draft EA should address the feasibility of removing the dam or retrofitting it for aquatic organism passage. The analysis should also evaluate whether other less damaging alternative water sources (i.e. rural water, uncontaminated ground water) are available and if any water rights held by the Department of the Army can be converted to instream flows for threatened and endangered species protection.

Likewise, reasonably foreseeable new facilities, which may change existing KSAAP land use and water use from the Neosho River, should also be evaluated. The draft reuse plan for KSAAP indicates a proposed coal-fired power plant. The plant appears to be located on high quality native prairie. Alternate locations that avoid native prairie should be investigated. In addition, the impacts of power plant water use on Neosho River streamflows should be considered as depletion of flows may adversely affect Neosho madtom, Neosho mucket and other stream fauna.

The operations at KSAAP have contaminated soil and ground water with metals (arsenic, lead, and mercury), explosives and solvents (trichloroethylene, polychlorinated biphenyls). Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires the United States (in this case, DOD) to clean up closed bases prior to transfer out of federal ownership. It does not specify cleanup standards for particular substances. Rather, it requires that cleanup comply with all legally applicable, relevant and appropriate requirements (ARARS) to protect human health and the environment. We are unaware of whether past contamination has impacted high value aquatic and terrestrial habitats on KSAAP. If clean up of these habitats is warranted, close coordination with the USFWS , Kansas Department of Wildlife and Parks and Kansas Department of Health and Environment is requested before clean-up actions are implemented.

If a permit from the Corps of Engineers is required, the USFWS will be given the opportunity to review the public notice on the proposed action and provide additional comments at that time. Section 404 guidelines require the sequence of avoidance of impacts, minimization of impacts and compensation for unavoidable impacts. When we review the public notice we will request information on alternatives considered, how the project avoided and minimized impacts to aquatic ecosystems, and the compensatory mitigation proposal, if one is required by the Corps.

Under the Migratory Bird Treaty Act (MBTA), construction activities in prairies, wetlands, stream and woodland habitats that would otherwise result in the taking of migratory birds,

eggs, young, and/or active nests should be avoided. Although the provisions of MBTA are applicable year-round, most migratory bird nesting activity in Kansas occurs during the period of April 1 to July 15, although some migratory birds are known to nest outside this period. If the proposed disposal of real property interests at KSAAP results in any construction that may involve the take of nesting migratory birds, the USFWS recommends a field survey during the nesting season of the affected habitats and structures to determine the presence of active nests. Our office should be contacted immediately for further guidance if a field survey identifies the existence of one or more active bird nests that cannot be avoided temporally or spatially by the planned construction activities.

Invasive species have been identified as a major factor in the decline of native flora and fauna and their ecosystems and impact aquatic resources. Invasive species of particular concern in Kansas are the zebra mussel (*Dreissena Polymorpha*), purple loosestrife (*Lythrum salicaria*), Johnson grass (*Sorghum halepense*), sericea lespedeza (*Lespedeza cuneata*) and reed canary grass (*Phalaris arundinacea*). Executive order 13112 Section 2 (3) directs federal agencies to not authorize, fund or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere and to ensure that all feasible and prudent measures to minimize risk and harm will be taken in conjunction with the actions. Proactive measures to prevent the inadvertent spread of exotic and invasive species would appear to satisfy this directive. Therefore, we recommend the implementation of the following Best Management Practice (BMP).

> All equipment brought on site will be thoroughly washed to remove dirt, seeds and plant materials. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water (hotter than 40° C or 104° F) and dried for a minimum of five days before being used at this project site. In addition, before transporting equipment from the project site all visible mud, plants, and fish/animals will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with the water will be cleaned and dried following the above procedure.

We appreciate the opportunity to provide comments during the development of this assessment for the proposed action and request the opportunity to review the draft EA. If you have questions regarding these comments; please contact Michele McNulty of the Kansas Ecological Services Office, at 785-539-3474 X 106.

Sincerely,

Michael J. LeValley

Michael J. LeValley
Field Supervisor

cc: KDWP, Pratt, KS (Environmental Services)
Connie Young-Dubovsky, R6, RO, (ES)

MARSTEL DAY
CONSERVATION & CONSULTING
FROM SEA TO STARS

www.marstel-day.com

September 18, 2006

Mr. Mike Hayden
Office of the Secretary
1020 S. Kansas, Rm 200
Topeka, KS 66612-1327

Dear Mr. Hayden:

In compliance with the National Environmental Policy Act, the Department of the Army is preparing an Environmental Assessment (EA) for the disposal and reuse of the Kansas Army Ammunition Plant (KSAAP), slated for closure under the Base Realignment and Closure Act of 2005. This EA will address the environmental and socioeconomic effects of the disposal of real property interests at KSAAP. Various property disposal alternatives are being evaluated in the EA. Specific plans for reuse are currently being developed by the Local Redevelopment Authority. Future redevelopment of KSAAP is considered a secondary action resulting from disposal.

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Army regulations require consideration of state-listed species in all Army actions. We are requesting a list of state listed threatened, endangered, or candidate species, as well as sensitive species known to occur, or potentially occurring on or in the vicinity of KSAAP. Also, we would appreciate information on any other sensitive natural resource that could be impacted by the proposed action. Furthermore, the Army invites comment from your Department on the conservation of the unique and rare areas such as the Labette creek corridor, native prairie and rare species that occur there.

If your office has any information available on this issue, please send it to:

Marstel-Day, LLC
(Attn: Jerry Thompson)
509-1 Jackson Street
Fredericksburg, VA 22401

Thank you in advance for your assistance in this matter. If you have any questions, or require additional information, please contact me at (210) 363-8772, or by email at jt@marstel-day.com

Sincerely,

Jerry Thompson
Biologist

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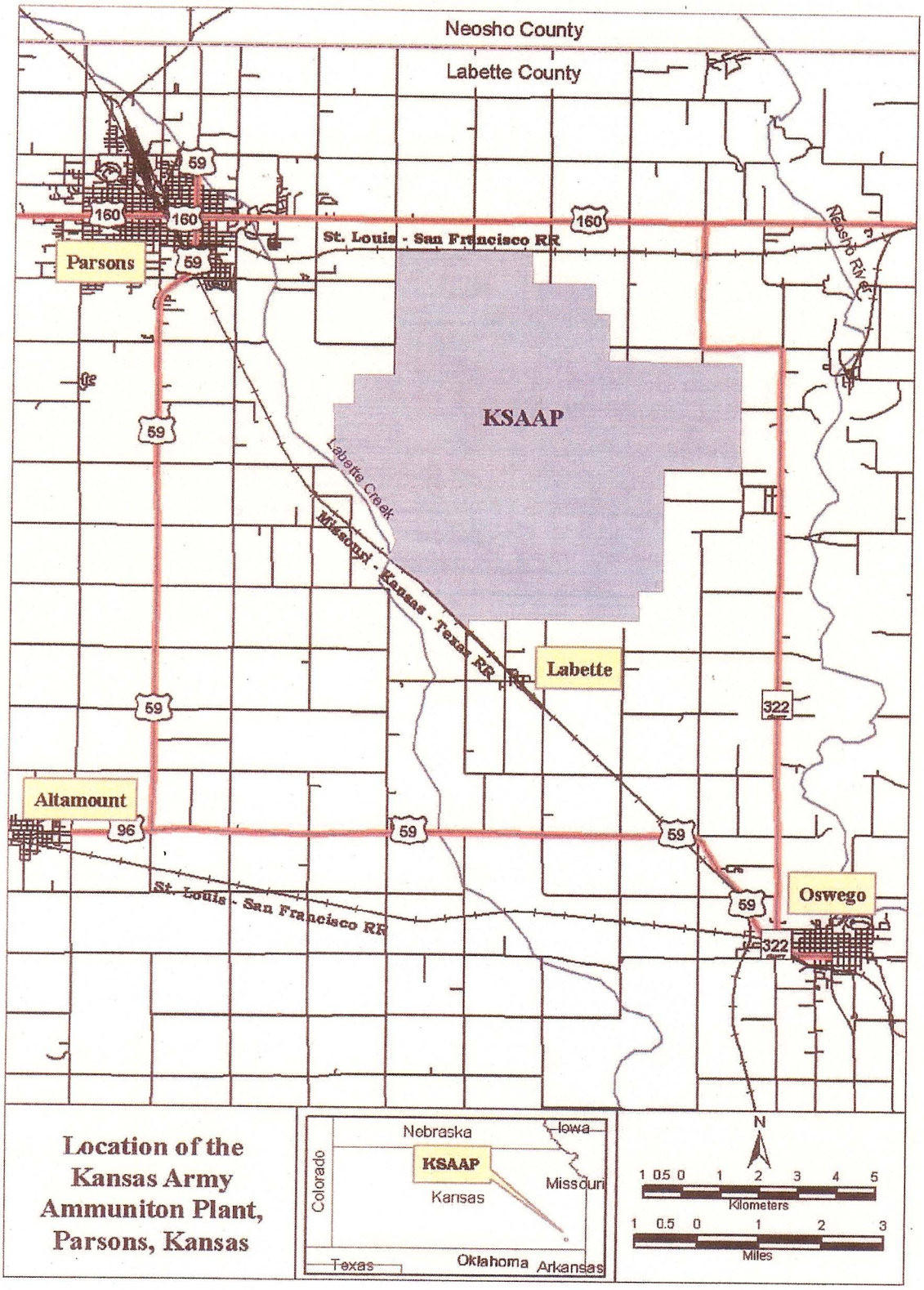


Location of the Kansas Army Ammuniton Plant, Parsons, Kansas

509-1 Jackson St., Fredericksburg, VA 22401 540-371-3338
218 North Lee Street, Suite 300, Alexandria, VA 22314 703-519-3777

KDWP Track: 20060651 CO: LB Ref: D3.0100

Preliminary request for comments regarding sale of KS Army Ammunition Plan (KSAAP).

Mr. Thompson,

Your explanation for an environmental review from our agency indicates the request is solely for the transfer of property from the DOA to the Redevelopment Authority. The transfer of property has no land disturbance proposed in it; as such, our review is very limited. We encourage you to coordinate with the Kansas Biological Survey for specifics on records and unique or high-quality natural resources since they have performed an inventory of the site already. For our purposes, the entire site holds value to fish & wildlife resources; however, specific areas may be worth noting in the EA development including:

1. Native grasslands or bottomland woodlands

2. Wetlands

3. Intermittant & perennial streams

4. Riparian woodlands

According to our database, only SINC listed species that have been documented on site including the Northern Crawfish Frog; Henslow's sparrow; Prairie Mole cricket; Southern Flying squirll; and Fawnsfoot mussel (Labette Creek). You may wish to view these species & their habitat preferences online at http://www.kdwp.state.ks.us/ <http://www.kdwp.state.ks.us/>

No impacts to these species or crucial wildlife habitats should occur from the sale of the property.

Please let us know if you need additional information.

Thank you,

Nate Davis
Ecologist;KDWP,Environmental Services Section;512 SE 25th Ave,Pratt,KS 67124
620.672.0795 (O)620.450.8311 (C),nated@wp.state.ks.us
http://www.kdwp.state.ks.us/news/other_services/threatened_and_endangered_species

DEPARTMENT OF THE ARMY
KANSAS ARMY AMMUNITION PLANT
23018 ROOKS ROAD, SUITE AA
PARSONS, KANSAS 67357-8403

REPLY TO
ATTENTION OF

SJMKS-CR

4 December 2006

Ms. Jennie Chin
State Historic Preservation Officer
Kansas State Historical Society
6425 SW 6th Avenue
Topeka, Kansas 66615

Dear Ms. Chin:

In compliance with the National Environmental Policy Act (NEPA), the Department of the Army is conducting an Environmental Assessment (EA) for the disposal and reuse of the Kansas Army Ammunition Plant (KSAAP), slated for closure under the Base Realignment and Closure Act (BRAC) of 2005. This EA will address the environmental, cultural resources, and socioeconomic effects of the disposal of real property interests at KSAAP. Various property disposal alternatives are being evaluated in the EA. Marstel-Day, LLC is the contractor preparing that EA. Specific plans for reuse are currently being developed by the Local Redevelopment & Planning Authority (LRPA). Future redevelopment of KSAAP is considered a secondary action resulting from disposal.

KSAAP is located in northern Labette County in southeast Kansas (see attached map). It is approximately two miles east of the City of Parsons. The Neosho River is approximately three miles east of the facility. Labette Creek forms a portion of the facility's western boundary. KSAAP is approximately 13,727 acres in size and the surrounding land is typically used for agriculture.

The facility is owned by the U.S. Army and is operated by the Army's operating contractor, Day and Zimmerman. The facility was constructed in 1941 to load, assemble, and pack (LAP) munitions for use in World War II. The areas developed for production or storage of munitions comprises more than 2,000 acres. The facility consists of production areas, administrative areas, storage areas, powerhouses, landfills, oxidation ponds and lagoons, ditches, burning grounds, sumps and waste treatment facilities. Improved areas occupy approximately 416 acres, which comprise the active and standby production facilities. Semi-improved areas contain railroads, storage areas, roads, and parking lots. KSAAP is a large facility with multiple load, assemble and pack (LAP) production lines. The plant contains 681 buildings and 187 storage igloos. Currently, the facility has very limited production and many areas are not active. Unimproved areas include leased agricultural fields, pastures, and woodlands.

To date no potentially eligible, eligible or listed National Register of Historic Places sites, structures or objects have been identified within KSAAP. There are no traditional cultural properties or Native American sacred sites identified at KSAAP.

No archeological surveys have been completed at KSAAP. However, a Phase I and Phase II archeological investigation is now underway at KSAAP in compliance with Sections 106 and 110 of the National Historic Preservation Act, in consultation with your office. We met on site in August 2006 with Dr. Tim Weston of your office, and Dr. Weston recommended specific methods for the Phase I and Phase II archaeological survey studies. We anticipate carrying out these studies in the spring of 2007, with draft reports submitted to your office during the summer of 2007. Brockington and Associates, Inc. is the contractor conducting the archeological survey. These NHPA surveys will provide information for the NEPA EA as well.

Standing structures were the subject of a 1980s HABS/HAER study, which concluded that, "Although the Kansas Army Ammunition Plant as a whole possesses limited historical significance as a typical World War II-era facility its individual buildings do not possess any specific historical, architectural or industrial significance at this time." (Burns, Libby Baylies and Julie Mueller, *Written Historical and Descriptive Data (Kansas Army Ammunition Plant, Parsons, Labette County Kansas*, 1982, HAER No. KS-4). An additional architectural history study was completed in 1984 (MacDonald and Mack Partnership, *Historic Properties Report, Kansas Army Ammunition Plant, DeSoto, Kansas*, 1984. HABS/HAER Record, National Park Service).

The Programmatic Agreement among the United States Army Materiel Command, the Advisory Council on Historic Preservation, and Multiple State Historic Preservation Offices concerning a Program to Cease Maintenance, Excess, and Dispose of Certain Properties (CEMED PA) dated January 22, 1993 covers all buildings and structures at KSAAP. Under this PA, KSAAP is considered historically important due to its association with the events of World War II. As such, the buildings or structures associated with the World War II plant are considered historically important as well. To mitigate adverse effects from the cease maintenance & disposal program, documentation for World War II architecture has been completed nationwide, including at KSAAP, and additional architectural surveys and evaluations are determined under the PA to be not required.

In addition, the Advisory Council on Historic Preservation Program Comment Regarding World War II and Cold War Era (1939 – 1974) Ammunition Storage Facilities and the Program Comment Regarding World War II and Cold War Era Army Ammunition Production Facilities and Plants would cover these buildings. Based on now expired CEMED PA and the ACHP Comment, no additional work is required.

There are two historic 19th-20th-century cemeteries on the installation.

NEPA and NHPA require an evaluation of the potential environmental impacts (both positive and negative) associated with implementing the Army's proposed disposal of property.
We wish to consult with you regarding the proposed action. In addition to the surveys described above, the Army is in the process of developing a specific Programmatic Agreement concerning the proposed action. After our initial discussions with the federally recognized tribes, we would like to talk with you regarding the drafting of this agreement.

Thank you for your attention to this matter. If you have any questions please contact the KSAAP Cultural Resources Manager Mr. Chris Deurmyer (620-421-7427; cdeurmyer@kansas-aap-army.com) Mr. Sean Donahoe is managing the NEPA studies for the firm of Marstel-Day, LLC, and NHPA surveys and tribal consultation are coordinated by Paul Brockington of Brockington and Associates, Inc. These contractors may be in contact with you concerning ongoing efforts.

Thank you.

Sincerely,

Don Dailey

Donald D. Dailey
Commander's Representative

cc: Ernie Seckinger, USACE, Mobile District, BTC Coordinator
Sean Donahoe, Marstel-Day, LLC
Paul Brockington, Brockington and Associates, Inc.

Attachment: Map

A representative Native American correspondence letter is found on the following pages. Consultation Letters were sent to the following Tribes:

LeRoy Howard, Acting Chief
Seneca-Cayuga Tribe of Oklahoma
P.O. Box 1283
Miami, OK 74355

Robert Chicks, President
Stockbridge-Munsee Community of Wisconsin
N8467 MO He Con Nuck Road
Bowler, WI 54416

Billy Evans Horse, Chairman
Kiowa Indian Tribe of Oklahoma
P.O. Box 369
Carnegie, OK 73015

Alex Walker, Chairman
Sac & Fox Tribe of Mississippi in Kansas
349 Meskwaki Road
Tama, IA 52339

Don Abney, Principle Chief
Sac and Fox Nation of Oklahoma
Route 2 Box 246
Stroud, OK 74079

Sandra Keo, Chairperson
Sac and Fox of Missouri
305 N. Main Street
Reserve, KS 66434

Tamara Summerfield, Chairperson
Quapaw Tribal Business Committee
P.O. Box 765
Quapaw, OK 74363

Badger Wahwasuck, Chairman
Prairie Band of Potawatomi Indians
16281 Q Road
Mayette, KS 66509

John P. Froman, Chief
Peoria Tribe of Oklahoma
P.O. Box 1527
Miami, OK 74355

Robert Chapman, President
Pawnee Nation of Oklahoma
P.O. Box 470
Pawnee, OK 74058

Danny Kaskaske, Chairman
Kickapoo Tribe of Oklahoma
P.O. Box 70
McCloud, OK 74851

Bobbie Darnell, Chairperson
Kickapoo Tribe in Kansas
P.O. Box 271
Horton, KS 66439

Principal Chief Jim Gray
Osage Nation of Oklahoma
P.O. Box 779
Pawhuska, Oklahoma 74056

Chief George G. Wickliffe
United Keetoowah Band of Cherokee Indians in Oklahoma
P.O. Box 746
Tahlequah, OK 74465-0746

Mr. Gary McAdams, President
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko, OK 73005

Charles Todd, Chief
Ottawa Tribe of Oklahoma
P.O. Box 110
Miami, OK 74355

Don Butler, Chairman
Otoe-Missouria Tribe of Oklahoma
8151 Highway 77
Red Rock, OK 74651

Donald Grant, Chairman
Omaha Tribal Council
P.O. Box 368
Macy, NE 68039

Floyd E. Leonard, Chief
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355

DEPARTMENT OF THE ARMY
KANSAS ARMY AMMUNITION PLANT
23018 ROOKS ROAD, SUITE AA
PARSONS, KANSAS 67357-8403

REPLY TO
ATTENTION OF

SJMKS-CR

4 December 2006

LeRoy Howard, Acting Chief
Seneca-Cayuga Tribe of Oklahoma
PO Box 1283
Miami, OK 74355

Dear Acting Chief Howard:

I am writing on behalf of the United States Army to inform you of the Base Realignment and Closure 2005 (BRAC) action for Kansas Army Ammunition Plant, Labette County, Kansas (see attached map). If this action is of interest to the Seneca-Cayuga Tribe of Oklahoma we would like to begin consultation.

The Kansas Army Ammunition Plant (KSAAP) is to be closed under BRAC 2005. An Environmental Assessment (EA) is now being prepared under requirements of the National Environmental Policy Act (NEPA). Marstel-Day, LLC is the contractor preparing that EA. This EA will evaluate any environmental, cultural resource, and socioeconomic effects of closing the KSAAP. Various property disposal alternatives are being evaluated in the EA. Specific plans for reuse are currently being developed by a Local Redevelopment & Planning Authority (LRPA).

KSAAP is approximately two miles east of the City of Parsons. The Neosho River is approximately three miles east of the facility. Labette Creek forms a portion of the facility's western boundary. KSAAP is approximately 13,727 acres in size and the surrounding land is typically used for agriculture.

KSAAP is a large facility with multiple ammunition production lines. The plant contains 681 buildings and 187 ammunition storage igloos. Improved areas occupy approximately 416 acres, which comprise the active and standby production facilities. Semi-improved areas contain railroads, storage areas, roads, and parking lots. Unimproved areas include agricultural fields, pastures, and woodlands.

The facility is owned by the U.S. Army and is operated by the Army's contractor, Day and Zimmerman. The facility was constructed in 1941 to load, assemble, and pack (LAP) munitions for use in World War II. The areas developed for production of munitions comprise more than 2,000 acres. The facility consists of production areas, administrative areas, storage areas, powerhouses, landfills, oxidation ponds and lagoons, ditches, burning grounds, sumps and waste treatment facilities. Currently, the facility has very limited production and many areas are not active.

To date no potentially eligible, eligible or listed National Register of Historic Places sites, structures or objects have been identified within KSAAP. There are no traditional cultural properties or Native American sacred sites that have ever been identified at KSAAP.

No archeological surveys have been completed at KSAAP. However, a Phase I and Phase II archeological investigation is now underway at KSAAP in compliance with Sections 106 and 110 of

the National Historic Preservation Act. We will closely follow the Native American Graves Protection Act (NAGPRA), as well as Kansas burial protection laws, and if desired, will notify you and other interested tribes if human remains are located during the surveys. If human remains are discovered, no disturbance will take place, and they will be protected until discussions with tribes and resolution of all issues occur.

In accordance with NEPA and the National Historic Preservation Act, an evaluation of the potential environmental impacts (both positive and negative) associated with implementing the Army's proposed disposal of property is required. This letter is meant to determine your interest. If you have an interest we can begin consultation.

In addition, the Army is in the process of developing a Programmatic Agreement concerning the proposed action, and seeking input for this agreement. We anticipate that first we will discuss the project with interested tribal leaders by telephone, and then also with the Kansas State Historic Preservation Officer. We would then develop a draft Programmatic Agreement for all parties to consider. If there are issues that you or other tribes wish to discuss further, we would continue our consultations. We could host an on-site meeting if that should be required.

If desired we can provide you with copies of the archeological and historical survey reports and the EA, as they are developed. Soon we could also provide you a draft Programmatic Agreement. Please let us know if you have any immediate concerns regarding sacred sites, traditional cultural properties, NAGPRA issues, or other issues.

I am happy to have this opportunity to work with the Seneca-Cayuga Tribe of Oklahoma, and I look forward to your comments. Should you have any questions concerning the BRAC EA and NHPA process, please contact the KSAAP Cultural Resources Manager, Mr. Chris Deurmyer (620-421-7427; cdeurmyer@kansas-aap-army.com). Your comments will be greatly appreciated.

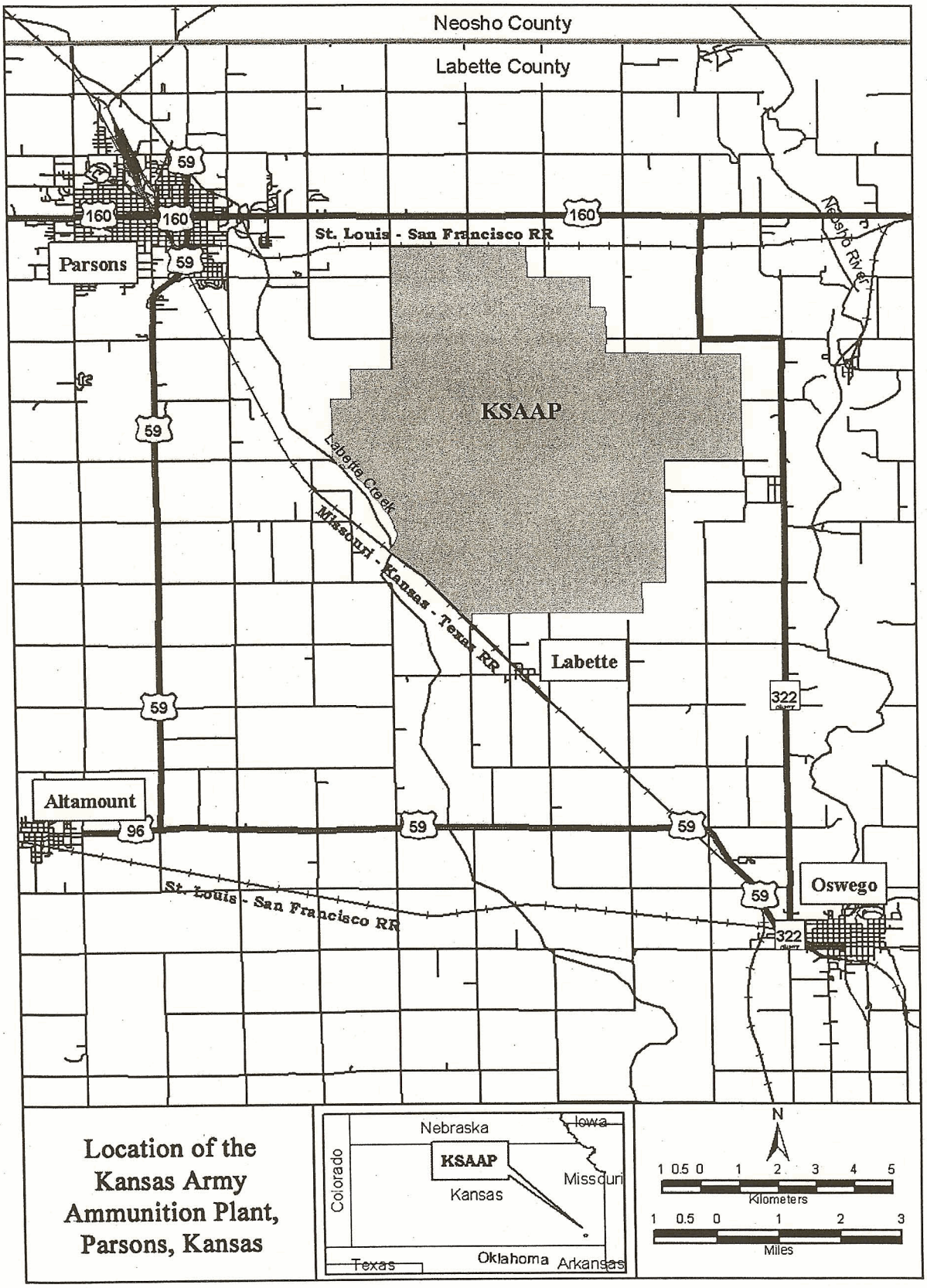
Sincerely,

Don Dailey

Donald D. Dailey
Commander's Representative

cc: Ernie Seckinger, USACE, Mobile District, BTC Coordinator
Sean Donahoe, Marstel-Day, LLC, NEPA Project Manager
Paul Brockington, Brockington and Associates, Inc., NHPA Project Manager

Attachment: Map



Location of the Kansas Army Ammunition Plant, Parsons, Kansas

From: Deanne Bahr [deannbahr@yahoo.com]
Sent: Saturday, March 31, 2007 8:35 PM
To: Whitney Olvey; dpilcher@sacandfoxcasino.com
Subject: Re: Consultation at KS Army Ammo Plant

The Sac and Fox Confederacy does not have an interest in the Kansas Army Ammunition Plant. Donald Pilcher may have another interest in this area other than the NAGPRA department. The above email for Mr. Pilcher should be correct.

Deanne Bahr
NAGPRA Contact person

Whitney Olvey <WhitneyOlvey@brockington.org> wrote:

> Hi Deann and Don,
> Yesterday I left a message for Don and then spoke with Deann concerning consolation at the Kansas Army Ammunition Plant near Parsons, Kansas. Although initially Deann thought the area to be too far south, Don expressed interest in being included in the consultation.
> I will add both of you to the list to receive a copy of the survey report as it is completed (sometime this summer) and the Programmatic Agreement as it develops. I have attached a copy of the letter sent from the Army in December that describes the facility and show the location on the attached map.
> I hope this double message business doesn't cause too much confusion. I am sorry!
> Please feel free to contact me if you have any questions or concerns.
> Thanks very much and have a great day!
> Whitney
>
> Whitney Olvey
> Brockington and Associates
> w 678-638-4124 direct line
> o 770-662-5807
> c 678-520-6210
> www.brockington.org
> www.thehistoryworkshop.com
> www.theflankcompany.com

It's here! Your new message!
Get new email alerts with the free Yahoo! Toolbar.

PEORIA TRIBE OF INDIANS OF OKLAHOMA
118 S. Eight Tribes Trail (918) 540-2535 FAX (918) 540-2538
P.O. Box 1527
MIAMI, OKLAHOMA 74355

CHIEF
John P. Froman

SECOND CHIEF
Jason Dollarhide

December 13, 2006

Department of the Army
Kansas Army Ammunition Plant
23018 Rooks Road, Suite AA
Parsons, Kansas 67357-8403

RE: Base Realignment and Closure 2005 (BRAC) action for Kansas Army Ammunition Plant, Labette County, Kansas

Thank you for notice of the referenced project. The Peoria Tribe of Indians of Oklahoma is currently unaware of any documentation directly linking Indian Religious Sites to the proposed construction. In the event any items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered during construction, the Peoria Tribe request notification and further consultation.

The Peoria Tribe has no objection to the proposed construction. However, if any human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction, the construction should stop immediately, and the appropriate persons, including state and tribal NAGPRA representatives contacted.

JPF

John P. Froman
Chief

xc: Bud Ellis, Repatriation/NAGPRA Committee Chairman

TREASURER
John Sharp

SECRETARY
Hank Downum

FIRST COUNCILMAN
[redacted]
Carolyn Garren

SECOND COUNCILMAN
Jenny Rampey

THIRD COUNCILMAN
Alan Goforth

From: Sherry White [Sherry.White@mohican-nsn.gov]
Sent: Wednesday, April 11, 2007 2:30 PM
To: Whitney Olvey
Subject: RE: Kansas Army Ammo Plant, Parsons, KS

Hi Whitney
This area of Kansas is out of our area of interest. But you may want to contact the Delaware Nation.
Thank you for contacting us.
Sherry White
THPO

From: Whitney Olvey [mailto:WhitneyOlvey@brockington.org]
Sent: Wednesday, April 11, 2007 1:15 PM
To: Sherry White
Subject: Kansas Army Ammo Plant, Parsons, KS

Hi Ms. White,
We spoke a few minutes ago about the Kansas Army Ammunition Plant near Parson, KS. The plant is closing as part of BRAC 05 and will be sold or donated. The survey for Native American archaeological sites is on-going and we are trying to determine which tribes are interested in this land in southeast Kansas. You indicated in our conversation that the Stockbridge-Munsee Community does not have an interest in this area.
When it's convenient, will you please send me an email or fax a letter (770) 662-5824 to this effect for the files.
Please feel free to contact me if you have any questions or concerns.
Thanks very much and have a great day!
Whitney

Whitney Olvey
Brockington and Associates
w 678-638-4124 direct line
o 770-662-5807
c 678-520-6210
www.brockington.org
www.thehistoryworkshop.com
www.theflankcompany.com

United Keetoowah Band of Cherokee Indians In Oklahoma

P. O. BOX 746, TAHLEQUAH, OKLAHOMA 74465-0746 2450 SOUTH MUSKOGEE AVE., TAHLEQUAH, OK 74464
PHONE: (918) 431-1818 FAX: (918) 431-1873

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Woodrow Proctor
Flint District

Joyce Fourkiller
Goingsnake District

Barbara Girty
Illinois District

Charles Smoke
Saline District

Barry Dotson
Sequoyah District

Albert Shade
Tahlequah District

April 3, 2007

Mr. Donald Dailey
Department of the Army
Kansas Army Ammunition Plant
23018 Rooks Road, Suite AA
Parsons, KS 67357-8403

Dear Mr. Dailey:

This letter serves to again confirm our desire to be a consulting party on the Base Realignment and Closure 2005 (BRAC) action for Kansas Army Ammunition Plant, Labette County, Kansas.

Please advise if there is an expected date to begin discussions for the proposed Programmatic Agreement.

Best Regards,

Lisa C. Stopp
Acting Tribal Historic Preservation Officer

From: Julie Olds [JLOlds@miamination.com]
Sent: Wednesday, April 11, 2007 3:40 PM
To: Whitney Olvey
Subject: Kansas Munitions consult

Ms. Olvey,

In response to your inquiry as to the interest of the Miami Nation in participating in a cultural resource consultation meeting regarding the Kansas Munitions Plant, in Parsons, Kansas, located in the southeastern portion of the State; the area you indicate is not in the historic or ancestral jurisdiction area of the Miami Tribe of Oklahoma, therefore the Miami Nation will not seek participation.

Regards,
Julie Olds

Julie Olds
Cultural Preservation Officer
Miami Tribe of Oklahoma
202 S. Eight Tribes Trail
Miami, OK 74354
918-541-1399

From: Tamara Francis [tfrancis@delawarenation.com]
Sent: Monday, May 14, 2007 2:58 PM
To: Whitney Olvey
Subject: Re: KS Army Ammo Plant Consultation

Whitney Olvey,
I have contacted your offices in two instances prior to this email. I explained that the project does not lie within the Delaware Nation area of interest. The Delaware Nation did not travel through Kansas to the final destination in Oklahoma. Let me explain:
Four bands of Lenape came from the east coast in the early 1700's. One group went into Canada, settling in Moravian Town. The next went into Wisconsin. The third group traveled further east and split up when they reached Illinois. One part of this group traveled on into Missouri in the late 1700's. They became known as the absentee Delaware. Their next stop would be arkansas, texas (brazos reserve), and on to oklahoma territory. In the mid 1800's. The other group of lenape that were left in illinois traveled a few years behind the absentee Delaware. They moved through Missouri into Kansas and down to settle with the Cherokee in North East Oklahoma. This latter group would be your contact Lenape group.
Please take care and good luck in this consultation endeavor.
Sincerely,
Tamara Francis
----- Original Message -----

From: Whitney Olvey
To: tfrancis@delawarenation.com
Sent: Tuesday, May 08, 2007 6:14 PM
Subject: KS Army Ammo Plant Consultation

Hi Ms. Francis,

I have left you several messages about the Kansas Army Ammunition Plant near Parson, KS over the past couple of months

The plant is closing as part of BRAC 05 and will be sold or donated. The survey for Native American archaeological sites is on-going and we are trying to determine which tribes are interested in this land in southeast Kansas.

When it's convenient, will you please send me an email or fax a letter (770) 662-5824 to let me know if you are interested in this area.

Please feel free to contact me if you have any questions or concerns.

Thanks very much and have a great day!

Whitney

Whitney Olvey
Brockington and Associates
w 678-638-4124 direct line
o 770-662-5807
c 678-520-6210
www.brockington.org
www.thehistoryworkshop.com
www.theflankcompany.com

MARSTEL DAY
CONSERVATION & CONSULTING
FROM SEA TO STARS
www.marstel-day.com

October 4, 2006

Mr. William Gilliam
Assistant State Conservationist
Natural Resource Conservation Service
3020 W 18th Ave., Suite B
Emporia, KS 66801

Dear Mr. Gilliam;

The 2005 Base Realignment and Closure Commission has recommended the closure of the Kansas Army Ammunition Plant in Parsons, Kansas. That order became final in November 2005. Pursuant to that recommendation, all Army missions at the installation must cease or be relocated. An Environmental Assessment (EA) document is being developed in accordance with NEPA and implementing regulations issued by the Council on Environmental Quality (40 CFR 1500–1508) and the Army (32 CFR Part 651). Its purpose is to inform decision-makers and the public of the likely environmental consequences of the proposed action and alternatives. The EA identifies, documents, and evaluates the potential environmental effects of property disposal and future uses of the Kansas Army Ammunition Plant.

The purpose of this letter is to make the Kansas Natural Resource Conservation Service and yourself aware of this project and exchange some of the information gathered. We would like to establish early communication and coordinate with you to address any immediate concerns that you may have concerning the property or its disposal.

It is our understanding that a Site Assessment is needed in accordance with the Farmland Protection Policy Act (FPPA of 1981) (7 CFR Part 658) - Prime Farmland and that a determination may be needed prior to property transfer. To date, no Farmland Conversion Impact Rating Form-AD1006 has been submitted. We are interested in your cooperation and participation to fulfill whatever requirements may be needed regarding this project. Furthermore, we request that your agency provide any information, data, and/or issues that you feel would be important relative to the property disposal actions at KSAAP. Formal correspondence on this issue can be sent to the following address:

Marstel-Day, LLC
(Attn: Ms. Darlene Stringos-Walker)
509-1 Jackson Street
Fredericksburg, Virginia 22401

Furthermore, we encourage you to correspond directly with the U.S. Army Corps of Engineers, Mobile District, Army BRAC NEPA Support Team to discuss the types of studies or reporting requirements that may be necessary relative to compliance with FPPA. The point of contact for this project at the Mobile District is Mr. Glenn Harbin

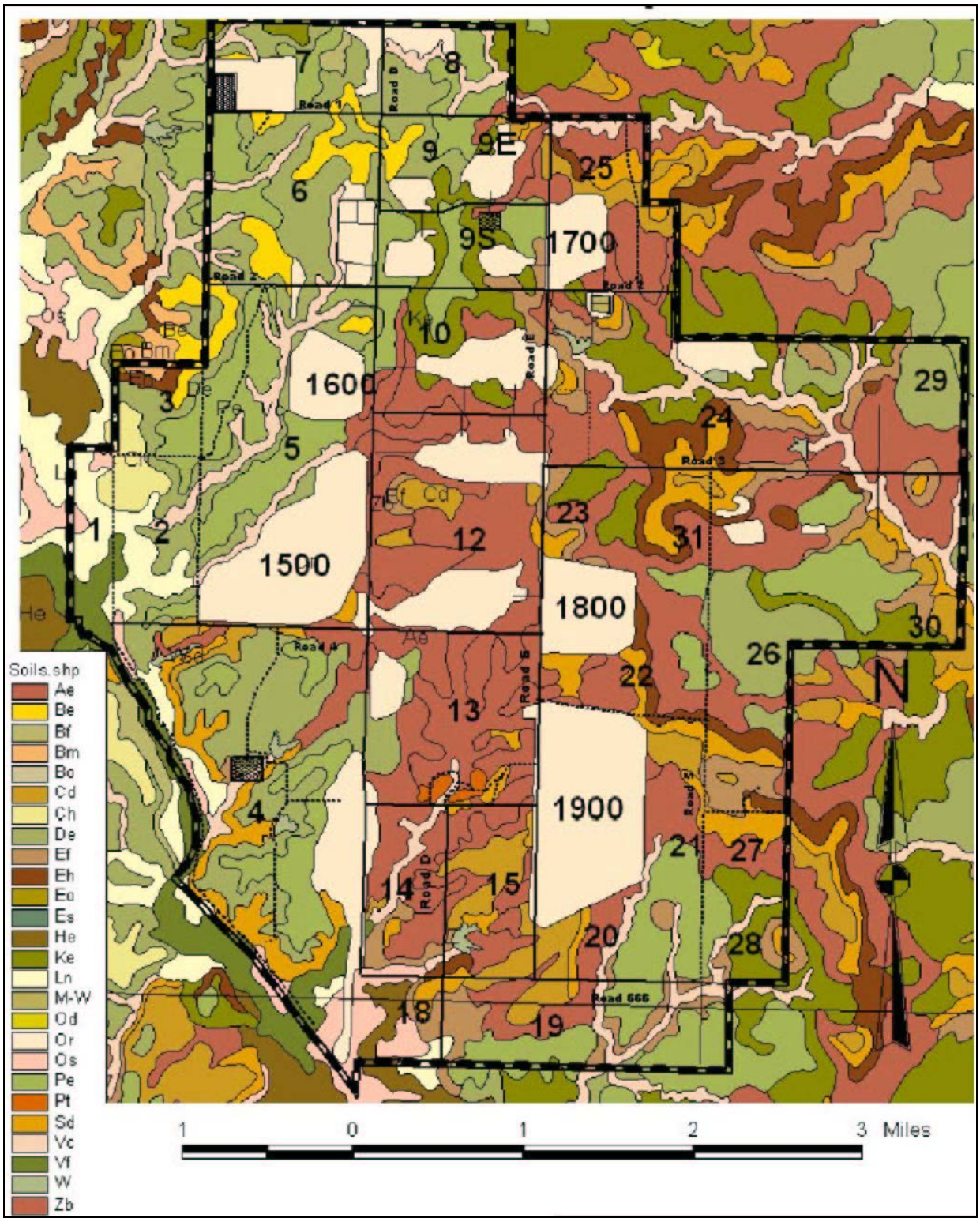
(251) 694-3867 email: Glenn.M.Harbin@sam.usace.army.mil)

We have enclosed mapping indicating where the agriculture leases are located within the installation. These are both present and previously used tracts but all are displaying the soil characteristics of Prime Farmland. We also have identified soil types throughout, based on previous investigations. We look forward to working with your agency on this project and would be interested coordinating with you at your earliest convenience.

Sincerely,

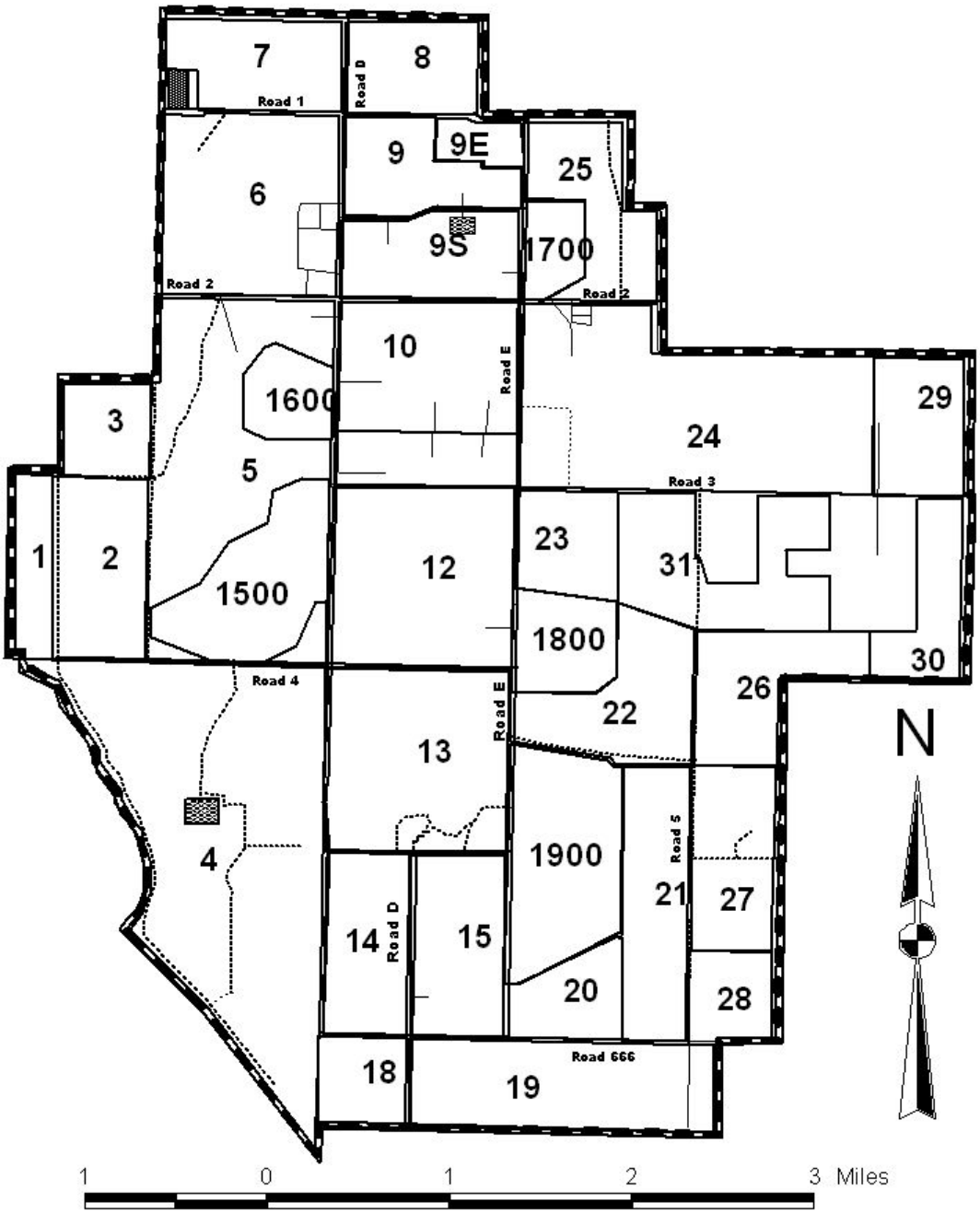
Darlene Stringos-Walker

Darlene Stringos-Walker
Marstel-Day Project Team
Geologist



KSAAP Soils Series Map

KSAAP Agriculture Map



Potential KSAAP Prime Farmland Affected by BRAC

Below are rough legal descriptions of current farming leases that correspond to the ag lease map. Other areas currently grazed may be eligible to meet the conditions of prime farmland.

T-31-S, R-20-E
SE ¼ of Section 33
Section 34
South ½ of Section 23

T-32-S, R-20-E
SE ¼ Section 2
Section 3
Section 4
Section 10
N ½ of Section 12
S ½ of Section 13
SE ¼ Section 14
West ½ of NW corner of Section 19
N ½ of Section 24

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
3020 W. 18th, Suite B
Emporia, Kansas 66801-6191

Phone: 620-343-7276
FAX: 620-343-7871
www.ks.nrcs.usda.gov

October 20, 2006

Marstel-Day, LLC
Attn: Darlene Stringos-Walker
509-1 Jackson Street
Fredericksburg, Virginia 22401

Dear Ms. Stringos-Walker:

Thank you for the opportunity to review the 2005 Base Realignment and Closure Commission's recommendation regarding the Kansas Army Ammunition Plant in Parsons, Kansas. It was indicated in your letter that all Army missions at this installation must cease or be relocated. This project is located in Labette County.

This proposed project is on land physically located outside the defined city limits from the legal description you provided in your letter. The proposed project may convert farmland to nonagricultural uses as defined in the Farmland Protection Policy Act and therefore, an AD-1006 form is required.

Enclosed are maps with their legals that indicate the areas that are under water, frequently flooding, occasional flooding and areas that are not flooding. Legends are attached to these maps to identify these areas.

Enclosed is the Farmland Conversion Impact Rating (AD-1006) form which your agency will need to complete. Please complete Parts I and III of this form. Once you have completed Parts I and III, please return this form to our office at the above address.

If I can be of further assistance, please let me know.

Sincerely,

William Gilliam

WILLIAM M. GILLIAM
Assistant State Conservationist

Enclosures

Cc:
Dennis S. Doring, District Conservationist, NRCS, Altamont, Kansas
Lynn E. Thurlow, Soil Conservationist, NRCS, Salina, Kansas

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name of Project	Federal Agency Involved
Proposed Land Use	County and State
PART II *(To be completed by NRCS)*	Date Request Received By NRCS / Person Completing Form:

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐ NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site				
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160				
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or local site assessment)*	160				
TOTAL POINTS *(Total of above 2 lines)*	260				

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side)

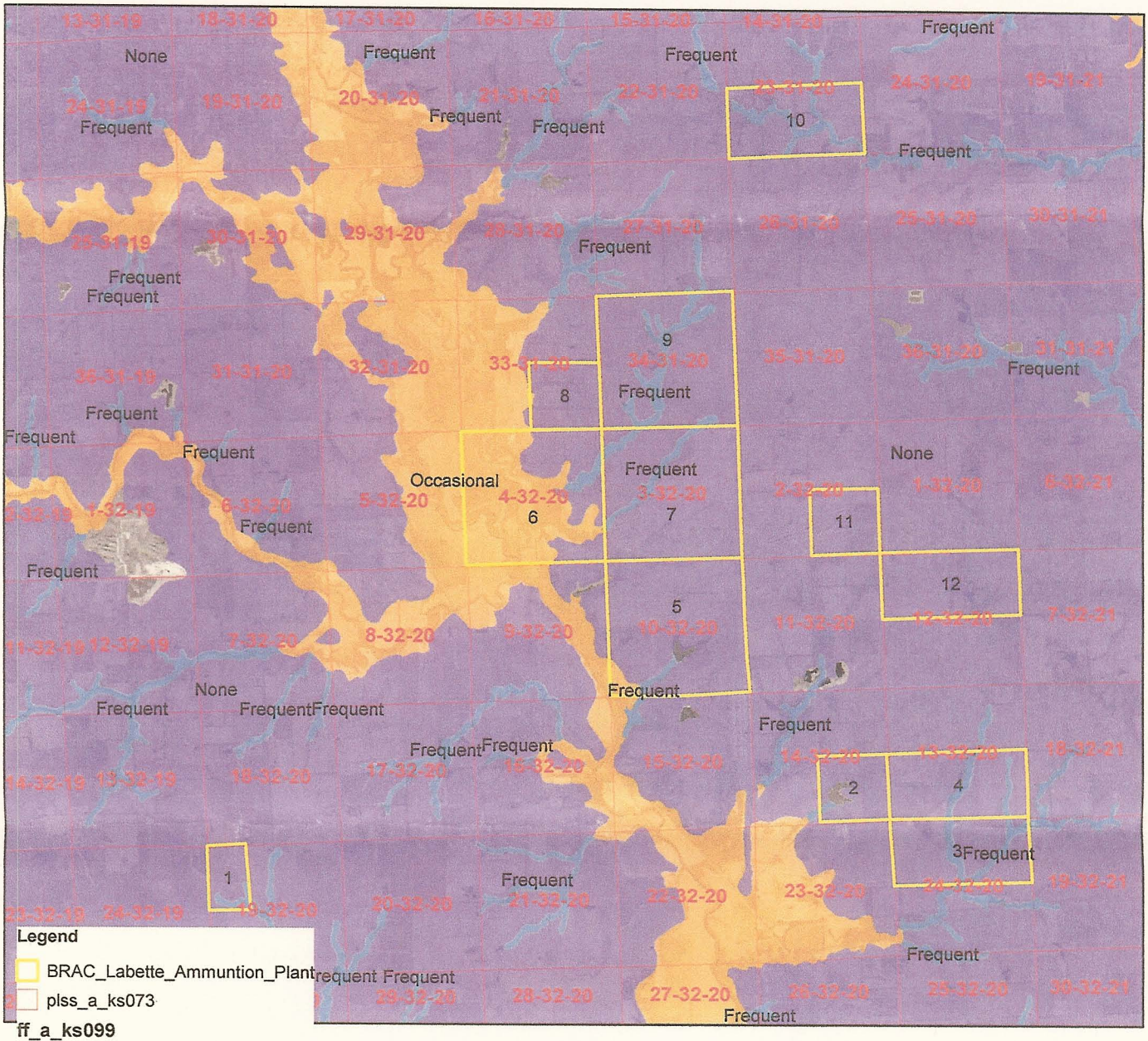
Form AD-1006 (03-02)

Frequent Flooding Map

Field Office: Emporia
Agency: NRCS
Assisted By: Sheldon L Hightower

Approximate Acres: 4488.5

Legal Description:



Legend

- BRAC_Labette_Ammuntion_Plant
- plss_a_ks073

ff_a_ks099

- <all other values>

FLDFRQCLDS

- Frequent
- None
- Occasional
- plss_a_ks099

Image: drg_ks099.tif

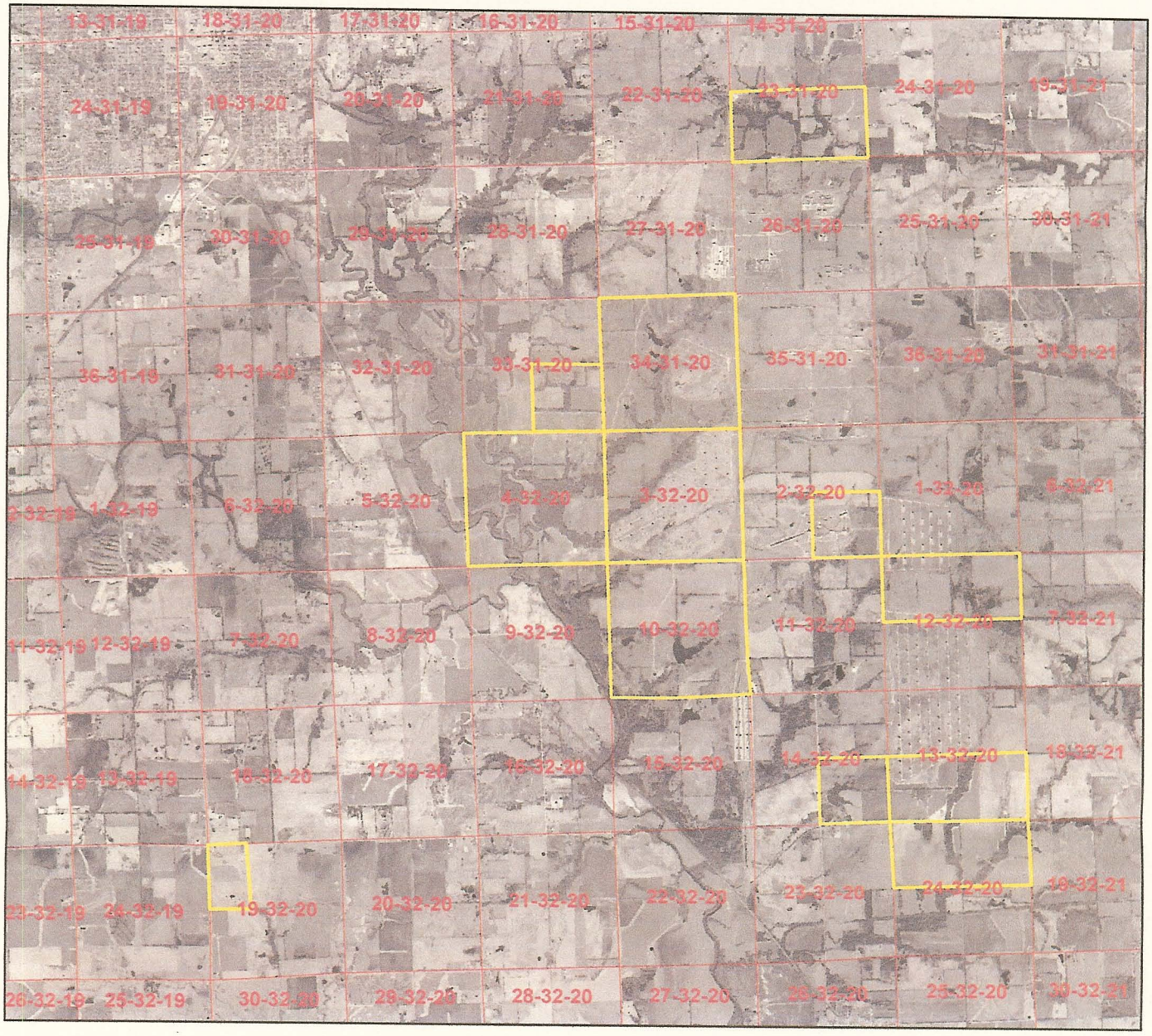
3,250 0 3,250 6,500 9,750 13,000 Feet

N

Conservation Plan Map

Field Office: Emporia
Agency: NRCS
Assisted By: Sheldon L Hightower

Approximate Acres: 4488.5
Legal Description:



Legend

BRAC_Labette_Ammuntion_Plant
plss_a_ks099
Image: drg_ks099.tif

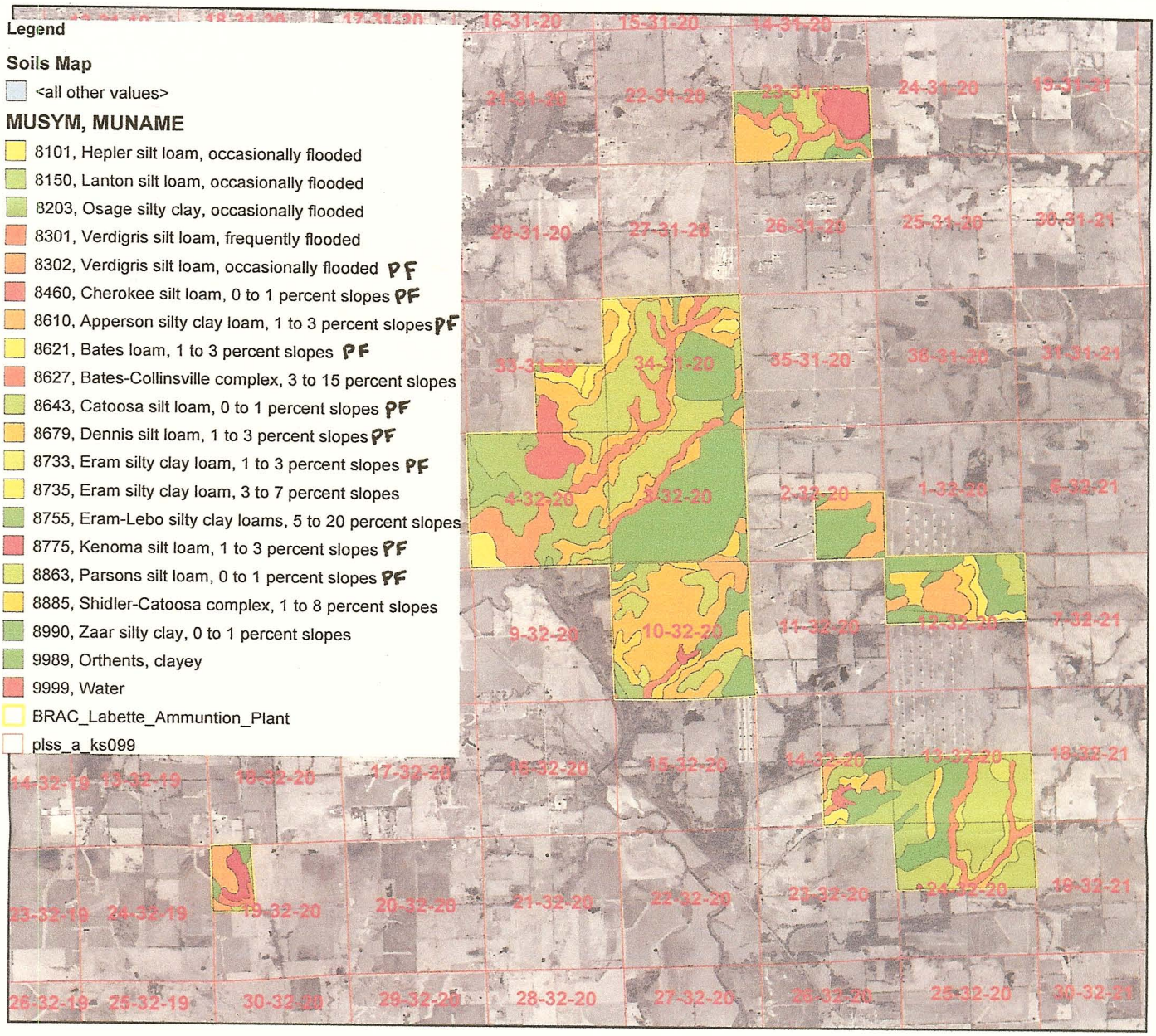
3,250 0 3,250 6,500 9,750 13,000 Feet

N

Soil Map

Field Office: Emporia
Agency: NRCS
Assisted By: Sheldon L Hightower

Approximate Acres: 4488.5
Legal Description:



PF= Prime Farmland

Image: drg_ks099.tif

3,300 0 3,300 6,600 9,900 13,200 Feet

N

DEPARTMENT OF THE ARMY
KANSAS ARMY AMMUNITION PLANT
23018 ROOKS ROAD, SUITE AA
PARSONS, KANSAS 67357-8403

REPLY TO ATTENTION OF

15 February 2008

SUBJECT: Kansas Army Ammunition Plant Prime Farmland Site Assessment

Mr. Gilliam
Assistant State Conservationist
3020 W 18th, Suite B
Emporia, KS 66801-6191

Dear Mr. Gilliam,

Please find enclosed Form AD-1006 with Parts VI and VII completed by the Kansas Army Ammunition Plant(KSAAP). This form supersedes all other Form AD-1006, which have been submitted on our behalf.

Appearently in the confusion of a previous submittal, your office inadvertently sent the AD-1006, which we prepared on January 28, to Mr Glenn Harbin of the U.S. Army Corps of Engineers by mistake. To ensure there is no confusion or delays in our responses, please direct all future correspondence to this office.

In order that future consideration may be addressed by the Local Redevelopment Planning Authority (LRPA) prior to any reuse, the results of the assessment will be incorporated in the Environmental Assessment which we are currently preparing.

I want to thank your staff for all their support in this matter, and I apologize for any confusion the previous submittal has caused. If you have any questions or need any additional information, please do not hesitate to contact me at 620-421-7596, or bret.raines@us.army.mil.

Sincerely,

Bret Raines
Environmental Coordinator

Enclosure:

-Form AD-1006

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 1/28/08
Name Of Project Kansas Army Ammunition Plant	Federal Agency Involved U.S. Army
Proposed Land Use Redevelopment of installation to civilian use.	County And State Labette County, Kansas
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 2/11/08

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).* Yes ☑ No ☐ | Acres Irrigated 993 | Average Farm Size 406

Major Crop(s) Wheat	Farmable Land In Govt. Jurisdiction Acres: 48 477 % 11.6	Amount Of Farmland As Defined in FPPA Acres: 798,193 % 7.3
Name Of Land Evaluation System Used LESA	Name Of Local Site Assessment System —	Date Land Evaluation Returned By NRCS

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly	10,473.0			
C. Total Acres In Site	10,473.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	8,879.3			
B. Total Acres Statewide And Local Important Farmland	—			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	21			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	11.6			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	63	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	15			
4. Protection Provided By State And Local Government	20	0			
5. Distance From Urban Builtup Area	15	15			
6. Distance To Urban Support Services	15	10			
7. Size Of Present Farm Unit Compared To Average	10	4			
8. Creation Of Nonfarmable Farmland	10	10			
9. Availability Of Farm Support Services	5	4			
10. On-Farm Investments	20	12			
11. Effects Of Conversion On Farm Support Services	10	6			
12. Compatibility With Existing Agricultural Use	10	5			
TOTAL SITE ASSESSMENT POINTS	160	0 106	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0 63	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0 106	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0 169	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☒ No ☐

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APPENDIX C LEAD BASED PAINT AND ASBESTOS PROVISIONS FOR BRAC LEASES AND DEEDS

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Lead Based Paint and Asbestos Provisions for BRAC Leases and Deeds

I. BRAC LEASE PROVISIONS

(1) WHERE LEASED PREMISES INCLUDE NO RESIDENTIAL HOUSING:

Lead-based Paint Warning and Covenant:

1. The Leased Premises do not contain residential dwellings and are not being leased for residential purposes. The Lessee is notified that the Leased Premises contains buildings built prior to 1978 that contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to lease.

2. Available information concerning known lead-based paint and/or lead-based paint hazards, the location of lead-based paint and/or lead-based paint hazards, and the condition of painted surfaces is contained in the Environmental Baseline Survey, which has been provided to the Lessee. Additionally, the following reports pertaining to lead-based paint and/or lead-based paint hazards have been provided to the Lessee:

Additionally, the Lessee has been provided with a copy of the federally-approved pamphlet on lead poisoning prevention. The Lessee hereby acknowledges receipt of all of the information described in this subparagraph.

3. The Lessee acknowledges that it has received the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards prior to execution of this Lease.

4. The Lessee shall not permit use of any buildings or structures on the Leased Premises for residential habitation without first obtaining the written consent of the Army. As a condition of its consent, the Army may require the Lessee to: (i) inspect for the presence of lead-based paint and/or lead-based paint hazards; (ii) abate and eliminate lead-based paint hazards by treating any defective lead-based paint surface in accordance with all applicable laws and regulations; and (iii) comply with the notice and disclosure requirements under applicable Federal and state law. The Lessee agrees to be responsible for any future remediation of lead-based paint found to be necessary on the Leased Premises.

5. The Army assumes no liability for remediation or damages for personal injury, illness, disability, or death, to the Lessee, its successors or assigns, sublessees or to any other person, including members of the general public, arising from or incident to

possession and/or use of any portion of the Leased Premises containing lead-based paint as residential housing. The Lessee further agrees to indemnify and hold harmless the Army, its officers, agents and employees, from and against all suits, claims, demands or actions, liabilities, judgments, costs and attorneys' fees arising out of, or in any manner predicated upon, personal injury, death or property damage resulting from, related to, caused by or arising out of the possession and/or use of any portion of the Leased Premises containing lead-based paint as residential housing. This section and the obligation of the Lessee hereunder shall survive the expiration or termination of this Lease and any conveyance of the Leased Premises to the Lessee. The Lessee's obligation hereunder shall apply whenever the United States of America incurs costs or liabilities for actions giving rise to liability under this section.

(2) LEAD-BASED PAINT PROVISION WHERE LEASED PREMISES CONTAIN RESIDENTIAL HOUSING:

NOTICE OF THE PRESENCE OF LEAD-BASED PAINT AND COVENANT

a. The Lessee is hereby informed and does acknowledge that all buildings on the Leased Premises, which were constructed or rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 residential housing, lessors must disclose to leassees and sublessees the presence of lead-based paint and/or lead-based paint hazards therein. Residential housing means any housing constructed prior to 1978, excepting housing for the elderly (households reserved for and composed of one or more persons 62 years of age or more at the time of initial occupancy) or persons with disabilities (unless any child who is less than 6 years of age resides or is expected to reside in such housing) or any 0-bedroom dwelling. A risk assessment or inspection for possible lead-based paint hazards by the Lessee is recommended prior to lease.

b. Available information concerning known lead-based paint and/or lead-based paint hazards, the location of lead-based paint and/or lead-based paint hazards, and the condition of painted surfaces is contained in the Environmental Baseline Survey, which has been provided to the Lessee. Additionally, the following reports pertaining to lead-based paint and/or lead-based paint hazards have been provided to the Lessee:

All lessees and subleases must also receive the federally-approved pamphlet on lead poisoning prevention. The lessee hereby acknowledges receipt of all of the information described in this subparagraph.

c. The Lessee acknowledges that it has received the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards prior to execution of this lease.

d. The Lessee shall not permit the occupancy or use of any buildings or structures as residential housing without complying with this section and all applicable federal, state, and local laws and regulations pertaining to lead-based paint and/or lead-based paint

hazards. Prior to permitting the occupancy of residential housing, if required by law or regulation, the Lessee, at its sole expense, will abate and eliminate lead-based paint hazards by treating any defective lead-based paint surface in accordance with all applicable laws and regulations.

e. The Army assumes no liability for remediation or damages for personal injury, illness, disability, or death, to the Lessee, its successors or assigns, sublessees or to any other person, including members of the general public, arising from or incident to possession and/or use of any portion of the Leased Premises containing lead-based paint as residential housing. The Lessee further agrees to indemnify and hold harmless the Army, its officers, agents and employees, from and against all suits, claims, demands or actions, liabilities, judgments, costs and attorneys' fees arising out of, or in any manner predicated upon, personal injury, death or property damage resulting from, related to, caused by or arising out of the possession and/or use of any portion of the Leased Premises containing lead-based paint as residential housing. This section and the obligations of the Lessee hereunder shall survive the expiration or termination of this Lease and any conveyance of the Leased Premises to the Lessee. The Lessee's obligation hereunder shall apply whenever the United States of America incurs costs or liabilities for actions giving rise to liability under this section.

(3) ASBESTOS PROVISION

Notice of the Presence of Asbestos and Covenant:

a. The Transferee/Lessee is hereby informed and does acknowledge that friable and non-friable asbestos or asbestos-containing materials (ACM) has been found on the Premises, as described in the final base-wide EBS. Except as provided for in c. below, the ACM on the Premises does not currently pose a threat to human health or the environment. All friable asbestos that posed a risk to human health has either been removed or encapsulated.

b. The Transferee/Lessee covenants agrees that its use and occupancy of the Premises will be in compliance with all applicable laws relating to asbestos and that the Transferor/Lessor assumes no liability for future remediation of asbestos or damages for personal injury, illness, disability, or death, to the Transferee/Lessee, its successors or assigns, subleassees, or to any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on the Premises described in this Transfer/Lease, whether the Transferee/Lessee, its successors or assigns have properly warned or failed to properly warn the individual(s) injured. The Transferee/Lessee agrees to be responsible for any future remediation of asbestos found to be necessary on the Premises.

c. The buildings listed in Exhibit ___ to this Deed/Lease contain asbestos which may pose an unacceptable risk to human health. The Transferee/Lessee agrees not to use or occupy said buildings without identifying and remediating any asbestos hazards therein in accordance with all applicable legal requirements, at Transferee/Lessee's sole expense.

This deed is granted based upon the Transferee/Lessee's representation that it will comply with this subparagraph c.

d. The Transferee/Lessee further agrees to indemnify and hold harmless the Army, its officers, agents and employees, from and against all suits, claims, demands or actions, liabilities, judgments, costs and attorneys' fees arising out of, or in any manner predicted upon, personal injury, death or property damage resulting from, related to, caused by or arising out of the possession and/or use of any portion of the Premises containing asbestos.

APPENDIX D NOISE ASSESSMENT DISCUSSION

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Background

Acoustical engineers analyze sound environments in terms of three dimensions: source, path and receiver. This traditional approach lends itself to a comprehensive description of how any soundscape influences human health, safety and welfare, either for the worse or for the better. The following pages summarize the Army's ICUZ program, how noise is measured through this program, and the process of normalizing sound measurements in order to accurately predict the impact of noise on human environments.

Army ICUZ Program. The tripartite distinction between source, path and receiver differs from the Army Installation Compatible Use Zone (ICUZ) program in that the ICUZ program focuses on the source and not the path or receiver. The computer models used in the ICUZ program tend to blur the unique characteristics of the paths over which sound travels in different climates and terrain. Also, the ICUZ program focuses on the absolute measurable level of military noise as received at a particular location, without regard to whether the receiving location is in an exceptionally quiet or an exceptionally noisy area. Because the guidelines for these measurable levels have been "normalized" to predict the annoyance of noise experienced by people living in a semi-urban or suburban environment, a rigid adherence to the ICUZ criterion levels may underestimate the annoyance of noise experienced by people living in extremely quiet environments. Consequently, the ICUZ criterion levels have proven to be poor predictors of the noise levels at which people living in quiet environments will complain about noise. A brief history of the evolution of the Army ICUZ program serves to illustrate its differences from the traditional analytical approach.

History of ICUZ. The Army's ICUZ program evolved from the Department of Defense's Air Installation Compatible Use Zone (AICUZ) program, and the AICUZ program was initiated to protect military airfields from noise complaints received from people who built homes near military airfields. The basic concept behind AICUZ was to warn local governments that some of the land located within their zoning or construction authority was unsuitable for residential or other noise-sensitive use. A prime mover for the development of AICUZ was the Navy's functional loss of the Los Alamitos Naval Air Station (NAS) in Orange County, California. At the time NAS Los Alamitos was constructed, residential areas were buffered from unhealthy levels of jet noise by orange groves. Over time, the orange groves were replaced with homes, and the residents began to lobby for the reduction of jet noise. As the Navy imposed restrictions, NAS Los Alamitos lost its utility for training and operations, and the land was transferred to a quieter operator, the California Army National Guard, in the 1970s.

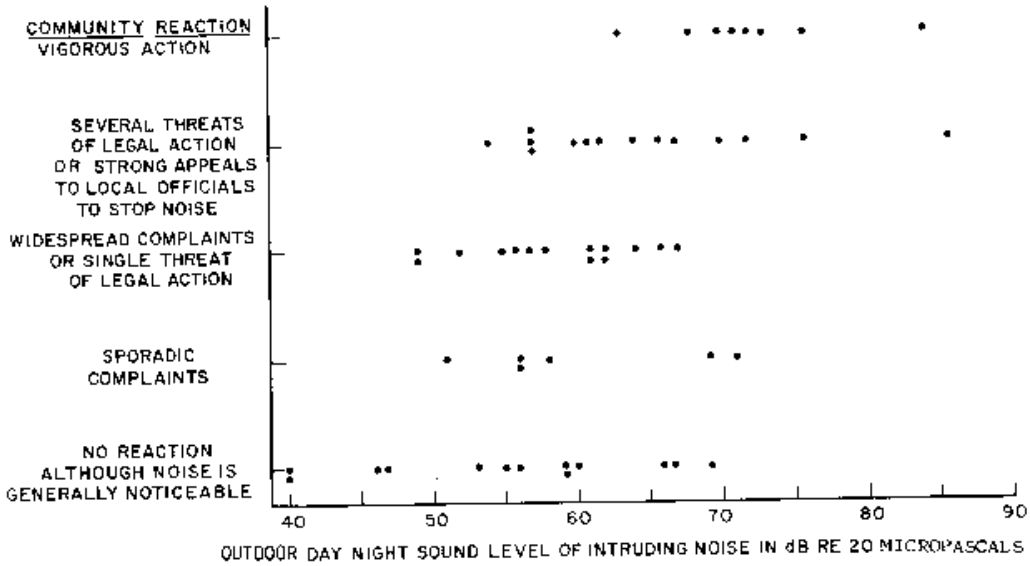
Based on the experience at NAS Los Alamitos and the experience of the Federal Aviation Administration, Veteran's Administration, and Department of Housing and Urban Development, Federal agencies reached a consensus that a day-night average sound level (DNL) of 65 decibels should be the threshold for where aircraft noise became incompatible with residential use. This criterion level was endorsed by the Department of Defense, including the Army. However, the Army was concerned about other noises besides aircraft noise, particularly the noise of tanks and artillery. For this reason, the Army extended the concept of AICUZ to include all potentially annoying noise, dropping

the A from AICUZ. Because the threshold of community response to gun noise differs from the threshold for aircraft noise, the Army's ICUZ incorporated different methods to map gun noise than had been used for mapping aircraft noise.

Normalizing to Suburban Environments.

The Air Force and the Navy displayed sound judgment when they normalized the criterion level of DNL 65 to predicting community response in suburban areas near most of their airfields. However, neither the AICUZ nor the ICUZ regulations included a policy for normalizing DNL levels to environments other than suburban. A short review of the U.S. Environmental Protection Agency's findings on normalization underscores the importance of this omission (USEPA 1974). Table D-1 shows the relationship between objective, measurable DNL for the 55 case studies included in the USEPA's analysis. USEPA reported the standard deviation of these data to be 7.9 decibels. Table D-3, which has been copied from Table D-7 of the USEPA report, lists various normalization factors for the 55 cases. Applying these factors decreased the standard deviation from 7.9 to 3.3 decibels. The improvement in prediction is shown graphically in Table D-1 below.

Table D-1 Copy of Figure D-8

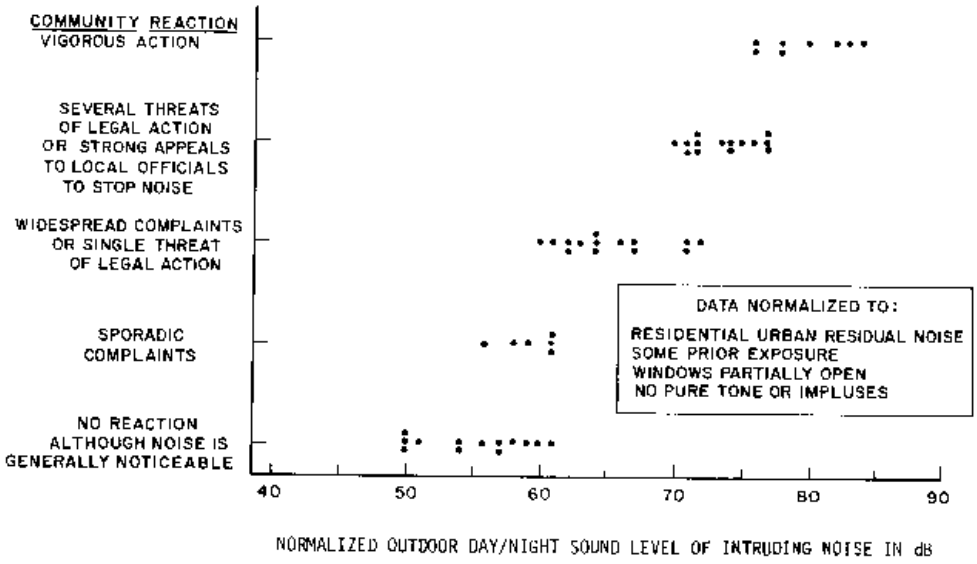


Published by USEPA (1974) and Portraying Community Reaction to Intensive Noises of Many Types as a Function of the Outdoor Day-Night Sound Level of the Intruding Noise without Normalization

Table D-2: CORRECTIONS TO BE ADDED TO THE MEASURED DAY-NIGHT SOUND LEVEL (L_{dn}) OF INTRUDING NOISE TO OBTAIN NORMALIZED L_{dn}

Type of Correction	Description	Amount of Correction
Seasonal Correction	Summer (or year-round operation).	0
	Winter only (or windows always closed).	-5
Correction for Outdoor Noise Level Measured in Absence of Intruding Noise	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking).	+10
	Normal suburban community (not located near industrial activity).	+5
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas).	0
	Noisy urban residential community (near relatively busy roads or industrial areas).	-5
	Very noisy urban residential community.	-10
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise.	+5
	Community has had some previous exposure to intruding noise but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	0
	Community has had considerable previous exposure to the intruding noise and the noise maker's relations with the community are good.	-5
	Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	-10
Pure Tone or Impulse	No pure tone or impulsive character.	0
	Pure tone or impulsive character present.	+5

Table D-3: Copy of Figure D-7



Published by USEPA (1974) and Portraying Community Reaction to Intensive Noises of Many Types as a Function of the Normalized Outdoor Day-Night Sound Level of the Intruding Noise

Normalization for Impulsive Noise. People complain about demolition grounds because their houses shake in response to the low-frequency components of the explosive sound. If people are asked to rate the annoyance of the sounds of explosives, their annoyance ratings relative to the decibels of the sound can be predicted from the amount of house vibration induced by that sound (Luz 1994) In this case, the amount of vibration is related to variation in house construction, not variation in the acoustic background (Schomer et al. 1985). Every construction has its unique patterns of resonance in response to the sound pressure wave of an explosive sound. A concrete or stone home will be as resistant to vibration in a wilderness area as next to a busy freeway. A cathedral-ceiling wood frame construction with large picture windows will be as susceptible to vibration next to a busy freeway as in a wilderness area. Because the degree of annoyance from explosive sounds is related to the building, not the acoustic environment, normalization to suburban environments would not improve the accuracy of predicting community response to blast noise. If normalization were to be applied to impulsive noise at all, it would be to small arms fire. In contrast to the sound of heavy weapons, the sound of small arms fire annoys people because they hear the sound.

Normalization for Continuous Noise. Variation in ambient background noise is particularly important with industrial facilities, such as power plants that operate 24 hours a day. Acoustical engineers dealing with such noise sources have been using normalization for years, and the most recent thought on this subject has been summarized in a paper by David Hessler (Hessler 2005). To understand the current approach to this issue, the reader must understand the differences between various statistical treatments of noise employed by acoustical engineers. Specifically, it is important to understand the

distinction between equivalent level (L_{eq}), L_{10}, and L_{90}. Each of these measures uses samples of sound digitized at rates of one second or less. L_{10} refers to the percentage of those samples exceeded 10 percent of the time. L_{90} refers to the percentage of those samples exceeded 90 percent of the time. L_{eq} refers to the average acoustic energy over the period of the sample. For environments dominated by traffic noise, the L_{10} and L_{eq} are usually within a fraction of a decibel of each other. For characterization of very quiet environments, acoustical engineers favor the L_{90}. Table D-4, which has been reproduced from Hessler's paper, lists a new category that a consensus group of acoustical engineers has added to the categories used by the USEPA in their 1974 normalization procedure. This new category is known as "very quiet rural or remote area." Table D-4 comes from Appendix A of the American National Standard Institute (ANSI) publication on Gas Turbine Installation Sound Emissions.

Table D-4: Definition of Acoustic Environments in Appendix A. ANSI B133.8

Typical Residential Area Sound Levels Daytime Residual L90 Level, dBA, Level Exceeded 90% of the Time		
Description	Typical Range	Average
Very Quiet Rural or Remote Area (New)	***26 to 30 inclusive***	***28***
Very Quiet Rural Area	31 to 35 inclusive	33
Quiet Suburban Residential	36 to 40 inclusive	38
Normal Suburban Residential	41 to 45 inclusive	43
Urban Residential	46 to 50 inclusive	48
Noisy Urban Residential	51 to 55 inclusive	53
Very Noisy Urban Residential	56 to 60 Inclusive	58

Conclusion.

Significant research in the field of acoustics has yielded more effective methods of analyzing the impact of noise on human environments. By normalizing sound levels within residential areas, researchers can effectively assess the noise impact in a variety of environments. Because Army installations are located in rural areas, urban areas, and residential areas, understanding the soundscape within these areas is essential to determining the impact of noise on human health and well-being.

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APPENDIX E VASCULAR PLANTS CONFIRMED ON KSAAP AND THOSE KNOWN FROM LABETTE COUNTY

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Vascular Plants Confirmed on KSAAP and Those Known From Labette County

Federal status: E - endangered, T - threatened

State status: E - endangered; T - threatened; /C2 - species in need of conservation, S1 - critically imperiled, S2 - imperiled

Habitat type: F - forest, W - wetland, P - prairie, A - aquatic, D – disturbed

BOLD INDICATES CONFIRMED ON KSAAP

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Acanthaceae						
Dicliptera brachiata	**dicliptera**	F		6650		
Justicia americana	**water willow**	W		6188		
Ruellia humilis	**fringeleaf ruellia**	P		6157		
Ruellia strepens	**limestone ruellia**	F		6585		
Aceraceae						
Acer negundo	**common box elder**	F		6042a		
Acer saccharinum	**silver maple**	F		6617		
Agavaceae						
Yucca filamentosa	**limp soapweed**	P				
Alismataceae						
Alisma subcordatum	**smallflower water plantain**	A,W		6467		
Sagittaria brevirostra	shortbeak arrowhead	A,W				
Sagittaria calycina	giant arrowhead	A,W				
Sagittaria latifolia	**common arrowhead**	A,W		6587		
Amaranthaceae						
Amaranthus retroflexus	rough pigweed	D				
Amaranthus rudis	**water hemp**	D,W		6575		
Amaranthus spinosus	spiny pigweed	D				
Froelichia gracilis	**slender snakecotton**	D		6562		
Iresine rhizomatosa	**bloodleaf**	F		6630, 6743		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Anacardiaceae						
Rhus aromatica	**late aromatic sumac**	F,P			T31S, R20E, Sec36 SW1/4 of NW1/4	
Rhus copallina	**dwarf sumac/ winged sumac**	F,P		6253		
Rhus glabra	**smooth sumac**	F,P		6209		
Toxicodendron radicans	**common poison ivy**	F,P		6529		
Annonaceae						
Asimina triloba	**pawpaw**					
Apiaceae						
Ammoselinum butleri	**Butler's sand parsley**	P		3388, 5850, 6050		
Chaerophyllum procumbens	**spreading chervil**	F		5984		
Chaerophyllum tainturieri	**erect chervil**	D,P		5972		
Cicuta maculata	**common water hemlock**	W		6478		
Conium maculatum	**poison hemlock**	D			T32S, R20E, Sec4, NE1/4	
Cryptotaenia canadensis	**honewort**	F		6633		
Daucus carota	**wild carrot**	D		6115		
Daucus pusillus	southwestern wild carrot	D				
Eryngium leavenworthii	**Leavenworth's eryngo**	P			T31S, R20E, Sec25, NW1/4 of SE1/4	
Eryngium yuccifolium	**button snakeroot**	P		6172		
Lomatium foeniculaceum	carrotleaf lomatium	P				
Osmorhiza longistylis	anise root	F				
Perideridia americana	eastern eulophus	P	/S1			
Polytaenia nuttallii	**prairie parsley**	P		5968, 6146		
Ptilimnium nuttallii	**Nuttall's mock bishop-weed**	P		6130, 6232, 6252		
Sanicula canadensis	**Canada sanicle**	F		6187		
Sanicula odorata	cluster sanicle	F				
Taenidia integerrima	yellow pimpernel	F				
Torilis arvensis	**hedge parsley**	D,P		6201		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Zizia aurea	**golden zizia**	F,W		6028		
Apocynaceae						
Apocynum cannabinum	**hemp dogbane**	D,P		6183		
Aquifoliaceae						
Ilex decidua	**deciduous holly**	F			T32S, R20E, Sec10, NW1/4	
Araceae						
Arisaema dracontium	**green dragon**	F		6042b		
Arisaema triphyllum	jack-in-the-pulpit	F				
Aristolochiaceae						
Aristolochia tomentosa	**woolly pipe-vine**	F			T32S, R20E, Sec 9, NE1/4, NE1/4	
Asclepiadaceae						
Asclepias hirtella	**prairie milkweed**	P		6545		
Asclepias incarnata	**swamp milkweed**	W		6447		
Asclepias meadii	Mead's milkweed	P	T/			
Asclepias purpurascens	**purple milkweed**	**F,P**			T32S, R20E, Sec 9, E1/2 of NE1/4	
Asclepias stenophylla	**narrowleaf milkweed**	P		6148		
Asclepias sullivantii	**Sullivant's milkweed**	P		6170		
Asclepias syriaca	common milkweed					
Asclepias tuberosa	**butterfly milkweed**			6167		
Asclepias verticillata	**whorled milkweed**	P		6177		
Asclepias viridiflora	**green-flowered milkweed**	P		6168		
Asclepias viridis	**green milkweed**	P		6169		
Cynanchum laeve	climbing milkweed					
Aspleniaceae						
Asplenium platyneuron	**ebony spleenwort**	**F**			T32S, R20 E, Sec9, E1/2 of NE1/4	
Asplenium resiliens	black-stemmed spleenwort	F				

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Asplenium rhizophyllum	walking fern	F				
Asteraceae						
Achillea millefolium	**western yarrow**	D,P		6174		
Ambrosia artemisiifolia	**common ragweed**	D,P		6461		
Ambrosia bidentata	**lanceleaf ragweed**	D,P		6507		
Ambrosia psilostachya	**western ragweed**	P		6515		
Ambrosia trifida	**giant ragweed**	D		6487		
Amphiachyris dracunculoides	**annual broomweed**			6454		
Antennaria neglecta	**field pussytoes**	P		5839, 5948		
Antennaria parlinii	plantainleaf pussytoes	F				
Artemisia ludoviciana	**Mexican sagewort**	P		6568		
Aster drummondii	**Drummond's aster**	F		6778		
Aster ericoides	**heath aster**	P		6717		
Aster lanceolatus	**common panicled aster**	W		6779		
Aster oblongifolius	**aromatic aster**	P		6744		
Aster oolentangiensis	**azure aster**	P		6718		
Aster paludosus	southern bog aster					
Aster parviceps	**small-headed aster**			6196		
Aster pilosus	**hairy aster**	D,P		6719		
Aster praealtus	**willow-leaved aster**	P		6716		
Bidens aristosa	**tickseed beggartick**	W		6541		
Bidens bipinnata	**Spanish needles**	D,F		6773		
Bidens frondosa	devil's beggartick	W				
Bidens vulgata	**tall beggartick**	W		6774		
Boltonia asteroides	**violet boltonia**	W		6601, 6728		
Brickellia eupatorioides	**corymbulose false boneset**	P		6485		
Cacalia plantaginea	**tuberous Indian plantain**	P		6136		
Carduus nutans	musk thistle	D				
Centaurea iberica	**star thistle**	D			T31S, R20 E, Sec27, W1/2 of SE1/4	On east side of BB Road

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Chrysanthemum leucanthemum	**ox-eye daisy**	D,P			T31S, R20 E, Sec27, E1/2 of NE1/4	
Chrysopsis pilosa	soft goldenaster	P				
Cichorium intybus	common chicory	D				
Cirsium altissimum	**tall thistle**	P		6527		
Cirsium undulatum	**wavyleaf thistle**	P		6248		
Cirsium vulgare	bull thistle	D				
Conyza canadensis	**Canada horseweed**			6508		
Conyza ramosissima	lawn horseweed	D				
Coreopsis grandiflora	**bigflower coreopsis**	P		6140		
Coreopsis palmata	finger coreopsis	P				
Coreopsis tinctoria	**plains coreopsis**	P,W		6159		
Dracopis amplexicaulis	**clasping coneflower**	P		6116		
Dyssodia papposa	foetid dogweed	P				
Echinacea pallida	**pale purple coneflower**	P		6249		
Eclipta prostrata	**yerba de tajo**	W		6502		
Elephantopus carolinianus	**elephant's-foot**	F		6616		
Erechtites hieracifolia	American burnweed	W				
Erigeron annuus	**annual fleabane**	D,P		6119		
Erigeron philadelphicus	**Philadelphia fleabane**	P,W		5961		
Erigeron strigosus	**daisy fleabane**	D,P		6151		
Erigeron tenuis	**slender fleabane**	D,P	/S1	5985, 6007		
Eupatorium altissimum	**tall joe-pye-weed**	P		6465		
Eupatorium coelestinum	mist-flower	P,W				
Eupatorium perfoliatum	boneset	W				
Eupatorium purpureum	**Holzinger's joe-pye-weed**	F		6632		
Eupatorium rugosum	**white snakeroot**	F		6565		
Eupatorium serotinum	**late eupatorium**	F,P		6526, 6714		
Euthamia gymnospermoides	**viscid euthamia**	P		6537		
Galinsoga quadriradiata	fringed quickweed	D				
Gnaphalium obtusifolium	**fragrant cudweed**	D,P		6552		

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Gnaphalium purpureum	purple cudweed	D,P				
Grindelia lanceolata	**spinytooth gumweed**	P		6459		
Helenium amarum	**bitter sneezeweed**	D,P		6556		
Helenium autumnale	**common sneezeweed**	W		6470		
Helenium flexuosum	**purplehead sneezeweed**	P	/S2	6129, 6231, 6265		
Helianthus annuus	**common sunflower**	D		6483		
Helianthus grosseserratus	**sawtooth sunflower**	P		6758		
Helianthus hirsutus	hairy sunflower	P				
Helianthus maximilianii	**Maximilian's sunflower**	P		6607, 6715		
Helianthus mollis	**ashy sunflower**	P		6533		
Helianthus pauciflorus	**stiff sunflower**	P		6457		
Helianthus salicifolius	**willowleaf sunflower**	P		6734		
Helianthus strumosus	woodland sunflower	F	/S2			
Helianthus tuberosus	**Jerusalem artichoke**	F,W		6615		
Heliopsis helianthoides	rough ox-eye	P				
Hieracium longipilum	**longbeard hawkweed**	P				
Hymenopappus scabioseus	**flattop hymenopappus**	P		6223		
Iva annua	**annual sumpweed**	D,W		6472		
Krigia caespitosa	**common dwarf dandelion**	P		5963, 6003, 6051		
Krigia dandelion	**tube dwarf dandelion**	P		5977, 6011		
Krigia occidentalis	western dwarf dandelion	P	/S2			
Lactuca floridana	**Florida lettuce**	F		6599		
Lactuca saligna	**willowleaf lettuce**	D		6557		
Lactuca serriola	prickly lettuce	D				
Liatris aspera	**rough gayfeather**	P		6469		
Liatris mucronata	pointed gayfeather					
Liatris punctata	**dotted gayfeather**	P		6739		
Liatris pycnostachya	**thickspike gayfeather**	P		6550		
Liatris squarrosa	hairy gayfeather	P				

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Parthenium hysterophorus	ragweed parthenium	P				
Prenanthes aspera	**rough rattlesnakeroot**	P		6468		
Pyrrhopappus carolinianus	**Carolina false dandelion**	D,P		6216		
Ratibida columnifera	yellow prairie coneflower	P				
Ratibida pinnata	**grayhead prairie coneflower**	P		6120		
Rudbeckia grandiflora	rough coneflower	F	/S1			
Rudbeckia hirta	**black-eyed Susan**	P		6128		
Rudbeckia laciniata	**cutleaf coneflower**	F		6592		
Rudbeckia subtomentosa	sweet coneflower	F,P				
Rudbeckia triloba	**brown-eyed Susan**	F,W			T32S, R20E, Sec15, NE1/4 of SW1/4	
Senecio obovatus	**roundleaf groundsel**	F		5979, 6040		
Senecio plattensis	**plains groundsel**	P		5952		
Senecio tampicanus		P				
Silphium integrifolium	wholeleaf rosinweed	P				
Silphium laciniatum	**compass plant**	P			T31S, R20E, Sec36, N1/2 of NW1/4	Roadside
Silphium perfoliatum	cup plant	P,W				
Silphium speciosum	**showy rosinweed**	P		6606		
Solidago canadensis	**Harger's Canada goldenrod**	P		6635		
Solidago canadensis	**Rough Canada goldenrod**	P		6722		
Solidago gigantea	**Giant goldenrod**	F		6591		
Solidago missouriensis	**Missouri goldenrod**	P		6535		
Solidago nemoralis	**gray goldenrod**	D,P		6713		
Solidago petiolaris	downy goldenrod	P				
Solidago rigida	**stiff goldenrod**	P		6732		
Solidago speciosa	noble goldenrod	P				
Solidago ulmifolia	**elmleaf goldenrod**	F		6642, 6785		
Sonchus asper	prickly sowthistle	D				
Taraxacum officinale	**common dandelion**	D		6259		

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Tragopogon dubius	**western salsify**	D		6222		
Verbesina alternifolia	**wingstem crownbeard**	F,W		6582, 6646		
Verbesina helianthoides	gravelweed crownbeard	F	/S1			
Verbesina virginica	**white crownbeard**	F		6623		
Vernonia arkansana	**Arkansas ironweed**	D,P		6464		
Vernonia baldwinii	**inland ironweed**	D,P		6569		
Xanthium strumarium	**common cocklebur**	D		6488		
Balsaminaceae						
Impatiens capensis	**spotted touch-me-not**	**W**			T32S R20 E, Sec 15, NW1/4 NW1/4	
Impatiens pallida	pale touch-me-not	W				
Berberidaceae						
Podophyllum peltatum	**may-apple**	F		6039		
Bignoniaceae						
Campsis radicans	**trumpet creeper**	F		6564		
Catalpa speciosa	**catalpa**	F			T32S, R20 E, Sec34, E1/2 of NW1/4	
Boraginaceae						
Heliotropium indicum	Indian heliotrope	W				
Heliotropium tenellum	**pasture heliotrope**	P		6193		
Lithospermum arvense	**corn gromwell**	D		5997		
Lithospermum canescens	**hoary puccoon**	P			T31S, R20 E, Sec 25NW1/4 of NW1/4	Hay meadow
Lithospermum incisum	**narrowleaf gromwell**	P		6225		
Myosotis verna	**Virginia forget-me-not**	P		5956		
Onosmodium bejariense	western marbleseed	P				
Brassicaceae						
Arabis canadensis	Canada rockcress	F				
Barbarea vulgaris	**winter cress**	D		6025		

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Brassica nigra	black mustard	D				
Brassica rapa	winter turnip	D				
Camelina microcarpa	small-seeded false flax	D				
Capsella bursa-pastoris	**shepherd's purse**	D		5843		
Cardamine concatenata	toothwort	F				
Cardamine parviflora	**small-flowered bittercress**	F,P		3387, 5852, 6020		
Cardamine pensylvanica	Pennsylvania bittercress	F,W				
Descurainia pinnata	tansy mustard	D,F				
Draba brachycarpa	**shortpod draba**	F,P		5849, 5981		
Draba cuneifolia	**wedgeleaf draba**	P			T32S, R20 E, Sec15, NE1/4 of SW1/4	
Erysimum repandum	bushy wallflower	D				
Iodanthus pinnatifidus	**purple rocket**	F		6652		
Lepidium densiflorum	**peppergrass**	D,P		5989		
Lepidium virginicum	**Virginia peppergrass**	D,P		6228		
Lesquerella gracilis	spreading bladderpod	P				
Nasturtium officinale	watercress					
Rorippa palustris	bog yellowcress	W				
Rorippa sessiliflora	**stalkless yellowcress**	W		6055		
Rorippa sylvestris	creeping yellowcress	W				
Selenia aurea	golden selenia	P,W				
Sibaria virginica	**Virginia rockcress**	P,W		5837		
Sisymbrium officinale	**hedge mustard**	D		5993		
Thlaspi arvense	pennycress	D				
Thlaspi perfoliatum	**thorowort pennycress**	D		6054		
Cactaceae						
Opuntia macrorhiza	**bigroot prickly pear**	P		6036		
Caesalpiniaceae						
Cercis canadensis	**redbud**	F		5842		

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Chamaecrista fasciculata	**showy partridge pea**	P		6517		
Chamaecrista nictitans	sensitive partridge pea	F,P				
Gleditsia triacanthos	**honey locust**	F		6567		
Gymnocladus dioica	**Kentucky coffee-tree**	F			T32S, R20 E, Sec14, N1/2 of NW1/4	
Senna marilandica	**Maryland senna**	F,P		6525		
Callitrichaceae						
Callitriche heterophylla	**water starwort**	A,W		6032		
Campanulaceae						
Campanula americana	**American bellflower**	F		6641		
Lobelia appendiculata	not IDed to variety	F	/S2			
Lobelia cardinalis	**cardinal flower**	F,W		6580		
Lobelia siphilitica	**blue lobelia**	F,W		6458		
Lobelia spicata	**palespike lobelia**	P		6235		
Triodanis biflora	venus looking glass	P				
Triodanis leptocarpa	venus looking glass	P				
Triodanis perfoliata	venus looking glass	P				
Caprifoliaceae						
Lonicera japonica	**Japanese honeysuckle**	D,F			T32S, R20 E, Sec9, NE1/4 of NE1/4	
Sambucus canadensis	**common elderberry**	F,P		6608		
Symphoricarpos orbiculatus	**buckbrush**	F		6574		
Viburnum rufidulum	**rusty blackhaw**	F		6771		
Caryophyllaceae						
Arenaria patula	Pitcher's sandwort					
Arenaria serpyllifolia	**thyme-leaved sandwort**	D		5995		
Cerastium brachypetalum	**gray chickweed**	P		6002a		
Cerastium brachypodum	**shortstalk cerastium**	P		5957		

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Cerastium fontanum	**mouse-ear chickweed**	D,P		6002b		
Cerastium glomeratum	**sticky mouse-ear chickweed**	P		6001		
Dianthus armeria	**Deptford pink**	D,P		6123		
Holosteum umbellatum	**jagged chickweed**	D		5847		
Sagina decumbens	**trailing pearlwort**	F,P	/S2	6023		
Saponaria officinalis	**bouncing bet**	D		6736		
Silene antirrhina	sleepy catchfly	P				
Silene stellata	starry campion	F				
Stellaria media	**chickweed**	D		6027		
Celastraceae						
Celastrus scandens	**American bittersweet**	F			T321S, R20 E, Sec 25, NW1/4 of NW1/4	
Euonymus atropurpurea	**wahoo**	F			T32S, R20 E, Sec9, NE1/4 of NE1/4	
Euonymus fortunei	**wintercreeper**				T32S, R20 E, Sec9, NE1/4 of NE1/4	
Ceratophyllaceae						
Ceratophyllum demersum	common hornwort	A				
Chenopodiaceae						
Chenopodium ambrosioides	Mexican tea	D				
Chenopodium missouriense	Missouri goosefoot					
Chenopodium standleyanum	**Standley's goosefoot**	D,F		6753		
Kochia scoparia	summer cypress	D				
Cistaceae						
Helianthemum bicknellii	Bicknell's frostweed	P				
Lechea tenuifolia	narrowleaf pinweed	F,P				
Clusiaceae						
Hypericum drummondii	**nits-and-lice**	P		6554		
Hypericum perforatum	**common St. John's-Wort**	D,P		6152		

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Hypericum punctatum	**spotted St. John's-wort**	D,P		6204		
Hypericum sphaerocarpum	**round-fruit St. John's-wort**	D,P		6150		
Commelinaceae						
Commelina communis	common dayflower	F,W				
Commelina diffusa	**creeping dayflower**	F,W	/S2	6637		
Commelina erecta	erect dayflower	F,W				
Commelina virginica	Virginia dayflower	F,W				
Tradescantia bracteata	**bracted spiderwort**	P		6029		
Tradescantia ohiensis	**Ohio spiderwort**	P		6242		
Convolvulaceae						
Calystegia silvatica	hedge bindweed	P				
Convolvulus arvensis	**field bindweed**	D		6254		
Evolvulus nuttallianus	Nuttall's evolvulus	P				
Ipomoea hederacea	**ivy-leaf morning-glory**	D		6612		
Ipomoea lacunosa	**white morning-glory**	D,F		6597		
Ipomoea pandurata	bigroot morning-glory	F				
Ipomoea purpurea	common morning-glory	D				
Cornaceae						
Cornus drummondii	**roughleaf dogwood**	F,P		6210		
Crassulaceae						
Penthorum sedoides	**ditch stonecrop**	W		6451		
Sedum pulchellum	**showy stonecrop**	P		6192		
Cucurbitaceae						
Melothria pendula	creeping cucumber	D,F	/S1			
Sicyos angulatus	**bur cucumber**	F,W		6783		
Cupressaceae						

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Juniperus virginiana	**eastern red-cedar**	D,F,P		6518		
Cuscutaceae						
Cuscuta indecora		F,P,W				
Cuscuta pentagona	**field dodder**	F,P,W			T32S, R20E, Sec1, SW1/4	Inside 1800
Cyperaceae						
Carex amphibola	**narrowleaf sedge**	F,W		6202		
Carex annectens	yellowfruit sedge	W				
Carex arkansana	Arkansas sedge	P,W	/S1			
Carex austrina	southern sedge	W				
Carex bicknellii	Bicknell's sedge	W				
Carex blanda	woodland sedge	F				
Carex brevior	straw sedge	P,W				
Carex bushii	**Bush's sedge**	P,W		6180		
Carex davisii	**Davis' sedge**	F,W		6018		
Carex frankii	**Frank's sedge**	W		6200		
Carex fissa	cleft sedge	W	/C2, S1			
Carex gravida	Lunell's sedge	W				
Carex grayi	**Gray's sedge**	F,W		6033		
Carex hirsutella	Hirsute sedge	F,W	/S2			
Carex hyalinolepis	**thinscale sedge**	F,W		6034		
Carex leavenworthii	**Leavenworth's sedge**	F		6010		
Carex lupulina	hop sedge	W				
Carex meadii	**Mead's sedge**	P		5958, 6045		
Carex microdonta	**littletooth sedge**	P		5943, 6046		
Carex pellita	**woolly sedge**	P,W		6009		
Carex sparganioides	Bur-reed sedge	W	/S2			
Carex vulpinoidea	**fox sedge**	W		6239		
Cyperus acuminatus	**tapeleaf sedge**	W		6220		
Cyperus echinatus	**globe flatsedge**	P,W		6237		
Cyperus lupulinus	not IDed to variety	P		6521		
Cyperus odoratus	**slender flatsedge**	D		6463		
Cyperus pseudovegetus	**falsegreen flatsedge**	W	/S2	6238		
Cyperus setigerus	lean flat sedge	W				
Cyperus squarrosus	awned flatsedge	W				

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Cyperus strigosus	false nutsedge	W				
Eleocharis montevidensis	**Sand spikerush**	W		6241		
Eleocharis obtusa	**blunt spikesedge**	W		6199		
Eleocharis wolfii	Wolf's spikerush	W	/C2, S1			
Eleocharis xyridiformis	**Irisleaf spikesedge**	W		6240		
Fimbristylis autumnalis	slender fimbristylis	W				
Fimbristylis puberula	**hairy fimbristylis**	W		6195		
Fuirena simplex	**Western umbrella sedge**	W		6546		
Isolepis koilolepis	**keeled bulrush**	P		6014		
Lipocarpha micrantha	common lipocarpha	P				
Scirpus atrovirens	**green bulrush**	W		6198		
Scirpus georgianus	Georgia bulrush	W				
Scirpus pendulus	**rusty bulrush**	W		6197		
Scleria pauciflora	**fewflower razorsedge**	P	/S2	6549		
Scleria triglomerata	**whip razorsedge**	P		6135		
Dioscoreaceae						
Dioscorea quaternata	Atlantic yam	F				
Dipsacaceae						
Dipsacus fullonum	Fuller's teasel	D				
Dryopteridaceae						
Cystopteris protrusa	southern bladder fern	F				
Woodsia obtusa	**blunt-lobed cliff fern**	**F**			T32S, R20E, Sec 9, E1/2 of NE1/4	
Woodsia occidentalis	cliff fern					
Ebenaceae						
Diospyros virginiana	**persimmon**	D,F		6501	T32S, R20E, Sec15, NW1/4	
Euphorbiaceae						
Acalypha gracilens	**slender copperleaf**	F,P		6543		
Acalypha ostryifolia	rough-pod copperleaf	D				

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Acalypha rhomboidea	**rhombic copperleaf**	F,W		6775		
Acalypha virginica	**Virginia copperleaf**	F,W		6456		
Chamaesyce humistrata	spreading spurge	D				
Chamaesyce maculata	**spotted spurge**	D		6563, 6576		
Chamaesyce missurica	**Missouri spurge**	P		6519		
Chamaesyce nutans	**eyebane**	D,P		6493		
Chamaesyce prostrata	prostrate spurge	D,P				
Chamaesyce serpens	**round-leaved spurge**	D,P		6491		
Croton capitatus	**woolly croton**	D,P		6479, 6764		
Croton glandulosus	tropic croton	D,P				
Croton monanthogynus	**one-seeded croton**	P		6117		
Euphorbia corollata	**flowering spurge**	P		6251		
Euphorbia cyathophora	painted spurge	P				
Euphorbia dentata	**toothed spurge**	D,P		6492		
Euphorbia spathulata	**warty spurge**	P		6044, 6263		
Tragia betonicifolia	**nettleleaf noseburn**	P		6134, 6735		
Fabaceae						
Amorpha canescens	**lead plant**	P		6147		
Amorpha fruticosa	**false indigo**	P,W		6182		
Amphicarpaea bracteata	**hog peanut**	F		6647		
Apios americana	American potato bean	F				
Astragalus crassicarpus	**common ground-plum**	P			T31S, R20E, Sec 25, NW1/4 of SE1/4	
Baptisia alba	**white wild indigo**	P		6236		
Baptisia australis	**blue false indigo**	P		5945, 6175		
Baptisia bracteata	**plains wild indigo**	P		5946, 6176		
Crotalaria sagittalis	rattlebox	F,P				
Dalea candida	**white prairie-clover**	P		6137		
Dalea purpurea	**purple prairie-clover**	P		6138		

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Desmodium canadense	**Canada tickclover**	F		6460		
Desmodium illinoense	**Illinois tickclover**	P		6247		
Desmodium paniculatum	**panicled tickclover**	F,P		6590		
Desmodium pauciflorum	**few-flowered tickclover**	F	/S1	6645		
Desmodium sessilifolium	**sessile-leaf tickclover**	P		6466		
Kummerowia stipulacea	**Korean clover**	D		6480		
Kummerowia striata	**Japanese clover**	D		6524		
Lathyrus latifolius	**everlasting pea**	D		6261		
Lathyrus pusillus	**singletary vetchling**	P	/S1	5944		
Lespedeza capitata	**round-head lespedeza**	P		6551		
Lespedeza cuneata	**sericea lespedeza**	D		6496		
Lespedeza violacea	**prairie lespedeza**	P		6474, 6740		
Lespedeza virginica	**slender bush lespedeza**	F,P		6495		
Medicago lupulina	**black medick**	D		5994, 6163		
Medicago minima	prickly medick	D				
Medicago sativa	alfalfa	D				
Melilotus albus	**white sweet clover**	D		6156		
Melilotus officinalis	**yellow sweet clover**	D		6262		
Orbexilum pedunculatum	Sampson's snakeroot	P				
Pediomelum esculentum	**prairie turnip**	P		6139		
Psoralidium tenuiflorum	**many-flowered scurfpea**	P		6153		
Strophostyles helvula	**wild bean**	F,P		6503		
Strophostyles leiosperma	**slick-seed bean**	F,P		6553		
Stylosanthes biflora	**pencilflower**	F,P			T31S, R20E, Sec34, NE1/4	
Tephrosia virginiana	goat's rue	P				
Trifolium campestre	**low hop clover**	P		5986		
Trifolium dubium	small hop clover	P				
Trifolium hybridum	Alsike clover	D				
Trifolium pratense	**red clover**	D		6255		

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Trifolium repens	**white clover**	D		5987		
Fagaceae						
Quercus alba	**white oak**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Quercus borealis	**northern red oak**	F		6780		
Quercus macrocarpa	**bur oak**	F		6595, 6769		
Quercus muehlenbergii	**chinquapin oak**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Quercus palustris	**pin oak**	F		6566, 6605		
Quercus shumardii	**Shumard's oak**	F		6621, 6770		
Quercus stellata	**post oak**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Quercus velutina	**black oak**	F			T32S, R20E, Sec9, NE1/4 of NE1/4	
Fumariaceae						
Corydalis crystallina	mealy corydalis	P				
Corydalis micrantha	**slender fumewort**	P			T31S, R20E, Sec1, NE1/4	
Dicentra cucullaria	**Dutchman's breeches**	F			T32S, R20E, Sec9, NE1/4 of NE1/4	
Gentianaceae						
Gentiana puberulenta	**downy gentian**	P		5949		
Sabatia campestris	**prairie rose gentian**	P		6229		
Geraniaceae						
Geranium carolinianum	**Carolina cranesbill**	D,P		6057		
Grossulariaceae						
Ribes missouriense	**Missouri gooseberry**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Ribes odoratum	**golden current**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Hippocastanaceae						
Aesculus glabra	western buckeye	F				

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Hippuridaceae						
Trichostema brachiatum	fluxweed	P				
Hydrophyllaceae						
Ellisia nyctelea	**waterpod**	F		6041		
Phacelia hirsuta	**hairy phacelia**	F			T32S, R20E, Sec15, NE1/4 of SW1/4	
Iridaceae						
Nemastylis geminiflora	nemastylis	P				
Sisyrinchium angustifolium	**common blue-eyed grass**	F,P		6035		
Sisyrinchium campestre	**prairie blue-eyed grass**	P		5960		
Isoëtaceae						
Isoëtes butleri	Butler's quillwort	P				
Juglandaceae						
Carya cordiformis	**bitternut hickory**	F		6649		
Carya illinoiensis	**pecan**	F		6602		
Carya laciniosa	**kingnut hickory**	F		6603		
Carya tomentosa	**mockernut hickory**	F			T32S, R20E, Sec15, NW1/4of NW1/4	
Carya ovata	**shagbark hickory**	F			T32S, R20E, Sec15, NW1/4of SW1/4	
Juglans nigra	**black walnut**	F		6516		
Juncaceae						
Juncus acuminatus	**tapertip rush**	W		6234		
Juncus brachycarpus	**shortfruit rush**	W		6266		
Juncus diffusissimus	**slimpod rush**	W		6221, 6233		
Juncus dudleyi	Dudley's rush	P,W				
Juncus interior	**inland rush**	P,W		6179		
Juncus marginatus	**shore rush**	W		6184		
Juncus tenuis	**path rush**	P,W		6784		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Juncus torreyi	**Torrey's rush**	W		6142		
Luzula bulbosa	wood rush	F				
Lamiaceae						
Agastache nepetoides	**catnip giant hyssop**	F		6763		
Glechoma hederacea	ground ivy	D				
Hedeoma hispida	**rough false pennyroyal**	D,P		6205		
Lamium amplexicaule	**henbit**	D		6053		
Lamium purpureum	**deadnettle**	D		6019		
Lycopus americanus	**American bugleweed**	W		6448		
Lycopus virginicus	**Virginia bugleweed**	W		6627		
Monarda citriodora	**lemon beebalm**	P		6121		
Monarda fistulosa	**wild bergamot**	P		6224		
Perilla frutescens	common perilla	F				
Physostegia angustifolia	**false dragonhead**	P,W	/S2	6131		
Prunella vulgaris	**self-heal**	W		6145		
Pycnanthemum tenuifolium	**slender mountain mint**	P		6126		
Salvia azurea	**blue sage**	P		6484		
Salvia reflexa	lanceleaf sage	D,P				
Scutellaria lateriflora	**sideflower skullcap**	W		6626		
Scutellaria parvula	**southern small skullcap**	P		5953		
Stachys tenuifolia	**slenderleaf betony**	F,W		6596		
Teucrium canadense	**American germander**	F,W		6122		
Trichostema brachiatum	**false pennyroyal**	F			T31S, R20E, Sec34, NE1/4	
Lauraceae						
Lindera benzoin	**Spice Bush**	F			T32S, R20E, Sec4, SE1/4	
Sassafras albidum	white sassafras					
Lemnaceae						
Lemna aequinoctialis		A				
Lemna perpusilla	minute duckweed	A				

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Spirodela polyrhiza	greater duckmeat	A				
Utricularia gibba	cone-spur bladderwort	A				
Liliaceae						
Allium canadense	**Canada wild onion**	P		3396, 6213		
Allium canadense	**lavender wild onion**	P			T32S, R20E, Sec11, W1/2 of SE1/4	
Allium sativum	**wild onion**	D		6056		
Allium stellatum	pink wild onion	P				
Allium vineale	field garlic	D				
Asparagus officinalis	asparagus	D				
Camassia angusta	wild hyacinth/ prairie camas	P,W				
Camassia scilloides	**wild hyacinth/eastern camas**	P,W			T31S, R20E, Sec26, N1/2 of SW1/4	
Erythronium albidum	white dogtooth violet	F				
Erythronium mesochoreum	**prairie dogtooth violet**	P		5838		
Hemerocallis fulva	day lily	D				
Hypoxis hirsuta	**yellow star grass**	P		5955		
Nothoscordum bivalve	**false garlic**	P		5966		
Zigadenus nuttallii	**Nuttall's death camas**	P			T32S, R20E, Sec 15, NE1/4 of SW1/4	
Linaceae						
Linum lewissii	**prairie flax**		/S1		T31S, R20E, Sec34, NE1/4	
Linum medium	**stiff yellow flax**	P	/S1	6245		
Linum sulcatum	**grooved flax**	P		6133, 6244		
Lythraceae						
Ammannia coccinea	**red ammannia**	W		6500		
Ammannia robusta	**purple ammannia**	W		6450		
Cuphea viscosissima	**blue waxweed**	W		6745		
Didiplis diandra	water purslane	A	/S1			
Lythrum alatum	**winged loosestrife**	W		6127		
Lythrum californicum	California loosestrife	W				

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Rotala ramosior	**rotala**	W		6449		
Malvaceae						
Abutilon theophrasti	**velvet-leaf**	D		6610		
Callirhoe alcaeoides	**pale poppy mallow**	P		5954		
Hibiscus laevis	**halberd-leaved rose mallow**	W		6385, 6628		
Hibiscus trionum	flower-of-an-hour	D				
Malva neglecta	common mallow	D				
Malvastrum hispidum	**hairy false mallow**	D,P		6481, 6737		
Sida spinosa	**prickly sida**	D		6625		
Menispermaceae						
Calycocarpum lyonii	cupseed	F	/S1			
Cocculus carolinus	**Carolina snailseed**	F		6600		
Menispermum canadense	**moonseed**	F		6757		
Mimosaceae						
Desmanthus illinoensis	**Illinois bundleflower**	P		6165		
Mimosa quadrivalvis	**catclaw sensitive brier**	P		6194		
Molluginaceae						
Mollugo verticillata	**carpetweed**	D		6609		
Monotropaceae						
Monotropa uniflora	**Indian pipe**	F		6766		
Moraceae						
Maclura pomifera	**Osage orange**	D,F		6579		
Morus alba	white mulberry	D,F				
Morus rubra	**red mulberry**	F		6640, 6752		
Najadaceae						
Najas guadalupensis	**southern naiad**	A		6513		
Nelumbonaceae						

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Nelumbo lutea	**American lotus**	**A**			T31S, R20E, Sec34, NE1/4	Small pond north of pistol range
Nyctaginaceae						
Mirabilis albida	**white four-o'clock**	P		6512		
Mirabilis nyctaginea	**wild four-o'clock**	D,P		6511		
Oleaceae						
Forestiera acuminata	swamp privet	F	/S1			
Fraxinus americana	white ash	F				
Fraxinus pennsylvanica	**green ash**	F		6638		
Onagraceae						
Gaura longiflora	**biennial gaura**	P		6486		
Gaura parviflora	velvety gaura	P				
Ludwigia alternifolia	**bush seedbox**	W		6536		
Ludwigia palustris	**water purslane**	A,W		6190		
Ludwigia peploides	**marsh seedbox**	A,W		6189		
Oenothera laciniata	**cutleaf evening primrose**	D,P		6016		
Oenothera linifolia	**narrow-leaved evening primrose**	P			T32S, R20E, Sec15, NW14, of NE1/4	South end of dam on pond 4.
Oenothera macrocarpa	**Missouri evening primrose**	P			T32S, R20E, Sec15, NW14, of NE1/4	
Oenothera speciosa	**white evening primrose**	P		6158		
Oenothera triloba	stemless evening primrose	P				
Oenothera villosa	**common evening primrose**	D,P		6540		
Ophioglossaceae						
Botrychium dissectum	**dissected grape fern**	F		6765		
Botrychium virginianum	**rattlesnake fern**	F		6037		
Ophioglossum engelmannii	**limestone adder's-tongue**	P		5947		
Orchidaceae						

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Corallorhiza wisteriana	Wister's coralroot	F				
Platanthera lacera	ragged orchid	P				
Platanthera praeclara	western prairie fringed orchid	P	T/			
Spiranthes cernua	**nodding ladies'-tresses**	P		6726, 6755		
Spiranthes lacera	**slender ladies'-tresses**	P		6742, 6756		
Spiranthes ovalis	**oval ladies'-tresses**	F	/S1	6767		
Spiranthes vernalis	**upland ladies'-tresses**	P		6264		
Oxalidaceae						
Oxalis dillenii	**green wood sorrel**	D,F,P		5964		
Oxalis stricta	**common wood sorrel**	D,F		6588		
Oxalis violacea	**violet wood sorrel**	P		5967		
Papaveraceae						
Papaver dubium	**longhead poppy**	D			T32S, R20E, Sec15, NE1/4 of SW1/4	In old firebreak
Phytolaccaceae						
Phytolacca americana	**pokeweed**	D		6118		
Plantaginaceae						
Plantago aristata	**bottlebrush plantain**	P		6164		
Plantago lanceolata	**English plantain**	D		5996		
Plantago patagonica	woolly plantain	P				
Plantago pusilla	**tiny plantain**	P		5982		
Plantago rhodosperma	**red-seeded plantain**	P		6206		
Plantago rugelii	**Rugel's plantain**	F		6593		
Plantago virginica	pale-seeded plantain	P				
Platanaceae						
Platanus occidentalis	**sycamore**	F		5988, 6217		
Poaceae						

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Aegilops cylindrica	**jointed goatgrass**	D		6226		
Agrostis hyemalis	**winter bentgrass**	P		6047, 6178		
Agrostis perennans	autumn bentgrass	W				
Agrostis stolonifera	**redtop**	D,P		6243		
Alopecurus carolinianus	**Carolina foxtail**	W		6022		
Andropogon gerardii	**big bluestem**	P		6510		
Andropogon ternarius	splitbeard bluestem	D,P				
Andropogon virginicus	**broomsedge bluestem**	D,P		6729		
Aristida dichotoma	**Curtiss' threeawn**	P		6548		
Aristida longespica		P				
Aristida oligantha	**prairie threeawn**	D,P		6490		
Aristida purpurascens	**arrow feather threeawn**	P		6547		
Bothriochloa laguroides	**silver bluestem**	D,P		6268		
Bouteloua curtipendula	**side-oats grama**	P		6227, 6473		
Bouteloua hirsuta	**hairy grama**	P		6762		
Bromus commutatus	**hairy chess**	D		5998		
Bromus inermis	smooth brome	D,P				
Bromus japonicus	**Japanese brome**	D,P		6161		
Bromus pubescens	Canada brome	F				
Bromus secalinus	rye brome	D				
Bromus tectorum	downy brome	D				
Cenchrus longispinus	**longspine sandbur**	D,P		6520		
Chasmanthium latifolium	**sea oats**	F		6581		
Chloris verticillata	**windmillgrass**	D		6721		
Cinna arundinacea	**stout woodreed**	F		6586		
Cynodon dactylon	**bermudagrass**	D		6260		
Dactylis glomerata	**orchardgrass**	D			T32S, R20E, Sec 4, SE1/4	
Danthonia spicata	poverty grass	F,P				
Diarrhena obovata	American beakgrass	F				
Dichanthelium acuminatum	Lindheimer's dichanthelium	P				
Dichanthelium clandestinum	**deertongue dichanthelium**	F		6624		

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Dichanthelium linearifolium	slimleaf dichanthelium	P				
Dichanthelium oligosanthes	**Scribner's dichanthelium**	P		6155		
Dichanthelium sphaerocarpon	**roundseed dichanthelium**	P		6166		
Digitaria ciliaris	**southern crabgrass**	D		6787		
Digitaria cognata	fall witchgrass	P				
Digitaria ischaemum	**smooth crabgrass**	D		6560		
Digitaria sanguinalis	hairy crabgrass	D				
Echinochloa muricata	**prickly barnyardgrass**	D,W		6475		
Eleusine indica	**goosegrass**	D		6571		
Elymus canadensis	**Canada wildrye**	P		6203		
Elymus glabriflorus	smooth wildrye	P				
Elymus virginicus	**Virginia wildrye**	F,P		6173		
Eragrostis capillaris	lacegrass	D,F				
Eragrostis cilianensis	**stinkgrass**	D		6572		
Eragrostis frankii	sandbar lovegrass	W				
Eragrostis hypnoides	teal lovegrass	W				
Eragrostis intermedia	**plains lovegrass**	F		6514		
Eragrostis pectinacea	**Carolina lovegrass**	D		6482, 6750		
Eragrostis reptans	creeping lovegrass	W				
Eragrostis spectabilis	**purple lovegrass**	P		6727		
Eriochloa contracta	**prairie cupgrass**	D,P		6542		
Festuca arundinacea	**tall fescue**	D,P		6162		
Festuca paradoxa	**cluster fescue**	P,W		6141		
Festuca rubra	**red fescue**	D,P		6049		
Festuca subverticillata	nodding fescue	F				
Festuca versuta	Texas fescue	D,P				
Glyceria striata	fowl mannagrass	W				
Holcus lanatus	velvetgrass	D				
Hordeum jubatum	foxtail barley	D,W				
Hordeum pusillum	**little barley**	D,W		6052		
Koeleria macrantha	**Junegrass**	P		6048		
Leersia oryzoides	**rice cutgrass**	W		6471, 6747		

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Leersia virginica	**whitegrass**	W		6634, 6746		
Leptochloa fascicularis	**bearded sprangletop**	W		6639		
Leptochloa mucronata	red sprangletop	W				
Muhlenbergia bushii	Bush's muhly	F				
Muhlenbergia frondosa	**wirestem muhly**	F		6738		
Muhlenbergia schreberi	**nimblewill**	F		6644, 6733, 6749		
Muhlenbergia sobolifera	rock muhly	F				
Muhlenbergia sylvatica	**forest muhly**	F		6760		
Panicum anceps	**beaked panicum**	P,W		6573		
Panicum capillare	**common witchgrass**	D,P		6558		
Panicum dichotomiflorum	**fall panicum**	D,P		6528		
Panicum flexile	**wiry witchgrass**	D,P		6477		
Panicum rigidulum	**redtop panicum**	P,W		6455		
Panicum virgatum	**switchgrass**	P		6489		
Paspalum floridanum	**Florida paspalum**	P		6498, 6782		
Paspalum fluitans	horsetail paspalum					
Paspalum pubiflorum	**smoothseed paspalum**	P		6522		
Paspalum setaceum	**thin paspalum**	P		6544		
Phleum pratense	timothy	D,W				
Poa annua	**annual bluegrass**	D		5853, 6015		
Poa compressa	**Canada bluegrass**	P		6143		
Poa pratensis	**Kentucky bluegrass**	D,P		6024		
Poa sylvestris	**woodland bluegrass**	F		6017		
Schedonnardus paniculatus	**tumblegrass**	D,P		6211		
Schizachyrium scoparium	**little bluestem**	P		6534		
Setaria faberi	**Chinese foxtail**	D		6530		
Setaria parviflora	**knotroot bristlegrass**	P		6212		
Setaria pumila	**yellow foxtail**	D		6559		
Setaria viridis	green foxtail	D				
Sorghastrum nutans	**Indiangrass**	P		6509		

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Sorghum bicolor	**sorghum**	D		6578		
Sorghum halepense	**Johnsongrass**	D		6577		
Spartina pectinata	**prairie cordgrass**	P,W		6611		
Sphenopholis obtusata	prairie wedgegrass					
Sporobolus asper	**Tall dropseed**	D,P		6724, 6730		
Sporobolus clandestinus		D,P				
Sporobolus heterolepis	prairie dropseed	P				
Sporobolus neglectus	puffsheath dropseed	D,P				
Sporobolus ozarkanus	**Ozark dropseed**	D,P		6723, 6725, 6741		
Sporobolus pyramidatus	**whorled dropseed**	D,P		6555		
Sporobolus vaginiflorus	**povertygrass**	D,P		6720		
Tridens flavus	**purpletop**	D		6476		
Tridens strictus	**longspike tridens**	P		6532		
Tripsacum dactyloides	**eastern gammagrass**	P		6171		
Vulpia octoflora	**sixweeks fescue**	P		6026, 6181		
Polemoniaceae						
Phlox divaricata	**sweetwilliam phlox**	F		6030		
Phlox pilosa	**prairie phlox**	P		6006		
Polygalaceae						
Polygala incarnata	**slender milkwort**	P			T31S, R20E, Sec34, NE1/4	
Polygala sanguinea	**blood milkwort**	P		6144		
Polygala verticillata	**whorled milkwort**	P		6214		
Polygonaceae						
Polygonum amphibium	swamp smartweed	W				
Polygonum arenastrum	**prostrate knotweed**	D		6561, 6648		
Polygonum bicorne	**longstyle smartweed**	W		6594		
Polygonum convolvulus	**wild buckwheat**	F,P			T32S, R20E, Sec9, E1/2 of NE1/4	
Polygonum hydropiperoides	**mild water-pepper**	W		6462, 6614, 6759		

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Polygonum lapathifolium	**pale smartweed**	W		6504		
Polygonum pensylvanicum	**Pennsylvania smartweed**	W		6506, 6748		
Polygonum persicaria	**lady's-thumb smartweed**	W		6267		
Polygonum punctatum	**dotted smartweed**	W		6589		
Polygonum ramosissimum	bush knotweed	D,P				
Polygonum scandens	**climbing false buckwheat**	F,P		6613		
Polygonum tenue	slender knowtweed	P				
Polygonum virginianum	**Virginia knotweed**	F		6631		
Rumex acetosella	sheep sorrel	D,P				
Rumex altissimus	**pale dock**	P,W		6008		
Rumex crispus	curly dock	D				
Rumex patientia	patience dock	W				
Portulacaceae						
Claytonia virginica	**Virginia spring beauty**	F,P		5840, 5848		
Potamogetonaceae						
Potamogeton diversifolius	waterthread pondweed	A				
Potamogeton foliosus	leafy pondweed	A				
Potamogeton nodosus	**longleaf pondweed**	A		6191		
Potamogeton pusillus	baby pondweed	A				
Primulaceae						
Androsace occidentalis	**western rock jasmine**	P		6021		
Dodecatheon meadia	**shooting star**	P		5951, 6004		
Lysimachia ciliata	fringed loosestrife	P,W				
Lysimachia nummularia	**moneywort**	W		6776		
Pteridaceae						
Argyrochosma dealbata	powdery cloak fern	F,P				
Pellaea atropurpurea	**purple cliff-brake**	**F,P**			T32S, R20E, Sec9, E1/2 of	

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					NE1/4	
Ranunculaceae						
Anemone caroliniana	**Carolina anemone**	P			T32S, R20E, Sec22, S1/2 of SW1/4	
Anemonella thalictroides	rue anemone	F				
Clematis pitcheri	Pitcher's clematis	F,P				
Delphinium carolinianum	**plains larkspur**	P			T32S, R20E, Sec11, W1/2 of NW1/4	
Delphinium tricorne	**dwarf larkspur**	F			T32S, R20E, Sec9, E1/2 of NE1/4	
Isopyrum biternatum	false rue anemone	F				
Myosurus minimus	**mousetail**	W		5836		
Ranunculus abortivus	**littleleaf buttercup**	F		5990		
Ranunculus fascicularis	early buttercup	F				
Ranunculus hispidus	**marsh buttercup**	F,W		6031		
Ranunculus sceleratus	cursed buttercup	W				
Thalictrum dasycarpum	purple meadow rue	F				
Rhamnaceae						
Ceanothus americanus	**New Jersey tea**	P		6250		
Rhamnus lanceolata	**buckthorn**	F			T32S, R20E, Sec15, NE1/4 of SW1/4	
Rosaceae						
Agrimonia parviflora	**many-flowered agrimony**	D,F		6629		
Agrimonia pubescens	**downy agrimony**	F		6768		
Amelanchier arborea	**tall service berry**	F			T32S, R20E, Sec3, N1/2 of SW1/4	
Crataegus crus-galli	**cockspur hawthorn**				T32S, R20E, Sec10, W1/2 of NW1/4	
Crataegus mollis	summer hawthorn	F				
Crataegus viridis	**green hawthorn**	F			T32S, R20E, Sec 10, SW1/4	
Duchesnea indica	Indian strawberry	D				
Fragaria virginiana	**wild strawberry**	P		5983		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Geum canadense	**white avens**	F			T31S, R21E, Sec 31, NW1/4 of SE1/4	
Geum vernum	**spring avens**	F		5978		
Gillenia stipulata	Indian physic	F				
Potentilla recta	**sulphur cinquefoil**	D,P		6149		
Potentilla simplex	**old-field cinquefoil**	D,P		5974		
Prunus angustifolia	chickasaw plum	F				
Prunus hortulana	hortulan plum	F				
Prunus munsoniana	**wild-goose plum**	F		5846		
Prunus serotina	**black cherry**	F		6000		
Pyrus ioensis	**wild crabapple**	F			T32S, R20E, Sec 10, SW1/4	
Rosa arkansana	**prairie wild rose**	P			T31S, R20E, Sec 25, NW1/4 of SE1/4	
Rosa multiflora	**multiflora rose**	D,P			T32S, R20E, Sec 10, SW1/4	
Rosa setigera	**climbing rose**	F,P		6246		
Rubus occidentalis	black raspberry	P				
Rubus ostryifolius	**highbush blackberry**	P		5965, 5975		
Rubus pensilvanicus	highbush blackberry	P				
Rubus trivialis	southern dewberry	P				
Rubiaceae						
Cephalanthus occidentalis	**buttonbush**	W		6505		
Diodia teres	**rough buttonweed**	P		6494		
Galium aparine	**catchweed bedstraw**	F		5992		
Galium circaezans	woods bedstraw	F				
Galium pedemontanum	**piedmont bedstraw**	P		5973		
Galium pilosum	hairy bedstraw	F				
Galium virgatum	southwestern bedstraw	F				
Houstonia pusilla	**small bluets**	P		5851		
Sherardia arvensis	field madder	D				
Spermacoce glabra	smooth buttonweed	W	/S2			
Rutaceae						

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Ptelea trifoliata	**common hop tree**	F			T32S, R20E, Sec10, E1/2 of SW1/4	
Zanthoxylum americanum	common prickly ash	F				
Salicaceae						
Populus deltoides	**plains cottonwood**	F		6208		
Salix nigra	**black willow**	F,W		6754		
Sapotaceae						
Bumelia lanuginosa	**woolly buckthorn**	F			T32S, R20E, Sec10, E1/2 of SW1/4	
Scrophulariaceae						
Agalinis aspera	rough agalinis	P				
Agalinis fasciculata	**beach false foxglove**	P	/S2		T32S, R20E, Sec15, NE1/4 of SW1/4	
Agalinis gattingeri	**Gattinger's agalinis**	P	/S2		T32S, R20E, Sec15, NE1/4 of SW1/4	
Agalinis heterophylla	**prairie false foxglove**	P		6453, 6539		
Agalinis skinneriana	Skinner's purple false foxglove	P				
Agalinis tenuifolia	**slender agalinis**	P,W		6452, 6538		
Buchnera americana	**blue hearts**	P		6132, 6230		
Castilleja coccinea	**Indian paintbrush**	P		5942, 5970,6005,		
Collinsia violacea	violet collinsia	F,P				
Dasistoma macrophylla	**mullein foxglove**	F		6761		
Leucospora multifida	**paleseed**	W		6218, 6499		
Linaria canadensis	**Texas toadflax**	F,P		6013		
Lindernia dubia	yellow false pimpernel	W				
Mimulus alatus	**sharpwing monkeyflower**	W		6584		
Penstemon cobaea	cobaea beardtongue	P				
Penstemon digitalis	**smooth beardtongue**	P,W		6215		
Penstemon tubaeflorus	**tube beardtongue**	P		6154		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Scrophularia marilandica	Maryland figwort	F				
Verbascum blattaria	**moth mullein**	D		6257		
Verbascum thapsus	**woolly mullein**	D			T32S, R20E, Sec11, S1/2 of SE1/4	
Veronica arvensis	**corn speedwell**	D		5962		
Veronica peregrina	**hairy purslane**	D,P		6012		
Veronica polita	wayside speedwell	D				
Smilacaceae						
Smilax herbacea	carrionflower greenbrier	F				
Smilax hispida	**bristly greenbrier**	F		6523		
Solanaceae						
Datura stramonium	**jimsonweed**	D			T32S, R20E, Sec26, NW1/4 of NE1/4	
Physalis angulata	**cutleaf groundcherry**	P		6497		
Physalis heterophylla	clammy groundcherry	P				
Physalis longifolia	**common groundcherry**	P		6570		
Physalis pumila	hairy groundcherry	P				
Solanum carolinense	**Carolina horse nettle**	D,P		6124		
Solanum ptycanthum	**black nightshade**	D,F		6643		
Solanum rostratum	**buffalo bur**	D,P		6258		
Staphyleaceae						
Staphylea trifolia	American bladdernut					
Tiliaceae						
Tilia american	**basswood**	**F**			T32S, R20E, Sec 14, NE1/4 of NW1/4	
Typhaceae						
Typha angustifolia	**narrow-leaved cattail**	W		6186		
Typha latifolia	**common cattail**	W		6185		
Ulmaceae						

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Celtis laevigata	**sugarberry**	F		5999		
Celtis occidentalis	**common hackberry**	F		3379, 6622		
Ulmus americana	**American elm**	F		6786		
Ulmus pumila	**Siberian elm**	D,F		5845		
Ulmus rubra	**slippery elm**	F		6604		
Urticaceae						
Boehmeria cylindrica	**bog hemp**	W		6598		
Laportea canadensis	**wood nettle**	F,W		6651, 6781		
Parietaria pensylvanica	Pennsylvania pellitory	F				
Pilea pumila	**clearweed**	F,W		6636, 6772		
Urtica chamaedryoides	**weak nettle**	F	/S1	6038		
Valerianaceae						
Valerianella radiata	**corn salad**	P		5969		
Verbenaceae						
Phryma leptostachya	lopseed	F				
Phyla lanceolata	**lanceleaf frogfruit**	W		6219		
Verbena bracteata	**prostrate verbena**	D,P		6160		
Verbena canadensis	**Canada verbena**	P		5976		
Verbena hastata	blue verbena	W				
Verbena simplex	**narrowleaf verbena**	P		6125		
Verbena stricta	**woolly verbena**	D,P		6256		
Verbena urticifolia	**white verbena**	F,W		6583		
Violaceae						
Hybanthus concolor	green violet	F				
Viola pedata	bird's-foot violet	P				
Viola pedatifida	**prairie violet**	P		5841, 5950		
Viola pratincola	**meadow violet**	P		5844, 5980		
Viola pubescens	**downy yellow violet**	F		5991		
Viola rafinesquii	**Johnny-jump-up**	D,P		6058		

Scientific Name	Common Name	Habitat Type	Status *Fed/State*	KBS ID #	Legal Description	Comments
Viola sagittata	**arrow-leaved violet**	P		5959, 5971		
Viola sororia	downy blue violet	F,P				
Viscaceae						
Phoradendron leucarpum	eastern mistletoe	F				
Vitaceae						
Ampelopsis arborea	pepper vine	F				
Ampelopsis cordata	**raccoon grape**	F		6207		
Parthenocissus quinquefolia	**Virginia creeper**	F			T32S, R20E, Sec15, NW1/4 of SW1/4	
Vitis cinerea	**graybark grape**	F		6531, 6777		
Vitis riparia	**riverbank grape**	F			T32S, R20E, Sec9, E1/2 of NE1/4	
Vitis vulpina	winter grape	F				
Zygophyllaceae						
Tribulus terrestris	**puncture vine**	D			T32S, R20E, Sec24, S1/2 of NW1/4	

APPENDIX F FAUNA CONFIRMED ON KSAAP AND OTHERS POTENTIALLY OCCURRING LOCALLY

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Fauna Confirmed on KSAAP and Others Potentially Occurring Locally

Federal status: E - endangered, T - threatened

State status: E - endangered; T - threatened; C - species in need of conservation, S1 - critically imperiled, S2 – imperiled, S3 - rare

Occurrence in Kansas: Y - year around resident, S - summer resident and presumed breeder, M – migrant

BOLD INDICATES CONFIRMED ON KSAAP

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
MAMMALS			
Canis latrans	**Coyote**		**Y**
Castor canadensis	**American Beaver**		**Y**
Chaetodipus hispidus	Hispid Pocket Mouse		Y
Cryptotis parva	**Least Shrew**		**Y**
Dasypus novemcinctus	**Nine-banded Armadillo**		**Y**
Didelphis virginiana	**Virginia Opossum**		**Y**
Eptesicus fuscus	Big Brown Bat		Y
Glaucomys volans	**Southern Flying Squirrel**	**/C**	**Y**
Lasiurus borealis	**Eastern Red Bat**		**S**
Lasiurus cinereus	Hoary Bat		M
Lepus californicus	Black-tailed Jack Rabbit		Y
Lynx rufus	**Bobcat**		**Y**
Marmota monax	**Woodchuck**		**Y**
Mephitis mephitis	**Striped Skunk**		**Y**
Microtus ochrogaster	**Prairie Vole**		**Y**
Microtus pinetorum	Woodland Vole		Y
Mus musculus	**House Mouse**		**Y**
Mustela frenata	Long-tailed Weasel		Y
Mustela vison	**Mink**		**Y**
Myotis lucifugus	Little Brown Myotis		Y
Neotoma floridana	**Eastern Woodrat**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Myotis lucifugus	Little Brown Myotis		Y
Neotoma floridana	**Eastern Woodrat**		**Y**
Nycticeius humeralis	Evening Bat		S
Odocoileus virginianus	**White-tailed Deer**		**Y**
Ondatra zibethicus	**Muskrat**		**Y**
Peromyscus leucopus	**White-footed Mouse**		**Y**
Peromyscus maniculatus	**Deer Mouse**		**Y**
Pipistrellus subflavus	Eastern Pipistrelle		Y
Procyon lotor	**Raccoon**		**Y**
Rattus norvegicus	**Norway Rat**		**Y**
Reithrodontomys fulvescens	Fulvous Harvest Mouse	/S2	Y
Reithrodontomys megalotis	**Western Harvest Mouse**		**Y**
Reithrodontomys montanus	**Plains Harvest Mouse**		**Y**
Scalopus aquaticus	**Eastern Mole**		**Y**
Sciurus carolinensis	**Eastern Grey Squirrel**		**Y**
Sciurus niger	**Eastern Fox Squirrel**		**Y**
Sigmodon hispidus	**Hispid Cotton Rat**		**Y**
Spermophilus tridecemlineatus	**Thirteen-lined Ground Squirrel**		**Y**
Spilogale putorius	Eastern Spotted Skunk	/T	Y
Sylvilagus floridanus	**Eastern Cottontail**		**Y**
Synaptomys cooperi	**Southern Bog Lemming**		**Y**
Tadarida brasiliensis	Brazilian Free-tailed Bat		M
Taxidea taxus	**American Badger**		**Y**
Urocyon cinereoargenteus	Common Grey Fox		Y
Vulpes vulpes	**Red Fox**		**Y**
Zapus hudsonius	Meadow Jumping Mouse		Y
BIRDS			

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Accipiter cooperii	**Cooper's Hawk**	**/S2**	**Y**
Accipiter striatus	**Sharp-shinned Hawk**	**/S1**	**M**
Actitis macularia	**Spotted Sandpiper**		**M**
Agelaius phoeniceus	**Red-winged Blackbird**		**Y**
Aix sponsa	**Wood Duck**		**S**
Ammodramus bairdii	Baird's Sparrow		M
Ammodramus caudacutus	Sharp-tailed Sparrow		M
Ammodramus henslowii	**Henslow's Sparrow**	**/C**	**M**
Ammodramus leconteii	Le Conte's Sparrow		M
Ammodramus savannarum	**Grasshopper Sparrow**		**S**
Anas acuta	**Northern Pintail**		**M**
Anas americana	**American Wigeon**		**M**
Anas clypeata	**Northern Shoveler**		**M**
Anas crecca	**Green-winged Teal**		**M**
Anas discors	**Blue-winged Teal**		**M**
Anas platyrhynchos	**Mallard**		**Y**
Anas rubripes	American Black Duck		M
Anas strepera	**Gadwall**		**M**
Anser albifronsgreater	White-fronted Goose		M
Archilochus colubris	**Ruby-throated Hummingbird**		**Y**
Ardea herodias	**Great Blue Heron**		**Y**
Asio flammeus	**Short-eared Owl**	**/S1**	**M**
Asio otus	**Long-eared Owl**	**/S2**	**M**
Aythya affinis	**Lesser Scaup**		**M**
Aythya americana	**Redhead**		**M**
Aythya collaris	**Ring-necked Duck**		**M**
Aythya marila	Greater Scaup		M
Aythya valisineria	**Canvasback**		**M**
Bartramia longicauda	**Upland Sandpiper**		**S**
Bombycilla cedrorum	**Cedar Waxwing**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Botaurus lentiginosus	**American Bittern**	**/S1**	**S**
Branta bernicla	Brant		M
Branta canadensis	**Canada Goose**		**Y**
Bubo virginianus	**Great Horned Owl**		**Y**
Bubulcus ibis	**Cattle Egret**		**S**
Bucephala albeola	**Bufflehead**		**M**
Bucephala clangula	**Common Goldeneye**		**M**
Buteo jamaicensis	**Red-tailed Hawk**		**Y**
Buteo lagopus	**Rough-legged Hawk**		**M**
Buteo lineatus	**Red-shouldered Hawk**		**Y**
Buteo platypterus	Broad-winged Hawk	/S2	M
Buteo swainsoni	**Swainson's Hawk**		**M**
Butorides striatus	**Green-backed Heron**		**S**
Calcarius lapponicus	Lapland Longspur		M
Calidris alba	Sanderling		M
Calidris alpina	Dunlin		M
Calidris bairdii	**Baird's Sandpiper**		**M**
Calidris fuscicollis	**White-rumped Sandpiper**		**M**
Calidris himantopus	Stilt Sandpiper		M
Calidris mauri	Western Sandpiper		M
Calidris melanotos	**Pectoral Sandpiper**		**M**
Calidris minutilla	Least Sandpiper		M
Calidris pusilla	Semipalmated Sandpiper		M
Caprimulgus caroinensis	**Chuck-will's-widow**		**S**
Caprimulgus vociferus	**Whip-poor-will**		**S**
Cardinalis cardinalis	**Northern Cardinal**		**Y**
Carduelis flammea	Common Redpoll		M
Carduelis pinus	Pine Siskin		M
Carduelis tristis	**American Goldfinch**		**Y**
Carpodacus purpureus	Purple Finch		M
Casmerodius albus	**Great Egret**	**/S2**	**S**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Cathartes aura	**Turkey Vulture**		**S**
Catharus fuscescens	Veery		M
Catharus guttatus	**Hermit Thrush**		**M**
Catharus minimus	**Gray-cheeked Thrush**		**M**
Catharus ustulatus	**Swainson's Thrush**		**M**
Catoptrophorus semipalmatus	**Willet**		M
Certhia Americana	**Brown Creeper**		**M**
Ceryle alcyon	**Belted Kingfisher**		**Y**
Chaetura pelagica	**Chimney Swift**		**S**
Charadrius alexandrinus	Snowy Plover	/T	M
Charadrius semipalmatus	Semipalmated Plover		M
Charadrius vociferus	**Killdeer**		**S**
Chen caerulescens	**Snow Goose**		**M**
Chen rossii	**Ross' Goose**		**M**
Chlidonias niger	Black Tern	/C	M
Chondestes grammacus	**Lark Sparrow**		S
Chordeiles minor	**Common Nighthawk**		S
Circus cyaneus	**Northern Harrier**		Y
Cistothorus platensis	**Sedge Wren**		S
Cistothrous palustris	Marsh Wren	/S1	M
Coccyzous americanus	**Yellow-billed Cuckoo**		**S**
Coccyzous erythropthamus	**Black-billed Cuckoo**		**S**
Colaptes auratus	**Northern Flicker**		**Y**
Colinus virginianus	**Northern Bobwhite**		**Y**
Columba livia	**Rock Dove**		**Y**
Contopus borealis	**Olive-sided Flycatcher**		**M**
Contopus virens	**Eastern Wood-pewee**		**S**
Corvus brachyrhynchos	**American Crow**		**Y**
Cyanocitta cristata	**Blue Jay**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Dendroica castanea	Bay-breasted Warbler		M
Dendroica cerulean	Cerulean Warbler	/C	S
Dendroica coronata	**Yellow-rumped Warbler**		**M**
Dendroica dominica	**Yellow-throated Warbler**	**/C**	**S**
Dendroica fusca	**Blackburnian Warbler**		**M**
Dendroica magnolia	**Magnolia Warbler**		**M**
Dendroica palmarum	Palm Warbler		M
Dendroica pensylvanica	**Chestnut-sided Warbler**		**M**
Dendroica petechia	**Yellow Warbler**		**S**
Dendroica striata	**Blackpoll Warbler**		**M**
Dendroica virens	**Black-throated Green Warbler**		**M**
Dolichonyx oryzivorus	Bobolink	/C	M
Dryocopus pileatus	**Pileated Woodpecker**		**Y**
Dumetella carolinensis	**Gray Catbird**		**S**
Egretta caerulea	**Little Blue Heron**	**/S3**	**S**
Egretta thula	**Snowy Egret**	**/S1**	**S**
Empidonax minimus	**Least Flycatcher**		**M**
Empidonax traillii	Willow Flycatcher		M
Empidonax virescens	**Acadian Flycatcher**		**S**
Eremophila alpestris	**Horned Lark**		**Y**
Euphagus carolinus	**Rusty Blackbird**		**M**
Euphagus cyanocephalus	**Brewer's Blackbird**		**M**
Falco columbarius	**Merlin**		**M**
Falco peregrinus	Peregrine Falcon	/E	M
Falco sparverius	**American Kestrel**		**Y**
Fulica Americana	**American Coot**		**S**
Gallinago gallinago	**Common Snipe**		**M**
Gavia immer	Common Loon		M
Geothlypis trichas	**Common Yellowthroat**		**S**
Guiraca caerulea	**Blue Grosbeak**		**S**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Haliaeetus leucocephalus	**Bald Eagle**	**T/E**	**M**
Hirundo pyrrhonota	Cliff Swallow		S
Hirundo rustica	**Barn Swallow**		**S**
Hylocichla mustelina	**Wood Thrush**		**S**
Icteria virens	**Yellow-breasted Chat**		**S**
Icterus galbula	**Northern Oriole**		**S**
Icterus spurious	**Orchard Oriole**		**S**
Ictinia mississippiensis	Mississippi Kite		M
Ixobrychus exilis	Least Bittern		S
Junco hyemalis	**Dark-eyed Junco**		**M**
Lanus excubitor	**Northern Shrike**		
Lanius ludovicianus	**Loggerhead Shrike**		**Y**
Larus argentatus	**Herring Gull**		**M**
Larus delawarensis	**Ring-billed Gull**		**M**
Larus hyperboreus	Glaucous Gull		M
Larus Philadelphia	**Bonaparte's Gull**		**M**
Larus pipixcan	**Franklin's Gull**		**M**
Laterallus jamaicensis	Black Rail	/C	M
Limnodromus scolopaceus	Long-billed Dowitcher		M
Limosa fedoa	Marbled Godwit		M
Limosa haemastica	Hudsonian Godwit		M
Lophodytes cucullatus	**Hooded Merganser**		**M**
Loxia curvirostra	Red Crossbill		M
Melanerpes carolinus	**Red-bellied Woodpecker**		**Y**
Melanerpes erythrocephalus	**Red-headed Woodpecker**		**Y**
Melanitta fusca	White-winged Scoter		M
Meleagris gallopavo	**Wild Turkey**		**Y**
Melospiza georgiana	**Swamp Sparrow**		**M**
Melospiza lincolnii	**Lincoln's Sparrow**		**M**
Melospiza melodia	**Song Sparrow**		**M**
Mergus merganser	**Common Merganser**		**M**
Mimus polyglottos	**Northern**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
	Mockingbird		
Mniotilta varia	**Black-and-white Warbler**		**S**
Molothrus ater	**Brown-headed Cowbird**		**S**
Myiarchus crinitus	**Great Crested Flycatcher**		**S**
Nyctanassa violacea	**Yellow-crowned Night-Heron**	**/S2**	**S**
Nyctea scandiaca	Snowy Owl		M
Nycticorax nycticorax	Black-crowned Night-Heron	/S2	S
Oporornis formosus	**Kentucky Warbler**		**S**
Oporornis philadelphia	Mourning Warbler		M
Otus asio	**Eastern Screech Owl**		**Y**
Oxyura jamaicensis	**Ruddy Duck**		**M**
Pandion haliaetus	**Osprey**		**M**
Parula americana	**Northern Parula**		**S**
Parus bicolor	**Tufted Titmouse**		**Y**
Parus carolinensis	**Carolina Chickadee**		**Y**
Passer domesticus	**House Sparrow**		**Y**
Passerculus sandwichensis	**Savannah Sparrow**		**M**
Passerella iliaca	**Fox Sparrow**		**M**
Passerina ciris	**Painted Bunting**		**S**
Passerina cyanea	**Indigo Bunting**		**S**
Pelecanus erythrorhynchos	**American White Pelican**		**M**
Phalacrocorax auritus	**Double-crested Cormorant**		**M**
Phalaropus lobatus	Red-necked Phalarope		M
Phalaropus tricolor	Wilson's Phalarope	/S1	M
Pheucticus ludovicianus	**Rose-breasted Grosbeak**		**S**
Picoides pubescens	**Downy Woodpecker**		**Y**
Picoides villosus	**Hairy Woodpecker**		**Y**
Pipilo erythrophthalmus	**Eastern Towhee**		**S**
Piranga olivacea	**Scarlet Tanager**		**M**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Piranga rubra	**Summer Tanager**		**S**
Pluvialis dominica	Lesser Golden Plover		M
Pluvialis squatarola	Black-bellied Plover		M
Podiceps auritus	Horned Grebe		M
Podiceps nigricollis	Eared Grebe	/S1	M
Podilymbus podiceps	**Pied-billed Grebe**		**S**
Polioptila caerulea	**Blue-gray Gnatcatcher**		**S**
Pooecetes gramineus	Vesper Sparrow		M
Porzana carolina	Sora		M
Progne subis	**Purple Martin**		**S**
Protonotaria citrea	**Prothonotary Warbler**		**S**
Quiscalus mexicanus	**Great-tailed Grackle**		**S**
Quiscalus quiscula	**Common Grackle**		**S**
Rallus elegans	King Rail		M
Rallus limicola	**Virginia Rail**		**M**
Recurvirostra americana	American Avocet	/S1	M
Regulus calendula	**Ruby-crowned Kinglet**		**M**
Regulus satrapa	Golden-crowned Kinglet		M
Riparia riparia	Bank Swallow		S
Sayornis phoebe	**Eastern Phoebe**		**S**
Scolopax minor	**American Woodcock**		**S**
Seiurus aurocapillus	**Ovenbird**	**/S1**	**M**
Seiurus motacilla	**Louisiana Waterthrush**		**S**
Seiurus noveboracensis	Northern Waterthrush		M
Setophaga ruticilla	**American Redstart**		**M**
Sialia sialis	**Eastern Bluebird**		**S**
Sitta canadensis	**Red-breasted Nuthatch**		**M**
Sitta carolinensis	**White-breasted Nuthatch**		**Y**
Sphyrapicus varius	**Yellow-bellied**		**M**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
	Sapsucker		
Spiza americana	**Dickcissel**		**S**
Spizella arborea	**American Tree Sparrow**		**M**
Spizella pallida	Clay-colored Sparrow		M
Spizella passerina	**Chipping Sparrow**		**S**
Spizella pusilla	**Field Sparrow**		**S**
Stelgidopteryx serripennis	**Northern Rough-winged Swallow**		**S**
Sterna antillarum	Least Tern	/S1	M
Sterna caspia	Caspian Tern		M
Sterna forsteri	Forster's Tern	/S1	M
Strix varia	**Barred Owl**		**Y**
Sturnella magna	**Eastern Meadowlark**		**Y**
Sturnella neglecta	Western Meadowlark		M
Sturnus vulgaris	**European Starling**		**Y**
Thryomanes bewicki	**Bewick's Wren**		**S**
Thryothrous ludovicianus	**Carolina Wren**		**Y**
Toxostoma rufum	**Brown Thrasher**		**S**
Tringa flavipes	**Lesser Yellowlegs**		**M**
Tringa melanoleuca	**Greater Yellowlegs**		**M**
Tringa solitaria	**Solitary Sandpiper**		**M**
Troglodytes aedon	**House Wren**		**S**
Troglodytes troglodytes	Winter Wren		M
Tryngites subruficollis	Buff-breasted Sandpiper		M
Turdus migratorius	**American Robin**		**Y**
Tympanuchus cupido	Greater Prairie Chicken		Y
Tyrannus forficatus	**Scissor-tailed Flycatcher**		**S**
Tyrannus tyrannus	**Western Kingbird**		**S**
Tyrannus vericalis	**Eastern Kingbird**		**S**
Tyto alba	Barn Owl		Y
Vermivora celata	Orange-crowned Warbler		M

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Vermivora chrysoptera	Golden-winged Warbler		M
Vermivora peregrina	**Tennessee Warbler**		**M**
Vermivora pinus	Blue-winged Warbler		M
Vermivora ruficapilla	Nashville Warbler		M
Vireo bellii	**Bell's Vireo**		**S**
Vireo flavifrons	**Yellow-throated Vireo**		**M**
Vireo gilvus	**Warbling Vireo**		**S**
Vireo griseus	**White-eyed Vireo**	**/S2**	**S**
Vireo olivaceus	**Red-eyed Vireo**		**S**
Vireo philadelphicus	Philadelphia Vireo		M
Vireo solitarius	**Solitary Vireo**		**M**
Wilsonia canadensis	Canada Warbler		M
Wilsonia citrina	Hooded Warbler		M
Wilsonia pusilla	Wilson's Warbler		M
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		M
Xema sabini	Sabine's Gull		M
Zenaida Macroura	**Mourning Dove**		**S**
Zonotrichia albicollis	**White-throated Sparrow**		**M**
Zonotrichia leucophrys	**White-crowned Sparrow**		**M**
Zonotrichia querula	**Harris' Sparrow**		**M**
REPTILES			
Agkistrodon contortrix	Copperhead		Y
Apalone spinifera	**Spiny Softshell**		**Y**
Carphophis amoenus	**Worm Snake**		**Y**
Chelydra serpentina	**Snapping Turtle**		**Y**
Chrysemys picta	**Painted Turtle**		**Y**
Cnemidophorus sexlineatus	**Six-lined Racerunner**		**Y**
Coluber constrictor	**Racer**		**Y**
Crotalus horridus	Timber Rattlesnake		Y
Crotaphytus collaris	Collared Lizard		Y

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Diadophis punctatus	**Ringneck Snake**		**Y**
Elaphe emoryi	**Great Plains Rat Snake**		**Y**
Elaphe obsoleta	**Rat Snake**		**Y**
Eumeces anthracinus	Coal Skink		Y
Eumeces fasciatus	**Five-lined Skink**		**Y**
Eumeces obsoletus	**Great Plains Skink**		**Y**
Graptemys ouachitensis	**Ouachita Map Turtle**		**Y**
Graptemys pseudogeographica	**False Map Turtle**	**/S2**	**Y**
Heterodon platirhinos	Eastern Hognose Snake	/C	Y
Lampropeltis calligaster	**Prairie Kingsnake**		**Y**
Lampropeltis getula	**Common Kingsnake**		**Y**
Lampropeltis triangulum	Milk Snake		Y
Macroclemys temminckii	Alligator Snapping Turtle	/C	Y
Nerodia erythrogaster	**Plainbelly Water Snake**		**Y**
Nerodia rhombifer	Diamondback Water Snake		Y
Nerodia sipedon	**Northern Water Snake**		**Y**
Opheodrys aestivus	**Rough Green Snake**		**Y**
Ophisaurus attenuatus	**Slender Glass Lizard**		**Y**
Pituophis melanoleucus	**Gopher Snake**		**Y**
Pseudemys concinna	**River Cooter**		**Y**
Regina grahamii	**Graham's Crayfish Snake**		**Y**
Sceloporus undulatus	Eastern Fence Lizard		Y
Scincella lateralis	Ground Skink		Y
Sistrurus catenatus	Massasauga		Y
Sonora semiannulata	Ground Snake		Y
Storeria dekayi	**Brown Snake**		**Y**
Storeria	Redbelly Snake	/T	Y

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
occipitomaculata			
Tantilla gracilis	Flathead Snake		Y
Terrapene carolina	**Eastern Box Turtle**		**Y**
Terrapene ornata	**Western Box Turtle**		**Y**
Thamnophis proximus	Western Ribbon Snake		Y
Thamnophis sirtalis	**Common Garter Snake**		**Y**
Trachemys scripta	**Slider**		
Tropidoclonion lineatum	Lined Snake		Y
Virginia striatula	Rough Earth Snake	/C	Y
AMPHIBIANS			
Acris crepitans	**Northern Cricket Frog**		**Y**
Ambystoma texanum	**Smallmouth Salamander**		**Y**
Ambystoma tigrinum	Tiger Salamander		Y
Bufo americanus	**American Toad**		**Y**
Bufo woodhousei	Woodhouse's Toad		Y
Gastrophryne olivacea	**Great Plains Narrowmouth Toad**		**Y**
Hyla chrysoscelis	**Cope's Gray Treefrog**		**Y**
Hyla versicolor	Eastern Gray Treefrog		Y
Necturus maculosus	Mudpuppy		Y
Pseudacris triseriata	**Western Chorus Frog**		**Y**
Rana areolata	**Crawfish Frog**	**/C**	**Y**
Rana blairi	Plains Leopard Frog		Y
Rana catesbeiana	**Bullfrog**		**Y**
Rana sphenocephala	**Southern Leopard Frog**		**Y**
FISH			
Ameiurus melas	**Black Bullhead**		**Y**
Ameiurus natalis	**Yellow Bullhead**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Aplodinotus grunniens	**Freshwater Drum**		**Y**
Campostoma anomalum	**Central Stoneroller**		**Y**
Carassius auratus	Goldfish		Y
Carpiodes carpio	**River Carpsucker**		**Y**
Ctenopharyngodon idella	**Grass Carp**		**Y**
Cycleptus elongatus	Blue Sucker	/C	Y
Cyprinella camura	Bluntface Shiner		Y
Cyprinella lutrensis	**Red Shiner**		**Y**
Cyprinus carpio	**Common Carp**		**Y**
Dorosoma cepedianum	**Gizzard Shad**		**Y**
Erimystax xpunctatus	Gravel Chub	/C	Y
Etheostoma chlorosomum	Bluntnose Darter	/C	Y
Etheostoma flabellare	Fantail Darter		Y
Etheostoma gracile	Slough Darter	/C	Y
Etheostoma spectabile	**Orangethroat Darter**		**Y**
Etheostoma whipplei	**Redfin Darter**		**Y**
Etheostoma zonale	Banded Darter	/C	Y
Fundulus notatus	**Blackstripe Topminnow**		**Y**
Gambusia affinis	**Western Mosquitofish**		**Y**
Ictalurus furcatus	Blue Catfish		Y
Ictalurus punctatus	**Channel Catfish**		**Y**
Ictiobus bubalus	**Smallmouth Buffalo**		**Y**
Ictiobus cyprinellus	Bigmouth Buffalo		Y
Ictiobus niger	Black Buffalo		Y
Labidesthes sicculus	**Brook Silverside**		**Y**
Lepisosteus oculatus	**Spotted Gar**	**/S1**	**Y**
Lepisosteus osseus	**Longnose Gar**		**Y**
Lepisosteus platostomus	Shortnose Gar		Y
Lepomis cyanellus	**Green Sunfish**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Lepomis gulosus	**Warmouth**		**Y**
Lepomis humilis	**Orangespotted Sunfish**		**Y**
Lepomis macrochirus	**Bluegill**		**Y**
Lepomis megalotis	**Longear Sunfish**		**Y**
Lythrurus umbratilis	**Redfin Shiner**		**Y**
Macrhybopsis storeriana	Silver Chub		Y
Micropterus dolomieu	Smallmouth Bass		Y
Micropterus punctulatus	**Spotted Bass**		**Y**
Micropterus salmoides	**Largemouth Bass**		**Y**
Minytrema melanops	**Spotted Sucker**	**/C**	**Y**
Morone chrysops	White Bass		Y
Moxostoma carinatum	River Redhorse	/C	Y
Moxostoma erythrurum	Golden Redhorse		Y
Moxostoma macrolepidotum	**Shorthead Redhorse**		**Y**
Notemigonus crysoleucas	**Golden Shiner**		**Y**
Notropis atherinoides	Emerald Shiner		Y
Notropis buchanani	**Ghost Shiner**		**Y**
Notropis rubellus	Rosyface Shiner		Y
Notropis stramineus	Sand Shiner		Y
Notropis volucellus	Mimic Shiner		Y
Noturus flavus	**Stonecat**		**Y**
Noturus miurus	Brindled Madtom		Y
Noturus nocturnus	**Freckled Madtom**		**Y**
Noturus placidus	Neosho Madtom	T/T	Y
Perca flavescens	Yellow Perch		Y
Percina caprodes	**Logperch**		**Y**
Percina phoxocephala	**Slenderhead Darter**		**Y**
Percina shumardi	River Darter	/C	Y
Phenacobius mirabilis	**Suckermouth Minnow**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Pimephales notatus	**Bluntnose Minnow**		**Y**
Pimephales promelas	Fathead Minnow		Y
Pimephales tenellus	**Slim Minnow**		**Y**
Pimephales vigilax	**Bullhead Minnow**		**Y**
Polyodon spathula	Paddlefish		Y
Pomoxis annularis	**White Crappie**		**Y**
Pomoxis nigromaculatus	**Black Crappie**		**Y**
Pylodictis olivaris	**Flathead Catfish**		**Y**
Semotilus atromaculatus	Creek Chub		Y
Stizostedion vitreum	Walleye		Y
MUSSELS			
Amblema plicata	**Threeridge**		**Y**
Ellipsaria lineolata	**Butterfly**	**/T**	**Y**
Elliptio dilatata	Spike		Y
Fusconaia flava	**Wabash Pigtoe**		**Y**
Lampsilis cardium	**Plain Pocketbook**		**Y**
Lampsilis rafinesqueana	Neosho Mucket	/E	Y
Lampsilis teres	**Yellow Sandshell**	**/C**	**Y**
Lasmigona complanata	**White Heel-splitter**		**Y**
Leptodea fragilis	**Fragile Papershell**		**Y**
Ligumia recta	Black Sandshell		Y
Ligumia subrostrata	**Common Pond Mussel**		**Y**
Megalonaias nervosa	**Washboard**	**/C**	**Y**
Obliquaria reflexa	**Three-horned**		**Y**
Pleurobema coccineum	**Round Pigtoe**	**/C**	**Y**
Potamilus ohiensis	**Pink Papershell**		**Y**
Potamilus purpuratus	**Bleufer**		**Y**
*Ptychobranchus occidentalis**	Ouachita Kidneyshell	/T	Y
Pyganodon grandis	**Giant Floater**		**Y**

Scientific Name	Common Name	Status *(Federal/State)*	Occurrence
Quadrula metanerva	**Monkeyface**		**Y**
Quadrula nodulata	**Wartyback**		**Y**
Quadrula pustulosa	**Pimpleback**		**Y**
Quadrula quadrula	**Mapleleaf**		**Y**
Tritogonia verrucosa	**Pistolgrip**		**Y**
Truncilla donaciformis	**Fawnsfoot**	**/C**	**Y**
Truncilla truncata	Deertoe		Y

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APPENDIX G ECONOMIC IMPACT FORECAST SYSTEM (EIFS) – MODELING RESULTS

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Economic Impact Forecast System (EIFS) – Modeling Results

The EIFS Model

The primary metric used to determine significance of changes in socioeconomic activity under the two reuse intensity scenarios at KSAAP is the U.S. Army's Economic Impact Forecast System (EIFS) model. The basis of the EIFS's analytical capabilities is the calculation of multipliers that are used to estimate the impacts resulting from Army-related changes in local expenditures or employment. In calculating the multipliers, EIFS uses the economic base model approach, which relies on the ratio of total economic activity to basic economic activity. Basic economic activity, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to base income is measurable and sufficiently stable so that future changes in economic activity can be forecasted. This technique is especially appropriate for estimating aggregate impacts and makes the economic base model ideal for the estimation and analysis of sustainability thresholds.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its base sector; for instance, a dollar increase in local expenditures due to an expansion of its military installation. EIFS estimates its multipliers using a location quotient approach based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The user inputs into the model the data elements that describe the Army action: the change in expenditures; change in civilian or military employment; average annual income of affected citizens or military employees; percent of civilians expected to relocate due to the Army's action; and percent of the military living on-post. From these inputs, the EIFS model provides projected changes in sales volume, income, employment, and population in the local economy. These variables are then used to measure and evaluate projected socioeconomic impacts. Sales volume is the direct and indirect change in local business activity and sales (total retail and wholesale trade sales, total selected service receipts, and value-added by manufacturing). Employment is the total change in local employment due to the proposed action, including not only the direct and secondary changes in local employment, but also those personnel who are initially affected by the military action. Income is the total change in local wages and salaries due to the proposed action, which includes the sum of the direct and indirect wages and salaries, plus the income of the civilian and military personnel affected by the proposed action. Population is the increase or decrease in the local population as a result of the proposed action.

Evaluation of Socioeconomic Impacts

Once EIFS model projections are obtained, the Rational Threshold Values (RTV) profile allows evaluation of the context and intensity of the impacts. The RTV profile reviews the historical trends for the defined region, based on U.S. Census data, and develops measures of local

historical fluctuations in sales volumes, employment, income, and population. These evaluations indicate the intensity of the positive and negative changes of a project.

The RTV provides boundaries (threshold values) to assess the magnitude of an action's impacts. The largest historical changes (both increases and decreases) define the boundaries. These values thus provide a basis for comparing an action's impact to the historical fluctuations in a particular area. As such, the assignment of thresholds is made on a region-specific basis. Specifically, EIFS sets the boundaries by multiplying the maximum historical deviation of the following variables:

	Increase	Decrease
Sales Volume	100%	75%
Income	100%	67%
Employment	100%	67%
Population	100%	50%

The percentage allowances are arbitrary but sensible. The maximum positive historical fluctuation is allowed with expansion because of the positive connotations of economic growth. While cases of damaging economic growth have been cited, and although the zero-growth concept is being accepted by many local planning groups, the effects of reductions and closures are generally more controversial than those of expansions.

The major strengths of the RTV criteria are its specificity to the region under analysis and its basis on actual historical time-series data for the defined region. The EIFS impact model, in combination with the RTV, has proven successful in addressing perceived socioeconomic impacts. The EIFS model and the RTV technique for measuring significance are theoretically sound and have been reviewed on numerous occasions.

The severity of conceivable impacts accelerates in the following order: total sales volume, total personal income, total employment, and total population. Sales volume impacts may be alleviated by manipulation of variables such as inventory and new equipment. Impacts on workers or proprietors are not easily or immediately assessed. Changes in employment and income are of primary interest. Employment and income impacts are followed by changes in personal income, directly affecting individuals within the region. Population threshold indicators are extremely important because they reflect the effects on local government revenues, housing, education, infrastructure, and other social services. They should be weighted accordingly.

Calculation of Model Input Parameters

The following presents the calculations and assumptions made in determining input parameters for the EIFS analysis for the closure of KSAAP. These statistics were derived to reflect a reasonable maximum year change in economic activity over the 20 year build-out period. Thus, these estimates are considered to exceed the "average" annual change in economic activity, but are well below the cumulative 20-year effect, as EIFS is based on an assessment of annual changes in economic activity.

Change in Local Expenditures: Data on KSAAP 2005 local expenditures and conservative assumptions were used to estimate the potential change in local expenditures in the ROI for each of the reuse scenarios for a maximum annual change in expenditures (e.g., initiation of a large, multi-year construction project averaged over a three year period, along with the simultaneous initiation of one to three large DZI-sized facility operations, both purchasing 25 to 75 percent of required goods and services within the ROI). The reuse scenarios reasonably and conservatively estimate an upper-bound projection that is commensurate with over two times the annual average growth over the 20-year build out period. The scenarios also reflect at the same time a large construction project initiated on the site, with purchasing 50 percent of the construction-related goods and services within the ROI. Specifically, the MLIR scenario conservatively assumes that three DZI-sized operations (approximately $3 million each) come on-line simultaneously in the same year and purchase 5 times the goods and services that DZI currently purchases within the ROI. DZI currently purchases about 5 percent of their goods and services within the ROI, so it is conservatively estimated that the new operations will purchase 25 percent of their goods and services from the ROI. In addition, it is assumed that at the same time a $100 million construction project, phased over three years, is initiated and that 50 percent of construction-related goods and services are purchased within the ROI (To determine the EIFS input, the three DZI-sized operations were calculated as $3,000,000*0.25*3 and combined with the amount expected from the larger construction project calculated as [$100,000,000/3]*0.50 to conclude that the MLIR scenario will conservatively result in approximately $20 million in expenditures during a year of maximum economic growth). The LIR scenario assumes that one DZI-sized operation will come on-line in a given year ($3,000,000*0.25*1), and that a $50 million construction project will be phased over three years in the same time period, with a conservative estimate of 50 percent of construction-related goods and services purchased within the ROI ([$50,000,000/3]*0.50). The projects assumed under LIR would result in approximately $10 million in expenditures.

Change in Civilian Employment: Civilian employment includes both civilian and government contractor jobs on KSAAP. Job losses from KSAAP closure reflect the change in civilian employment under Caretaker Status. Reuse scenario employment projections were used to arrive at changes in civilian employment over the 20-year phased build-out period. Conservative assumptions were used to estimate the maximum annual change in employment, in consideration of both short-term construction activities and redevelopment intensity. These figures represent the net increase in a maximum year in consideration that DZI operations would likely continue as is under either baseline conditions or under reuse. The employment

projections are commensurate with the assumptions previously discussed above for the MLIR and LIR scenarios.

Average Income of Affected Civilians: Average wage was estimated according to the lost jobs at KSAAP. For the 20-year phased build-out reuse scenarios and the year(s) of maximum economic change, model input of $28,100 was used as the broadly representative average wage.

Percent Expected to Relocate: The percent expected to relocate is uncertain. For the model runs for the 20-year phased build-out, 50 percent were conservatively assumed to relocate, given the level of unemployment and work force in the ROI.

Change in Military Employment: According to installation data, KSAAP will lose eight military jobs with the base closure.

Average Income of Affected Military: According to data provided by DZI employment and income data, average wages for KSAAP military staff was $70,800.

Percent of Military Living on Post: There are no housing facilities on KSAAP.

EIFS REPORT

PROJECT NAME

KSAAP 2005 BRAC Caretaker Status

STUDY AREA

20021 Cherokee, KS
20037 Crawford, KS
20099 Labette, KS
20125 Montgomery, KS
20133 Neosho, KS

FORECAST INPUT

Change In Local Expenditures	($100,000)
Change In Civilian Employment	-282
Average Income of Affected Civilian	$28,100
Percent Expected to Relocate	50
Change In Military Employment	-8
Average Income of Affected Military	$70,800
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	2.58	
Income Multiplier	2.58	
Sales Volume - Direct	($6,709,267)	
Sales Volume - Induced	($10,600,640)	
Sales Volume - Total	($17,309,910)	-0.54%
Income - Direct	($8,502,049)	
Income - Induced)	($1,981,725)	
Income - Total(place of work)	($10,483,770)	-0.4%
Employment - Direct	-328	
Employment - Induced	-59	
Employment - Total	-387	-0.49%
Local Population	-371	
Local Off-base Population	-371	-0.27%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	7.96 %	7.3 %	3.43 %	2.2 %
Negative RTV	-6.8 %	-7.3 %	-3.61 %	-0.62 %

EIFS REPORT

PROJECT NAME

KSAAP Maximum Economic Change Year LIR

STUDY AREA

20021 Cherokee, KS
20037 Crawford, KS
20099 Labette, KS
20125 Montgomery, KS
20133 Neosho, KS

FORECAST INPUT

Change In Local Expenditures	$10,000,000
Change In Civilian Employment	500
Average Income of Affected Civilian	$28,100
Percent Expected to Relocate	50
Change In Military Employment	-8
Average Income of Affected Military	$70,800
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	2.58	
Income Multiplier	2.58	
Sales Volume - Direct	$17,143,260	
Sales Volume - Induced	$27,086,350	
Sales Volume - Total	$44,229,610	1.38%
Income - Direct	$14,628,450	
Income - Induced)	$5,063,628	
Income - Total(place of work)	$19,692,080	0.75%
Employment - Direct	588	
Employment - Induced	151	
Employment - Total	739	0.93%
Local Population	603	
Local Off-base Population	603	0.44%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	7.96 %	7.3 %	3.43 %	2.2 %
Negative RTV	-6.8 %	-7.3 %	-3.61 %	-0.62 %

EIFS REPORT

PROJECT NAME

KSAAP Maximum Economic Change Year MLIR

STUDY AREA

20021 Cherokee, KS
20037 Crawford, KS
20099 Labette, KS
20125 Montgomery, KS
20133 Neosho, KS

FORECAST INPUT

Change In Local Expenditures	$20,000,000
Change In Civilian Employment	1100
Average Income of Affected Civilian	$28,100
Percent Expected to Relocate	50
Change In Military Employment	-8
Average Income of Affected Military	$70,800

FORECAST OUTPUT

Percent of Military Living On-post		0
Employment Multiplier	2.58	
Income Multiplier	2.58	
Sales Volume - Direct	$36,822,740	
Sales Volume - Induced	$58,179,920	
Sales Volume - Total	$95,002,650	2.96%
Income - Direct	$32,633,300	
Income - Induced)	$10,876,380	
Income - Total(place of work)	$43,509,680	1.67%
Employment - Direct	1298	
Employment - Induced	325	
Employment - Total	1623	2.05%
Local Population	1350	
Local Off-base Population	1350	0.98%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	7.96 %	7.3 %	3.43 %	2.2 %
Negative RTV	-6.8 %	-7.3 %	-3.61 %	-0.62 %

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