FINDING OF NO SIGNIFICANT IMPACT

FOR THE

ENVIRONMENTAL ASSESSMENT

ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD AT KIRTLAND AIR FORCE BASE, NEW MEXICO

JANUARY 2011

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FOR CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Introduction

The U.S. Air Force (USAF) prepared an Environmental Assessment (EA), *Environmental Assessment Addressing Construction, Operation, and Maintenance of a Hot Cargo Pad at Kirtland Air Force Base, New Mexico*, to identify and evaluate potential environmental effects from construction, operation, and maintenance of a hot cargo pad at Kirtland Air Force Base (AFB), New Mexico. The USAF prepared the EA in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] Section 4321–4347) and the Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508).

1. Description of Proposed Action and Alternatives

The USAF proposes to construct, operate, and maintain a hot cargo pad at Kirtland AFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5). Other components of the Proposed Action include construction of a new taxiway to the proposed hot cargo pad; replacement of the deteriorating taxiway to Pad 5; addition of new and relocation of existing anti-ram barriers, defensive fighting positions, and personal shelters surrounding the proposed hot cargo pad and Pad 5; addition of new lighting at the proposed hot cargo pad and Pad 5; and removal of existing lighting at Pad 5. In addition to the Proposed Action, the No Action Alternative of not constructing, operating, and maintaining a hot cargo pad was analyzed in the EA.

2. Environmental Analysis

Based on the analysis contained in the *Environmental Assessment Addressing Construction, Operation, and Maintenance of a Hot Cargo Pad at Kirtland Air Force Base, New Mexico*, which is attached and herewith incorporated by reference, the USAF has determined that the Proposed Action has the potential to result in less-than-significant adverse environmental impacts. The following summarizes the results of the EA.

Land Use. The Proposed Action would not require changes to be made to existing installation land use designations, nor would it preclude the viability of existing land uses, or the continued use and occupation of areas surrounding the proposed hot cargo pad site. The Proposed Action would also be consistent with the *2002 Kirtland Air Force Base, New Mexico General Plan*, and would not result in impacts on municipal land use plans or policies. However, construction and operation of the proposed taxiway and repair of the exiting taxiway would be within the Clear Zone and Accident Potential Zone (APZ) I for Runway 26 at the Albuquerque International Sunport. The Proposed Action would also be within the 1,250-foot quantity-distance (QD) arc for Pad 5. While the Proposed Action would be consistent with regulations associated with the Clear Zone and APZ I and the QD arc, its presence within these areas would result in less than significant impacts on land use compatibility from safety issues related to proximity to an airport and QD arcs.

Noise. Noise generation under the Proposed Action would occur during demolition and construction activities, lasting only for the duration of the activities and isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). The noise levels produced by demolition and construction activities are expected to be similar; however, noise resulting from construction would last longer. The proposed hot cargo pad is within the day-night average sound level (DNL) 65 to 69 A-weighted decibel (dBA) noise contours and the proposed taxiway is within the DNL 70 to 74 dBA noise contours from aircraft operations at Albuquerque International Sunport; therefore, populations within and adjacent to the Proposed Action site are accustomed to noise levels up to 90 dBA. Operation of the Proposed Action would not change the noise environment from existing conditions because the proposed and existing hot cargo pads would not be used simultaneously. The Proposed Action would result in impacts on the noise environment associated with demolition and construction activities; however, these impacts would be expected to be less than significant.

Visual Resources. Demolition and construction activities would result in a temporary impact on the installation's overall aesthetic appeal at the proposed hot cargo pad site; however, the impacts would be less than significant. Demolition and construction wastes and construction materials would be visible at the site, as well as other areas of the installation and off-installation during transport. Operation of the proposed hot cargo pad would result in adverse change to the visual condition of the site; however, this change would be negligible because it would be consistent with the existing visual conditions due to the proposed pad's location adjacent to the existing hot cargo pad. Installation of and improvement to lighting at the proposed hot cargo pad would enhance the aesthetic appearance of the area. Therefore, the Proposed Action would result in a beneficial impact on visual resources.

Air Quality. Demolition and construction activities under the Proposed Action would result in impacts on air quality; however, these impacts are expected to be less than significant. Air quality impacts during construction and demolition would result primarily from ground-disturbing activities and operation of construction equipment. All emissions associated with demolition and construction operations would be temporary in nature. There would be no operational emissions from the Proposed Action because there would be no new hot cargo missions and no change to the quantity of aircraft that utilize the proposed or existing hot cargo pad. The Proposed Action would have negligible contribution towards the New Mexico statewide greenhouse gas inventory.

Implementation of the Proposed Action would result in temporary impacts from slightly elevated air pollutant concentrations. The Proposed Action would generate emissions below 10 percent of the emissions inventory for the Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region and the emissions would be short-term. However, Kirtland AFB is in attainment for all criteria pollutants and the Proposed Action would only generate a slight increase in air pollutant concentration. The demolition and construction activities associated with the Proposed Action would not have significant effects on air quality at Kirtland AFB or on regional or local air quality.

Geology and Soils. Under the Proposed Action, no significant impacts on geological resources or soils would be expected. The proposed demolition and construction activities would occur on previously disturbed and undisturbed land, and compliance with a sediment-and-erosion-control plan and use of best management practices (BMPs) during these activities would minimize any potential soil erosion and sedimentation. Loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns; however, use of storm water control measures and other BMPs would minimize the long-term potential for erosion and sediment production as a result of future storm events. Because the proposed hot cargo pad site has been previously disturbed, it is anticipated that implementation of the Proposed Action would not result in a significant impact on soil erosion and sedimentation. No impacts from geologic hazards would be expected.

Water Resources. The Proposed Action would create ground disturbance on a small scale, which could, in turn, increase erosion potential and runoff during heavy precipitation events. Implementation of BMPs and post-construction restabilization and revegetation would reduce erosion potential and runoff;

therefore, adverse effects on surface waters would be less than significant. Design of the proposed hot cargo pad would include storm water control; therefore, no long-term adverse effects on water resources from sheet runoff during storm events would be expected.

Less-than-significant adverse impacts on water quality would be expected from implementation of the Proposed Action. BMPs would be implemented to protect against potential petroleum or hazardous materials spills from demolition and construction equipment. In the event of a spill, procedures outlined in Kirtland AFB's Hazardous Material Emergency Planning and Response Plan would be followed to quickly contain and clean up the spill. Less-than-significant impacts on floodplains would be expected because the proposed hot cargo pad site is outside of the 100-year floodplain of the Tijeras Arroyo and the Arroyo del Coyote. Less-than-significant impacts on groundwater availability could occur if groundwater is used for dust suppression.

Biological Resources. Implementation of the Proposed Action would not result in significant impacts on vegetation because the site of the Proposed Action has been previously disturbed and consists of minimal vegetation. Prairie dog colonies exist north and east of the proposed hot cargo pad site. Noise created during demolition and construction activities and increased lighting could result in adverse effects on nearby wildlife and migrating birds, respectively; however, these impacts on wildlife species and habitat are expected to be less than significant. The burrowing owl *(Athene cunicularia)* is the only species of concern in the vicinity of the Proposed Action; three burrowing owl nesting locations have been observed near the proposed hot cargo pad and taxiway and the within the quantity distances arcs for the existing and proposed pads. At least one of these nests could be disturbed during demolition or construction activities. Surveys would be conducted prior to commencement of ground-disturbing activities, and if owls are present, ground disturbing demolition and construction activities would only commence after the owls have left from the area and nesting burrows would be flagged for avoidance. Compliance with these procedures would mean that any impacts on burrowing owls would be expected to be less than significant. No wetlands are found within the footprint of the proposed hot cargo pad site.

Cultural Resources. No cultural resources are known to be present within the proposed hot cargo pad site; therefore, no effects on cultural resources would be expected under the Proposed Action.

Infrastructure. The Proposed Action would result in less-than-significant impacts on electrical and water supply systems. Demolition and construction activities would require minimal amounts of electricity and water. Interruptions of service from these systems might be expected during demolition and construction; however, these interruptions would be temporary and short-lived. The demand for electrical power and water would negligibly increase during operation of the proposed hot cargo pad. The Proposed Action would have less-than-significant impacts on storm water systems due to the increase in storm water runoff from soil erosion and sediment production during demolition and construction activities, and the increase of impervious surfaces from the presence of the proposed hot cargo pad and taxiway. BMPs would be employed during construction and operation of the Proposed Action to minimize effects on the storm water system. A temporary increase in demand on the solid waste management system would occur during demolition and construction activities; however, this demand is not expected to overburden the system and no significant impacts would be expected. Implementation of the Proposed Action would not result in any impacts on natural gas systems, liquid fuels, central heating and cooling systems, sanitary sewer and wastewater systems, and communications systems.

Hazardous Materials and Waste. No impacts on hazardous materials management would be expected during the Proposed Action. Petroleum products would be used by construction equipment; however, no new chemicals or toxic substances would be used or stored at the installation. No significant impacts would be expected from the generation of hazardous and wastes during demolition and construction activities. It is anticipated that the quantity of hazardous wastes generated would be negligible, and would be properly disposed of. BMPs would be used to ensure that contamination from a spill would not occur. No impacts on hazardous materials management or hazardous wastes would be expected from the operation and maintenance of the proposed hot cargo pad because it would not result in an increase in the type or quantity of hot cargo missions.

The proposed hot cargo pad would overlap onto a small portion (likely less than 0.5 acres) of Environmental Restoration Program (ERP) Site WP-26, and would require setting some of the monitoring wells associated with the ERP site flush with the cement ground surface of the pad. The surface sludge at WP-26 is currently being removed, which would alleviate any potential adverse effects on the environment and human health from soil contamination. Therefore, construction activities would result in impacts on the ERP site; however, these impacts would be expected to be less than significant. No significant impacts on the ERP site would be expected from the operation and maintenance of the proposed hot cargo pad because the remaining contamination is primarily in the soil vapor and groundwater.

While an incremental increase in hazardous materials and wastes would be expected from the Proposed Action, adherence to the Pollution Prevention Program and associated plans and use of BMPs would ensure adverse impacts are less than significant. No impacts related to asbestos-containing material, lead-based paint, or polychlorinated biphenyls would be expected as a result of the Proposed Action.

Safety. Demolition and construction activities conducted at Kirtland AFB under the Proposed Action would result in effects on contractor safety; however, these effects are expected to be less than significant due to implementation of effective health and safety programs. No effects are anticipated on military personnel or the public during construction or operation of the Proposed Action. Although access to the proposed hot cargo pad site is normally limited to authorized personnel, all work areas would be fenced and appropriate signs posted to reduce risks to installation personnel and the public. Construction and operation of the Proposed Action would include work within the QD arc of Pad 5 and establishment of a QD arc, respectively. Compliance with USAF explosives safety regulations during construction and creation of the new QD arc would result in less than significant impacts on explosives and munitions safety.

Aircraft Safety. Design and construction of the proposed hot cargo pad in accordance with USAF explosives safety standards would be expected to lessen the aircraft safety concerns associated with the current hot cargo mission (e.g., foreign object damage, aircraft tire-cut potential, and insufficient lighting) to negligible levels. Therefore, operation of the proposed pad would be expected to have a less-than-significant beneficial impact on aircraft safety. The proposed hot cargo pad would be used in conjunction with Pad 5 to ensure that critical hot cargo missions continue unimpeded, thereby improving the ability to schedule and complete hot cargo missions, which would be expected to have a less-than-significant beneficial impact on aircraft safety. Operation of the proposed pad would have an inherent low risk level, which would result in less-than-significant, adverse impacts. However, the probability of an aircraft mishap from operation of the proposed hot cargo pad is expected to be Level E: Unlikely. A no-fly zone would be enforced over the proposed hot cargo pad. Adherence to USAF policy on explosives safety, as well as design and safety standards would also be expected to lessen the probability of an aircraft mishap.

Socioeconomics and Environmental Justice. Less-than-significant impacts would be expected on socioeconomics and environmental justice. The number of new residents who move to the Albuquerque area as a result of the Proposed Action would be negligible. Relocation of workers required for demolition and construction activities would not be necessary, and no new staff is anticipated to be hired or transferred to Kirtland AFB for operation of the proposed hot cargo pad. Demolition and construction activities would result in indirect beneficial impacts from the increase in payroll tax revenues, purchase of materials, and purchases of goods and services in the local area. No impacts would result on the facilities (e.g., housing and transportation) required for workers at Kirtland AFB. The Proposed Action would not negatively impact minority populations or children as demolition and construction activities would be concentrated at Kirtland AFB.

BMPs/Mitigation. BMPs for the Proposed Action are discussed throughout the EA. Potential demolition and construction BMPs include fencing off work areas, protecting storm water inlets in the project area with hay bales and sand bags to prevent sediment from entering local waterways, and implementing measures to protect against potential petroleum and hazardous materials releases. BMPs that would be implemented after construction include revegetating and restabilizing the post-construction site and implementing storm water control measures favoring reinfiltration to prevent long-term soil erosion and minimize runoff.

3. Regulations

The Proposed Action would not violate NEPA; CEQ regulations; or any other Federal, state, or local environmental regulations.

4. Commitment to Implementation

The USAF affirms their commitment to implement this Proposed Action in accordance with NEPA. Implementation is dependent on funding. The USAF would ensure that adequate funds are requested in future years' budgets to achieve the goals and objectives set forth in this EA.

5. Public Review and Comment

The Draft EA was available for public review and comment from 5 September 2010 to 4 October 2010 at Central New Mexico Community College, Montoya Library, 4700 Morris NE, Albuquerque, New Mexico 87102 and Kirtland AFB Library, Building 20204, Kirtland AFB, New Mexico 87117, as well as http://www.kirtland.af.mil/. No comments from the general public were received during this review period. Two comments were received from agencies (Albuquerque Environmental Health Department Air Quality Division and New Mexico Department of Game and Fish) and their comments were incorporated into the analysis of potential environmental impacts performed as part of this EA, where applicable.

6. Finding of No Significant Impact

After reviewing the EA, the USAF believes that the Proposed Action would not generate significant controversy or have a significant impact on the quality of the human or natural environment. The Draft EA and proposed FONSI were made available for a 30-day public review and comment period. After reviewing the comments, the USAF has determined that the Proposed Action would not have a significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement does not need to be prepared. This analysis fulfills the requirements of NEPA and the CEQ Regulations.

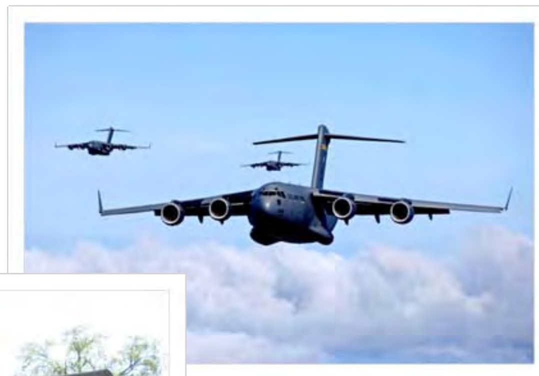
Signature on file, Signed 3 January 2011

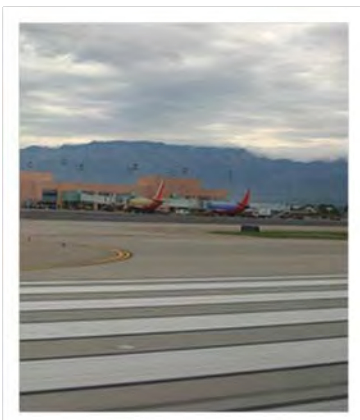
Date

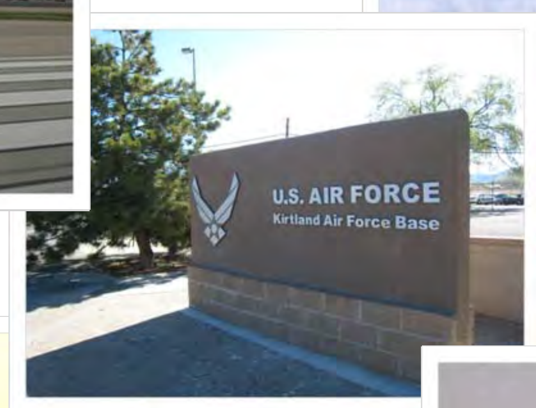
ROBERT L. MANESS, Colonel, USAF
Commander

FINAL

ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD AT KIRTLAND AIR FORCE BASE, NEW MEXICO







JANUARY 2011

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
µg/m^3	microgram per cubic meter
377 ABW	377th Air Base Wing
377 MSG	377th Mission Support Group
AAFES	Army and Air Force Exchange Service
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing material
AEHD	Albuquerque Environmental Health Department
AFB	Air Force Base
AFH	Air Force Handbook
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFMAN	Air Force Manual
AFPAM	Air Force Pamphlet
AFPD	Air Force Policy Directive
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AICUZ	Air Installation Compatible Use Zone
AMRGI	Albuquerque-Mid Rio Grande Intrastate
APE	area of potential effect
APZ	Accident Potential Zone
AQCB	Air Quality Control Board
AQCR	Air Quality Control Region
AQD	Air Quality Division
ARMS	Archaeological Records Management Section
ARPA	Archaeological Resource Protection Act
ASR	Alkali-silica reactivity
AT/FP	Anti-terrorism force protection
BASH	Bird/Wildlife Aircraft Strike Hazard
BAT	Best Available Technology
bgs	below ground surface
BMP	best management practice
BTU	British Thermal Unit
CAA	Clean Air Act
CEANC	Civil Engineer Compliance Branch
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel
DCE	1,1-dichloroethene
DDESB	Department of Defense Explosives Safety Board
DERP	Defense Environmental Restoration Program
DFP	Defensive Fighting Position
DNL	day-night average sound level
DOD	Department of Defense
DOE	U.S. Department of Energy
DOPAA	Description of Proposed Action and Alternatives
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act
ERP	Environmental Restoration Program
ES	exposed site
ESA	Endangered Species Act
ESP	explosives site plan
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FICON	Federal Interagency Committee on Noise
FOD	Foreign object damage
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HMMS	Hazardous Materials Management System

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HSWA	Hazardous and Solid Waste Amendments
HUD	U.S. Department of Housing and Urban Development
IB	Inhabited Building
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IL	Intraline
JD	jurisdictional determination
LA	Laboratory of Anthropology
LBP	lead-based paint
LTM	Long Term Monitoring
MBTA	Migratory Bird Treaty Act
MC	Munitions Constituent
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MEC	Munitions and Explosives of Concern
mg/m^3	milligrams per cubic meter
MGD	million gallons per day
MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MVA	million-volt amperes
MW	monitoring well
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NO_2	nitrogen dioxide
N_2O	nitrous oxide
NO_x	nitrogen oxides
NOA	Notice of Availability
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
ODS	ozone-depleting substance
OSH	occupational safety and health
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
percent g	percentage of the force of gravity
PES	Potential Explosive Site
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
PPA	Pollution Prevention Act
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTR	public traffic route
QD	quantity-distance
RCRA	Resource Conservation and Recovery Act
RFI	Resource Conservation and Recovery Act Facility Investigation
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SUA	Special Use Airspace
SWPPP	Storm Water Pollution Prevention Plan
TCE	trichloroethylene
TMDL	Total Maximum Daily Load
TNW	Traditional Navigable Water
tpy	tons per year
TSCA	Toxic Substance Control Act
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
U.S.C.	United States Code
VOC	volatile organic compound

FINAL

ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD AT KIRTLAND AIR FORCE BASE, NEW MEXICO

377th Air Base Wing
Kirtland Air Force Base, New Mexico

JANUARY 2011

COVER SHEET

FINAL ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD AT KIRTLAND AIR FORCE BASE, NEW MEXICO

Proposed Action: The 377th Air Base Wing (377 ABW) proposes to construct, operate, and maintain a hot cargo pad at Kirtland Air Force Base (AFB).

Report Designation: Final Environmental Assessment (EA)

Responsible Agency: U.S. Air Force (USAF), 377 ABW, Kirtland AFB

Affected Location: Kirtland AFB, New Mexico

Abstract: Under the Proposed Action, the 377 ABW proposes to construct, operate, and maintain a hot cargo pad at Kirtland AFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5). Other components of the Proposed Action include construction of a new taxiway to the proposed hot cargo pad; replacement of the deteriorating taxiway to Pad 5; addition of new and relocation of existing anti-ram barriers, defensive fighting positions, and personnel shelters surrounding the proposed hot cargo pad and Pad 5; addition of new lighting at the proposed hot cargo pad and Pad 5; and removal of existing lighting at Pad 5. The analysis in this EA considers the Proposed Action and the No Action Alternative. Four alternatives to the Proposed Action were considered, but eliminated from detailed analysis due to infeasibility.

For additional information on this EA contact Kirtland AFB NEPA Program Manager by mail at 377 MSG/CEANQ, 2050 Wyoming Boulevard SE, Suite 125, Kirtland Air Force Base, NM 87117-5270, or by email at nepa@kirtland.af.mil.

EXECUTIVE SUMMARY

Introduction

This Environmental Assessment (EA) has been prepared for the 377th Air Base Wing (377 ABW) at Kirtland Air Force Base (AFB), New Mexico, to identify and assess the potential environmental impacts associated with constructing, operating, and maintaining a new hot cargo pad at Kirtland AFB.

Purpose and Need

The purpose of the Proposed Action is to construct, operate, and maintain a new hot cargo pad, as well as related components such as a taxiway, security measures, and lighting, at Kirtland AFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5).

Pad 5 is the only cargo pad at Kirtland AFB with a sufficient surrounding clear zone to accommodate hot cargo (i.e., weapons, ammunition, explosives, and other hazardous cargo). However, Pad 5 and its taxiway are in poor condition due to cracking, spalling, and failing of the pad's Portland cement concrete caused by alkali-silica reactivity (ASR), and disintegration of the taxiway's asphalt due to age. The deficient condition of Pad 5 and its taxiway have the potential to jeopardize aircraft safety, and delay or abort critical hot cargo missions due to foreign object damage (FOD) and aircraft tire-cut potential. In addition, the existing lighting at Pad 5 is not sufficient and further jeopardizes aircraft safety. During the past 5 years, approximately $1 million has been spent on repairs to the pad and taxiway, but a stable state of repair is difficult due to its continual use and repairs are ongoing. Hot cargo is continuously flown in and out of Kirtland AFB; therefore, a pad capable of handling hot cargo must be mission-ready at all times. The need for the Proposed Action is to increase the reliability, safety, and cargo capacity of the available pads able to accommodate hot cargo to ensure that this critical mission can be fulfilled.

Description of Proposed Action and Alternatives

Proposed Action. The 377 ABW proposes to construct, operate, and maintain a hot cargo pad at Kirtland AFB in the northwestern portion of Kirtland AFB, adjacent to the existing hot cargo pad (Pad 5). The proposed hot cargo pad would be a 4.2-acre semi-circular pad consisting of 18-inch-thick Portland cement concrete with additives to reduce the effects of ASR. A new 6-inch-thick asphalt taxiway would be constructed from the existing taxiway to the proposed pad, and the existing deteriorating taxiway for Pad 5 would be demolished and replaced. Other components of the Proposed Action would include construction of anti-terrorism force protection measures (i.e., anti-ram barriers and defensive fighting positions [DFPs]), new lighting, and personnel shelters. Existing anti-ram barriers (i.e., cabling) around Pad 5 would be relocated and new cabling would be added to enclose the existing and proposed hot cargo pads and their taxiways. DFPs would be constructed around the proposed pad to provide additional security. One personnel shelter would be constructed at the southern end of the proposed pad to provide protection from the elements for personnel. The light poles at Pad 5 would be demolished and new mast light poles would be constructed at both Pad 5 and the proposed new pad.

The proposed hot cargo pad would be used for loading and unloading weapons, ammunition, explosives, and other hazardous cargo of Hazard Classification 1.1 from various aircraft, including C-130, C-17, and possibly F-16. The proposed pad would be used in conjunction with Pad 5 to ensure the critical hot cargo missions continue unimpeded; each pad would act as contingency if the other pad is unavailable. The type and quantity of current hot cargo operations at the pads would not change and there would be no increase in the quantity of aircraft utilizing the hot cargo pads. Activities that would occur at the proposed hot cargo pad include pre- and post-flight procedures, cargo loading and unloading, and, if necessary, emergency aircraft repairs. Regular maintenance at the proposed hot cargo pad would consist of FOD sweeps and mechanical sweeping, as well as joint resealing and replacement, spall repair, and re-striping. Long-term maintenance might include repairs such as select slab replacement.

No Action Alternative. Under the No Action Alternative, a new hot cargo pad and associated infrastructure would not be constructed, upgrades would not be made to existing infrastructure, and only Pad 5 would be available for hot cargo missions. Selection of this alternative would result in continued deterioration of Pad 5 and its taxiway, which would cause FOD and aircraft tire-cut potential to reach unacceptable levels, and impair nighttime operations due to poor lighting conditions. Aircraft and personnel safety would be jeopardized and critical hot cargo missions would be delayed or aborted, which would adversely affect U.S. Air Force (USAF) missions at Kirtland AFB and globally.

Alternatives Considered But Eliminated from Detailed Analysis. Four alternative site locations to the Proposed Action, all in the general vicinity of Pad 5, were considered. Alternative Site 1 would require the removal of the Explosive Holding Area due to overlap with its quantity-distance (QD) arc, and would be within the Clear Zone and Accident Potential Zone (APZ) I for Runway 26. Alternative Site 2 would be primarily within Environmental Restoration Program Site (ERP) site, WP-26, and its QD arc would overlap with Pennsylvania Avenue, a high-density public traffic route. Alternative Sites 3 and 4 would abut an approximately 90-foot cliff, and Alternative Site 4 would also be primarily within the ERP site. Therefore, these alternatives were not considered feasible and were eliminated from detailed analysis.

Summary of Environmental Impacts

Table ES-1 provides an overview of potential impacts anticipated under the Proposed Action and the No Action Alternative broken down by resource area. **Section 4** of this EA addresses these impacts in more detail.

Table ES-1. Summary of Environmental Impacts

Resource Area	Proposed Action	No Action Alternative
Land Use	No adverse impacts on installation or municipal land use plans and policies, or land use viability and continued land occupation are anticipated. Less than significant adverse impacts on the land use compatibility from noise production, and safety issues related to proximity to an airport and QD arcs are anticipated.	No new impacts are anticipated.
Noise	Less-than-significant adverse impacts on noise due to temporary increased noise production from demolition and construction activities are anticipated.	No new impacts are anticipated.
Visual Resources	Less-than-significant adverse impacts on visual resources due to short-term visibility of wastes and supplies during demolition and construction activities, and negligible alteration of the visual conditions during operation are anticipated.	No new impacts are anticipated.

Resource Area	Proposed Action	No Action Alternative
Air Quality	Less-than-significant adverse impacts are anticipated during demolition and construction activities due to short-term combustion emissions from equipment and dust emissions from ground disturbance, and negligible contribution towards the New Mexico statewide greenhouse gas inventory. Dust control could reduce overall emissions.	No new impacts are anticipated.
Geology and Soils	No significant adverse impacts on geological resources or soils are anticipated. Use of best management practices (BMPs) could minimize impacts on soils due to soil erosion and sedimentation.	No new impacts are anticipated.
Water Resources	Less-than-significant adverse impacts on groundwater availability, surface water resources, water quality, and floodplains due to ground disturbance and potential use of groundwater for dust suppression are anticipated. Use of BMPs identified in the National Pollutant Discharge Elimination System permit and Storm Water Pollution Prevention Plan would help minimize impacts due to potential spills and soil erosion and sedimentation from runoff.	No new impacts are anticipated.
Biological Resources	Less-than-significant adverse impacts on burrowing owls *(Athene cunicularia)* due to potential disturbance of nests during demolition or construction are anticipated. Surveys prior to demolition and construction, and flagging of nests or relocation of owls would minimize the impact. Increased noise during construction and increased lighting during operation are anticipated to result in less-than-significant impacts on wildlife and migrating birds, respectively. No significant adverse impacts on vegetation are anticipated due to the previously disturbed nature of the site. No wetlands are within the site.	No new impacts are anticipated.
Cultural Resources	No cultural resources are present within the proposed hot cargo pad site; therefore, no adverse impacts are anticipated.	No new impacts are anticipated.
Infrastructure	Less-than-significant adverse impacts on electrical and water supply systems are anticipated due to short-term increase in demand and possible service interruption during construction, and negligible increases in demand during operation. Short- and long-term, less-than-significant adverse impacts on storm water systems are anticipated due to increased soil erosion and sedimentation during construction and the increase of impervious surfaces. Temporary, less-than-significant adverse impacts on solid waste management system are anticipated due to increased demand during demolition and construction. No impacts on natural gas systems, liquid fuels, central heating and cooling systems, sanitary sewer and wastewater systems, and communications systems are anticipated.	No new impacts are anticipated.

Resource Area	Proposed Action	No Action Alternative
Hazardous Materials and Waste	Less-than-significant adverse impacts on hazardous materials and petroleum products management, hazardous and petroleum wastes, and pollution prevention are anticipated. No new chemicals or toxic substances would be used or stored, but petroleum products would be used during construction. The quantity of hazardous wastes generated would be negligible, and properly disposed of. Use of BMPs and compliance with the Installation Hazardous Waste Management Plan, Hazardous Materials Emergency Planning and Response Plan, and Spill Prevention, Control and Countermeasure Plan could minimize impacts. Less-than-significant adverse impacts related to ERP site WP-26 are anticipated. No adverse impacts related to asbestos-containing material, lead-based paint, or polychlorinated biphenyls are anticipated.	No new impacts are anticipated.
Safety	Less-than-significant adverse impacts on contractor safety are anticipated. Compliance with health and safety programs would minimize impacts. No adverse impacts on military personnel or the public are anticipated. Less-than-significant adverse impacts on explosives and munitions safety are anticipated from location within and establishment of QD arcs.	No new impacts are anticipated.
Aircraft Safety	Operation of the proposed pad is anticipated to have a beneficial impact on aircraft safety, but this impact would not be significant. Hot cargo missions would be safer due to improved lighting and less potential for FOD and aircraft tire-cut. The ability to schedule and complete hot cargo missions would also likely improve. Operation of the proposed pad would have an inherent low risk level, but this would not be a significant adverse impact. The probability of an aircraft mishap during operation is unlikely, and adherence to USAF policy on explosives safety, as well as design and safety standards would also be expected to lessen the probability of an aircraft mishap.	No new impacts are anticipated, although aircraft safety would continue to be impacted due to the ongoing deterioration of Pad 5 and the existing poor lighting conditions.
Socioeconomics and Environmental Justice	Less-than-significant adverse impacts on population, housing, and environmental justice are anticipated. Short-term, beneficial impacts on local business, employment, and the local economy are anticipated.	No new impacts are anticipated.

FINAL ENVIRONMENTAL ASSESSMENT
ADDRESSING CONSTRUCTION, OPERATION, AND MAINTENANCE OF A HOT CARGO PAD
AT KIRTLAND AIR FORCE BASE, NEW MEXICO

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1. Purpose and Need for Action

1.1 Introduction

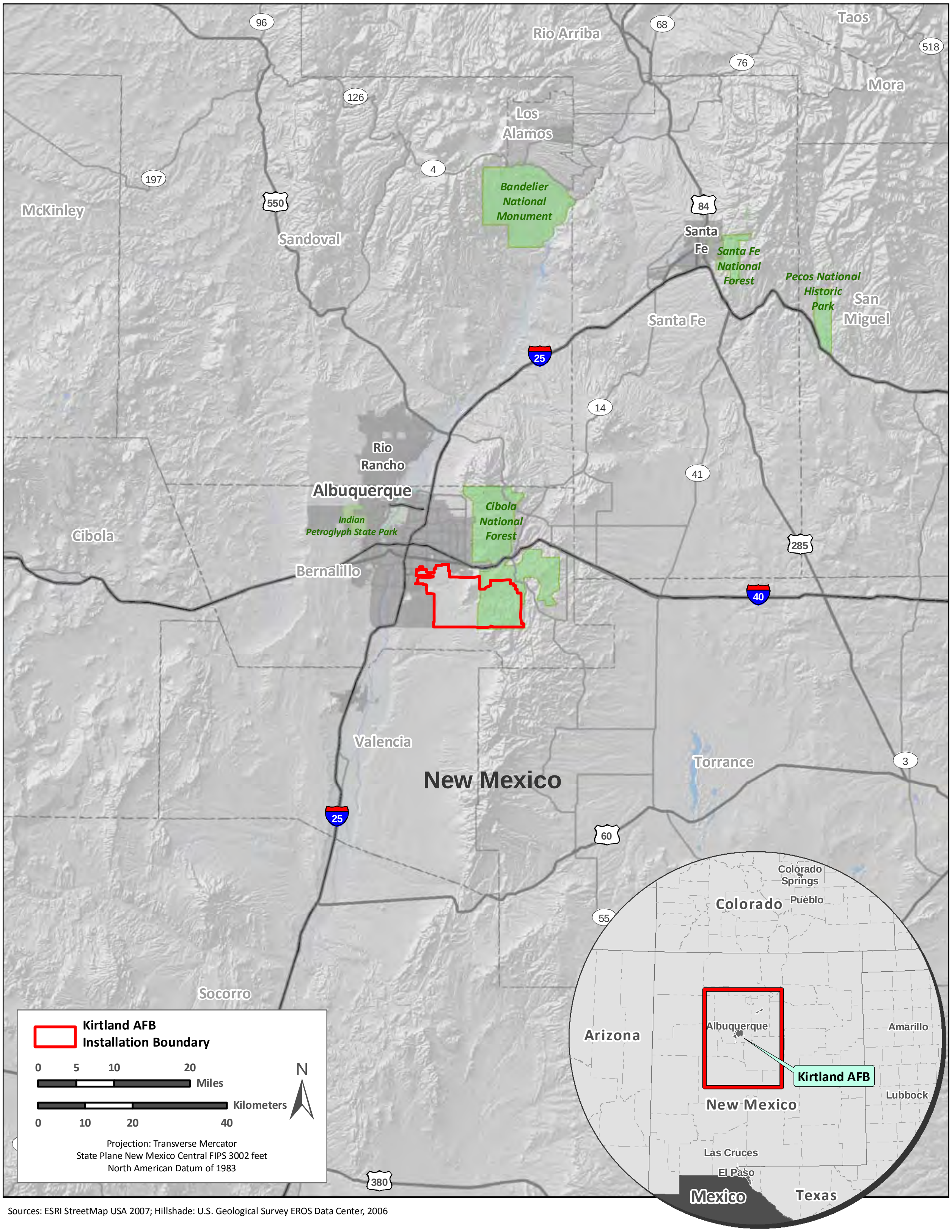
This section describes the purpose and need for the Proposed Action at Kirtland Air Force Base (AFB), provides summaries of the environmental review process and the applicable regulatory requirements, and presents an overview of the organization of the document.

Federal agencies are required to consider the environmental consequences of proposed actions in the decisionmaking process under the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] Sections 4321 to 4370d) and the Council on Environmental Quality's (CEQ) implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508). Kirtland AFB is also required to consider U.S. Air Force (USAF) NEPA-implementing regulation (32 CFR 989), and Department of Defense (DOD) Instruction 4715.9, *Environmental Planning Analysis*. This Environmental Assessment (EA) addressing the Construction, Operation, and Maintenance of a Hot Cargo Pad at Kirtland AFB was prepared in accordance with NEPA. This EA evaluates the potential environmental impacts associated with construction, operation, and maintenance of a hot cargo pad at Kirtland AFB, and other related components including construction of a new taxiway to the proposed hot cargo pad; replacement of a existing deteriorating taxiway to Pad 5; relocation and addition of anti-ram barriers, defensive fighting positions (DFPs), and personnel shelters surrounding the proposed hot cargo pad and Pad 5; addition of new lighting at the proposed hot cargo pad and Pad 5; and removal of existing lighting at Pad 5.

Kirtland AFB is just southeast of Albuquerque, New Mexico (see **Figure 1-1**), at the foot of the Manzano Mountains. These mountains define the eastern boundary of an area called East Mesa. Kirtland AFB encompasses approximately 52,000 acres of the East Mesa and has an average elevation of 5,400 feet above mean sea level. Land use for areas adjacent to the installation includes the Cibola National Forest to the northeast and east, the Isleta Indian Reservation (Isleta Pueblo) and Cibola National Forest (including Manzano Wilderness Area) to the south, and residential and business areas of the City of Albuquerque to the west and north.

Kirtland AFB was established in the late 1930s as a training base for the Army Air Corps. In 1941, construction of permanent barracks, warehouses, and a chapel was completed, and a single B-18 bomber, Kirtland AFB's first military aircraft, arrived. Troops soon followed, and Kirtland AFB grew rapidly with U.S. involvement in World War II. The installation served as a training site for air crews for many of the country's bomber aircraft, including the B-17, B-18, B-24, and the B-29. After World War II, Kirtland AFB shifted from a training facility to a test and evaluation facility for weapons delivery, working closely with both Los Alamos National Laboratory and Sandia National Laboratory. In 1971, Kirtland AFB and its adjoining neighbor to the east, Sandia Army Base, were combined. The two divisions of the installation are still referred to as Kirtland West and Kirtland East, respectively. Kirtland AFB is now operated by the 377th Air Base Wing (377 ABW).

The 377 ABW is a unit of the Air Force Materiel Command (AFMC), and its prime mission, as the host unit at Kirtland AFB, is to support more than 100 Mission Partners with support personnel, resources, equipment, and facilities. The installation functions as a test and evaluation center for the Space and Missile Systems Center and Air Force Operational Test and Evaluation Center; and it is the headquarters for operational organizations, such as the Air Force Security Police Agency, Air Force Inspection Agency, Sandia National Laboratories, and Albuquerque Service Center for the U.S. Department of Energy (DOE). Kirtland AFB also functions as a training base for the 58th Special Operations Wing of



Sources: ESRI StreetMap USA 2007; Hillshade: U.S. Geological Survey EROS Data Center, 2006

Figure 1-1. Kirtland AFB Location Map

Air Education and Training Command's 19th Air Force. The 150th Fighter Group of the New Mexico Air National Guard is also stationed at the installation. The 377 ABW provides fire protection (including crash and rescue) for Albuquerque International Sunport.

This EA is organized into six sections and appendices. **Section 1** states the purpose, need, scope, and public involvement efforts for the Proposed Action. **Section 2** contains a detailed description of the Proposed Action and the alternatives considered. **Section 3** describes the existing conditions of the potentially affected environment. **Section 4** identifies the environmental consequences of implementing all reasonable alternatives, including direct, indirect, and cumulative impacts. **Section 5** provides the list of preparers for this EA. **Section 6** lists the references used to support the analyses. Publication of this Final EA will also include a signed Finding of No Significant Impact (FONSI) for the Proposed Action.

1.2 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to construct, operate, and maintain a new hot cargo pad, as well as related components such as a taxiway, security measures, and lighting, at Kirtland AFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5).

Pad 5 is the only cargo pad at Kirtland AFB with a sufficient surrounding clear zone to accommodate hot cargo (i.e., weapons, ammunition, explosives, and other hazardous cargo). However, Pad 5 and its taxiway are in poor condition due to cracking, spalling, and failing of the pad's Portland cement concrete caused by alkali-silica reactivity (ASR), and disintegration of the taxiway's asphalt due to age. The deficient condition of Pad 5 and its taxiway have the potential to jeopardize aircraft safety, and delay or abort critical hot cargo missions due to foreign object damage (FOD) and aircraft tire-cut potential. In addition, the existing lighting at Pad 5 is not sufficient and further jeopardizes aircraft safety. During the past 5 years, approximately $1 million has been spent on repairs to the pad and taxiway, but a stable state of repair is difficult due to its continual use and repairs are ongoing. Hot cargo is continuously flown in and out of Kirtland AFB; therefore, a pad capable of handling hot cargo must be mission-ready at all times. The need for the Proposed Action is to increase the reliability, safety, and cargo capacity of the available pads able to accommodate hot cargo to ensure that this critical mission can be fulfilled.

1.3 Scope of the EA

Scope consists of the range of actions, alternatives, and impacts to be considered. The scope of the Proposed Action and the range of alternatives considered are presented in detail in **Section 2**. In accordance with CEQ regulations implementing NEPA (40 CFR 1502.14), the No Action Alternative is analyzed to provide the baseline against which the environmental impacts of implementing the range of alternatives addressed can be compared. This EA identifies appropriate mitigation measures and best management practices (BMPs) that are not already included in the Proposed Action or alternatives to avoid, minimize, reduce, or compensate for adverse environmental impacts. This EA examines the environmental impacts of the Proposed Action and reasonable alternatives on the following resource areas: land use, noise, visual resources, air quality, geology and soils, water resources, biological resources, cultural resources, infrastructure, hazardous materials and waste, safety, aircraft safety, and socioeconomics and environmental justice. The resource areas that do not apply are eliminated from further analysis in **Section 3**.

1.3.1 Environmental Laws, Regulations, and Executive Orders

To comply with NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.), the planning and decisionmaking process involves a study of other relevant environmental laws, regulations, and Executive Orders (EOs).

The NEPA process does not replace procedural or substantive requirements of other environmental laws; it addresses them collectively in an analysis, which enables decisionmakers to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively" (40 CFR 11 1500.2).

As required under the CEQ implementing guidance for NEPA in 40 CFR 1500.2(c), the EA contains a list of Federal permits, licenses, and coordination that might be required in implementing the Proposed Action or alternatives (see **Table 1-1**).

Table 1-1. List of Coordination and Permits Associated with the Proposed Action

Agency	Permit/Approval/Condition
DOD Explosives Safety Board (DDESB)	• DDESB-Approved Explosives Safety Plan
U.S. Fish and Wildlife Service (USFWS)	• Endangered Species Act (ESA) Section 7 Coordination • Migratory Bird Treaty Act (MBTA) Coordination
U.S. Army Corps of Engineers (USACE)	• Clean Water Act (CWA) Section 404 Permit
U.S. Environmental Protection Agency (USEPA)	• National Pollutant Discharge Elimination System (NPDES) permit
Albuquerque Environmental Health Department (AEHD)	• Applicable air quality permits • Title V Permit
New Mexico Historic Preservation Division	• National Historic Preservation Act (NHPA) Section 106 Consultation

Appendix A contains summaries of the environmental laws, regulations, and EOs that might apply to this project. Where relevant, these laws will be described in more detail in the appropriate resource areas presented in **Section 3** of the EA. The scope of the analysis of potential environmental consequences in **Section 4** considers direct, indirect, and cumulative impacts.

1.4 Interagency Coordination and Public Involvement

NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions would be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning (IICEP)*, requires the USAF to implement an agency coordination process, which is used for the purpose of facilitating and receiving agency input on the Proposed Action and implements scoping requirements.

Through the IICEP process, Kirtland AFB made the Draft EA available to relevant Federal, state, and local agencies and Tribes to share the analyses associated with the Proposed Action and alternatives, and provide them sufficient time to make known their environmental concerns specific to the action. The IICEP process also provided Kirtland AFB with the opportunity to coordinate with and consider state, local, and tribal views in implementing the Federal proposal. IICEP materials related to this EA are included in **Appendix B**. The agencies and Tribes contacted during the IICEP process are listed in **Appendix B**.

A Notice of Availability (NOA) for the Draft EA was published in *The Albuquerque Journal* on September 5, 2010. The publication of the NOA initiated the 30-day review period. At the closing of the public review period, no comments from the general public had been received. Two comments from government agencies (Albuquerque Environmental Health Department [AEHD] Air Quality Division [AQD] and New Mexico Department of Game and Fish [NMDGF]) were received. These comments were incorporated into the analysis of potential environmental impacts performed as part of this EA, where applicable. **Appendix B** contains additional details about the public review period.

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2. Description of Proposed Action and Alternatives

2.1 Proposed Action

This section describes the Proposed Action and alternatives considered. As discussed in **Section 1.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.2**. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential impacts would be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations.

The 377 ABW proposes to construct, operate, and maintain a hot cargo pad immediately adjacent to the east of the existing hot cargo pad (Pad 5) in the northwestern portion of Kirtland AFB southeast of the eastern end of Runway 26 of Albuquerque International Sunport (see **Figure 2-1**). The proposed hot cargo pad would be a 4.2-acre semi-circular pad consisting of 18-inch-thick Portland cement concrete with additives to reduce the effects of ASR[1] on top of base material. A concrete area approximately 200 feet wide would separate the proposed hot cargo pad and Pad 5. A new 6-inch-thick asphalt taxiway would be constructed from the existing taxiway (leading to Pad 5) to the proposed pad, and the existing deteriorating taxiway for Pad 5 would be demolished and replaced. Construction would likely begin in mid-2012 and last 12 to 14 months.

Other components of the Proposed Action would include construction of anti-terrorism force protection (AT/FP) measures (i.e., anti-ram barriers and DFPs), new lighting, and personnel shelters. Existing anti-ram barriers (i.e., cabling) around Pad 5 would be relocated and new cabling would be added to enclose the existing and proposed hot cargo pads and their taxiways. DFPs would be constructed around the proposed pad to provide additional security. One personnel shelter would be constructed at the southern end of the proposed pad to provide protection from the elements for personnel. The current lighting at Pad 5 is not adequate; therefore, the light poles at Pad 5 would be demolished and new mast light poles would be constructed at both Pad 5 and the proposed pad. The Proposed Action would comply with sustainable design principles mandated by EO 13423 and minimum DOD AT/FP standards.

Construction of the proposed hot cargo pad would require overlap into an area designated as an Environmental Restoration Program (ERP) site (WP-26) east of Pad 5. WP-26 consists of two abandoned sewage lagoons that are surrounded by berms and a locked fence. WP-26 also includes the golf course main pond; however, because the pond is approximately 2 miles southeast of the Proposed Action it will not be considered in this EA and future reference to WP-26 or ERP site refers to the sewage lagoons only. Each lagoon covers approximately 7 acres with a total area of 14 acres. WP-26 is contaminated due to its historical use as settling ponds for Kirtland AFB's residential and light industrial raw sewage. These historical lagoons were in service for a 7-month period (April through October) each year from 1962 to 1987. WP-26 has metals contamination in the surface sediment (i.e., sewage sludge), and organics contamination, including trichloroethylene (TCE), in groundwater (perched aquifer) and soil gas. The site is currently being remediated to excavate surface contamination consisting of the top 5 inches of sewage sludge; these activities are expected to be completed in Spring 2010. Under the Proposed Action, the proposed hot cargo pad would overlap into the extreme northwestern corner of this site (see **Figure 2-1**).

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[1] ASR is a chemical reaction that occurs between alkaline components in Portland cement and silica in aggregates that causes the absorption of water, and subsequent swelling and cracking of affected concrete.

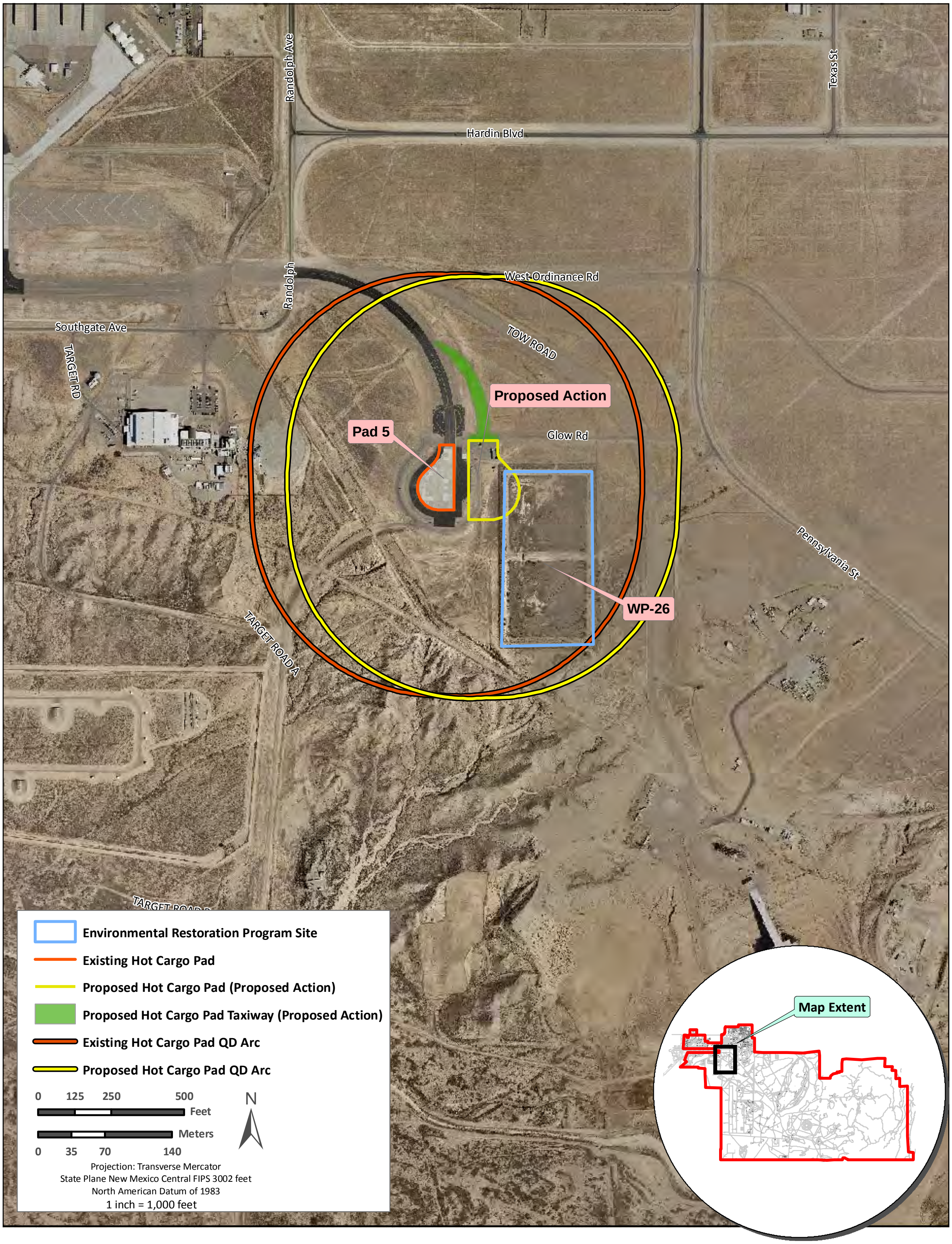

Figure 2-1. Proposed Hot Cargo Pad Location Map

2.1.1 Demolition and Construction

Prior to construction of the proposed hot cargo pad, existing aboveground infrastructure, including light poles, personnel shelter, storage shed, fencing, utility infrastructure, protective bollards, and lagoon infrastructure (berms and fencing), within the footprint of the proposed pad would be removed. Some infrastructure, including a personnel shelter and DFPs, would be relocated to the perimeter of the proposed pad. No lagoon infrastructure would be rebuilt after construction is complete. Monitoring wells associated with WP-26 that are within the proposed pad footprint would be modified to make the well head and cover flush with the ground surface. A small asphalt parking and storage area for mobile lighting equipment northeast of Pad 5 would be demolished, and the equipment would be relocated. The perimeter road on the eastern side of Pad 5 would be demolished. The location of all underground utilities would be verified to the extent possible before commencement of ground disturbing activities.

Construction activities would involve grading of the ground surface, and application of base material and 18-inch-thick Portland cement concrete pad. A paved shoulder would be constructed around the perimeter of the pad to protect adjacent areas from jet blast, help mitigate FOD risk, permit equipment storage, and to facilitate drainage. The surface adjacent to the paved shoulder would be graded to facilitate drainage and to prevent storm water from ponding on the outside edge of the shoulder. Existing light poles surrounding Pad 5 would be removed, and new mast light poles would be installed around the perimeter of the proposed pad and Pad 5. Additional DFPs and at least one personnel shelter would be constructed on the perimeter of the proposed pad. Some existing anti-ram cabling would be relocated, and new cabling would be added in order to surround the perimeter of the proposed hot cargo pad and Pad 5. Demolition and replacement of the existing asphalt taxiway (leading to Pad 5) would occur after construction of the proposed hot cargo pad. Asphalt from the taxiway, small parking and storage area, and perimeter road would be crushed and screened if rebar is not present.

Dumpsters would be provided for municipal solid waste generated by construction activity at the project site. The asphalt waste from demolition of the taxiway would be transported to the Kirtland AFB landfill for recycling or disposal. If necessary, hazardous construction debris would be transported to the Rio Rancho Landfill, since the Kirtland AFB landfill accepts only nonhazardous demolition and construction waste. To the extent possible, materials would be diverted from landfills and either recycled or reused. Cardboard wastes would be separated for pickup and would be recycled as a function of the Kirtland AFB Qualified Recycling Program. Miscellaneous salvageable metals would be transported to the Defense Reutilization and Marketing Office for recycling or reuse. In addition, clean fill material, ground up asphalt, and broken up cement would be diverted from landfill disposal and reused whenever possible.

Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, concrete mixers, asphalt vehicles, and generators would be required to support the proposed demolition, site preparation, and construction activities. Sufficient amounts of fuels, hydraulic fluids, oils, and lubricants would be stored on site during the project to support contractor vehicles and machinery. No other hazardous materials would be stored on site. All material needs, such as concrete and asphalt, would be supplied by offsite vendors. Construction activities would require small amounts of electricity; however, no natural gas or steam would be required for demolition or construction. If a dust nuisance or hazard has the potential to occur during demolition or construction, Kirtland AFB would supply water to be used for dust control. Water would be applied by water trucks and sprayers. Due to the area of land disturbance that would occur during demolition and construction activities, the Proposed Action would require National Pollutant Discharge Elimination System (NPDES) permit coverage and preparation of a Storm Water Pollution Prevention Plan (SWPPP), and a fugitive dust-control construction permit from the AEHD-AQD.

2.1.2 Operation and Maintenance

The proposed hot cargo pad would be used for loading and unloading weapons, ammunition, explosives, and other hazardous cargo of Hazard Classification 1.1 from various aircraft, including C-130, C-17, and possibly F-16. F-16s currently utilize the existing hot cargo pad (Pad 5) as part of the 150th Fighter Wing of the New Mexico Air National Guard; however, the F-16s are scheduled to be reassigned in 2010. It is not known at this time what aircraft, if any, the 150th Fighter Wing might acquire in the future. Some general (nonhazardous) cargo might also be included within the hot cargo shipments. Both the proposed hot cargo pad and Pad 5 would be used for hot cargo missions, but the pads would likely not be used simultaneously. The proposed hot cargo pad would be used in conjunction with Pad 5 to ensure the critical hot cargo missions continue unimpeded; each pad would act as contingency if the other pad is unavailable. The type and quantity of current hot cargo operations at the pads would not change and there would be no increase in the quantity of aircraft utilizing the hot cargo pads. Activities that would occur at the proposed hot cargo pad include pre- and post-flight procedures, cargo loading and unloading, and, if necessary, emergency aircraft repairs.

Hot cargo pads are required at facilities where the existing aprons cannot be used for handling hazardous cargo for safety reasons due to insufficient quantity-distance (QD) clear zones, which are protection requirements from potential explosive sites (PESs) to various types of exposed sites (ESs). Under the Proposed Action, the proposed hot cargo pad would be the PES and inhabited buildings and public traffic routes (PTRs) (i.e., public highways or railroad lines) would be ESs. Air Force Manual (AFMAN) 91-201, *Explosives Safety Standards*, describes the inhabited building (IB) distance, the minimum distance required to protect nonexplosives-related facilities and personnel. IB distance applies to several different types of ESs, including buildings and operations involving people not related to munitions/explosives work, joint DOD/non-DOD use runways, and high-density PTRs. The proposed hot cargo pad would be in the northwestern portion of the installation, but south of the main cantonment areas at a location in which the immediately surrounding area is generally undeveloped. However, there are several potential ESs in the general vicinity of the proposed hot cargo pad, including the east end of Runway 26 approximately 0.65 miles northwest, the Zia Park housing area approximately 0.6 miles north, the Airborne Laser Hanger approximately 0.3 miles west, and Pennsylvania Avenue approximately 0.25 miles east. The Proposed Action would require an IB separation distance of 1,250 feet (approximately 0.24 miles); therefore, none of the ESs listed above would be within the IB distance. In addition, a no-fly zone would be enforced over the proposed hot cargo pad.

Routine maintenance, conducted weekly and prior to missions, at the proposed hot cargo pad would consist of FOD sweeps and mechanical sweeping. Additional regular maintenance activities would include joint resealing and replacement, spall repair, and restriping. Long-term maintenance, possibly 10 to 20 years after construction, might include repairs such as select slab replacement.

2.2 No Action Alternative

CEQ regulations specify the inclusion of the No Action Alternative in the alternatives analysis (40 CFR 1502.14). The No Action Alternative is analyzed to provide a baseline of the existing conditions against which the potential environmental and socioeconomic impacts of the Proposed Action and alternative actions can be compared. Under the No Action Alternative, the 377 ABW would not construct a hot cargo pad, taxiway, anti-ram cabling, DFPs, lighting, and personnel shelters. Selection of this alternative would result in continued deterioration of the existing hot cargo pad (Pad 5) and its taxiway due to ASR and age, respectively. The condition of Pad 5 was rated SERIOUS (just above FAILED) and assigned a C-17 FOD rating of POOR (lowest possible rating) in a 2004 Air Force Civil Engineering Support Agency airfield condition survey. Without implementation of the Proposed Action, the pavement conditions at Pad 5 would continue to deteriorate causing FOD and aircraft tire-cut potential to be at unacceptable levels, and nighttime operations would be impaired due to poor lighting conditions. Aircraft and personnel safety would be jeopardized and critical hot cargo missions would be delayed or aborted, which would adversely affect USAF missions at Kirtland AFB and globally.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

Due to logistics and safety and security issues associated with operation and maintenance of a hot cargo pad, several criteria were evaluated when developing potential alternative locations for the proposed hot cargo pad. These criteria include the following:

- Location adjacent to existing runway, taxiway, and roads
- Sufficient QD separation distance of 1,250 feet
- Minimal impact on QD separation distances and other critical facilities.

In addition to the Proposed Action, the 377 ABW considered four alternative locations on Kirtland AFB near existing Pad 5 due to the proximity to existing Runway 8-26, and the associated taxiways and road network (see **Figure 2-2**). Land uses are restricted within QD separation distances. In order to minimize the size of restricted land use areas, the QD separation distances for Pad 5 and the proposed hot cargo pad would be combined as much as possible, and the alternative locations would all surround Pad 5 to take advantage of its existing QD separation distance.

Alternative Site 1. Alternative Site 1 is north-northeast of Pad 5, and adjacent to the east of the existing taxiway. The Explosive Holding Area (also called Safe Haven or Safe Refuge) is immediately adjacent to the northeast of this alternative. The Explosive Holding Area is a portion of an infrequently traveled paved road that is used to park vehicles transporting hot cargo while they are cleared to enter or exit the installation. The Explosive Holding Area is at its current location because it is close to Pad 5 and the Truman Gate, and away from inhabited crowded areas of the installation. This alternative would require the discontinuation of use of the Explosive Holding Area due to the required intraline (IL) separation distance. IL distance provides the minimum amount of protection to activities associated with explosives. Alternative Site 1 is also within the Clear Zone and Accident Potential Zone (APZ) I for Runway 26 of Albuquerque International Sunport. Explosive facilities are prohibited from Clear Zones and APZs I and II. Alternative Site 1 is not feasible because it would require the removal of the Explosive Holding Area, an integral security component that can not be sited elsewhere on the installation, and explosive facilities are prohibited from the proposed location of Alternative Site 1. Therefore, this alternative has been eliminated from further detailed analysis.

Alternative Site 2. Alternative Site 2 is east of Pad 5, adjacent to the east of the location of the Proposed Action. Pennsylvania Avenue, which is categorized as a high-density PTR, is approximately 850 feet west of this alternative. A high-density PTR would require IBD protection of 1,250 feet of separation from the hot cargo pad. In addition, a majority of this alternative would be within an ERP site (WP-26), which could present additional construction costs due to infrastructure removal and remediation activities. Alternative Site 2 is not feasible because it would not comply with the required separation distance for high-density PTRs; therefore, it has been eliminated from further detailed analysis.

Alternative Site 3. Alternative Site 3 is southeast of Pad 5, and would abut an approximately 90-foot cliff (into Tijeras Arroyo) to the south. This alternative's location next to a cliff presents dangerous conditions for operation of the proposed hot cargo pad, including movement of personnel; maneuvering of aircraft within the pad; and placement of access roads, lighting, drainage, AT/FP measures, and associated equipment on the perimeter of the pad. The presence of the cliff presents additional security issues for personnel guarding the aircraft and pad due to potentially obstructed sightlines to locations below the

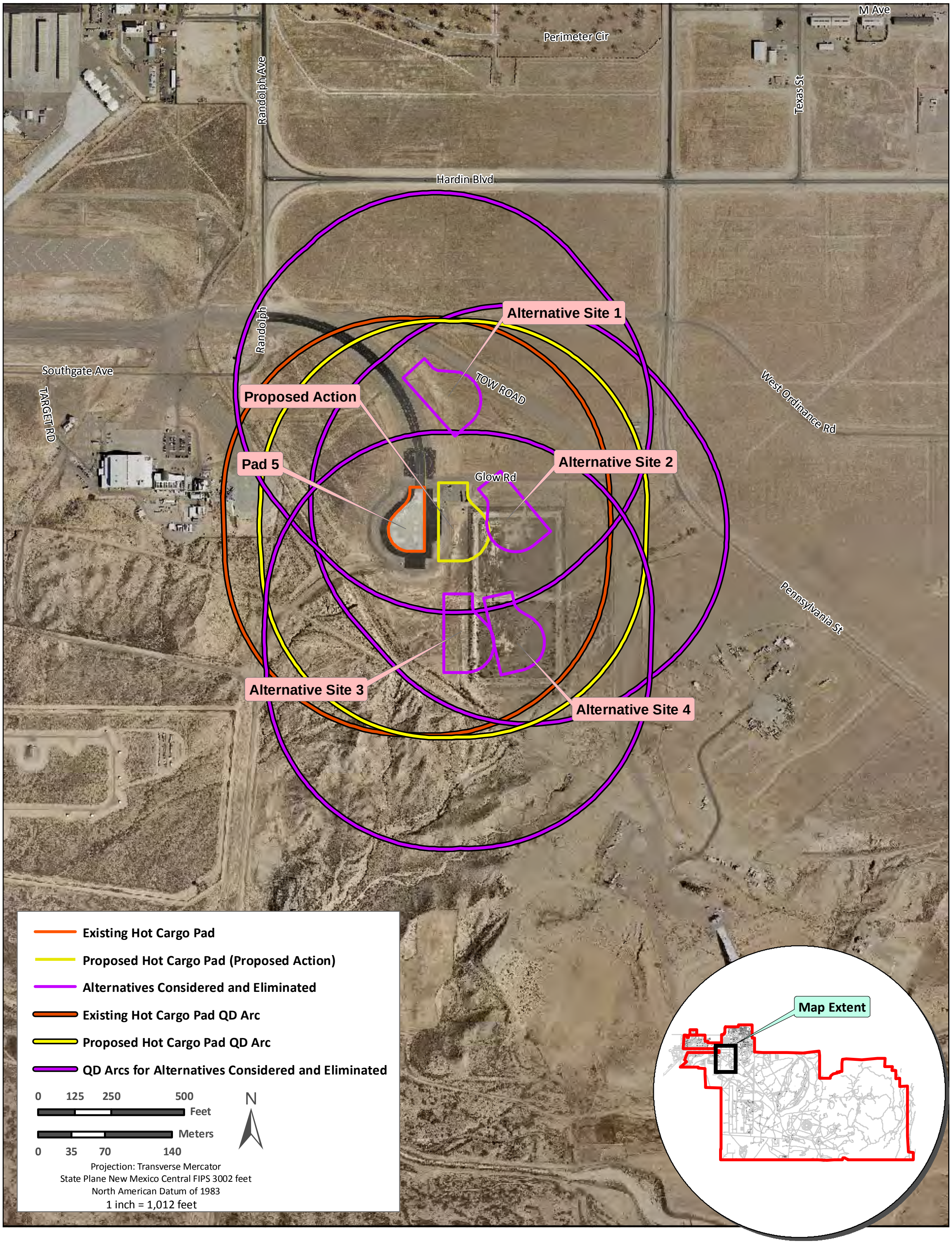

Figure 2-2. Alternatives Location Map

cliff. Alternative Site 3 has been eliminated from further detailed analysis due to safety and security issues that would make this alternative infeasible.

Alternative Site 4. Alternative Site 4 is southeast of Pad 5, and would abut an approximately 90-foot cliff (into Tijeras Arroyo) to the south. This alternative's location next to a cliff presents dangerous conditions for operation of the proposed hot cargo pad, including movement of personnel; maneuvering of aircraft within the pad; and placement of access roads, lighting, drainage, AT/FP measures, and associated equipment on the perimeter of the pad. The presence of the cliff presents additional security issues for personnel guarding the aircraft and pad due to potentially obstructed sightlines to locations below the cliff. In addition, this alternative would be entirely within an ERP site (WP-26), which could present additional construction costs due to infrastructure removal and remediation activities. Alternative Site 4 has been eliminated from further detailed analysis due to safety and security issues that would make this alternative infeasible.

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3. Affected Environment

All potentially relevant resource areas were initially considered for analysis in this EA. In compliance with NEPA and CEQ guidelines, the discussions of the affected environment in **Section 3** and the environmental consequences in **Section 4** focus only on those resource areas considered potentially subject to impacts and with potentially significant environmental issues. This section includes land use, noise, visual resources, air quality, geology and soils, water resources, biological resources, cultural resources, infrastructure, hazardous materials and waste, safety, aircraft safety, and socioeconomics and environmental justice. Airspace management is not addressed in this EA because the Proposed Action does not involve any resources that would impact airspace.

3.1 Land Use

3.1.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational. USAF installation land use planning commonly utilizes 12 general land use classifications: Airfield, Aircraft Operations and Maintenance, Industrial, Administrative, Community (Commercial), Community (Service), Medical, Housing (Accompanied), Housing (Unaccompanied), Outdoor Recreation, Open Space, and Water (USAF 1998a).

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. According to Air Force Pamphlet (AFPAM) 32-1010, *Land Use Planning*, land use planning is the arrangement of compatible activities in the most functionally effective and efficient manner (USAF 1998a). Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning within the civilian sector include written master plans/management plans, policies, and zoning regulations. The USAF comprehensive planning process also utilizes functional analysis, which determines the degree of connectivity among installation land uses as well as between installation and off-installation land uses, to determine future installation development and facilities planning.

In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

3.1.2 Existing Conditions

Surrounding Land Use. Kirtland AFB is in the southwestern portion of Bernalillo County, New Mexico (see **Figure 1-1**). It is bounded on the west and north by the City of Albuquerque, on the northeast and east by the Cibola National Forest, and on the south by Isleta Indian Reservation (Isleta Pueblo). The Albuquerque International Sunport, the City of Albuquerque's airport, abuts Kirtland AFB's northwestern border and allows uses of its runways by the installation. The region surrounding Kirtland AFB includes both urban and rural areas, including generalized land uses of residential (single and multi-family), parks/recreation, and pockets of industrial/manufacturing, public/institutional (hospital and medical center), and commercial (retail and service) to the north; open space (vacant/other and low-impact recreation) to the northeast and east; open space and forest or vacant land to the south; and a mixture of open space (vacant/other and parks/recreation), transportation/utilities, and public/institutional (Zia Rifle and Pistol Club) to the west (KAFB 2002, City of Albuquerque 2008).

Several proposed developments within the City of Albuquerque pose constraints to future development at Kirtland AFB, including residential projects and improvement/extension of area roadway corridors. An approximately 13,000-acre, mixed-use, master-planned community, Mesa del Sol, is proposed at an area adjacent to the southwestern boundary of Kirtland AFB. In order to prevent land use incompatibility issues and avoid future conflicts from this development on the installation's operational effectiveness, it will be separated from Kirtland AFB by La Semilla, a 2,700-acre, 1-mile-wide nature refuge and environmental education campus that will be controlled by the DOE and have minimal structures and limited land uses (Forest City 2005). A second planned mixed-use community, Valle del Sol, is proposed for an area within Tijeras Arroyo, southwest of Kirtland AFB, in unincorporated Bernalillo County (KAFB 2002). While providing a limitation to installation expansion, the extension of Eubank Boulevard and improvement to the Gibson Boulevard corridor will also improve vehicle access and movement for Kirtland AFB employees (KAFB 2002).

On-Installation Land Use. Kirtland AFB consists of approximately 52,000 acres, making it the third largest installation in the AFMC, and the sixth largest installation in the USAF (KAFB 2002). The 377 ABW is the host organization at Kirtland AFB and provides installation operations support to more than 100 Mission Partners in more than 2,000 buildings (KAFB 2002, KAFB 2007, Krieg 2010). The land at Kirtland AFB is primarily owned by the USAF, but several other ownerships and leases also apply. The DOE occupies the largest amount of land area of any Mission Partners at Kirtland AFB. The DOE owns and operates facilities on approximately 7,500 acres, primarily in the eastern portion of the cantonment area, and the southwestern and northeastern portion of the installation.

The most heavily developed area of Kirtland AFB is the cantonment area in the northwestern portion of the installation. The cantonment area is commonly referred to in terms of its east or west sides; the west side is the site of the original Kirtland AFB while the east side included Sandia and Manzano Bases. Recent installation planning and infrastructure efforts have focused on unifying the formerly segregated western and eastern portions of the cantonment area into a more unified installation (KAFB 2002).

Airfield operations and aircraft support facilities are concentrated in the airfield complex area, which is in the western portion of the cantonment area adjacent to and surrounding the Albuquerque International Sunport and its runways. Several Mission Partners, including the Air Force Research Laboratory, the New Mexico Air National Guard, the Space and Missiles Systems Center/Test and Evaluation, and the 58th Special Operations Wing, are also in this area. In addition, there are two housing areas in the western cantonment area along the northern border of the installation. The remaining intensive development at Kirtland AFB, including administrative, housing, medical, recreation, and commercial services uses, is in the eastern portion of the cantonment area. A majority of the 377 ABW's buildings are in this area, as well as the facilities of other major Mission Partners, including Sandia National Laboratories, the DOE Albuquerque Office, the Air Force Operational Test and Evaluation Center, the Defense Threat Reduction Agency, and the Air Force Safety Center. Most military family housing and their associated community uses are at the northeastern border of the cantonment area, adjacent to existing off-installation neighborhoods.

The southern and western portions of Kirtland AFB, which represent approximately 80 percent of the installation's total land area, are largely dedicated to military training and operational facilities. Some facilities in these areas of Kirtland AFB include the Star Fire Optical Range, High Energy Research Test Facility, and the Lovelace Respiratory Research Institute. Sandia National Laboratories also operates and maintains several facilities on the installation for research, testing and evaluation of various weapons, communications, and energy systems. While most recreational facilities are in the cantonment area, the golf course is in the southwestern portion of the installation. No outdoor recreation is permitted in the eastern portion of the installation (KAFB 2007).

Kirtland AFB has 10 land use designations: Aircraft Operations/Maintenance, Airfield, Administration and Research, Community (includes commercial and service functions), Military Family Housing, Industrial, Medical, Outdoor Recreation, Open Space, and Associate-Owned (see **Figure 3-1**) (KAFB 2002). The installation is a closed base; therefore, hunting, trapping, fishing, and commercial forestry operations are prohibited (KAFB 2007). In Kirtland AFB Future Land Use Plan, presented in the *2002 Kirtland Air Force Base, New Mexico General Plan*, land use zones have been established to guide the type and location of development at the installation. Future land use plans include the following general land use recommendations:

- Expand and concentrate Airfield uses along the flightline. Industrial and Aircraft Operations/Maintenance land uses would also be appropriate along or near the flightline.
- Concentrate Administration and Research land uses in the western portion of the cantonment area (surrounding the Air Force Research Laboratory campus) and in the eastern portion of the cantonment area (north of Sandia National Laboratories and DOE).
- Concentrate Community land uses in the northeastern portion of the cantonment area, adjacent to Administration and Research land uses, with the intention of creating a mixed use "town site" that would become the functional and symbolic center of the installation.
- Privatize existing housing inventory and associated improvements with the intention of removing west side housing areas and consolidating military family housing in the eastern portion of the cantonment area. Consolidation and migration of the housing areas could be accompanied by the consolidation of Community uses.
- Implement several transportation-related projects, including establishment of a new arterial between the western and eastern portions of the cantonment area, extension of Eubank Boulevard onto the installation, and construction of a new entry gate on Eubank Boulevard, to improve circulation (KAFB 2002).

The location of the proposed hot cargo pad is in the northwestern portion of the installation in the eastern portion of the cantonment area, and approximately 0.5 miles southeast of the eastern end of Runway 26 of the Albuquerque International Sunport (see **Figure 2-1**). The proposed site consists of undeveloped land, concrete and asphalt surfaces (shoulders, roadways, and small parking lot) associated with the existing hot cargo pad, and a portion of ERP site WP-26, two abandoned sewage lagoons. The location of the proposed hot cargo pad is immediately surrounded by the existing hot cargo pad (Pad 5) to the west, ERP site WP-26 to the east, and undeveloped land to the north and south. The Airborne Laser Hanger is approximately 0.3 miles west of the proposed hot cargo pad. The current land use designation of the proposed hot cargo pad is Aircraft Operations/Maintenance and Open Space, while the future land use designation is Aircraft Operations/Maintenance.

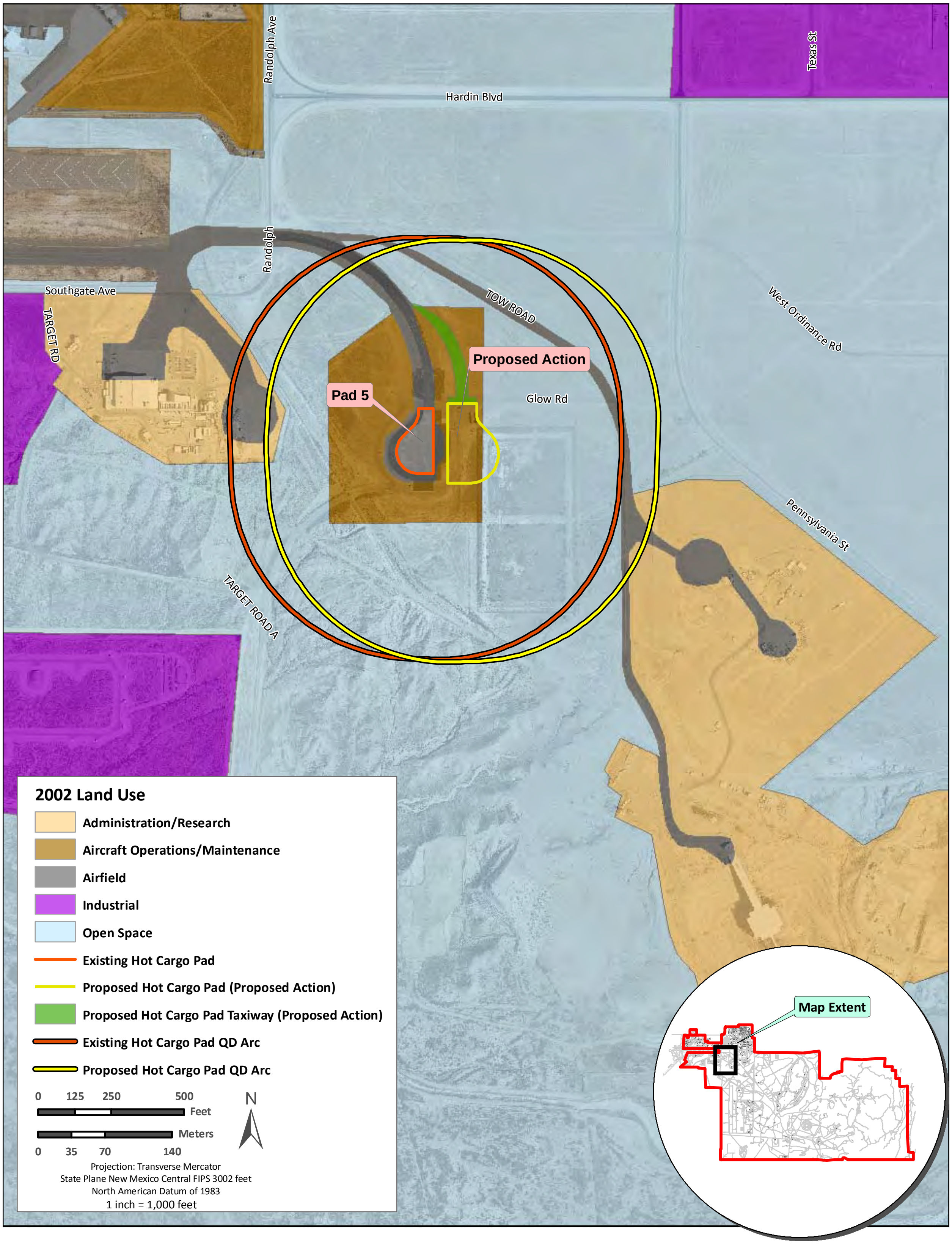


Figure 3-1. Land Use Map for Kirtland AFB

The proposed hot cargo pad would be within the day-night average sound level (DNL) 65 to 69 A-weighted decibel (dBA) noise zone, and proposed taxiway would be within the DNL 70 to 74 dBA noise zone from aircraft operations at the Albuquerque International Sunport (see **Figure 3-2**).

The Proposed Action would also be within the 1,250-foot-radius QD arc of the existing hot cargo pad (Pad 5). As discussed in **Section 2.1.2**, QD arcs are an area surrounding a potential explosion site that is defined by explosive limits of the potential explosion site.

The northern portion of the proposed taxiway would be within the Runway 26 Clear Zone and APZ I at the Albuquerque International Sunport (KAFB 2002). Existing USAF facilities and land uses may continue in the Clear Zone; however, replacement facilities should be sited outside the Clear Zone. Generally, people intensive uses and uses not required for flight operations should not be sited within the Clear Zone. Acceptable land uses within the Clear Zone are: agriculture; livestock grazing (excluding feed and dairy lots); permanent open space; existing or new water areas provided they do not create bird strike hazards; rights-of-way for single track railroads and fenced, two-lane highways without sidewalks or bicycle trails provided they do not violate obstacle clearance criteria; rights-of-way for communications and utilities provided all facilities are at grade level or underground; and essential navigation aids and operational facilities, provided there are no feasible alternatives. In addition, actions or uses that create a substance (e.g., dust) that would impair visibility, produce light that would distract pilots, produce electrical interference, or attract birds are prohibited in the Clear Zone. Land use guidelines within the APZ I are less restrictive; however, uses that concentrate people in small areas are not acceptable. Some general land uses permitted in the APZ I are industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture (USAF 1999).

3.2 Noise

3.2.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Sound is measured with instruments that record instantaneous sound levels in decibels. The dBA is used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event.

Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one’s ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations. Sound levels, resulting from multiple single events, are used to characterize community noise effects from aircraft or vehicle activity and are measured in DNL. The DNL noise metric incorporates a “penalty” for evening and nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging single event values for a given 24-hour period. DNL is the preferred sound level metric used to characterize noise impacts of the Federal Aviation Administration (FAA), U.S. Department of Housing and Urban Development (HUD), U.S. Environmental Protection Agency (USEPA), and DOD for modeling airport environments.

DNL is the metric recognized by the U.S. government for measuring noise and its impacts on humans. According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds a DNL of 75 dBA, "normally unacceptable" in regions exposed to noise between 65 dBA and 75 dBA, and "normally acceptable" in areas exposed to noise of 65 dBA or lower. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of DNL sound levels (FICON 1992). For outdoor activities, the USEPA recommends a DNL sound level of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

Noise levels vary depending on the population density and proximity to land uses such as parks, schools, or industrial facilities. As shown on **Table 3-1**, noise levels in a suburban residential area are a DNL of about 55 dBA, which increases to 60 dBA for an urban residential area, and to 80 dBA in the downtown section of a city (FHWA 1980).

Table 3-1. Typical Outdoor Noise Levels

DNL (dBA)	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: FHWA 1980

Most people are exposed to DNL sound levels of 50 to 55 dBA or higher on a daily basis. Studies specifically conducted to determine noise effects on various human activities show that approximately 90 percent of the population is not significantly bothered by outdoor sound levels below a DNL of 65 dBA (FICON 1992). Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with effect assessments and that there is a consistent relationship between DNL and the level of annoyance.

Demolition and Construction Sound Levels. Demolition and construction work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from graders, loaders, trucks, pavers, and other work activities and processes. **Table 3-2** lists noise levels associated with common types of construction equipment. Demolition and construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

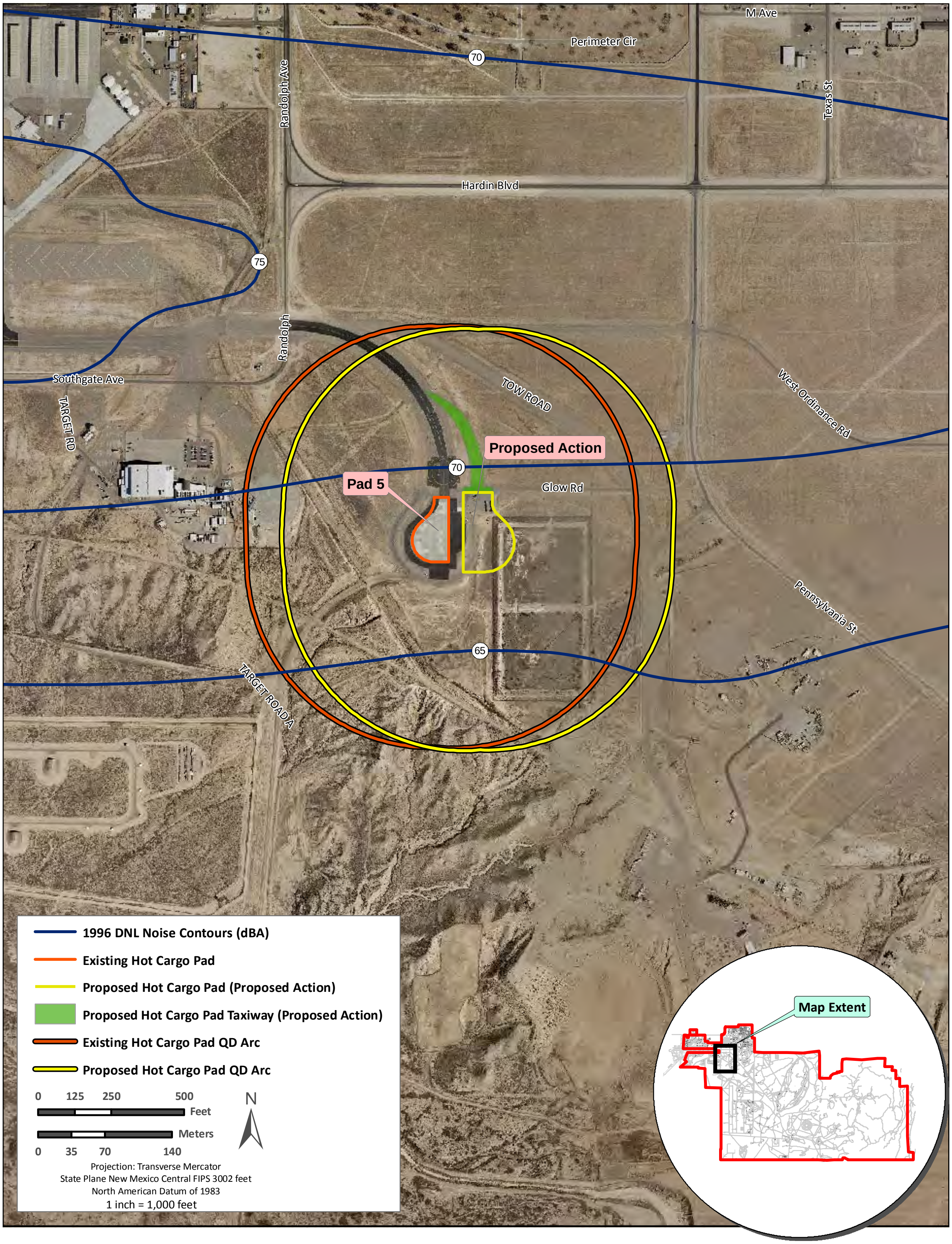


Figure 3-2. Noise Contours at Proposed Action Site

3.2.2 Existing Conditions

Ambient Noise Environment. The ambient noise environment at Kirtland AFB is affected mainly by USAF and civilian aircraft operations. The commercial and military aircraft operations at Albuquerque International Sunport are the primary source of noise in the northern and northwestern areas of the installation.

Table 3-2. Predicted Noise Levels for Construction and Demolition Equipment

Construction Category and Equipment	Predicted Noise Level at 50 Feet
Bulldozer	80 dBA
Dump Truck	83–94 dBA
Backhoe	72–93 dBA
Front-End Loaders	72–82 dBA
Pavers	87–88 dBA

Source: USEPA 1971

Noise from aircraft operations is present throughout the northwestern portion of Kirtland AFB as a result of operations at the Albuquerque International Sunport. The DNL 65 to 80+ dBA noise contours from aircraft operations at Albuquerque International Sunport were plotted on an aerial map (see **Figure 3-2**). The plotted contours from aircraft operations extend along the runways to the east, west, and southwest. The DNL 65 to 69 dBA noise zone encompasses the proposed hot cargo pad, and the DNL 70 to 74 dBA noise zone encompasses the associated new taxiway.

3.3 Visual Resources

3.3.1 Definition of the Resource

Visual resources include the natural and man-made physical features that give a particular landscape its character. The features that form the overall visual impression a viewer receives include landforms, vegetation, water, color, adjacent scenery, scarcity, and man-made modifications.

3.3.2 Existing Conditions

Military and civilian airfields compose much of the visual environment of Kirtland AFB. The prominent visual features of the installation include hangars, maintenance and support facilities, and aircraft. Off-installation, the visual environment varies from urban to rangeland to forest. To the north and west of Kirtland AFB are urban areas of the City of Albuquerque; to the northeast and east open spaces, forests, and rangeland are the prominent visual features; south of Kirtland AFB is Isleta Pueblo, which generally consists of open space, forests, or vacant land (KAFB 2003).

The Proposed Action site is approximately 0.65 miles southeast of the eastern end of the Albuquerque International Sunport's Runway 26, immediately east of Kirtland AFB's existing hot cargo pad (Pad 5). The Proposed Action area contains a small asphalt-paved vehicle parking area with a service road, a small storage shed, a personnel shelter, protective bollards and fences, and natural vegetation. No permanent, prominent visual features are currently at or in the vicinity of the Proposed Action; however, military aircraft and land-based vehicles are often seen at Pad 5 during hot cargo transport missions. In general, the aesthetic appearance of the Proposed Action area and vicinity is similar to that of a typical military airfield. **Figures 3-3**, **3-4**, and **3-5** are photographs documenting the current visual conditions at and in the vicinity of the Proposed Action.

Figure 3-3. Current Visual Conditions at the Northern Portion of the Proposed Action Site. View is facing north at existing small parking area.

Figure 3-4. Current Visual Conditions at the Central Portion of the Proposed Action Site. View is facing east at ERP site WP-26 (fenced area in background) and personnel shelter.

Figure 3-5. Current Visual Conditions at the Southern Portion of the Proposed Action Site. View is facing southeast at ERP site WP-26 (fenced area in background).

3.4 Air Quality

3.4.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m^3), or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. The USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-3** presents the primary and secondary USEPA NAAQS.

Table 3-3. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standard	
		Primary	Secondary
O_3	1 Hour [a]	0.12 ppm	Same as Primary Standard
	8 Hours [b]	0.08 ppm ($157 \mu g/m^3$)	
	8 Hours	0.075 ppm[g]	
PM_{10}	24 Hours [c]	$150 \mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean [d]	----	
$PM_{2.5}$	24 Hours [e]	$35 \mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean [f]	$15 \mu g/m^3$	
CO	8 Hours [c]	9.0 ppm ($10 mg/m^3$)	None
	1 Hour [c]	35 ppm ($40 mg/m^3$)	
NO_2	Annual Arithmetic Mean	0.053 ppm ($100 \mu g/m^3$)	Same as Primary Standard
SO_2	Annual Arithmetic Mean	0.03 ppm ($80 \mu g/m^3$)	0.5 ppm $1,300 \mu g/m^3$, 3-Hour averaging time
	24 Hours [c]	0.14 ppm ($365 \mu g/m^3$)	
Pb	Quarterly Average	$1.5 \mu g/m^3$	Same as Primary Standard

Source: USEPA 2009a

Notes: Parenthetical values are approximate equivalent concentrations.

a. (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) As of June 15, 2005, the USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

b. (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as the USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

c. Not to be exceeded more than once per year.

d. To attain this standard, the expected annual arithmetic mean PM10 concentration at each monitor within an area must not exceed 50 µg/m3.

e. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3.

f. To attain this standard, the 3-year average of the annual arithmetic mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.

g. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_2.

As authorized by the CAA, the USEPA has delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by the USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by the USEPA.

In 1997, the USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour O_3, $PM_{2.5}$, and regional haze standards that were promulgated in that year. The 1-hour O_3 standard will no longer apply to an area 1 year after the effective date of the designation of that area for the 8-hour O_3 NAAQS. The effective designation date for most areas was June 15, 2004. The USEPA designated $PM_{2.5}$ nonattainment areas in December 2004, and finalized the $PM_{2.5}$ implementation rule in January 2005.

On September 22, 2009, the USEPA issued a final rule for mandatory greenhouse gas (GHG) reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on carbon dioxide (CO_2) and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO_2 equivalent per year. The first emissions report is due in 2011 for 2010 emissions. Although GHGs are not currently regulated under the CAA, the USEPA has clearly indicated that GHG emissions and climate change are issues that need to be considered in future planning. GHGs are produced by the burning of fossil fuels and through industrial and biological processes.

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, installation, or activity) that has the potential to emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be “significant” if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s designation as Class I, II, or III [40 CFR 52.21(c)]. Because Kirtland AFB is not within 10 kilometers of a Class I area, PSD regulations do not apply and are not discussed further in this EA.

3.4.2 Existing Conditions

Kirtland AFB is in Bernalillo County which is within the Albuquerque-Mid Rio Grande Intrastate (AMRGI) Air Quality Control Region (AQCR) 152 (40 CFR 81.83). The AMRGI AQCR consists of portions of Sandoval and Valencia counties, and Bernalillo County in its entirety. The City of Albuquerque and Bernalillo County have been designated as being in maintenance status for CO effective July 15, 1996 (USEPA 1996). Kirtland AFB and the surrounding area are in attainment for all other criteria pollutants.

The most recent emissions inventories for Bernalillo County and the AMRGI AQCR are shown in **Table 3-4**. Bernalillo County is considered the local area of influence, and the AMRGI AQCR is considered the regional area of influence for the air quality analysis.

Table 3-4. Local and Regional Air Emissions Inventory for 2002

Location	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Bernalillo County, New Mexico	24,930	24,310	185,250	1,568	61,892	8,183
AMRGI AQCR	36,778	31,651	245,346	2,619	137,376	16,676

Source: USEPA 2009b

The DOE, Energy Information Administration states that in 2005, gross CO_2 emissions in New Mexico were 59.5 million metric tons (DOE 2009).

The Albuquerque-Bernalillo County Air Quality Control Board (AQCB) is the air pollution control authority for Bernalillo County while the AEHD-AQD handles air quality management functions. There are various sources on the installation that emit criteria and hazardous air pollutants (HAPs), including emergency generators, boilers, hot water heaters, fuel storage tanks, gasoline service stations, surface coating, aircraft engine testing, and miscellaneous chemical usage. As required by the Albuquerque-Bernalillo County AQCB regulations, Kirtland AFB estimates annual emissions from stationary sources and provides this information to the AEHD-AQD. **Table 3-5** summarizes the calendar year 2008 air emissions inventory for Kirtland AFB.

Table 3-5. Calendar Year 2008 Air Emissions Inventory for Kirtland AFB

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2008 Actual Emissions	12.8	60.0	13.0	1.1	8.1

Source: KAFB 2009a

The AEHD-AQD has fugitive dust-control requirements in 20.11.20 New Mexico Administrative Code (NMAC), *Fugitive Dust Control*. A fugitive dust-control construction permit is required for projects disturbing 0.75 acres or more, as well as the demolition of buildings containing more than 75,000 cubic feet of space. An application for a fugitive dust-control construction permit from the AEHD-AQD must be submitted a minimum of 30 days prior to the start of construction. As stated in 20.11.20.12 NMAC *General Provisions*, each person shall use reasonably available control measures or any other effective control measure during active operations or on inactive disturbed surface areas, as necessary to prevent the release of fugitive dust, whether or not the person is required by 20.11.20 NMAC to obtain a fugitive dust-control permit. This regulation also contains a provision for buildings containing asbestos-containing materials (ACMs) as stated in 20.11.20.22 NMAC *Demolition and Renovation Activities; Fugitive Dust Control Construction Permit and Asbestos Notification Requirements*: "All demolition and renovation activities shall employ reasonably available control measures at all times, and, when removing asbestos-containing material (ACM), shall also comply with the federal standards incorporated in 20.11.64 NMAC, *Emission Standards for Hazardous Air Pollutants for Stationary Sources*. A person who demolishes or renovates any commercial building, residential building containing five or more dwellings, or a residential structure that will be demolished in order to build a nonresidential structure or building shall file an asbestos notification with the department no fewer than 10 calendar days before the start of such activity. Written asbestos notification certifying to the presence of ACM is required even if regulated ACM is not or may not be present in such buildings or structures."

3.5 Geology and Soils

3.5.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology. Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban developed land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland.

The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects. Determination of whether an area is considered prime or unique farmland and potential impacts associated with a proposed action is based on preparation of the farmland conversion impact rating form AD-1006 for areas where prime farmland soils occur and by applying criteria established at Section 658.5 of the FPPA (7 CFR 658). The NRCS is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, 5 July 1984).

3.5.2 Existing Conditions

Regional Geology. The City of Albuquerque and Kirtland AFB are near the junction of five physiographic provinces: the Colorado Plateau, the Basin and Range, the Southern Rocky Mountains, the Rio Grande rift, and the Great Plains (Grant 1981). Kirtland AFB is in the eastern margin of the Albuquerque Basin, a major feature of the Rio Grande rift. The Rio Grande rift is approximately 620 miles long and is bordered on the west by the Colorado Plateau and on the east by the Great Plains. The Albuquerque Basin is north-trending and is approximately 90 miles long and 31 miles wide. It extends from near the Rio Grande to the foothills of the Sandia and Manzanita mountains (KAFB 2007). The Albuquerque Basin is defined to the south by the Socorro Channel, to the north by the Nacimiento Uplift, to the west by the Puerco Plateau and Lucero Uplift, and to the east by the Sandia and Manzanita mountains. The widest point of the Albuquerque Basin is near Kirtland AFB and it tapers off gradually towards its north and south ends. The basin was deepened and local mountain ranges were tilted by large-scale faulting that occurred approximately 11.2 to 5.3 million years ago. Geologic formations found within Kirtland AFB range in age from Precambrian granites to present-day windblown sands.

Topography. Most of Kirtland AFB is situated on a relatively flat mesa. This mesa is cut by the east-west trending Tijeras Arroyo, which drains into the Rio Grande. Elevations at Kirtland AFB range from 5,200 feet in the west to almost 8,000 feet in the Manzanita Mountains. In addition, several canyons (e.g., Lurance, Sol se Mete, Bonito, Otero, and Madera) are located on Kirtland AFB.

Soils. Most of the Albuquerque Basin consists of poorly consolidated sediments that eroded from the surrounding mountains. These sediments, known as the Santa Fe Group, are overlain in places by the 5.3-to-1.6-million-year-old Ortiz gravel deposits. Rio Grande soil types and volcanic deposits are also interspersed. The dominant soils of the Albuquerque Basin are well-drained and loamy, with minor amounts of gravelly and stony soils also found along the mountains and arroyos. Twenty-five soil types have been identified on Kirtland AFB. Of these 25 soil types, 3 are found at the site proposed for the proposed hot cargo pad (see **Figure 3-6**). **Table 3-6** provides general characteristics and limitations associated with the soils mapped within the Proposed Action site.

Table 3-6. Soil Properties of the Mapped Soil Type Found at the Proposed Action Site

Map Unit Name	Slope (percent)	Farmland Classification	Drainage	Road Limitations	Building Limitations	Excavation Limitations
Embudo gravelly fine sandy loam	0 to 5	Not prime farmland soil	Well-drained	Somewhat limited	Very limited	Very limited
Wink fine sandy loam	0 to 5	Not prime farmland soil	Well-drained	Not limited	Not limited	Somewhat limited
Bluepoint-Kokan association	--	Not prime farmland soil	Not rated	Somewhat limited	Very limited	Very limited

Source: NRCS 2009

Prime Farmland. Of the 25 soil types mapped at Kirtland AFB, none are considered prime farmland soils or farmland soils of statewide importance (NRCS 2009). Kirtland AFB is not currently used for agricultural purposes, nor is any agricultural use planned for the future.

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. This includes earthquakes, landslides, sinkholes, tsunamis, and volcanoes. In the City of Albuquerque, the primary geologic hazard that could potentially endanger lives or threaten property is earthquakes. The Albuquerque area is characterized by a series of faults on the eastern side of the Sandia and Manzano mountains. Movement on these faults has not occurred within the past 10,000 years; however, the Albuquerque area in general has a history of relatively frequent, but low magnitude and intensity, earthquakes (KAFB 1997a). The U.S. Geological Survey has produced seismic hazards maps based on current information about the rate at which earthquakes occur in different areas and on

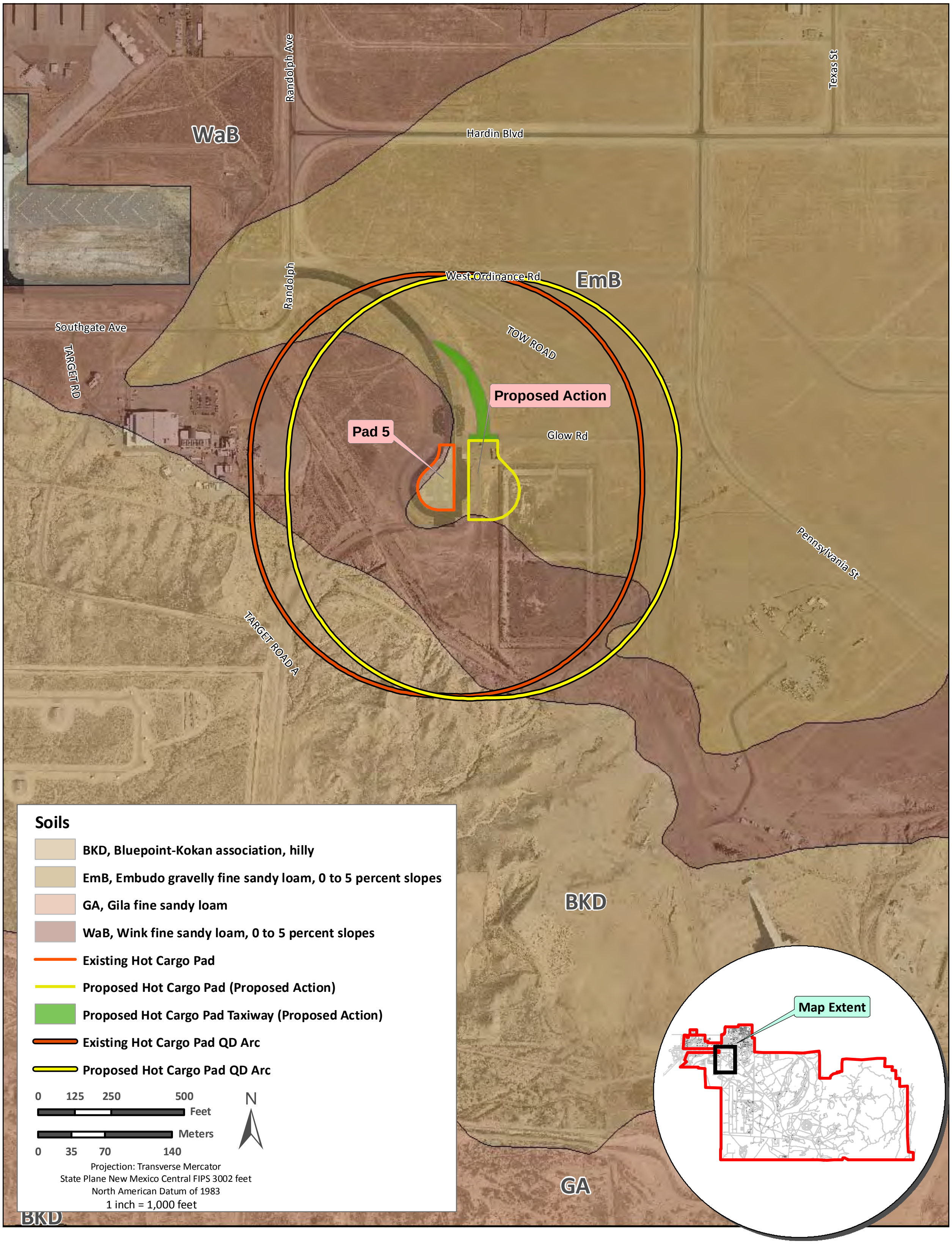


Figure 3-6. Mapped Soil Units at the Proposed Action Site

how far strong shaking extends from the quake source. The hazard maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g. The region of Kirtland AFB has a seismic hazard rating of approximately 16 to 20 percent g (USGS 2009).

3.6 Water Resources

3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. The Clean Water Act (CWA) (33 U.S.C. 1251 et seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (end of pipe) and nonpoint (storm water) sources of water pollution. Section 404 of the CWA regulates the discharge of dredge or fill material into waters of the United States, which includes wetlands. Waters of the United States are defined within the CWA, as amended, and jurisdiction is addressed by the USEPA and the U.S. Army Corps of Engineers (USACE). See **Section 3.7.1** for further details regarding jurisdiction by these agencies and wetlands, a subset of waters of the United States.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters. Proper management of storm water flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces has potential to impact adjacent streams as a result of stream bank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff onsite during construction and to maintain predevelopment storm water flow characteristics following development, through either the application of infiltration or retention practices. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

In 2010, the USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development Point Source Category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010, all new construction (or demolition) sites that disturb one or more acres of land are required to meet the non-numeric effluent limitations and effective erosion and sedimentation controls must be designed, installed, and maintained. These include:

- Control storm water volume and velocity to minimize erosion
- Control storm water discharges including both peak flow rates and total storm water volume
- Minimize the amount of soil exposed during construction activities
- Minimize the disturbance of steep slopes
- Minimize sediment discharges from the site using controls that address factors such as the amount, frequency, intensity and duration of precipitation; the nature of resulting storm water runoff; and soil characteristics, including the range of soil particle sizes expected to be present on the site
- Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration where feasible
- Minimize erosion at outlets and downstream channel and stream bank erosion
- Minimize soil compaction and preserve topsoil where feasible.

In addition, construction site owners and operators that disturb one or more acres of land are required to use BMPs to ensure that soil disturbed during construction activities does not pollute nearby water bodies.

Effective August 1, 2011, construction activities disturbing a total of 20 or more acres at one time, including non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development, must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation will be 280 nephelometric turbidity units.

Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 square feet of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses shall be conducted to evaluate the effectiveness of the as-built storm water reduction features. As stated in a DOD memorandum dated January 19, 2010, these regulations will be incorporated into applicable DOD Unified Facilities Criteria (UFC) within 6 months (DOD 2010). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

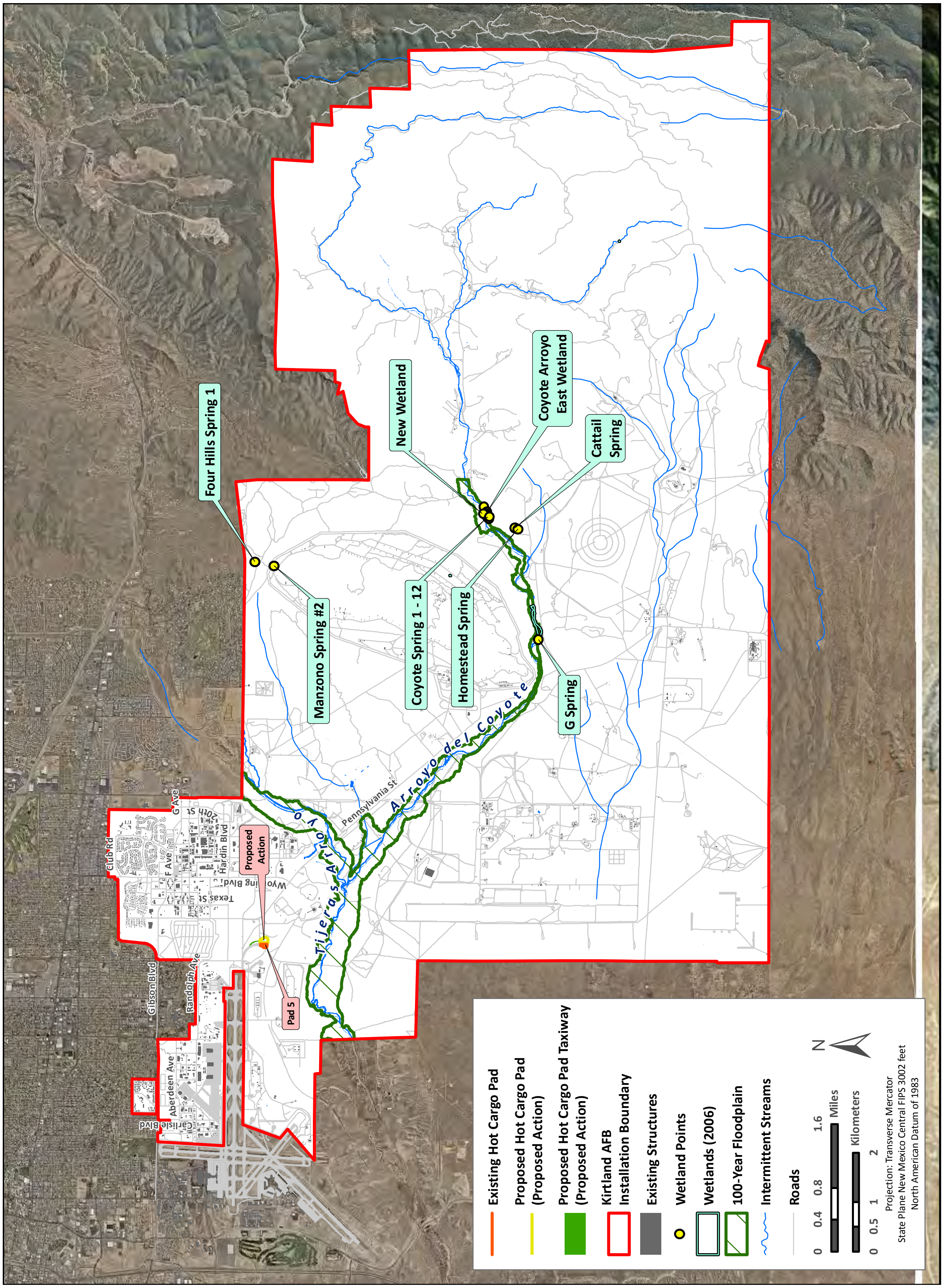
Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and habitat for a diversity of plants and animals. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Risk of flooding is influenced by local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety. EO 11988, *Floodplain Management*, directs Federal agencies to avoid siting within floodplains unless the agency determines that there is no practicable alternative.

3.6.2 Existing Conditions

Groundwater. Kirtland AFB is within the limits of the Rio Grande Underground Water Basin, which is defined as a natural resource area and is designated as a "declared underground water basin" by New Mexico. The Basin is regulated by the state as a sole source of potable water, although the Albuquerque area will be supplemented in the future with surface water diverted from the San Juan and Chama rivers to the Rio Grande (KAFB 2007). Two aquifers, a regional and a perched aquifer, underlie Kirtland AFB. The regional aquifer is present under all of Kirtland AFB and ranges in depth from near surface to depths of 200 feet below grade surface east of the major fault zones in the eastern portion of Kirtland AFB, and to depths of 350 to 500 feet below grade surface west of the fault zone. The regional aquifer is used for the installation's water supply. The perched aquifer is limited in area, straddling Tijeras Arroyo northeast of the confluence of Tijeras Arroyo and Arroyo del Coyote, and occurs at depths of 200 to 400 feet below grade surface. The perched aquifer is a result of infiltration of water from both man-made and natural origins, with a flow direction to the southeast, and is not used for any purpose. The presence of faults has a direct bearing on the movement and occurrence of groundwater in the vicinity of Kirtland AFB. The groundwater flow direction is down basin (south), with local variations and even reversals due to groundwater pumping, specific geologic structures, or shallow influences near the Rio Grande (KAFB 2002).

Surface Water. Kirtland AFB is within the Rio Grande watershed. The Rio Grande is the major surface hydrologic feature in central New Mexico, flowing north to south through Albuquerque approximately 5 miles west of Kirtland AFB (KAFB 2007). Water resources on Kirtland AFB reflect its dry climate. The average annual precipitation in Albuquerque is 9 inches, with half of the average annual precipitation occurring from July to October during heavy thunderstorms (KAFB 2007). Surface water generally occurs in the form of storm water sheet flow that drains into small gullies during heavy precipitation (KAFB 2007). Surface water generally flows across Kirtland AFB in a western direction toward the Rio Grande.

The two main surface water drainage channels on Kirtland AFB are Tijeras Arroyo and the smaller Arroyo del Coyote, which joins Tijeras Arroyo approximately 1 mile west of the Tijeras Arroyo Golf Course (see **Figure 3-7**). Tijeras Arroyo and Arroyo del Coyote are tributaries to the Rio Grande, and no jurisdictional determinations (JDs) have been made on these water features. If JDs were made, these arroyos could be regulated under Section 404 of the CWA (see **Sections 3.7.1** and **3.7.2.5** for more information on jurisdictional wetlands). Both arroyos flow intermittently during heavy thunderstorms and spring snowmelt, but most of the water percolates into alluvial deposits or is lost to the atmosphere via evapotranspiration (KAFB 2002). Tijeras Arroyo, which is dry for most of the year, is the primary surface channel that drains surface water from Kirtland AFB to the Rio Grande. Precipitation reaches Tijeras Arroyo through a series of storm drains, flood canals, and small, mostly unnamed arroyos. Nearly 95 percent of the precipitation that flows through Tijeras Arroyo evaporates before it reaches the Rio Grande, and the remaining 5 percent is equally divided between groundwater recharge and runoff (KAFB 2002). The closest main drainage channel that sheet runoff from the proposed hot cargo pad could drain to is the Tijeras Arroyo, which is approximately 0.75 miles south of the proposed hot cargo pad. A clearly defined tributary to the Tijeras Arroyo is approximately 0.35 miles south of the proposed hot cargo pad. There are no natural lakes or rivers on Kirtland AFB. Six man-made ponds are located on Tijeras Golf Course. At least 12 naturally occurring springs have been found on the installation (KAFB 2007).



Sources: USACE 2006, Hot Cargo Pads and Hydrography data: Kirtland AFB 10/2009

Figure 3-7. Surface Water, Floodplains, and Wetlands on Kirtland AFB

Storm water runoff on Kirtland AFB predominantly flows through the drainage patterns created by natural terrain and paved surfaces. In some areas, runoff is directed through ditches and piping, with direct discharges into a receiving stream or surface water body. Kirtland AFB has a Storm Water Municipal Separate Storm Sewer System (MS4), which collects and conveys storm water from storm drains, pipes, and ditches, and discharges storm water into Tijeras Arroyo and the City of Albuquerque's MS4. Storm water in the developed area of Kirtland AFB drains into small culverts. There are also four storm water detention ponds within the cantonment area. Storm water in the industrial/laboratory areas of Kirtland AFB discharges via surface runoff or three large culverts that drain toward Tijeras Arroyo. Kirtland AFB has an NPDES General Storm Water Permit for industrial activities and an active program for construction projects that require an NPDES permit. Kirtland AFB must also comply with MS4 permit requirements and has developed a Storm Water Management Plan as required by the MS4 permit (KAFB 2002).

Floodplains. A 100-year floodplain encompasses Tijeras Arroyo and Arroyo del Coyote (see **Figure 3-7**). These are the only two arroyos with a floodplain on the installation. Vegetation can encroach on the Tijeras Arroyo channel and obstruct the flow of water, which can cause flooding, especially during high-intensity thunderstorms between May and October. Tijeras Arroyo and Arroyo del Coyote floods occur infrequently and are characterized by high peak flows, small volumes, and short durations (KAFB 2007).

3.7 Biological Resources

3.7.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur, and native or introduced species found in landscaped or disturbed areas. Protected species are defined as those listed as threatened, endangered, or proposed or candidate for listing by the U.S. Fish and Wildlife Service (USFWS); New Mexico Energy, Minerals, and Natural Resources Department; or NMDGF. Federal species of concern are not protected by law; however, these species could become listed, and therefore are given consideration when addressing biological resource impacts of an action.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the Endangered Species Act (ESA) and sensitive ecological areas as designated by state or Federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer/winter habitats).

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection. Wetlands have been defined as areas that are "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987). Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats, including wetlands. For regulatory purposes, wetlands are defined by three factors: vegetation, hydrologic regime, and soil characteristics. In addition, many states have local regulations governing wetlands and their buffer areas.

In 2006, the U.S. Supreme Court addressed the jurisdictional scope of Section 404 of the CWA, specifically the term "the waters of the United States," in *Rapanos v. United States* and in *Carabell v.*

United States. As a consequence of the associated U.S. Supreme Court decision, the USEPA and USACE, in coordination with the Office of Management and Budget and the CEQ, developed the *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States and Carabell v. United States* memorandum (USEPA and USACE 2007a). The guidance requires a greater level of documentation to support an agency JD for a particular water body. As a result of the decision, the agencies now assert jurisdiction over the following categories of water bodies: Traditional Navigable Waters (TNWs); all wetlands adjacent to TNWs; nonnavigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and wetlands that directly abut such tributaries. In addition, the agencies assert jurisdiction over every water body that is not a Relatively Permanent Water if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW. The classes of water bodies that are subject to CWA jurisdiction, only if such a significant nexus is demonstrated are: nonnavigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, nonnavigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, or biological, integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.

An additional memorandum regarding USEPA and USACE coordination on JDs under CWA Section 404 in light of the Solid Waste Agency of Northern Cook County and Rapanos Supreme Court Decisions was developed and signed in response to the *Rapanos* decision (USEPA and USACE 2007b). Headquarters originally required the districts to request concurrence for only those JDs where the district was considering asserting jurisdiction over a nonnavigable, intra-state, isolated water or wetland. The agencies now require that all determinations for nonnavigable, isolated waters be elevated for USACE and USEPA Headquarters review prior to the district making a final decision on the JD.

3.7.2 Existing Conditions

Kirtland AFB lies at the intersection of four major North American physiographic and biotic provinces: the Great Plains, Great Basin, Rocky Mountains, and Chihuahuan Desert. Vegetation and wildlife found within Kirtland AFB are influenced by each of these provinces, the Great Basin being the most dominant. Elevations at Kirtland AFB range from approximately 5,000 feet in the west to almost 8,000 feet in the Manzanita Mountains, providing a variety of ecosystems. Several canyons (Lurance, Sol se Mete, Bonito, Otero, and Madera) are in the eastern portion of the installation; a few smaller canyons occur on Manzano Base portion of the installation. Kirtland AFB is near three regional natural areas: Sandia Mountain Wilderness Area, Sandia Foothills Open Space, and the Rio Grande Valley State Park. The Sandia Mountain Wilderness Area, encompassing 37,877 acres, is approximately 5 miles north of the eastern portion of the installation. This area is home to many species plants and animals and is also located on an important raptor migration route (KAFB 2007).

3.7.2.1 Applicable Laws, Regulation, and Policies

Appendix A contains summaries of the Federal environmental laws, regulations, and EOs that might apply to the Proposed Action. The State of New Mexico also has regulations applicable to biological resources. The New Mexico Wildlife Conservation Act of 1974 declared that native wildlife found to be threatened or endangered should be managed to maintain and, to the extent possible, enhance their numbers. Responsibility for implementing this Act was given to the NMDGF.

3.7.2.2 Vegetation

Four main plant communities are found on Kirtland AFB: grassland (includes sagebrush steppe and juniper woodlands), pinyon-juniper woodlands, ponderosa pine woodlands, and riparian/wetland/arroyo (see **Table 3-7**). Grassland and pinyon-juniper woodlands are the dominant vegetative communities at Kirtland AFB. The riparian/wetland/arroyo community is confined to drainages and isolated areas inundated by surface water during at least some part of the year. The ponderosa pine woodland community is found along the eastern boundary of the installation (KAFB 2007).

Table 3-7. Kirtland AFB Vegetation Communities

Vegetation Community Type	Elevation (feet)
Grassland (including sagebrush steppe and juniper woodlands)	5,200–5,700
Pinyon-Juniper Woodlands	6,300–7,500
Ponderosa Pine Woodlands	7,600–7,988
Riparian/Wetland/Arroyo	variable

Source: KAFB 2007

Grassland Community. This community is found between elevations of 5,200 and 5,700 feet at Kirtland AFB. The grassland community at Kirtland AFB was further delineated into two more community types, including sagebrush steppe in the western portion of the installation and juniper woodlands in the eastern portion. In the sagebrush steppe the understory is less dense, with cryptogamic crust covering areas of exposed ground. Juniper woodlands are similar to the grasslands to the east except for the greater abundance of one seeded juniper. The presence of this shrubby tree creates a savanna-like habitat in an otherwise treeless area. Juniper woodlands are found at a slightly higher elevation then the surrounding grassland. This habitat type provides a transition into pinyon-juniper woodlands (KAFB 2007).

Pinyon-Juniper Woodland Community. The pinyon-juniper woodland community ranges in elevation from 6,300 to 7,500 feet. This plant community is composed primarily of Colorado pinyon pine and one seeded juniper, with an understory of shrubs and grasses (KAFB 2007).

Ponderosa Pine Woodland Community. The ponderosa pine woodland community is found in the highest elevations of the eastern portion of the installation. It is typically found between 7,600 to 7,988 feet (KAFB 2007).

Riparian/Wetland/Arroyo Community. The riparian/wetland/arroyo community consists of species that have a greater moisture requirement than species common to the other communities on the installation. These plant communities are found along Tijeras Arroyo, Arroyo del Coyote, and at the various springs located throughout Kirtland AFB. Most of the small, scattered wetlands on Kirtland AFB are in good condition and occur in conjunction with other plant communities (KAFB 2007).

Turf and Landscaped Areas. Kirtland AFB promotes water conservation landscaping by using xeriscape methods combined with native plant materials (KAFB 2007).

The Proposed Action site is previously disturbed area that consists of asphalt, compacted gravel ground surface, two small structures, and undeveloped land with bare ground or minimal vegetation consisting of annual weeds and native grasses (see **Figures 3-3**, **3-4**, and **3-5**). Vegetation typical of the surrounding grassland community includes broom snakeweed (*Gutierrezia sarothrae*), Great Plains yucca (*Yucca glauca*), Indian ricegrass (*Oryzopsis hymenoides*), purple three-awn (*Artemisia pupurea*), black grama

(*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), galleta (*Hilaria jamesii*), foxtail barley (*Hordeum jubatum*), four-wing saltbush (*Atriplex canescens*), sand sagebrush (*Artemisia filifolia*), needle-and-thread grass (*Stipa comata*), globemallows (*Sphaeralcea* spp.), Siberian elm (*Ulmus pumila*), Mormon tea (*Ephedra viridis*), New Mexican bitterweed (*Senecio neomexicanus*), ring muhly (*Muhlenbergia torreyi*), plains prickly-pear (*Opuntia polyacantha*), and bottlebrush squirrel tail (*Elymus longifolius*) (KAFB 2003).

3.7.2.3 Wildlife Species and Habitat

Wildlife management falls under the jurisdiction of the NMDGF and the USFWS for migratory birds and federally threatened and endangered species. Threatened and endangered species are addressed in this EA under **Section 3.7.2.4**. Other laws protecting wildlife include, but are not limited to, the Bald Eagle Protection Act of 1940 (protects bald and golden eagles), the Migratory Bird Treaty Act (MBTA) of 1918 (protects neotropical migrants), and the ESA. Refer to **Appendix A** for additional laws and regulations (KAFB 2007).

Wildlife species found at Kirtland AFB are representative of the species diversity common to the regional ecosystem (grassland, juniper woodland, pinyon-juniper woodland, and ponderosa pine woodlands) and species common to semideveloped grassland areas. Species can be transient and travel or inhabit several communities, or exist in transitional areas between vegetation communities.

The location of the Proposed Action lies within the grassland association of Kirtland AFB. Common birds associated with the grassland association at Kirtland AFB include horned lark (*Eremophila alpestris*), scaled quail (*Callipepia squamata*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), American crow (*Cowus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), curved-billed thrasher (*Toxostoma curvirostre*), lark sparrow (*Chordestes grammacus*), black-throated sparrow (*Amphispiza bilineata*), western meadowlark (*Sturnella neglecta*), brown-headed cowbird (*Molothrus ater*), and house finch (*Carpodacus mexicanus*). The birds of prey, or raptors, most commonly found in the grassland association include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), prairie falcon *(F. mexicanus*), long-eared owl (*Asio otus*), and great horned owl (*Bubo virginianus*). A common scavenger in this habitat type is the turkey vulture (*Cathartes aura*) (KAFB 2003).

The grassland association has a mammal community dominated by rodents, rabbits, and hares. These include the desert cottontail (*Sylvilagus audubonii*), Gunnison’s prairie dog (*Cynomys gunnisoni*), white-footed deer mouse (*Peromyscus maniculatus*), silky pocket mouse (*Perognathus flavus*), Merriam’s kangaroo rat (*Dipodomys merriami*), and the northern grasshopper mouse (*Onychomys leucogaster*). Mammalian predators found in the grassland association include the coyote (*Canis latrans*), badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), striped skunk (*Mephitis mephitis*) and bobcat *(Lynx rufus*) (KAFB 2003). During the site visit for the Proposed Action in September 2009, prairie dogs were observed north and northeast of the proposed hot cargo pad site in the general vicinity of the new taxiway.

Amphibians and reptiles found on the grasslands at Kirtland AFB include the following: Woodhouse’s toad (*Bufo woodhousii*), New Mexico spadefoot (*Spea multiplicata*), coachwhip snake (*Masticophis flagellum*), whiptail lizards (*Cnemidophorus* spp.), lesser earless lizard (*Holbrookia maculata*), and the western rattlesnake (*Crotalus viridis*). Many of these species have extensive periods of dormancy during dry conditions and rapid breeding cycles when temporary ponds occur after rains (KAFB 2003).

3.7.2.4 Threatened and Endangered Species

The agencies that have primary responsibility for the conservation of plant and animal species in New Mexico are the USFWS; the NMDGF; and the New Mexico Energy, Minerals, and Natural Resources Department. These agencies maintain lists of plant and animal species that have been classified, or are potential candidates for classification, as threatened or endangered in Bernalillo County. Of those species known to occur in the county, two Federal species of concern (western burrowing owl [*Athene cunicularia hypugaea*] and mountain plover [*Charadrius montanus*]), and one state threatened species (gray vireo [*Vireo vicinior*]) have the potential to occur in the project area.

Gray vireo. The gray vireo (*Vireo vicinior*), a state threatened species, as listed by the NMDGF, is the only federally or state-listed species known to occur on the installation. The USFWS considers the gray vireo a sensitive species. In 2003, an installationwide gray vireo survey was conducted in which 53 territories were mapped (KAFB 2004a). Territories were found throughout the juniper woodland community in an elevational belt of 5,850 to 6,600 feet. Gray vireos occupied areas with an open canopy (i.e., less than 25 percent) with one seeded juniper as the dominate tree/shrub species (KAFB 2007).

Western burrowing owl. The western burrowing owl (*Athene cunicularia hypugaea*), a Federal species of concern, is a common resident at Kirtland AFB. It is very closely associated with the prairie dog colonies on the installation, as they use abandoned prairie dog burrows for nesting on Kirtland AFB during summer months. Owls generally occur on the installation between March and October before migrating south, although a few birds might occur on the installation during mild winters. Burrowing owl inventories have been conducted every year since 1994, and in 2005 a migration study was initiated to identify where nesting owls at Kirtland AFB go to winter. Since burrowing owls use old prairie dog burrows for nesting, a Prairie Dog Management Plan was developed for the installation, which takes into account burrowing owl habitat requirements (KAFB 2007). **Figure 3-8** shows potential prairie dog habitat and burrowing owl locations (observed 15 July 2009) at Kirtland AFB. Although not depicted on **Figure 3-8**, prairie dogs have been observed within the QD arcs for the exiting and proposed hot cargo pads.

Mountain plover. Mountain plovers (*Charadrius montanus*), a Federal species of concern, are not known to occur on the installation. However, in 2003, an adult with two chicks was observed just south of the installation on the Isleta Pueblo Indian Reservation (KAFB 2004a). Appropriate nesting habitat for this species is limited on the installation; therefore, it is unlikely that the mountain plover uses Kirtland AFB during the nesting season. However, the southern grasslands of the installation could potentially be used as brood-rearing habitat or during migration (KAFB 2007).

Santa Fe milkvetch. Santa Fe milkvetch (*Astragalus feensis*), a rare plant in New Mexico, is known or expected to occur on Kirtland AFB (KAFB 2008d). Santa Fe milkvetch is found on gravelly hillsides in pinyon-juniper woodland or plains-mesa grassland (5,100 to 6,000 feet elevation) (NMRPTC 1999).

Critical Habitat

Critical habitats are those areas of land, air, or water that are essential for maintaining or restoring threatened or endangered plant or animal populations. Neither the NMDGF nor the USFWS has designated or identified any critical habitat on Kirtland AFB. Surveys and literature indicate that important habitats on the installation include the wetlands, which are rare in the region and provide water in an otherwise arid environment. Other important habitats on the installation include prairie dog towns, which provide nesting habitat for the burrowing owl, and areas between 5,900 and 6,600 feet elevation containing open juniper woodlands, which are used as nesting habitat by the gray vireo (KAFB 2007).

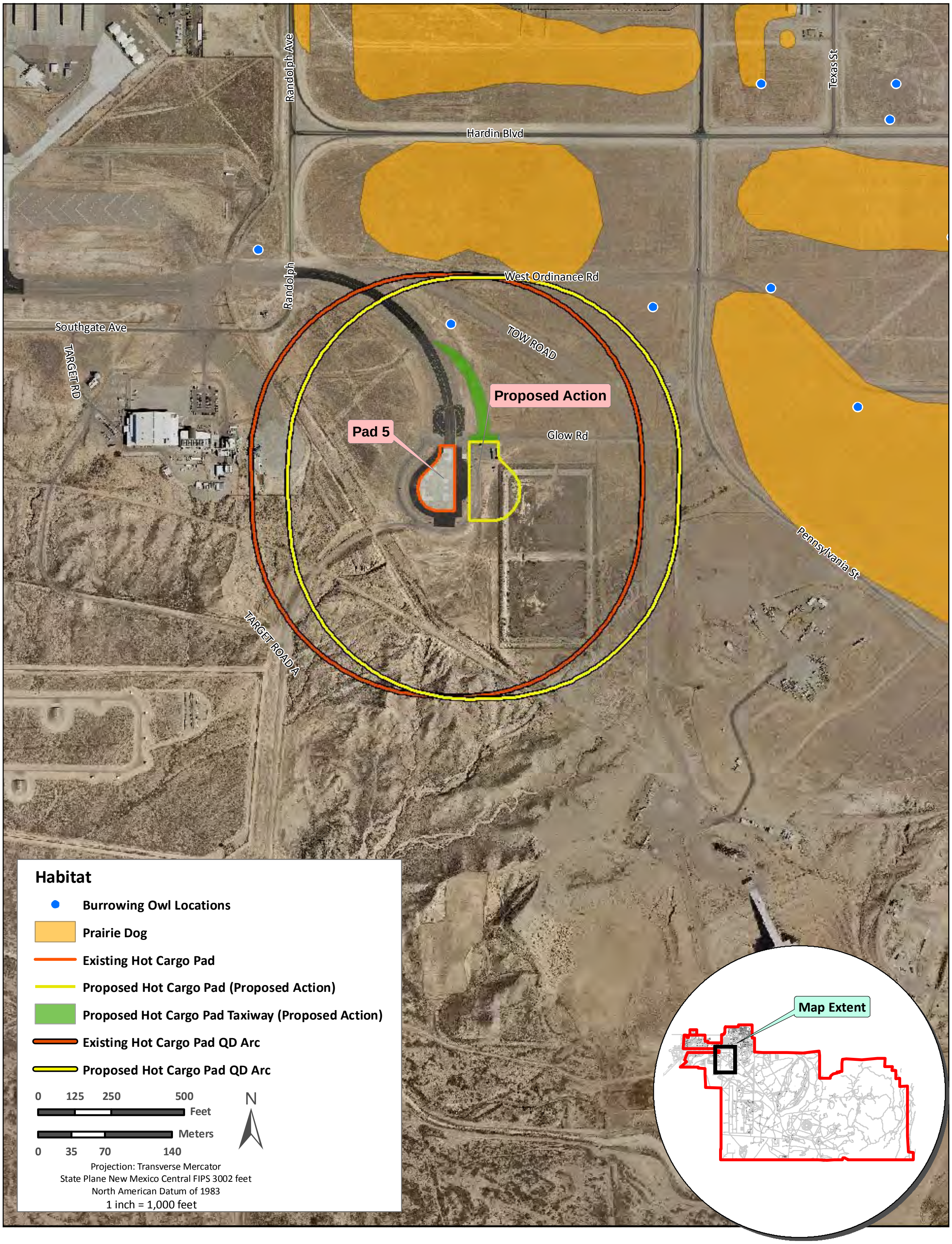


Figure 3-8. Potential Prairie Dog Colonies and Burrowing Owl Nest Locations near the Proposed Action Site

3.7.2.5 Wetlands

Wetlands provide an important function in recharging aquifers and buffering streams by filtering sediment and nutrients. Wetlands have been defined by agencies responsible for their management. The term "wetland" used herein, is defined using USACE conventions. The USACE has jurisdiction to protect wetlands under Section 404 of the CWA using the following definition:

> . . . areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]). Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands have three diagnostic characteristics that include: (1) over 50 percent of the dominant species present must be classified as obligate, facultative wetland, or facultative, (2) the soils must be classified as hydric, and (3) the area is either permanently or seasonally inundated, or saturated to the surface at some time during the growing season of the prevalent vegetation (USACE 1987).

Wetlands are considered waters of the United States if they are determined to be jurisdictional by the USACE and USEPA. See **Section 3.7.1** for further details regarding jurisdiction by these agencies.

There are several wetlands on Kirtland AFB; however there are no wetlands at or near the proposed hot cargo pad site (see **Figure 3-7**).

3.8 Cultural Resources

3.8.1 Definition of the Resource

Cultural resources include prehistoric and historic archaeological sites, structures, districts, or areas containing physical evidence of human activity. These resources are protected and identified under several Federal laws and EOs. The Federal Laws include the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

The NHPA requires that Federal agencies assume the responsibility for the preservation of historic and prehistoric resources located on lands owned or controlled by that agency. Section 110 (a)(2) of the NHPA requires that "...each Federal agency shall establish a program to locate, inventory, and nominate to the Secretary all properties under the agency's ownership or control...that appear to qualify for inclusion on the National Register…." Section 110 (a)(2) further requires that "Each agency shall exercise caution to assure that any property that might qualify for inclusion is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly." These requirements are also included in DOD Directive 4710.1.

Under NHPA guidelines, cultural resources, including building, structures, objects, sites, and districts, are to be evaluated for National Register of Historic Places (NRHP) eligibility using the NRHP Criteria for Evaluation, as listed in 36 CFR 60.4. To be listed in, or considered eligible for the NRHP, a cultural resource must be 50 years or older and possess at least one of the four following criteria:

- The resource is associated with events that have made a significant contribution to the broad pattern of history (criterion A).

- The resource is associated with the lives of people significant in the past (criterion B).
- The resource embodies distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic value; or represents a significant and distinguishable entity whose components may lack individual distinction (criterion C).
- The resource has yielded, or might be likely to yield, information important in prehistory or history (criterion D).

In addition to meeting at least one of the above criteria, a cultural resource must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Integrity is defined as the authenticity of a property's historic identity, as evidenced by the survival of physical characteristics it possessed in the past and its capacity to convey information about a culture or group of people, a historic pattern, or a specific type of architectural or engineering design or technology. Location refers to the place where an event occurred or a property was originally built. Design considers elements such as plan, form, and style of a property. Setting is the physical environment of the property. Materials refer to the physical elements used to construct the property. Workmanship refers to the craftsmanship of the creators of a property. Feeling is the ability of the property to convey its historic time and place. Association refers to the link between the property and a historically significant event or person.

Cultural resources meeting these standards (i.e., age, eligibility, and integrity) are termed "historic properties" under the NHPA. Sites or structures that are not considered individually significant can be considered eligible for listing in the NRHP as part of a historic district. According to the NRHP, a historic district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects that are historically or aesthetically united by plan or physical development.

Typically, cultural resources are grouped into three separate categories: archaeological, architectural, or sites that have a traditional religious or cultural significance to Native American tribes. Archaeological resources are defined as areas that have altered the landscape. Architectural resources are built structures of significance. In general, these architectural resources are typically more than 50 years old but newer structures can be evaluated under the entire above criterion. Resources of traditional, religious, or cultural significance to Native American tribes can include architectural or archaeological resources, sacred sites, neighborhoods, geographic landmarks, flora or faunal habitats, mineral localities, or sites considered essential for the preservation of traditional culture.

The EA process requires the assessment of potential impacts on cultural resources. In addition, under Section 106 of the NHPA, Federal agencies must take into account the effect of their undertakings on historic properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Under this process, the Federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's area of potential effect (APE) and assesses the possible effects of the proposed undertaking on historic resources in consultation with the State Historic Preservation Officer (SHPO) and other parties. The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to establish programs to inventory and nominate cultural resources under their purview to the NRHP.

3.8.2 Existing Conditions

Current understanding of Kirtland AFB history and prehistory reflects archival data, data collected during surveys, limited test and block excavations, as well as information derived from comparisons with archaeological sequences developed for the middle Rio Grande. The prehistoric chronological sequence used at Kirtland AFB is based primarily on projectile point forms and supported in part by radiocarbon age estimates available for the Holocene epoch and the discovery of early projectile point types in a stratified context. In general, the prehistory and history of Central New Mexico, including Kirtland AFB, is divided into four basic periods: Paleoindian, Archaic, Pueblo, and Historic. Numerous Kirtland AFB reports review the general cultural chronology and the history of prehistoric settlement, and subsistence patterns of the Middle Rio Grande.

The town of Albuquerque was founded in 1706 and has experienced a long and rich history. The decades following the U.S. Civil War witnessed a period of western settlement, encouraged in part by the Homestead Act of 1862. The Rio Grande saw an increase in settlement, with farming and ranching becoming the major economic activities. Substantial economic development followed the arrival of the Atchison, Topeka, and Santa Fe Railroads in 1879 and soon Albuquerque became the largest city in New Mexico.

As Spanish, and later Mexican, populations expanded, the Albuquerque area's population continued to shift outward and the foothills provided areas to graze cattle and sheep. In the late 1800s, mineable sources of coal, copper, lead, and zinc were discovered near the city. Fluorspars were mined in the Manzanita region as fluorite in the 1930s and 1940s (Voynick 1997). The upland forest attracted colonial woodcutters. Roads were later built to gain access to timber along the upper canyons and ridge tops during the late 1800s and early 1900s.

Archaeological Resources. According to an online records search conducted through the Archaeological Records Management Section (ARMS) of the New Mexico Department of Cultural Affairs and the New Mexico State Historic Preservation Office (http://stubbs.arms.state.nm.us/arms/), there have been more than 150 cultural resources projects undertaken at Kirtland AFB. These projects have resulted in the identification of 661 archaeological sites and the NRHP evaluations of more than 2,000 facilities. Of the 661 archaeological sites recorded within the boundaries of Kirtland AFB, most are located in the eastern portion of Kirtland AFB. Laboratory of Anthropology (LA) numbers have been assigned for each of these archaeological resources. NRHP eligibility evaluations are generally complete for the sites located on the lower piedmonts and drainages of the western portions of Kirtland AFB and the eastern Manzanita Mountains.

There have been three archaeological sites identified within one mile of the Proposed Action: LA 99781 (historic milled lumber structure with an associated historic trash component), LA 131751 (historic scatter of domestic and military medical artifacts), and LA 131741 (historic artifact scatter representing a historic trash dump) (see **Table 3-8**). All of the sites were determined ineligible to the NRHP and were concurred by the SHPO.

Table 3-8. Archaeological Sites Identified Near the Proposed Action Site

LA Number	Description	Eligibility
99781	Historic structure with associated historic trash	Not eligible
131751	Historic scatter of domestic and military medical artifacts	Not eligible
131741	Historic artifact scatter (domestic trash dump)	Not eligible

None of the sites occur within the APE and no known sites would be disturbed by the Proposed Action.

Architectural Resources. The inventory and assessment of architectural resources at Kirtland AFB has been ongoing since 1984. To date, 2,183 structures have been evaluated for NRHP eligibility. Of these, 244 buildings and structures have been determined eligible through consultation with the New Mexico SHPO.

No NRHP-eligible architectural resources occur within the APE and no NRHP-eligible architectural resources would be disturbed by the Proposed Action.

Traditional Cultural Properties. No traditional cultural properties or sacred sites have been identified at Kirtland AFB.

3.9 Infrastructure

3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure information provided below was primarily obtained from the *2002 Kirtland Air Force Base, New Mexico General Plan* (KAFB 2002) and provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include utilities and solid waste management.

Utilities include electrical, natural gas, liquid fuel, central heating and cooling, water supply, sanitary sewage/wastewater, storm water handling, and communications systems. Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs.

3.9.2 Existing Conditions

Electrical Systems. Kirtland AFB purchases electrical power from Western Area Power Administration. All electricity to the installation comes through the Sandia Switching Station on an approximately 80 million-volt amperes (MVA) capacity electrical circuit. The estimated normal electrical load for Kirtland AFB is approximately 35 MVA, and the estimated historical maximum electrical load is approximately 76 MVA. A 12.47-kilovolt underground electrical main currently supplies electricity to the area of the Proposed Action (KAFB 2008b).

Natural Gas Systems. Coral Energy supplies Kirtland AFB with natural gas. Natural gas enters the installation through a 60 pound-per-square inch pipeline just east of Pennsylvania Avenue. There are approximately 70 miles of natural gas mains at Kirtland AFB that provide natural gas service to multiple buildings on the installation. The primary buildings that receive natural gas service are in the cantonment area, family housing areas, and the Sandia Steam Plant. Natural gas demand depends on weather conditions; however, the approximate consumption for 2006 was 1,100,000 million British Thermal Units (BTUs). No natural gas mains currently extend to the area of the Proposed Action (KAFB 2008b).

Liquid Fuel. Liquid fuels are supplied to Kirtland AFB by contractors. The primary liquid fuels supplied include JP-8 (jet fuel), diesel, and gasoline. All of these fuels are purchased in bulk, delivered to the installation by tanker truck, and stored in various sized storage tanks scattered across the installation. The primary use for liquid fuels at Kirtland AFB is to power military aircraft and land-based vehicles (KAFB 2002).

Central Heating and Cooling Systems. Kirtland AFB has approximately 20 miles of steam mains that provide heating service to select buildings on the installation. The steam system is powered by three central heating plants; however, only one, the Sandia Steam Plant, is currently in service. Natural gas is the fuel source for the Sandia Steam Plant. Kirtland AFB is in the process of gradually disconnecting buildings from the central heating system and aims to eventually shut down the entire central heating system. No central heating mains currently extend to the area of the Proposed Action, and Kirtland AFB does not have a centralized cooling system (KAFB 2002).

Water Supply Systems. Water is supplied to Kirtland AFB by seven groundwater wells that have a collective water-pumping maximum of 9.3 million gallons per day (MGD). Kirtland AFB also purchases water from the City of Albuquerque to meet demand during peak periods; however, the amount of water purchased from the city has been negligible since 1998. The maximum water supply capacity from the City of Albuquerque is 8.6 MGD, which results in a maximum total water supply to Kirtland AFB of 17.9 MGD (KAFB 2008b). Water is stored in approximately 24 water storage tanks at Kirtland AFB, which have a collective storage capacity of approximately 5.5 million gallons. Water is transported throughout Kirtland AFB by two separate but interconnected water distribution systems, and is currently supplied to the area of the Proposed Action. There are approximately 160 miles of potable water supply piping and approximately 50 miles of nonpotable water supply piping. Nonpotable water is primarily used for golf course irrigation and fire protection systems. In general, the water supply piping is properly sized and is in good condition despite being more than 50 years of age on average (KAFB 2002).

Current water demand at Kirtland AFB is approximately 6 to 10 MGD during the summer and 2 to 4 MGD during the winter. As such, the groundwater wells generally have sufficient pumping capacity to meet current water demand (KAFB 2002).

Sanitary Sewer/Wastewater Systems. Kirtland AFB does not have its own sewage treatment facility. Instead, the sanitary sewer system of Kirtland AFB, which consists of approximately 92 miles of collection mains, transports wastewater to the City of Albuquerque treatment facility. Kirtland AFB is permitted a maximum of 1.149 million gallons of sewer discharge per day (901,000 gallons per day average) (Segura 2010). Kirtland AFB utilizes approximately 40 oil/water separators to collect greases and oils before they enter the wastewater collection system. Some facilities in remote portions of the installation are not serviced by the sanitary sewer system; these facilities instead utilize isolated, onsite septic systems to dispose of wastewater. Wastewater service is currently not available at the area of the Proposed Action (KAFB 2002).

Storm Water Systems. Man-made storm water drainage systems, which include gutters, culverts, ditches, and underground piping, direct storm water to receiving channels and basins in developed portions of Kirtland AFB. In less-developed portions of Kirtland AFB, man-made storm water drainage systems have not been installed, and storm water drains by sheet flow to various natural drainageways. Most storm water at Kirtland AFB that does not get absorbed into the ground drains into the Rio Grande, which eventually discharges in the Gulf of Mexico (KAFB 2002).

Communications Systems. Kirtland AFB utilizes copper and fiber optic cable for telephone and data transmission services. Kirtland AFB operates its own telephone switching system, which is adequately sized to support the current needs of the installation. The data transmission system has been designed to accommodate future growth of the installation (KAFB 2002).

Solid Waste Management. Solid waste generated at Kirtland AFB is collected by contractors and disposed of at the Rio Rancho Landfill, which is off-installation in the City of Rio Rancho and operated by Waste Management. In 2008, the Rio Rancho Landfill received a 10-year permit renewal and approval for a permit modification that allows for an increase of approximately 1,179,600 cubic yards of capacity over the amount approved in its 1998 New Mexico Environment Department permit (Permit Number 231402), but anticipates closure in 2019 (Waste Management 2010, NMED undated). From 2007 to 2009, Kirtland AFB sent an average of 2,500 tons of solid waste per year to the City of Rio Rancho landfill (Kitt 2010). Kirtland AFB operates a construction-and-demolition-only landfill on the installation. This landfill accepts only construction and demolition waste from permitted contractors working on the installation. The maximum capacity of the Kirtland AFB landfill is 10,164,000 cubic yards (4,065,676 tons) and the remaining capacity is 5,017,316 cubic yards (2,006,964 tons). From 2007 to 2009, Kirtland AFB disposed of an average of 23,000 tons per year of construction and demolition waste at the on-installation landfill (Kitt 2010). Kirtland AFB manages a recycling program to reduce the amount of solid waste sent to landfills. The Kirtland AFB Qualified Recycling Program is operated by contractors and collects office paper, cardboard, and aluminum from pick-up points scattered across the installation (KAFB 2002). Additional recycling efforts are oftentimes included in specific construction and demolition projects.

3.10 Hazardous Materials and Waste

3.10.1 Definition of the Resource

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. 6903(5), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include ACM, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act (TSCA) Title 15 U.S.C. Chapter 53. TSCA Subchapter I identifies PCBs, Subchapter II ACMs and Subchapter IV LBP. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763 with additional regulation concerning emissions (40 CFR 61). Whether from lead abatement or other activities, depending on the quantity or concentration the disposal of the LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR 750 and 761. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

The DOD has developed the ERP, which facilitates environmentally responsible land management through investigation and cleanup of contaminated sites on military installations. Through the ERP, the

DOD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed).

The information provided in this section focuses on the presence and management of hazardous materials and wastes associated with the demolition and construction activities, and operation and maintenance of the proposed hot cargo pad. The analysis includes the generation, storage, transportation, and disposal of hazardous wastes generated through implementation of the Proposed Action.

For the USAF, Air Force Policy Directive (AFPD) 32-70, *Environmental Quality,* and the AFI 32-7000 series incorporate the requirements of all Federal regulations, and other AFIs and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.10.2 Existing Conditions

Hazardous Materials and Petroleum Products. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. As part of the Hazardous Waste Management Plan, Kirtland AFB has deemed the 377th Mission Support Group (377 MSG)/Civil Engineer Compliance Branch (CEANC) as the responsible entity to oversee the storage and usage of hazardous materials on installation. Part of the 377 MSG/CEANC responsibilities is to control the procurement and use of hazardous material to support USAF missions, ensure the safety and health of personnel and surrounding communities, and minimize USAF dependence on hazardous materials. The 377 MSG/CEANC is charged with managing materials to reduce the amount of hazardous waste generated on the installation (KAFB 2004b).

There are no known hazardous materials or petroleum products at the proposed hot cargo pad site.

Hazardous and Petroleum Wastes. The 377 ABW maintains a *Hazardous Waste Management Plan* (KAFB 2004b) as directed by AFI 32-7042, *Waste Management*. This plan prescribes the roles and responsibilities of Kirtland AFB personnel with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for solid waste and hazardous waste management. Kirtland AFB is a large-quantity hazardous waste generator (Handler Identification NM9570024423). Kirtland AFB has several 90-day hazardous waste accumulation areas.

The existing Pad 5 area has historically been used for aircraft cargo loading. No known hazardous or petroleum wastes were generated, stored, or disposed of at the proposed hot cargo pad project area.

Environmental Restoration Program. The Defense Environmental Restoration Program (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD sites. The ERP and the Military Munitions Response Program (MMRP) are components of the DERP. The ERP requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses nonoperational range lands that are suspected or known to contain unexploded ordnance, discarded military munitions, or Munitions Constituent (MC) contamination.

Construction of the proposed hot cargo pad would overlap into one ERP site, WP-26, east of Pad 5. WP-26 consists of two abandoned sewage lagoons that are surrounded by berms and a locked fence. The lagoons were constructed from local material in 1962 and were unlined. Elevated levels of silver, benzo(a)pyrene, and TCE contamination have been identified at WP-26 due to its historical use as settling ponds for residential and light industrial raw sewage waste generated at Kirtland AFB. These historical lagoons were in service from 1962 to 1987 (KAFB 2008a, KAFB 2008e).

Initial sampling occurred in 2002 and 2003, and identified TCE and 1,1-dichloroethene (DCE) at levels above the minimum detection concentration in soil vapor samples from 50 to 200 feet below ground surface (bgs). Additionally, TCE was detected in perched groundwater samples above the USEPA Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L). Subsequent sampling association associated with a RCRA Facility Investigation (RFI) from 2004 through 2006 revealed soil vapor sampling of TCE, DCE, and acetone at concentrations significantly above the minimum detection concentration. Perched groundwater (from approximately 200 feet bgs) samples were collected under the RFI confirming that TCE was the only constituent of concern detected above its USEPA MCL (KAFB 2008e).

Soil sampling occurred separately from 2006 to 2007. The sampling event delineated the thickness of sewage sludge and effect the sludge had on subsurface soils to a depth of 5 feet. This investigation found several metals at elevated concentrations in the sewage sludge. Laboratory testing confirmed that chromium identified in the samples was not hexavalent chromium (the most toxic form). The sampling data were utilized to compile an Ecological and Human Health Risk Assessment. The conclusions of the assessment stated that silver in the sewage sludge was the only metal likely to create an ecological hazard. Concurrently, benzo(a)pyrene in the sludge-soil mixed layer was identified as the sole human health potential carcinogen risk (KAFB 2008a).

To address the potential risks identified in the Ecological and Human Health Risk Assessment Report, a remedial action consisting of removal of the top 5 inches of sewage sludge will be conducted in Spring 2010 (Holmes 2009).

Four MMRP sites (SR763, SR764, and SR767 Rifle Ranges and the SR766 Sub-Machine Gun Range) have been identified as overlapping with the existing hot cargo pad (Pad 5) and the proposed hot cargo pad site. The historical and revised historical range boundaries for SR763, SR764, and SR766, and the revised historical range boundary for SR767 overlap with the Proposed Action area. Phase I surveys were conducted for these ranges, and expended small arms cartridges and links were discovered at SR764 during the survey. No other MCs were identified at these ranges. Although, it was determined that SR766 and SR767 were not surveyed because discrepancies in the locations and boundaries of SR766 and SR767 were identified after completion of the surveys. All four MMRP sites are listed as category G for human health, chemical warfare, and explosive hazard. This hazard classification category corresponds with a minimal potential for exposure. It is not anticipated that these areas contain Munitions and Explosives of Concern (MEC); however, due to their historical use as firing ranges, there is a potential for MC contamination (USACE 2007).

Asbestos-Containing Material. Asbestos is regulated by the USEPA under the CAA, TSCA, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The USEPA has established that any material containing more than 1 percent asbestos is considered an ACM. Friable ACM is any material containing more than 1 percent asbestos, and that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable ACM is any ACM that does not meet the criteria for friable ACM. There are no records of ACMs at the Proposed Action site.

Lead-Based Paint. The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X) regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards. The existing shelter and storage facility at Pad 5 were constructed after 1978 and, therefore, likely does not contain LBP.

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment such as transformers and fluorescent light ballasts. Federal regulations govern items containing 50 to 499 ppm PCBs. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s, but were banned in 1979. PCB-containing oil is typically found in older electrical transformers and light fixtures (ballasts). Transformers containing greater than 500 ppm PCBs, between 50 and 500 ppm PCBs, and less than 50 ppm PCB are considered PCB, PCB-contaminated, and non-PCB, respectively. There are no records indicating the presence of PCBs at the Proposed Action site.

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act; Pollution Prevention Act of 1990; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*. AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans, which have management and minimization strategies for ozone-depleting substances, USEPA 17 industrial toxics, hazardous wastes, municipal solid wastes, affirmative procurement of environmentally friendly products, energy conservation, and air and water pollutant reduction. The 377 ABW fulfills this requirement with the following plans.

- Pollution Prevention Management Action Plan (KAFB 1999)
- Final Management Action Plan (KAFB 1997b)
- Hazardous Waste Management Plan (KAFB 2004b)
- Spill Prevention, Control, and Countermeasures (SPCC) Plan (KAFB 2001)
- Hazardous Material Emergency Planning and Response Plan (KAFB 2008c).

3.11 Safety

3.11.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses workers' health and safety during construction activities as well as public health and safety during and following construction activities.

Construction site safety requires adherence to regulatory requirements imposed for the benefit of employees. It includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and military-branch specific regulations designed to comply with standards issued by the Federal Occupational Safety and Health Administration (OSHA), USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Health and safety hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazards include transportation, maintenance and repair activities, and the creation of noisy environments or a potential fire hazard. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments due to noise or fire hazards for nearby populations. Noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

3.11.2 Existing Conditions

Contractor Safety. All contractors performing demolition and construction activities are responsible for following Federal and State of New Mexico OSHA regulations and are required to conduct demolition and construction activities in a manner that does not increase risk to workers or the public.

New Mexico is one of several states that administer their own occupational safety and health (OSH) program according to the provisions of the Federal Occupational Safety and Health Act of 1970, which permits a state to administer its own OSH program if it meets all of the Federal requirements regarding the program's structure and operations. The New Mexico Occupational Health and Safety Bureau program has the responsibility of enforcing Occupational Health and Safety Regulations within New Mexico. Its jurisdiction includes all private and public entities such as city, county, and state government employees. Federal employees are excluded as they are covered by Federal OSHA regulations.

OSH programs address the health and safety of people at work. OSH regulations cover potential exposure to a wide range of chemical, physical, biological, and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, or use of PPE. Occupational health and safety is the responsibility of each employer, as applicable. Employer responsibilities are to review potentially hazardous workplace conditions; monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), biological (e.g., infectious waste, wildlife, poisonous plants) agents, and ergonomic stressors; recommend and evaluate controls (e.g., prevention, administrative, engineering, PPE) to ensure exposure to personnel is eliminated or adequately controlled; and ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to the use of respiratory protection, engaged in hazardous waste work, asbestos, lead, or other work requiring medical monitoring.

One ERP site, WP-26, is partially within the area of the Proposed Action and, as such, represents a potential exposure to contractor personnel. WP-26 consists of two abandoned sewage lagoons that were used as settling ponds for Kirtland AFB's residential and light industrial sewage system from 1962 to 1987. Soil and groundwater sampling has identified both surface and subsurface media contamination at WP-26. Specific contaminates identified include TCE in subsurface soil vapor and perched groundwater, and various heavy metals and benzo(a)pyrene in surface sludge. Additionally, WP-26 might contain pathogens from sewage, such as tetanus and Hepatitis A. Exposure to any of these contaminates or pathogens are potential health and safety concerns to contractors working on site. Further details regarding contamination at WP-26 are presented in **Section 3.10.2**.

Military Personnel Safety. Each branch of the military has its own policies and regulations that act to protect its workers, despite their work location. Air Force regulation AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health* (AFOSH) *Program*, which implements AFPD 91-3, *Occupational Safety and Health*, governs the recognition, evaluation, control, and protection of Air Force personnel from occupational health and safety hazards. The purpose of the AFOSH Program is to minimize the loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks.

Kirtland AFB's existing hot cargo pad (Pad 5) currently presents safety concerns to military personnel. Pad 5 and its associated taxiways are in poor condition due to cracking and spalling of the pad's concrete surface and disintegration of the taxiways' asphalt due to age. The condition of Pad 5 was rated SERIOUS (just above FAILED) and assigned a C-17 FOD rating of POOR (lowest possible rating) in a 2004 Air Force Civil Engineering Support. The current condition of Pad 5 and its taxiways have the potential to jeopardize military personnel safety by damaging aircraft and delaying or aborting critical hot cargo missions. Additionally, the existing lighting at Pad 5 is not sufficient, which further jeopardizes military personnel safety. Currently, Pad 5 must remain in a state of continuous operation because Kirtland AFB does not have any other cargo pads with the mandated safety clearance zones required for handling hot cargo. As such, Pad 5 currently cannot be shut down for extended periods to receive needed maintenance and safety improvements.

Public Safety. Kirtland AFB has its own emergency services department. The emergency services department provides Kirtland AFB with not only fire suppression, crash-response, rescue, emergency medical, and hazardous substance protection but also provides emergency response planning and community health and safety education through the dissemination of public safety information to the installation. A Veterans Administration hospital and the 377th Medical Group's Outpatient Clinic are the primary military medical facilities at Kirtland AFB (KAFB 2009b). A number of other hospitals and clinics, which are devoted to the public, are off-installation in the City of Albuquerque. These facilities include the University of New Mexico Hospital and Kaseman Presbyterian Hospital (Google 2009).

The Fire and Rescue Emergency Services Division for the City of Albuquerque provides fire suppression, crash-response, rescue, emergency medical, and hazardous substance response to the nearby City of Albuquerque. The Fire and Rescue Emergency Services Division includes 23 fire engine companies, 7 fire ladder companies, 3 hazardous materials response units, and 18 medical response ambulances (City of Albuquerque 2009a). The City of Albuquerque also has an approximately 500-person police force available to provide law enforcement services (City of Albuquerque 2009b). A mutual aid agreement is in place between the City of Albuquerque and Kirtland AFB.

Explosives and Munitions Safety. Explosives, munitions, and ordnance are currently not handled, stored, or used at the area of the proposed hot cargo pad; however, immediately to the east of the proposed hot cargo pad is Kirtland AFB's existing hot cargo pad (Pad 5). All aircraft shipments of explosives, munitions, and ordnance to and from Kirtland AFB utilize Pad 5.

3.12 Aircraft Safety

3.12.1 Definition of the Resource

Aircraft safety for this EA is based on the physical risks associated with the movement of hazardous cargo. Under the Proposed Action, the proposed hot cargo pad would be used in conjunction with Pad 5 and each pad would act as contingency if the other pad is unavailable. The type and quantity of current hot cargo operations at the pads would not change from existing operations, and there would be no increase in the quantity of aircraft utilizing the hot cargo pads. Therefore, aircraft safety concerns that apply to aircraft flight operations, such as obstructions to flights, hazardous weather conditions, and Bird/Wildlife Aircraft Strike Hazard (BASH) issues, are not discussed in this EA.

Transportation facilities provide for the movement of munitions materials and equipment to meet operating and mission requirements. These facilities include hot cargo pads, flight line munitions holding points, primary and alternate munitions movement routes, vehicle parking, and load and unload platforms (railheads) (USAF 2004). Basic design and safety standards for munitions transportation facilities, such as hot cargo pads, are provided in multiple USAF documents, including AFMAN 91-201, *Explosives Safety Standards;* Air Force Handbook (AFH) 32-1084, *Facility Requirements*; AFI 32-1021, *Planning and Programming Military Construction (MILCON) Projects;* and UFC 3-260-1, *Airfield and Heliport Planning and Design*, among others. The USAF *Munitions Facilities Standards Guide* summarizes the multitude of USAF regulations into a single document that provides planning, site selection guidance, and design standards for munitions-related facilities (USAF 2004).

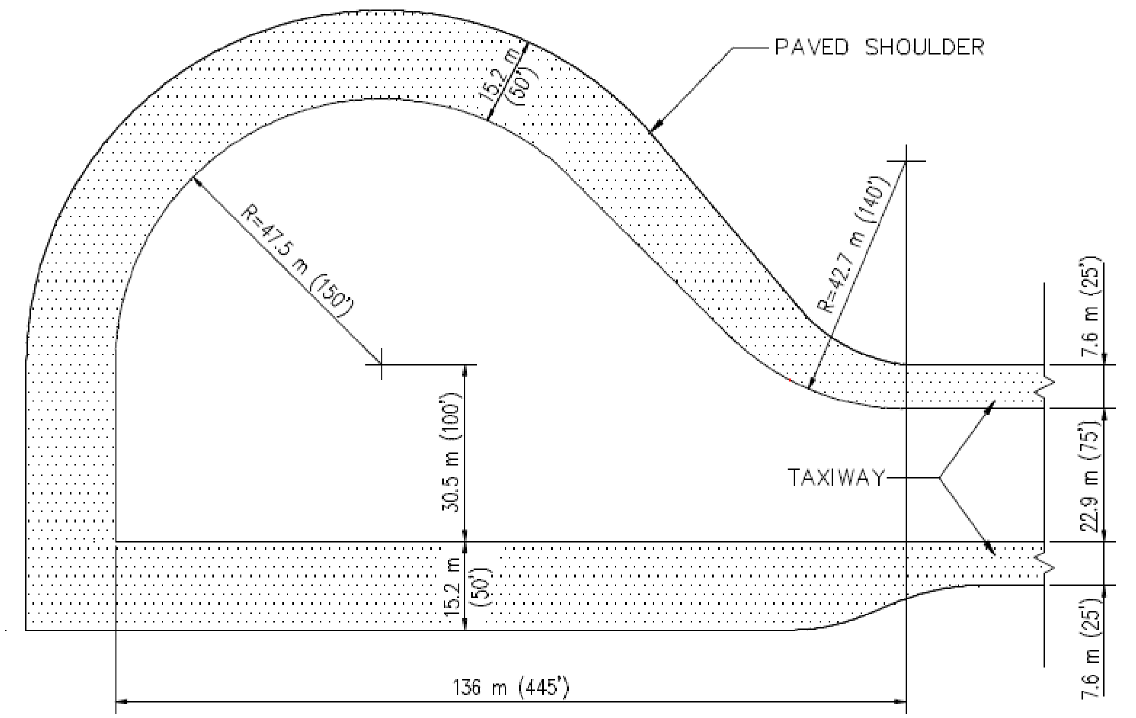
USAF policy on explosives safety requires the following (USAF 2009):

- Provide the maximum possible protection to personnel and property, both inside and outside the installation, from the damaging effects of potential accidents involving ammunition and explosives
- Comply with the cardinal principle for explosives safety: Expose the minimum number of people to the minimum amount of explosives for the minimum amount of time
- Compliance with AFMAN 91-201 except when compliance with more restrictive local standards is mandatory by an international agreement.

Design criteria for hot cargo pads include the following (USAF 1996, DOD 2008):

- The pad must be located to satisfy explosives safety standards as prescribed in DOD Directive 6055.9-STD, *DOD Ammunition and Explosives Safety Standards*, and AFMAN 91-201.
- Medium-load pavement must be used for the pad and its access taxiway.
- Tiedown anchors and grounding points in the pad must be installed.
- Blue, flush-type taxiway lights around the edge of the pads must be provided in accordance with AFI 32-1044, *Visual Air Navigation Systems*, and AFMAN 32-1076, *Design Standards for Visual Air Navigation Facilities*.
- An access taxiway must be provided for access from the primary taxiway to the hazardous cargo pad. The taxiway should be designed for the aircraft to taxi into the hazardous cargo pad under its own power.

Per AFH 31-1084 and the USAF *Munitions Facilities Standards Guide*, paved shoulders are included in hot cargo pad construction as shown in **Figure 3-9**. Paved shoulders are authorized when it is necessary to protect the shoulder areas against jet blast; reduce maintenance of the unpaved shoulder area; support aircraft outrigger gear; or accommodate snow removal equipment, aircraft service vehicles, and emergency vehicles (USAF 1996). Paved shoulders also provide locations for lighting and control of FOD. Paved shoulders should be a minimum 10 feet (3.1 meters) wide with lights installed. Wider shoulders are required for wide-bodied aircraft (USAF 2004).



Source: USAF 1996

Figure 3-9. Hot Cargo Pad Design Criteria

Risk is the probability and severity of loss from exposure to a hazard, such as the loading of weapons, ammunition, explosives, and other hazardous cargo from various aircraft. The assessment step is the application of quantitative or qualitative measures to determine the level of risk associated with a specific hazard. This process defines the probability and severity of a mishap that could result from the hazard based upon the exposure of personnel or assets to that hazard (USAF 2009).

Historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. These rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft. Since the inception of the USAF in 1947, aircraft accidents have steadily declined each year.

Because of the potentially damaging effects of explosives mishaps, separate facilities, such as a hot cargo pad (which is separate from the existing apron) are provided for explosives operations based on the type of hazards involved (USAF 1996). Weapon systems such as guns, rockets, missiles, and flare dispensers pose an additional hazard because of their directional response and potential long range if inadvertently activated on the ground. Aircraft are positioned to present the minimum hazard to personnel and resources in the event of a mishap (USAF 2009).

Per AFH 32-1084, a hot cargo pad is required at installations where explosives or other dangerous materials must be loaded frequently on cargo aircraft and where existing aprons cannot be used without violating QD safety criteria. The term QD refers to protection requirements from PESs to different kinds of ESs. The QD standards were developed over many years and are based on explosives mishaps and tests. As discussed in **Section 2.1.2**, an IB separation distance of 1,250 feet (approximately 0.24 miles) is required for Hazard Classification 1.1 explosives. At this distance some damage could still be expected (i.e., standard glass windows will shatter and unstrengthened buildings will receive 5 percent damage) (USAF 2009). The IB distance applies to several different types of ESs, including buildings and operations involving people not related to munitions/explosives work, joint DOD/non-DOD use runways, and high-density PTRs.

3.12.2 Existing Conditions

Pad 5 is the only cargo pad at Kirtland AFB with a sufficient surrounding clear zone to accommodate hot cargo (i.e., weapons, ammunition, explosives, and other hazardous cargo). However, Pad 5 is deteriorating due to cracking, spalling, and failing of the pad's Portland cement concrete caused by ASR, and disintegration of the taxiway's asphalt due to age. The condition of Pad 5 was rated SERIOUS (just above FAILED) and assigned a C-17 FOD rating of POOR (lowest possible rating) in a 2004 Air Force Civil Engineering Support Agency airfield condition survey. The report ranked replacement of Pad 5 as the installation's highest priority (KAFB undated).

The deficient condition of Pad 5 and its taxiway have the potential to jeopardize aircraft safety, and delay or abort critical hot cargo missions due to FOD and aircraft tire-cut potential. In addition, the existing lighting at Pad 5 is not sufficient and further jeopardizes aircraft safety. During the past 5 years, approximately $1 million has been spent on repairs to the pad and taxiway, but a stable state of repair is difficult due to its continual use (hot cargo is continuously flown in and out of Kirtland AFB) and repairs are ongoing.

3.13 Socioeconomics and Environmental Justice

3.13.1 Definition of the Resource

Socioeconomics. Socioeconomics is the relationship between economies and social elements such as population levels and economic activity. Factors that describe the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identifies gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region are used to compare the before and after effects of any jobs created or lost as a result of a proposed action. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.

Environmental Justice. Consideration of environmental justice concerns includes race, ethnicity, age, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. EO 12898 pertains to environmental justice issues and relates to various socioeconomic groups and the disproportionate effects that could be imposed on them. EO 13045 ensures consideration of environmental health and safety risks to children from proposed actions. **Appendix A** includes additional information on EOs 12898 and 13045.

3.13.2 Existing Conditions

Demographics. The population of the Albuquerque Metropolitan Statistical Area (MSA), defined by the U.S. Census Bureau as Bernalillo, Sandoval, and Valencia counties, was estimated to be 829,644 people in 2008. The 2008 estimate represents a 16 percent increase, or 2 percent annual increase, from the 2000 U.S. Census for the Albuquerque MSA population (U.S. Census Bureau 2000, U.S. Census Bureau 2008).

The population of Bernalillo County was 635,139 in 2008, representing 32 percent of the State of New Mexico population. The State of New Mexico's population totaled nearly 2,000,000 in 2008. Bernalillo County grew 14 percent from 2000 to 2008, while during this same time period Sandoval County experienced a 36 percent increase in population. Based on 2000 U.S. Census data and 2008 U.S. Census Bureau estimates, the population of Valencia County grew by 9 percent from 2000 to 2008. The growth rate of population in the Albuquerque MSA (16 percent) was much greater than the growth rate of the State of New Mexico (9 percent) and of the United States (8 percent) over the same time period. See **Table 3-9** for 2000 population and 2008 population estimate data (U.S. Census Bureau 2000, U.S. Census Bureau 2008).

Table 3-9. 2000 Population and 2008 Population Estimates

Location	2000	2008	Percentage Change
United States	281,421,906	304,059,724	8.0%
New Mexico	1,819,046	1,984,356	9.1%
Albuquerque MSA	712,738	829,644	16.4%
Bernalillo County	556,678	635,139	14.1%
Sandoval County	89,908	122,298	36.0%
Valencia County	66,152	72,207	9.2%

Sources: U.S. Census Bureau 2000, U.S. Census Bureau 2008

According to the U.S. Census Bureau, the State of New Mexico contains one of the largest percentages of minorities in the United States. The Hispanic population in New Mexico is the largest by percentage in the United States (42 percent), and the Native American population in New Mexico is the second largest by percentage in the United States (10 percent). The non-Hispanic White population in New Mexico is one of the smallest in the country as well at 45 percent (U.S. Census Bureau 2000). The Black or African American population in New Mexico is 2 percent and the Asian or Pacific Islander population is 1 percent, much less than the national averages of 12 percent and 4 percent, respectively (U.S. Census Bureau 2000).

Employment Characteristics. Approximately 1 percent of the Albuquerque MSA population is employed within the armed forces (U.S. Census Bureau 2000). The three largest industries and the corresponding percentage of the workforce employed within the industry are the educational, health, and social services industry (21 percent); the professional, scientific, management, administrative, and waste management services industry (13 percent); and the retail trade industry (12 percent). The construction industry represents 8 percent of the workforce. The average median household income for the Albuquerque MSA is $39,088, slightly less than the United States average of $41,994 (U.S. Census Bureau 2000)

Unemployment in the Albuquerque MSA from 1999 to 2008, ranged from 3.9 to 5.3 percent annually. In August 2009 the unemployment rate climbed to 7.9 percent (BLS 2009).

Kirtland AFB. The number of persons employed on Kirtland AFB is greater than 31,000, making it the single largest employer in the Albuquerque MSA. There are 1,170 active-duty personnel on the installation. Direct payroll expenditures from Kirtland AFB exceed $2 billion annually. When non-payroll expenditures associated with Kirtland AFB are included total expenditures sum $4.6 billion. The number of indirect jobs that are created as a result of Kirtland AFB expenditures and employment are estimated at 23,500 jobs (KAFB 2002).

Environmental Justice and Protection of Children. To provide a baseline measure for environmental justice an area around the installation must be established to examine the impacts on minority and low-income populations. For the purpose of this analysis a 50-mile radius around Kirtland AFB was evaluated to identify minority and low-income populations. This 50-mile radius includes numerous towns, villages, census-designated places, and cities. The largest of these is the City of Albuquerque with a population of 448,607. In the City of Albuquerque, 40 percent of the population is Hispanic and 4 percent is Native American (see **Table 3-10**). The City of Rio Rancho is on the northwestern side of Albuquerque and has a population of 51,765 and is the second largest city within 50 miles of Kirtland AFB. The Hispanic population represents 28 percent of the total population in Rio Rancho and the Native American population represents 2 percent of the total population. The third largest population center within 50 miles of Kirtland AFB is South Valley, situated to the west of Kirtland AFB, containing 39,060 persons. In South Valley the Hispanic population is 78 percent of the total population and the Native American population is 2 percent of the total population (U.S. Census Bureau 2000).

Table 3-10. Minority and Low-Income Characteristics (2000)

Race and Origin	City of Albuquerque	City of Rio Rancho	South Valley	New Mexico	United States
Total Population	448,607	51,765	39,060	1,819,046	281,421,906
Percent Under 5 Years of Age	6.9	7.5	7.9	7.2	6.8
Percent Over 65 Years of Age	12.0	11.8	10.0	11.7	12.4
Percent White	71.6	78.4	57.2	66.8	75.1
Percent Black or African American	3.1	2.7	1.1	1.9	12.3
Percent American Indian and Alaska Native	3.9	2.4	2.0	9.5	12.3
Percent Asian	2.2	1.5	0.3	1.1	12.3
Percent Native Hawaiian and Other Pacific Islander	0.1	0.2	0.1	0.1	0.1
Percent Other Race	14.8	10.9	35.0	17.0	5.5
Percent Two or More Races	4.3	4.1	4.2	3.6	2.4
Percent Hispanic or Latino	39.9	27.7	77.6	42.1	12.5
Median Household Income	$38,272	$47,169	$30,879	$34,133	$41,994
Percent of Families Living Below Poverty	10.0	3.7	32.1	14.5	9.2

Source: U.S. Census Bureau 2000

Note: Hispanic denotes a place of origin.

The percentage of families living below the poverty level varies greatly throughout the metropolitan area of Albuquerque, with the City of Albuquerque having poverty levels similar to the State of New Mexico and the United States. South Valley has a higher poverty rate compared to the State of New Mexico and the United States, and Rio Rancho has a lower poverty rate than the State of New Mexico and the United States.

4. Environmental Consequences

This section describes the potential environmental consequences on the affected environment of implementing the Proposed Action and the No Action Alternative. In **Sections 4.1** to **4.13**, each alternative is evaluated for its potential to affect physical, biological, and socioeconomic resources in accordance with 40 CFR 1508.8. Potential impacts for each resource area are described in terms of their significance. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR 1508.27) and should receive the greatest attention in the decision-making process.

4.1 Land Use

4.1.1 Evaluation Criteria

The significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use impact would be significant if it were to cause the following:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

4.1.2 Environmental Consequences

4.1.2.1 Proposed Action

The Proposed Action would be in compliance with the land use policies presented in the *2002 Kirtland Air Force Base, New Mexico General Plan*, including the main goals of providing operational support for missions; promoting the health, safety, and quality of life of Kirtland AFB's personnel; and applying space utilization standards to improve efficiencies and reduce operating costs. The Proposed Action would specifically satisfy several development objectives identified in the *2002 Kirtland Air Force Base, New Mexico General Plan* to achieve these goals, such as achieving higher development densities, combining similar missions, and siting facilities for maximum efficiency. The Proposed Action would be designated as Aircraft Operations/Maintenance land use, which would be consistent with the existing Aircraft Operations/Maintenance and Open Space uses at the proposed location, and would be compatible with the Open Space land uses in the surrounding area. The land use designation of small portions of the Proposed Action area would need to be changed from Open Space to Aircraft Operations/Maintenance; however, this would conform to the Kirtland AFB Future Land Use Plan. Therefore, the Proposed Action would be consistent with the existing and future installation land use designations and would comply with the *2002 Kirtland Air Force Base, New Mexico General Plan*. No impacts on land use plans or policies would be expected.

The Proposed Action would also be consistent with zoning designations in surrounding off-installation areas, which include ordinances relating to the Albuquerque International Sunport. Regardless, the

Proposed Action would not violate local zoning ordinances because municipal zoning regulations do not apply to Federal property. Therefore, the Proposed Action would not result in any impacts on municipal land use plans or policies.

The Proposed Action would not preclude the viability of existing land uses, or the continued use and occupation of surrounding areas. The proposed hot cargo pad would be compatible with the surrounding Aircraft Operations/Maintenance and Open Space land uses. Therefore, the Proposed Action would result in no impacts on existing land use viability or continued land occupation.

Demolition and construction activities would produce temporary, elevated noise levels that could be heard by persons immediately surrounding the proposed hot cargo pad site (see **Section 4.2.2** for environmental consequences related to noise). Operation of the Proposed Action would not produce increase noise above ambient noise levels because the type and quantity of hot cargo operations at the pads would not change from existing conditions, and there would be no increase in the quantity of aircraft utilizing the hot cargo pads. The Proposed Action would not result in significant impacts on land use compatibility from noise production.

As discussed in **Section 3.1.2**, several land uses and actions, including use of explosives and the development of people-intensive facilities not associated with flightline operations or other essential functions that must be sited within the Clear Zone, are prohibited within the Runway 26 Clear Zone and APZ I (USAF 1999). Major Command/Civil Engineering must approve alterations, minor additions, or improvements to existing facilities, and the construction of new facilities in the Clear Zone. The Proposed Action would be consistent with these regulations as it is a facility associated with flightline operations that must be within the Clear Zone in order to provide service to hot cargo aircraft missions. Therefore, with approval from Major Command/Civil Engineering, the Proposed Action would comply with these regulations. The Proposed Action would not conflict with planning criteria established to ensure the safety and protection of human life and property due to close proximity to an airport. Less-than-significant impacts on land use compatibility from safety issues related to proximity to an airport.

The Proposed Action would require the establishment of a 1,250-foot QD arc, and would also be within the existing 1,250-foot QD arc for Pad 5. Operation of both hot cargo pads would be considered compatible land uses because operation of the pads would not occur simultaneously, rather each pad would act as contingency if the other pad is unavailable. Prior to commencement of any work within the existing QD arc, all pad and roadway construction, utilities, and electromagnetic radiation sources must be coordinated with 377 ABW Weapons Safety to determine if an explosives site plan (ESP) is required; and if an ESP is required, work cannot start until approval is granted by DDESB or Major Command. Operation of the proposed hot cargo pad would be consistent with AFMAN 91-201. Compliance with these policies would ensure that the Proposed Action would result in less than significant impacts on land use compatibility from safety issues related to QD arcs.

4.1.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and existing land use conditions would remain the same as discussed in **Section 3.1.2**. No impacts on land use would be expected.

4.2 Noise

4.2.1 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise effects were evaluated qualitatively for the alternatives considered.

4.2.2 Environmental Consequences

4.2.2.1 Proposed Action

The Proposed Action includes the construction of a new hot cargo pad, including the associated taxiway, and demolition and repair of the taxiway to the existing hot cargo pad (Pad 5) as discussed in **Section 2.1.1**. Noise from demolition and construction activities would vary depending on the type of equipment being used, the area the activity would occur in, and the distance of the activity from the noise source. To predict how construction activities would impact adjacent populations, noise from the probable construction was estimated. For example, as shown in **Table 3-2**, construction usually involves several pieces of equipment (e.g., dump truck and paver) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative demolition noise during daytime hours at specified distances are shown in **Table 4-1**. These sound levels were predicted at 100, 200, 400, 800, and 1,200 feet from the source of the noise.

Table 4-1. Predicted Noise Levels from Demolition and Construction Activities

Distance from Noise Source	Predicted Noise Level
100 feet	86 dBA
200 feet	80 dBA
400 feet	74 dBA
800 feet	68 dBA
1,200 feet	64 dBA

The proposed hot cargo pad would fall within the DNL 65 to 69 dBA noise contours, and the proposed taxiway would fall within the DNL 70 to 74 dBA noise contours from aircraft operations at Albuquerque International Sunport. Since multiple single noise events create the cumulative DNL value, the actual sound levels that a person hears within the area of the DNL noise contours fluctuates throughout a 24-hour period. Consequently, populations within and adjacent to the Proposed Action are accustomed to fluctuations of noise levels in the 70 to 90 dBA range. Noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Consequently, demolition and construction activities from the Proposed Action would result in impacts on the noise environment; however, these impacts would be expected to be less than significant.

Operation of the Proposed Action would not change the noise environment from existing conditions because, if implemented, the proposed and existing hot cargo pads would act as contingency if the other pad is unavailable. The type and quantity of current hot cargo operations at the pads would not change and there would be no increase in the quantity of aircraft utilizing the hot cargo pads. Therefore, operation of the Proposed Action would not result in any impacts on the noise environment.

4.2.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented, and the existing conditions discussed in **Section 3.2.2** would remain unchanged. Therefore, the ambient noise environment would not change from existing conditions.

4.3 Visual Resources

4.3.1 Evaluation Criteria

The Proposed Action would result in significant impacts on visual resources if it caused the following:

- Adversely influence a national, state, or local park or recreation area
- Degrade or diminish a Federal, state, or local scenic resource
- Create adverse visual intrusions or visual contrasts affecting the quality of a landscape.

4.3.2 Environmental Consequences

4.3.2.1 Proposed Action

During construction activities, the area of the Proposed Action would have little aesthetic appeal. Construction equipment, including bulldozers, backhoes, front-end loaders, dump trucks, and concrete mixing trucks, would be visible from the areas adjoining the Proposed Action site. Demolition and construction wastes temporarily stored for disposal would be visible in piles and in dumpsters at the area of the Proposed Action, and construction wastes would be visible in trucks on and off the installation as it is being transported to landfills. Construction supplies would also be visible during transport to and temporary storage at the project site. Although the construction activities would adversely impact the installation's overall aesthetic appeal, the adverse impacts would be temporary (12- to 14-month duration). Less-than-significant impacts on visual resources would be expected from construction activities.

Kirtland AFB would experience adverse effects on its overall visual condition following the implementation of the Proposed Action. Although the proposed hot cargo pad and its associated facilities, land-based vehicles, and aircraft would alter the existing visual conditions of Kirtland AFB, it would be situated immediately east of Kirtland AFB's existing hot cargo pad (Pad 5). As such, the proposed hot cargo pad's visual appearance would be consistent with the existing aesthetic conditions for this area, and visual alteration would be negligible. No additional aircraft and land-based vehicles would be observable at Kirtland AFB following the construction of the proposed hot cargo pad. The proposed hot cargo pad and Pad 5 would not be used simultaneously, and the total volume of hot cargo traffic at Kirtland AFB would remain unchanged. The Proposed Action also includes the installation of lighting at the proposed hot cargo pad and improvements to lighting at Pad 5. Lighting at both hot cargo pads would be designed to enhance the overall aesthetic condition of the area. The Proposed Action would result in negligible changes to visual condition of the proposed hot cargo pad site; however, the effects on visual resources would be less than significant.

4.3.2.2 No Action Alternative

The No Action Alternative would result in continuation of the existing visual and aesthetic conditions, as discussed in **Section 3.3.2**. Construction of the proposed hot cargo pad would not take place, and no changes to the installation's current aesthetic appearance would occur.

4.4 Air Quality

4.4.1 Evaluation Criteria

The Federal *de minimis* threshold emissions rates were established by the USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. **Table 4-2** presents these thresholds, by regulated pollutant. As shown in **Table 4-2**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

Table 4-2. Conformity de minimis Emissions Thresholds

Pollutant	Status	Classification	***de minimis*** **Limit (tpy)**
O_3 (measured as NO_x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment / maintenance	Serious	70
		Moderate	100
		Not Applicable	100
$PM_{2.5}$ (measured directly, as SO_2, or as NO_x)	Nonattainment/ maintenance	All	100
SO_2	Nonattainment/ maintenance	All	100
NO_x	Nonattainment/ maintenance	All	100

Source: 40 CFR 93.153

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard

- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Effects on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21(b)(23)(iii)).

4.4.2 Environmental Consequences

4.4.2.1 Proposed Action

Demolition and construction activities at Kirtland AFB under the Proposed Action would result in impacts on air quality resources; however these impacts are expected to be less than significant. Air quality impacts during construction and demolition activities would result primarily from site-disturbing activities and operation of construction equipment. All emissions associated with demolition and construction operations would be temporary in nature. The proposed project includes the construction and operation of a 4.2-acre hot cargo pad and elements to tie the existing pad and the proposed pad together. The project also involves demolishing and removing existing aboveground infrastructure elements such as light poles, a personnel shelter, a storage shed, and various utility and lagoon infrastructures. It is not expected that emissions from the Proposed Action would contribute to or affect local or regional attainment status with the NAAQS. Emissions from the Proposed Action are summarized in **Table 4-3**. Emissions estimation spreadsheets and methodology are included in **Appendix C**.

The Proposed Action would generate particulate matter emissions as fugitive dust from ground-disturbing activities (e.g., road surface demolition, paving, and construction). A fugitive dust-control construction permit from AEHD-AQD prescribing fugitive dust minimization procedures would be required for the Proposed Action because the action would result in ground disturbance of greater than 0.75 acres. Appropriate fugitive dust-control measures would be employed during demolition activities to suppress emissions. Combustion emissions of all criteria pollutants would result from the operation of construction equipment and portable generators during demolition activities, hauling demolition wastes from the project site, and construction workers commuting to the project site. Fugitive dust and combustion emissions associated with construction equipment would produce slightly elevated air pollutant concentrations. However, the effects would be temporary, fall off rapidly with distance from the Proposed Action site, and would not result in any long-term impacts.

Table 4-3. Estimated Air Emissions Resulting from the Proposed Action

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Construction Combustion	10.513	0.743	4.389	0.491	0.691	0.670	1,216.674
Construction Fugitive Dust	--	--	--	--	34.436	2.858	--
Haul Truck On-Road	0.092	0.067	0.271	0.007	0.109	0.028	23.307
Construction Commuter	1.412	1.878	20.191	0.060	0.762	0.208	293.250
Total Proposed Action Emissions	**12.02**	**2.69**	**24.85**	**0.56**	**36.00**	**3.76**	**1,533.23**
Percent of AMRGI Inventory	0.0327%	0.0085%	0.0101%	0.0213%	0.0262%	0.0226%	NA

Fugitive dust emissions would vary from day to day depending on the level of activity and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Fugitive dust emissions for various construction activities were calculated using emissions factors and methodology published by the USEPA. Fugitive dust emission estimations and methodology are included in **Appendix C**.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for construction and experience with similar types of construction projects. For the purpose of this analysis the duration of this project would occur over a one-year period. The estimated emissions for this project are presented in **Table 4-3**. Detailed assumptions used for estimating emissions are included in **Appendix C**.

Since Kirtland AFB is in attainment for all criteria pollutants, General Conformity Rule requirements are not applicable. In addition, the Proposed Action would generate emissions below 10 percent of the emissions inventory for the AMRGI AQCR and the emissions would be short-term. Therefore, the construction and demolition activities associated with the Proposed Action would not have significant effects on air quality at Kirtland AFB or on regional or local air quality. **Appendix C** includes the air emission estimation spreadsheets.

Greenhouse Gases

GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative environmental, economic, and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges. Predictions of long-term negative environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a substantial reduction in winter snow pack.

The most common GHGs emitted from natural processes and human activities include CO_2, methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydro fluorocarbons and per fluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. To simplify analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e).

Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in Federal laws and EOs, most recently, EO 13514, *Leadership in Environmental, Energy, and Economic Performance*. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In addition, groups of states (such as the Western Climate Initiative) have formed regionally based collectives to jointly address GHG pollutants.

The Energy Information Administration states that in 2005, gross CO_2 emissions in New Mexico were 59.5 million metric tons of CO_2 (DOE 2009). Approximately 1,390 metric tons of CO_2 (1,533 tons) were estimated to be emitted by the proposed project. The CO_2 emitted is approximately 0.0023 percent of the New Mexico statewide CO_2. Therefore, the Proposed Action would have negligible contribution towards the New Mexico statewide GHG inventory. CO_2 emission estimates are included in **Appendix C**.

4.4.2.2 No Action Alternative

Under the No Action Alternative, Kirtland AFB would not construct the hot cargo pad or associated infrastructure, which would result in the continuation of the existing conditions discussed in **Section 3.4.2**. Therefore, no direct or indirect environmental effects would be expected on local or regional air quality from implementation of the No Action Alternative.

4.5 Geology and Soils

4.5.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating the potential impacts of a proposed action on geological resources. Generally, adverse impacts can be avoided or minimized if proper construction techniques, erosion-control and storm water management measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structures that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function (including prime farmland and other unique soils) within the environment.

4.5.2 Environmental Consequences

4.5.2.1 Proposed Action

Under the Proposed Action no significant impacts on geological resources or soils would be expected. The Proposed Action would require disturbance of approximately 4.2 acres of previously disturbed and undisturbed land for construction and operation of a new hot cargo pad, and disturbance of additional land to construct a new taxiway. Construction activities would require removal of existing infrastructure within the project site. Following demolition, the project site would require clearing of vegetation, grading, and paving. Clearing of vegetation could increase erosion and sedimentation potential. Soil erosion and sediment production would be minimized for all construction operations as a result of following an approved sediment-and-erosion-control plan. In addition, construction BMPs would be implemented to minimize soil erosion; therefore, no significant impacts on soils would be anticipated at the project site.

As a result of implementing the Proposed Action, soils would be compacted, and soil structure would be disturbed and modified. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and would be eliminated in those areas within the footprint of the proposed hot cargo pad and taxiway. Loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns. Soil erosion and sediment control measures would be included in the site plan to minimize long-term erosion and sediment production. Use of storm water control measures that favor reinfiltration would minimize the potential for erosion and sediment production as a result of future storm events. However, as most of the site is only sparsely vegetated and has been previously disturbed, it is anticipated that clearing of vegetation would not result in a significant impact on soil erosion and sedimentation.

Construction of the hot cargo pad would not require any infrastructure that would be susceptible to damage or impacts on inhabitants as a result of earthquakes. No impacts from geologic hazards would be expected.

4.5.2.2 No Action Alternative

Under the No Action Alternative, the 377 ABW would not construct a hot cargo pad and existing conditions would remain. No effects on geological resources would be anticipated.

4.6 Water Resources

4.6.1 Evaluation Criteria

Evaluation of impacts on water resources is based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would be adverse if it were to substantially affect water quality; substantially reduce water availability or supply to existing users; threaten or damage hydrologic characteristics; or violate established Federal, state, or local laws and regulations. The potential impact of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

4.6.2 Environmental Consequences

4.6.2.1 Proposed Action

Under the Proposed Action, less-than-significant impacts on water resources would be expected. Groundwater might be temporarily used for dust suppression during demolition and construction activities, depending on site conditions. If water application were required for dust suppression, sufficient water resources are available on the installation; therefore, less-than-significant adverse impacts on groundwater availability would be expected.

The Proposed Action would create ground disturbances on a small scale, which could in turn increase erosion potential and runoff during heavy precipitation events. Demolition and construction debris could reach waterways through wind or surface runoff if measures were not taken to keep debris on site. Proper housekeeping and retention of debris within the site boundaries would prevent construction debris from entering waterways. The USEPA's Construction General Permit outlines a set of provisions construction operators must follow to comply with the requirements of the NPDES storm water regulations. The NPDES storm water program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under an NPDES permit for their storm water discharges. Kirtland AFB manages an active program for tracking and inspecting large (greater than 5 acres) and small (1 to 5 acres) construction activities that require coverage under the NPDES program (KAFB 2002). Because the Proposed Action would disturb more than 1 acre (approximately 11 acres for proposed pad and taxiway), it would require NPDES permit coverage, which would further require the preparation of a Notice of Intent (NOI) to discharge storm water and preparation of a Storm Water Pollution Prevention Plan (SWPPP) that would be implemented during construction. The SWPPP would be developed in accordance with the requirements of the Construction General permit. Prior to submission of the NOI to the USEPA, which is the NPDES permitting authority in New Mexico, the construction operator would be required to submit the SWPPP to the 377 MSG/CEANC for review. A SWPPP would identify BMPs to reduce erosion and runoff from construction of the proposed hot cargo pad.

As a new requirement under the CWA Final Rule for its NPDES Construction General Permit, Kirtland AFB would be required to meet the non-numeric effluent limitations of the CWA and design, install, and maintain effective erosion and sedimentation controls as described in **Section 3.6.1**. The implementation of these non-numeric effluent limitations would minimize short-term adverse effects on surface waters from erosion, sedimentation, and pollution. In addition, Kirtland AFB would be subject to the new storm water design requirements of Section 438 of the EISA that require Federal construction projects that disturb 5,000 square feet or more of land to maintain or restore predevelopment site hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Under the Proposed Action, construction contractors would be required to provide documentation on how they would meet Section 438 of the EISA requirements. Therefore, no significant short-term or long-term, adverse impacts on water resources would be expected from the Proposed Action.

Design of the proposed hot cargo pad would include storm water control. Storm water from the proposed hot cargo pad would be incorporated into Kirtland's MS4; therefore, no long-term adverse effects on water resources from sheet runoff during storm events would be expected from the operation of the hot cargo pad. In addition, Kirtland AFB's MS4 permit requires that all construction activities, regardless of size, implement BMPs to ensure that storm water pollutants do not enter the storm drainage system and that storm water pollutants are contained within the project area. All storm water drop inlets in the project area must be protected with a barrier (e.g., hay bales, socks, sand bags). Contractors must minimize stock piles and keep the construction area clean of debris, designate equipment and storage areas, ensure equipment are free of leaks, minimize exits and entrances to the project area, minimize track out, and implement good housekeeping measures to ensure practices are reducing storm water pollutants to the maximum extent practicable.

Heavy equipment (e.g., bulldozers, backhoes, dump trucks, concrete mixers, asphalt vehicles) and generators would be on site throughout periods of demolition and construction. Fuels, hydraulic fluids, oils, and other lubricants would be stored on site during the project to support contractor vehicles and machinery. No other hazardous materials are anticipated to be stored on site during demolition or construction activities. It is assumed that construction personnel would follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Proper housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of fluids into groundwater or surface waters. In the event of a spill, procedures outlined in Kirtland AFB's Hazardous Material Emergency Planning and Response Plan would be followed to quickly contain and clean up a spill (see **Sections 3.10** and **4.10** for more information on hazardous materials and wastes). Therefore, less-than-significant adverse impacts on water quality would be expected as a result of the Proposed Action.

The existing and proposed hot cargo pads are outside of the Tijeras Arroyo and Arroyo del Coyote 100-year floodplains; therefore, no direct impacts on floodplains would be expected. Although the quantity of storm water sheet flow from disturbed sites to the intermittent streams on Kirtland AFB could increase during demolition and construction activities, this increase is not anticipated to be significant. Therefore, the Proposed Action would have less-than-significant impacts on floodplain flow characteristics.

4.6.2.2 No Action Alternative

Under the No Action Alternative, the proposed hot cargo pad and related components would not be constructed and there would be no changes to current water resources. Therefore, no new impacts on water resources would be expected as a result of the No Action Alternative. Without implementation of the Proposed Action, the pavement conditions at Pad 5 would continue to deteriorate. Deterioration could lead to cracks in pavement, which would not prevent release of pollutants into soils or groundwater in the event of a spill; therefore, long-term, adverse effects could occur from the No Action Alternative.

4.7 Biological Resources

4.7.1 Evaluation Criteria

The level of impact on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of general classes of effects (i.e., removal of critical habitat, noise, human disturbance).

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts on wetland resources are considered significant if high value wetlands would be adversely affected.

Ground disturbance and noise associated with construction activities might directly or indirectly cause potential effects on biological resources. Direct effects from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Mortality of individuals, habitat removal, and damage or degradation of habitats are effects that might be associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. To evaluate effects, considerations were given to the number of individuals or critical species involved, amount of habitat affected, relationship of the area of potential effect to total available habitat within the region, type of stressors involved, and magnitude of the effects.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid “taking” threatened or endangered species, which includes jeopardizing threatened or endangered species habitat. Section 7 of the ESA establishes a consultation process with the USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project.

4.7.2 Environmental Consequences

4.7.2.1 Proposed Action

Vegetation

The site of the Proposed Action lies within a previously disturbed area. The site consists of minimal vegetation, mostly annual weeds and native grasses, with open asphalt and compacted gravel ground surfaces. Therefore, impacts on vegetation would be less than significant.

Wildlife Species and Habitat

There are several potential prairie dog colonies immediately north and east of the proposed hot cargo pad. Locations of burrowing owls within the proposed project area are discussed under ***Threatened and Endangered Species***.

There is a small possibility that noise created during construction and demolition activities could result in adverse effects on nearby wildlife. These effects would include subtle, widespread effects from the overall elevation of ambient noise levels. This would result in reduced communications ranges, interference with predator/prey detection, or habitat avoidance. More intense effects would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex composition. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can become accustomed (or habituate) to the noise. The rate of habituation to short-term demolition noise is not known. Overall, impacts on wildlife would be less than significant.

Existing conditions include flying areas that are located near a major migratory flyway along the Rio Grande River. It is possible that the updated lighting infrastructure could result in adverse effects on migratory birds in the area. In poor weather conditions, such as low cloud ceiling, fog, rain, or poor visibility, lighted structures might not be visible to migrating birds and can cause bird kills because nocturnal migrating species are attracted by lights on towers under these conditions (USFWS undated). Although the lighting poles are not expected to exceed 200 feet in height, the possibility exists for the birds to be attracted to the lights in the Project area. Light attributes that reduce danger to migrating birds include dim lights, and lights with long flash time intervals and short flash duration. These have been demonstrated to reduce the danger to migrating birds. Impacts are expected to be minimal due to the low pole height and design (i.e., single mast poles without support cables). Overall, due to the current status of the site and its location in a developed area, impacts on the wildlife species and habitat would be less than significant.

Threatened and Endangered Species

The burrowing owl *(Athene cunicularia)* is the only species of concern listed by the USFWS in the vicinity. There are three burrowing owl nesting locations within 400 feet of the QD clear zone associated with the proposed hot cargo pad and one owl location within 50 feet of the proposed hot cargo pad taxiway (**Figure 3-8**). During ground disturbing construction and demolition activities, there is the possibility that at least one of these nests could be disturbed. The category of species of concern, which applies to the burrowing owl, carries no legal requirement, but identifies those species that deserve special consideration in management and planning. Kirtland AFB already has a program in place that identifies locations of nesting burrowing owls and has developed procedures to relocate owls if necessary. To avoid disturbances to potential nesting burrowing owls, a survey would be conducted prior to any ground disturbing demolition and construction activities. If owls are present, ground disturbing demolition and construction activities would only commence after the owls have left from the area (i.e., October 15 through March 15). Additionally, nesting burrows would be flagged and avoided during ground disturbing demolition and construction activities, so that the nesting sites could still be viable after activities. Therefore, any impacts on burrowing owls would be expected to be less than significant.

Wetlands

The USACE and USEPA regulate and permit dredge and fill activities within the waters of the United States, including wetlands under the authority of Section 404 of the CWA. The USEPA reviews and provides input to the permit applications.

No wetlands are located on the proposed hot cargo pad site; therefore, no impacts on wetlands would be expected.

4.7.2.2 No Action Alternative

Under the No Action Alternative, the 377 ABW would not construct the proposed hot cargo pad and new taxiway. Selection of this alternative would result in continued deterioration of the existing cargo pad that does not meet current environmental standards. Furthermore, the frequent maintenance and repair to the existing cargo pad would result in increased noise and disturbance by maintenance personnel and vehicles.

4.8 Cultural Resources

4.8.1 Evaluation Criteria

Adverse impacts on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; general neglect of the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of the agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

For the Proposed Action, ground-disturbing activities associated with the construction of the hot cargo pad and its associated facilities, constitute the most relevant potential effects on cultural resources.

4.8.2 Environmental Consequences

4.8.2.1 Proposed Action

No cultural resources are known to be present within the proposed APE of the hot cargo pad or the associated components. Accordingly, no adverse effects on any architectural or archaeological resources on the NRHP would be expected.

It is however, recommended that any ground-disturbing construction or maintenance activities should take into consideration the potential discovery of previously undiscovered cultural resources. If any archaeological sites are identified during the demolition, construction, operation, or maintenance of the proposed hot cargo pad, these sites should be documented and evaluated for NRHP eligibility. Impacts on unevaluated and potentially eligible cultural resources could be significant if NRHP eligibility status has not yet been determined. Once documented and evaluated through consultation with the SHPO, adverse impacts on NRHP-eligible and -listed cultural resources should be avoided; if avoidance is not possible, then mitigation of adverse effects is recommended.

4.8.2.2 No Action Alternative

Under the No Action Alternative, the baseline conditions described in **Section 3.8.2** would remain unchanged. Therefore, no significant impacts on cultural resources would occur as a result of the implementation of the No Action Alternative.

4.9 Infrastructure

4.9.1 Evaluation Criteria

Effects on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and create additional needs for energy (electric, natural gas, and liquid fuels), central heating and cooling, potable water, sanitary sewer, storm water systems, communications, and solid waste management. Impacts might arise from energy needs created by either direct or indirect workforce and population changes related to installation activities. An impact would be significant if implementation of the Proposed Action resulted in the following effects on electrical power, natural gas, liquid fuels, central heating and cooling, potable water, sanitary sewer/wastewater, storm water, communications, and solid waste systems:

- Exceeded capacity of a utility
- A long-term interruption of the utility
- A violation of a permit condition
- A violation of an approved plan for that utility.

4.9.2 Environmental Consequences

4.9.2.1 Proposed Action

Electrical Systems. The Proposed Action would require minimal amounts of electricity during construction activities; however, because these activities would be limited to a short period (12- to 14-month duration), the increase in electrical demand would only be temporary. Electrical service interruptions might be experienced should aboveground or underground electrical cables need to be rerouted outside of the proposed work area. Service interruptions might also be experienced when the lighting infrastructure for the existing and proposed hot cargo pads is connected to the Kirtland AFB electrical system.

Following the implementation of the Proposed Action, the overall electrical demand at Kirtland AFB would increase negligibly due to the added lighting infrastructure. As such, the Proposed Action would not result in significant effects on electrical systems.

Natural Gas Systems. The Proposed Action would not alter the amount of natural gas used at Kirtland AFB. Natural gas would not be used during construction activities, and operation of the proposed hot cargo pad would not require natural gas service.

Liquid Fuel. The Proposed Action would not alter the quantities of liquid fuels (JP-8, diesel, and gasoline) used at Kirtland AFB nor would it affect their handling and storage. The Proposed Action would not change aircraft or land-based vehicle traffic volumes; therefore, liquid fuel demand would remain unchanged.

Central Heating and Cooling Systems. The Proposed Action would not impact the central heating system of Kirtland AFB. Central heating resources would not be used during construction activities, and the proposed hot cargo pad facilities would not require central heating service.

Water Supply Systems. Construction of the proposed hot cargo pad would require minimal amounts of water, primarily for dust-suppression purposes. This water would be obtained from the Kirtland AFB water supply system, and because construction activities would be limited to a short period, the increase in water demand would only be temporary. Water service interruptions might be experienced should underground water lines need to be rerouted outside of the proposed work area. Service interruptions might also be experienced when the proposed hot cargo pad facilities are connected to the Kirtland AFB water supply system.

Following the implementation of the Proposed Action, the overall water demand at Kirtland AFB could increase due to the added infrastructure at the proposed hot cargo pad site and operation and maintenance activities. However, because the proposed and existing hot cargo pads would not be used simultaneously and the volume of hot cargo traffic at Kirtland AFB would remain unchanged, the potential increase in water demand from the use of the proposed hot cargo pad would be largely offset by the reduction in use of Pad 5. Any potential increase in water demand from the implementation of the Proposed Action would be negligible in magnitude and within the current available capacity of the Kirtland AFB water supply system. As such, the Proposed Action would result in adverse effects on water systems; however, these effects would be expected to be less than significant.

Sanitary Sewer and Wastewater Systems. The Proposed Action would not impact the sanitary sewer and wastewater systems of Kirtland AFB. Wastewater service would not be required for construction activities or during operation of the proposed hot cargo pad.

Storm Water Systems. Construction of the proposed hot cargo pad would require ground disturbance as heavy equipment would clear, grade, and contour land surfaces. These activities would temporarily disrupt natural and man-made storm water drainage methods, increase sedimentation in runoff, and increase the potential for storm water runoff to erode soil during construction activities. Soil erosion and sediment production would be minimized during the construction period by following erosion- and sediment-control plans, and by using construction BMPs that would minimize ground surface disturbance and attempt to provide adequate temporary storm water management techniques.

The construction of the proposed hot cargo pad and the associated taxiways, vehicle parking areas, personnel shelters, and storage sheds could add as much as approximately 11 acres (4.2 acres for the proposed hot cargo pad and approximately 7 acres for the new taxiway) of new impervious service at the area of the Proposed Action. This increase in impervious surface would reduce the amount of surface area for storm water to permeate into the ground and increase the amount of storm water runoff. Long-term storm water management techniques, which might include the use of pipes, channels, culverts, and impoundment basins, would be implemented to reduce and control the volume of storm water runoff. The Proposed Action would result in adverse effects on storm water systems; however, with appropriate BMPs, these effects would be expected to be less than significant.

Communications Systems. Because the proposed hot cargo pad and the existing hot cargo pad (Pad 5) would not be used simultaneously and the volume of hot cargo traffic at Kirtland AFB would remain unchanged, no net increase in communication demand would be expected from the implementation of the Proposed Action. The Proposed Action would not impact the communication systems of Kirtland AFB.

Solid Waste Management. The implementation of the Proposed Action would generate minimal quantities of construction waste. Nonhazardous construction waste, such as asphalt, concrete, wood, and nonrecyclable metals, would be transported to the Kirtland AFB landfill for disposal. Receptacles would be provided for municipal solid waste generated by worker activity. Municipal solid waste would be transported to the Rio Rancho Landfill, because the Kirtland AFB landfill accepts only nonhazardous construction and demolition waste.

To reduce the amount of landfill waste, materials that could be recycled or reused would be diverted from landfills to the greatest extent possible. Cardboard wastes would be recycled as a function of the Kirtland AFB Qualified Recycling Program. Miscellaneous salvageable metals would be transported to the Defense Reutilization and Marketing Office for recycling or reuse. Clean fill material, ground up asphalt, and broken-up cement would be diverted from landfills and reused whenever possible.

Following the implementation of the Proposed Action, the amount of solid waste generated at Kirtland AFB would not increase due to the operation and maintenance of the proposed hot cargo pad. Therefore, the Proposed Action would result in adverse effects on solid waste resources.

4.9.2.2 No Action Alternative

The No Action Alternative would result in continuation of the existing conditions of infrastructure resources, as discussed in **Section 3.9.2**. No additional effects on infrastructure resources would be expected as a result of the Proposed Action not being implemented.

4.10 Hazardous Materials and Waste

4.10.1 Evaluation Criteria

Impacts would be considered significant if the Proposed Action resulted in worker, resident, or visitor exposure to hazardous materials or wastes, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on hazardous materials management would be considered significant if the Proposed Action resulted in noncompliance with applicable Federal and New Mexico Environment Department (NMED) regulations, or increased the amounts generated or procured beyond current Kirtland AFB waste management procedures and capacities. Impacts on the ERP would be considered significant if the Proposed Action disturbed (or created) contaminated sites resulting in adverse impacts on human health or the environment.

4.10.2 Environmental Consequences

4.10.2.1 Proposed Action

Hazardous Materials and Petroleum Products. No impacts on hazardous materials management during demolition or construction would be expected. Equipment used for demolition and construction activities would require the use of petroleum products. Contractors would be responsible for the management of hazardous materials and petroleum product usage, which would be handled in accordance with Federal, state, and USAF regulations. Contractors must report the use of hazardous materials to the 377 MSG/CEANC in order to be entered into the Hazardous Materials Management System (HMMS). If a material that is less hazardous can be used, the 377 MSG/CEANC should make this recommendation. Use of the HMMS system would also ensure that ozone-depleting substances (ODSs) are not available for use. Use of ODSs in such products as refrigerants, aerosols, and fire suppression systems is not permitted by the DOD without a formal request by waiver. There would be no new chemicals or toxic substances used or stored at the installation in conjunction with the demolition and construction.

The operation and maintenance of the proposed hot cargo pad would not result in an increase in the type or quantity of hot cargo missions. Therefore, no impacts on hazardous materials and petroleum product management would be expected from the operation and maintenance activities.

Hazardous and Petroleum Waste. No significant impacts would be expected from the generation of hazardous wastes during demolition and construction activities. It is anticipated that the quantity of hazardous wastes generated from these activities would be negligible. No impacts on the installation’s hazardous waste management program would be expected from the construction activities. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, as well as the installation’s Hazardous Waste Management Plan. BMPs, such as use of drop cloths at refueling points and use secondary containment when handling hazardous materials, would be followed to ensure that contamination from a spill would not occur. However, if a spill were to occur, the Hazardous Material Emergency Planning and Response Plan outlines the appropriate measures for spill situations.

The operation and maintenance of the hot cargo pad would not result in an increase in the type or quantity of hot cargo missions. No impacts on hazardous and petroleum waste management would be expected from the operation and maintenance activities.

Environmental Restoration Program. The construction of the proposed hot cargo pad would require the disturbance of a small area (likely less than 0.5 acres) of the northwestern portion of ERP site, WP-26.

The area disturbed would overlap with soil vapor monitoring well (MW) KAFB-2604, and could also affect MW KAFB-2606. In addition, the construction would overlap with groundwater MW KAFB-2622 and MW KAFB-2602A (KAFB 2008e). These and other MWs around the periphery of the Proposed Action footprint are Long Term Monitoring (LTM) wells for monitoring soil vapor and groundwater components of the WP-26. Presently, WP-26 is in the remedial investigation phase. During the construction of the proposed hot cargo pad, BMPs should be followed to avoid damage to the existing MWs. Additional MWs may need to be installed in the future. These MWs would require continued use, which could also require surface modification (i.e., modification to flush-covering).

The NMED concurs that the removal of the surface sewage sludge would alleviate any potential adverse effects on the environment and human health from soil contamination (Bitner 2009). Additionally, the Proposed Action includes setting the existing MWs flush with the paving of the proposed hot cargo pad. This would allow for the continued use of the MWs to aid in the remediation of the soil vapor and ground water contamination, once appropriate remedial actions for these areas are selected. Consequently, construction activities at Kirtland AFB would result in impacts on the ERP site; however, these impacts would be expected to be less than significant.

No significant impacts on ERP site WP-26 would be expected from the operation and maintenance of the proposed hot cargo pad. While a remedial action has not been selected for the soil vapor and perched groundwater contamination identified in the RFI, the samples with the highest identified levels of contaminants were at the perched groundwater interface at approximately 200 feet bgs (KAFB 2008e). It is likely that the approved remedial action will require periodic access to the area for collection of media samples from the MWs. In addition, because the final remedial abatement has not been selected, additional surface equipment, such as soil vapor extraction blowers/piping, might need to be installed. While it is anticipated that interference with the proposed hot cargo pad would be minimal and required equipment installation would be designed to operate from remote locations, some overlap might occur.

No significant impacts associated with the four MMRP sites would be expected during construction or operational activities under the Proposed Action. Use of the four historic ranges identified in the Kirtland AFB MMRP that overlap with the proposed hot cargo pad site was discontinued prior to 1962, and the Proposed Action area has undergone significant alteration in the intervening years. It is unlikely that quantities of MC and MECs, if any, would be encountered during construction.

Asbestos-Containing Material. The construction, operation, and maintenance of the proposed hot cargo pad would not involve the handling of ACMs; therefore, the Proposed Action would not result in any impacts related to ACMs.

Lead-Based Paint. The construction, operation, and maintenance of the proposed hot cargo pad would not involve the use of LBP; therefore, the Proposed Action would not result in any impacts related to LBP.

Polychlorinated Biphenyls. The construction, operation, and maintenance of the proposed hot cargo pad would not involve the handling of materials containing PCBs; therefore, the Proposed Action would not result in any impacts related to PCBs.

Pollution Prevention. Less-than-significant impacts on the Pollution Prevention Program at Kirtland AFB would be expected from implementation of the Proposed Action. An incremental increase in hazardous materials and wastes would be expected during construction and operation under the Proposed Action. Adherence to the Pollution Prevention Program and associated plans at Kirtland AFB, in particular the Hazardous Material Emergency Planning and Response Plan, would reduce adverse impacts resulting from the Proposed Action. BMPs utilized during construction activities would minimize impacts on the natural environment.

The operation and maintenance of the proposed hot cargo pad would not result in an increase in the type or quantity of hot cargo missions. No impacts on the Pollution Prevention Program would be expected from the operation and maintenance activities.

4.10.2.2 No Action Alternative

The No Action Alternative would result in no change to the existing hazardous materials or waste management conditions discussed in **Section 3.10.2**. No impacts on hazardous materials or waste management would be expected as a result of the Proposed Action not being implemented.

4.11 Safety

4.11.1 Evaluation Criteria

If implementation of the Proposed Action were to increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community; or hinder the ability to respond to an emergency, it would represent an adverse effect. An effect would be significant if implementation of the Proposed Action were to substantially increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community; substantially hinder the ability to respond to an emergency; or introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

4.11.2 Environmental Consequences

4.11.2.1 Proposed Action

Contractor Safety. Implementation of the Proposed Action would slightly increase the health and safety risk to contractors performing demolition and construction work at the Proposed Action site during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain health and safety programs for their employees.

The implementation of the Proposed Action would require the disturbance of a small area of ground surface within the northwestern portion WP-26 (likely less than 0.5 acres). While not part of the Proposed Action, remedial action to clean the surface of WP-26 will be conducted during Spring 2010. This surface remediation will consist of removing and disposing of the top 5 inches of the ground surface, which is potentially contaminated sewage sludge, within WP-26 in a manner consistent with Federal, state, and USAF regulations. The remedial action would not involve subsurface products or groundwater contamination, and monitoring wells would remain in place to continue tracking the contamination.

Although the surface remedial efforts would reduce the potential health and safety concerns to contractors working on site, all contractors would still need to take health and safety precautions to guard against potential exposure to contaminates and pathogens at WP-26. Health and safety precautions might include contractors listing exposure guidelines in the site specific health and safety programs, and training all employees working on site how to reduce potential exposure to these contaminates. If any soil potentially containing contamination was discovered during the construction of the Proposed Action, the contractor would be required to immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Commencement of field activities would not continue in this area until the issue was investigated and resolved. In addition, appropriate health and safety procedures would need to be established to prevent exposure to groundwater contaminants when existing monitoring wells are modified (i.e., made flush with the ground surface).

Military Personnel Safety. No effects on military personnel health and safety would be expected during implementation of the Proposed Action. Installation personnel would be required to vacate the area of the Proposed Action during construction activities. The Proposed Action work site would be fenced and appropriate signs posted to further reduce safety risks to installation personnel. The current hot cargo pad (Pad 5) would remain in service during the implementation of the Proposed Action.

Following the implementation of the Proposed Action, Kirtland AFB would have two hot cargo pads, which would act as contingencies if the other pad was unavailable. Pad 5 would no longer need to be in continuous service, and either pad could be shut down for required maintenance and safety improvements. With two available hot cargo pads, critical hot cargo missions would no longer be in jeopardy of being delayed or aborted due to unforeseen circumstances occurring at one of the hot cargo pads. The Proposed Action would also improve lighting conditions and enhance security barricades at both Pad 5 and the proposed hot cargo pad; both lighting and security improvements would create a safer environment for military personnel working at the hot cargo pads. The implementation of the Proposed Action would result in beneficial effects on military personnel safety.

Public Safety. No effects on public health and safety would result from the implementation of the Proposed Action. Construction activities would not pose a safety risk to the public or to off-installation areas. The Proposed Action work site would be fenced and appropriate signs posted to further reduce safety risks to the public. Access to the proposed hot cargo pad would be limited to authorized personnel. As such, the use of the proposed hot cargo pad at Kirtland AFB would not be expected to result in effects on the public safety.

Explosives and Munitions Safety. No significant effects on explosives and munitions safety would be expected during the implementation of the Proposed Action. Following implementation of the Proposed Action, the use of the proposed hot cargo pad would result in changes to the handling of explosives and munitions at Kirtland AFB, because, by its very definition, the proposed hot cargo pad would be used to load and unload hot cargo (i.e., weapons, ammunition, and explosives). In order to maintain explosive and munitions safety, USAF regulations mandate QD safety clearance zones of a specific separation distance between PESs and ESs. Under the Proposed Action, the proposed hot cargo pad would be the PES and any inhabited buildings or public traffic routes would be ESs, and a separation distance of 1,250 feet (approximately 0.24 miles) would be required between the PES and ESs. No inhabited buildings, public roads, or other ESs are currently within this zone, and no future construction would be permitted in this zone. **Figure 2-1** illustrates the QD clear zones for the proposed hot cargo pad and Pad 5.

The Proposed Action does not call for an increase in the quantity of hot cargo aircraft traffic at Kirtland AFB; therefore, the amount of explosives and munitions transported via the existing and proposed hot cargo pads together would not change. Additionally, the Proposed Action would not alter the storage or usage of explosives and munitions at Kirtland AFB. The implementation of the Proposed Action would result in adverse effects on explosives and munitions safety; however, with the establishment of a QD clear zone around the proposed hot cargo pad, these effects would be expected to be less than significant.

4.11.2.2 No Action Alternative

The No Action Alternative would result in continuation of the existing safety conditions and their associated impacts, as discussed in **Section 3.11.2**.

4.12 Aircraft Safety

4.12.1 Evaluation Criteria

Explosives risk assessments are a subset of the commander's overall risk management program. An explosives risk assessment analyzes hazards associated with transporting, storing, disposing of, handling or firing ammunition and explosive materials. Operational Risk Assessments, per AFPAM 91-215, *Operational Risk Management Guidelines and Tools*, can range from examining the relationship between a PES and an ES**,** to determine what effect one has on the other in the event of an accidental explosion, to ascertaining the worst credible event ramifications of an explosives handling mishap (USAF 1998b). Risk levels are calculated based on three criteria: the likelihood of a mishap, the exposure of personnel and resources to an explosives hazard, and the possible consequences of a mishap (USAF 1998b).

The likelihood of a mishap is the relative probability an explosives mishap will occur based on the type of explosives involved, the level of activity at the PES, and external threats to the location. Each PES is categorized according to one of five generalized probability levels as defined in AFMAN 91-215, which include frequent, likely, occasional, seldom, and unlikely (USAF 1998b).

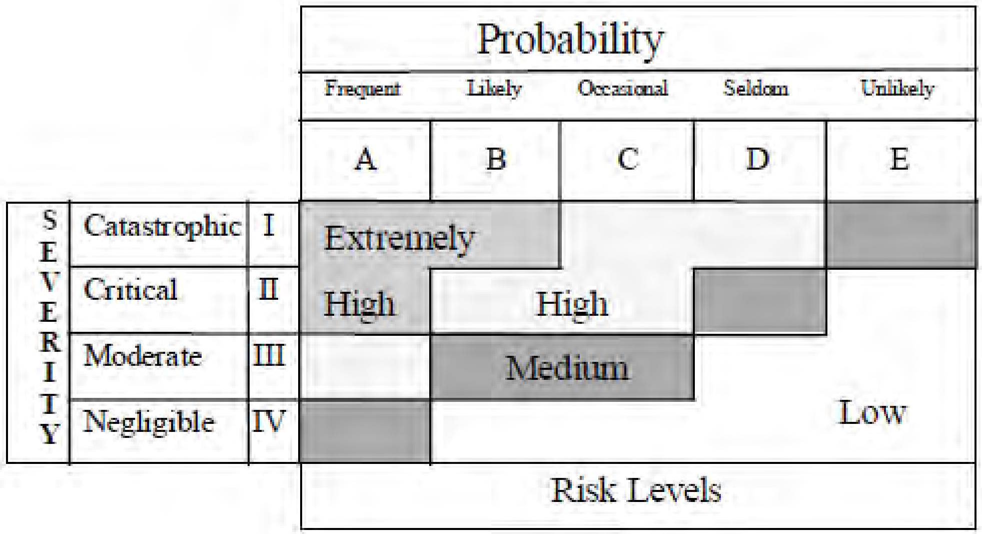
The severity of an explosive accident is categorized based on their effect on personnel, mission capability, and other resources according to **Table 4-4**.

Table 4-4. Severity of a Mishap

Category	Criteria
Catastrophic	• Greater than 5 related personnel fatalities or any unrelated fatality • Mission curtailed • $10 million in damage
Critical	• Less than 5 related personnel fatalities • Serious injury to unrelated personnel • Mission interrupted • $500,000 in damage
Moderate	• Some serious injury to related personnel • Mission degraded • $50,000 damage
Negligible	• Minor injury • Mission unaffected • $1,000 damage

Source: USAF 2009

Combining the severity and probability estimates for a mishap forms a risk assessment for the potential hazard. By combining the probability of occurrence with severity, a matrix is created where intersecting rows and columns define a Risk Assessment Matrix. The Risk Assessment Matrix forms the basis for judging both the acceptability of a risk and the management level at which the decision on acceptability will be made. The matrix might also be used to prioritize resources to resolve risks due to hazards or to standardize hazard notification or response actions (USAF 1998b). A sample Risk Assessment Matrix is shown in **Figure 4-1**.



Source: USAF 1998b

Figure 4-1. Sample Risk Assessment Matrix

The possible consequences of an explosives mishap are based on the worst-case type and amount of explosives present, the construction of both the PES and ES, and the distance between the PES and ES. The consequences of an explosive mishap are based on the effects of the blast, i.e., the violent release of energy from a detonation. Blast effects to an IB for Hazard Classification 1.1 explosives include the following (USAF 2009):

- Personnel in buildings are provided a degree of protection from death or fatal injury. Personnel injuries from projectile fragments and the failure of the exposed facility (including the possibility of fatalities) will depend upon the PES structure, the amount of ammunition, their fragmentation characteristics, and the strength of the ES structure.
- Unstrengthened buildings can be expected to sustain damage of approximately 5 percent of the building's replacement cost.
- Glass breakage and structural damage can be reduced by means such as orientation between the PES and the ES, and by keeping the surface area of exposed glass panels to a minimum. The use of blast resistant, reinforced glass windows is recommended.

4.12.2 Environmental Consequences

4.12.2.1 Proposed Action

Per AFMAN 91-201, the probability of a mishap due to hot cargo missions of unserviceable or unpackaged material is unlikely (i.e., can be expected to occur infrequently in a typical career in the USAF), and the probability for serviceable package material is "practically impossible" (i.e., so rare, a mishap is not expected to occur during a typical career) (USAF 2009). Therefore, the probability of an aircraft mishap from operation of the proposed pad is expected to be Level E: Unlikely, as shown in **Figure 4-1**. A no-fly zone would be enforced over the proposed hot cargo pad. Since aircraft would not be able to fly over the proposed pad, the likelihood of a mishap involving aircraft other than the aircraft parked on pad would be very low. In addition, adherence to USAF policy on explosives safety, as well as design and safety standards as described in **Section 3.12.1** would also be expected to lessen the probability of an aircraft mishap.

As discussed in **Section 3.12.1**, an IB separation distance of 1,250 feet (approximately 0.24 miles) is required for Hazard Classification 1.1 explosives, and would be applied to the Proposed Action. As discussed in **Section 2.1.2**, there are several potential ESs in the general vicinity of the proposed hot cargo pad. However, none of the ESs would be within the IB distance for the proposed pad. Since there are no ESs within the IB distance, the severity of a mishap is expected to be negligible to moderate as described in **Table 4-4**. As discussed previously, at the IB distance some damage could still be expected (i.e., standard glass windows will shatter and unstrenthened buildings will receive 5 percent damage). In addition, in the event that a mishap was to occur, personnel in the immediate vicinity of the aircraft could be injured. However, the lowest probability level of a mishap, Level E: Unlikely, would be expected.

As shown on **Figure 4-1**, the combination of a probability level of Unlikely and a severity level of negligible to moderate would have a risk assessment level of "low." Therefore, operation of the proposed pad would be expected to have a less-than-significant, adverse impact on aircraft safety.

Construction of the proposed pad per USAF explosives safety standards would be expected to lessen the aircraft safety concerns associated with the current hot cargo mission to negligible levels. The current aircraft safety concerns include FOD, aircraft tire-cut potential, and insufficient lighting due to the current state of the existing hot cargo pad. In addition to construction of the pad itself, the addition of paved shoulders would also provide for the control of FOD. Therefore, operation of the proposed pad would be expected to have a less-than-significant, beneficial impact on aircraft safety. The improvements to the existing pad included under the Proposed Action would also be expected to have a beneficial impact on aircraft safety since they would address the aircraft safety concerns associated with the current pad. The proposed hot cargo pad would be used in conjunction with Pad 5 to ensure the critical hot cargo missions continue unimpeded, thereby improving the ability of the 377 ABW to schedule and complete hot cargo missions, which would be expected to have a less-than-significant, beneficial impact on aircraft safety.

4.12.2.2 No Action Alternative

Under the No Action Alternative, the 377 ABW would not construct a hot cargo pad, taxiway, anti-ram cabling, DFPs, lighting, and personnel shelters. The Pad 5 pavement condition would continue to deteriorate, causing FOD and aircraft tire-cut potential to increase to unacceptable levels. Aircraft safety would be jeopardized, and critical cargo missions would be delayed or aborted, adversely impacting critical missions at Kirtland AFB and throughout the world. Without lighting improvements, nighttime flying operations would be impaired and aircraft and personnel safety would be jeopardized.

4.13 Socioeconomics and Environmental Justice

4.13.1 Evaluation Criteria

Socioeconomics. This section addresses the potential for direct and indirect impacts that the Proposed Action could have on local or regional socioeconomics. Impacts on local or regional socioeconomics are evaluated according to their potential to stimulate the economy through the purchase of goods or services and increases in employment. Similarly, impacts are evaluated to determine if overstimulation of the economy (e.g., the construction industry's ability to sufficiently meet the demands of a project) could occur as a result of the Proposed Action.

Environmental Justice and Protection of Children. Ethnicity and poverty data are examined for the Albuquerque metropolitan area (50-mile radius around Kirtland AFB) and compared to the State of New

Mexico and the United States to determine if a low-income or minority population could be disproportionately affected by the Proposed Action.

4.13.2 Environmental Consequences

4.13.2.1 Proposed Action

Under the Proposed Action, the 377 ABW would construct, operate, and maintain a hot cargo pad at Kirtland AFB adjacent to the existing hot cargo pad. The total cost of construction to build the proposed hot cargo pad is estimated at $14,600,000 (KAFB undated).

Demographics. The number of workers who would be hired to construct a hot cargo pad at Kirtland AFB would most likely come from within the greater Albuquerque area. Relocation of construction workers to meet demand for the Proposed Action would not be expected as the scope of construction activities should not necessitate out-of-town workers to permanently relocate. No new staff is anticipated to be hired or transferred to Kirtland AFB for operation and maintenance of the proposed hot cargo pad. The number of new residents who would move to the Albuquerque area as result of the Proposed Action would be negligible; therefore, less-than-significant impacts on demographics would be expected as a result of the Proposed Action.

Employment Characteristics. The construction industry within the Albuquerque MSA should adequately provide the workers that would be required to construct the hot cargo pad. The number of construction workers necessary for the Proposed Action, estimated to be less than 1 percent of all construction workers in the Albuquerque area, is not large enough to outstrip the supply of the industry. Indirect beneficial impacts would result from the increase in payroll, tax revenues, purchase of materials, and purchase of goods and services in the area resulting in less-than-significant impacts on the socioeconomic climate of Albuquerque.

Kirtland AFB. The temporary increase of construction employees at Kirtland AFB would represent a small increase in the total number of persons working on Kirtland AFB and no additional facilities (e.g., housing and transportation) would be necessary to accommodate the workforce. Changes to employment and expenditures resulting from the Proposed Action would be negligible; therefore, less-than-significant impacts would be expected.

Environmental Justice and Protection of Children. The Albuquerque metropolitan area contains an elevated minority and low-income population in comparison to the United States, but similar to the State of New Mexico (see **Section 3.13.2)**. Construction activities would be concentrated adjacent to the existing hot cargo pad (Pad 5); therefore, no minority population would be disproportionately impacted by the Proposed Action. Operation of the proposed hot cargo pad would not result in an increased number of hot cargo missions, but would rather provide an additional hot cargo pad so that operations could continue unimpeded. Therefore, minority populations would not be disproportionately impacted in the long term. Indirect disproportionate negative impacts on minority, low income, and youth populations would not be expected as result of the Proposed Action.

4.13.2.2 No Action Alternative

Under the No Action Alternative, the construction, operation, and maintenance of the proposed hot cargo pad at Kirtland AFB would not occur. No impacts on socioeconomics would be expected as no additional jobs would be created, expenditures for goods and services to maintain the existing facilities would be minimal, and there would be no increase in tax revenue as a result of employee wages and sales receipts.

Also, impacts on environmental justice would not occur as part of the No Action Alternative as the existing hot cargo pad (Pad 5) would continue operating under current conditions.

4.14 Cumulative Impacts

CEQ defines cumulative impacts as the "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects.

This section briefly summarizes past, current, and reasonably foreseeable future projects within the same general geographic and time scope as the Proposed Action. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on noise, geology and soils, and safety is very narrow and focused on the location of the resource. The geographic scope of land use, air quality, infrastructure, transportation, and socioeconomics is much broader and considers more county- or regionwide activities.

The past, current, and reasonably foreseeable projects, identified below, make up the cumulative impact scenario for the Proposed Action. The cumulative impact scenario is then added to the Proposed Action's impacts on the individual resource areas analyzed in **Section 4** to determine the cumulative impacts of the Proposed Action. In accordance with CEQ guidance, the current effects of past actions are considered in aggregate as appropriate for each resource area without delving into the historical details of individual past actions.

4.14.1 Impact Analysis

4.14.1.1 Past Actions

Kirtland AFB has been used for military missions since the 1930s and has continuously been developed as DOD missions, organizations, needs, and strategies have evolved. Development and operation of training ranges have impacted thousands of acres with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects, too, have resulted from the operation and management of Kirtland AFB including, but not limited to, increased employment and income for Bernalillo County, the City of Albuquerque, and its surrounding communities; restoration and enhancement of sensitive resources such as the Coyote Springs wetland area; consumptive and nonconsumptive recreation opportunities; and increased knowledge of the history and pre-history of the region through numerous cultural resources surveys and studies.

4.14.1.2 Present and Reasonably Foreseeable Actions

Kirtland AFB is a large military installation that is continually evolving. Projects that were examined for potential cumulative impacts are included in **Table 4-5**.

Table 4-5. Present and Reasonably Foreseeable Actions at Kirtland AFB

Project Name	Description
HC-130 and MC-130 Aircraft Simulator Facilities	The 58th Special Operations Wing proposes to construct new HC-130 and MC-130 simulator facilities at Kirtland AFB. The proposed construction would include one-story facilities in the southwestern section of Kirtland AFB.
Heavy Weapons Range	The 377 ABW is proposing to establish and use a heavy weapons range in the southeastern section of Kirtland AFB, approximately 0.25 miles east of the Starfire Optical Range facilities along Mount Washington Road. The proposed range would encompass the existing M60 range. It would include two firing positions and firing lines and would use the existing targets at the M60 range. Firing distance would be approximately 7,300 feet. Firing position two would be used for sniper heavy weapons (0.50 caliber) and would fire in a more southerly direction to the existing target area, approximately 3,800 feet.
Construction and Demolition of Military Support Facilities	Kirtland AFB proposes to demolish and construct several military personnel support facilities in the developed area in the northwestern portion of the installation. The areas include the Visiting Officer Quarters Complex, the Main Enlisted Dormitory Campus, the Noncommissioned Officer Academy, and Dormitory Campus 2. Approximately 36 acres would be included in the construction and demolition activities. Kirtland AFB currently has a surplus of old substandard dormitory spaces that this project would help eliminate.
Army and Air Force Exchange Service (AAFES) Base Exchange Shopping Center	AAFES proposes to construct and operate a new 95,421-square-foot Shopping Center on an approximately 2.3-acre developed site between the existing Commissary (Building 20180) and existing Base Exchange (Building 20170) on Pennsylvania Avenue. The project also includes demolition of the 1,540-square-foot existing satellite pharmacy (Building 20167), closure of a portion (approximately 345 feet) of Pennsylvania Avenue, and construction of approximately 492 feet of new road to connect Texas Street with Pennsylvania Avenue north of the new Shopping Center. The new Shopping Center would include a new Base Exchange, pharmacy, and retail laundry/dry cleaning, a beauty/barber shop, concession kiosks, five food concepts with a food court, and other similar services.
Construct New Fire Station	Kirtland AFB proposes to replace Fire Station 3 within the Manzano Base area. The proposed structure would be approximately 7,300 square feet, one story, with three high-bay drive-through apparatus stalls. The new structure would be located along a main road in the south-central section of Kirtland AFB. The action also includes the demolition of an approximately 4,300-square-foot fire station (Building 638) within the Manzano Base area.
498th Nuclear System Wing Facility	Kirtland AFB proposes to construct a 32,400-square-foot facility to house the newly formed 498th Nuclear Systems Wing. This facility would be a two-story, steel-framed structure with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying in to utilities and communications and parking for 120 vehicles. The facility would accommodate approximately 200 personnel. The new facility location is proposed between "G" and "H" Avenues west of Wyoming Boulevard directly behind the Nuclear Weapons Center (Building 20325).

Project Name	Description
Air Force Nuclear Weapons Center Sustainment Center	Kirtland AFB proposes to construct a 15,946-square-foot sustainment center for the Nuclear Weapons Center. This facility would be a two-story, steel-framed structure built as a Sensitive Compartmented Information Facility with reinforced concrete foundation, floors, and reinforced masonry walls. The construction further includes tying in to utilities and communications and parking for vehicles. The facility would accommodate approximately 36 personnel. The new facility location is proposed between "G" and "H" Avenues west of Wyoming Boulevard directly behind the Nuclear Weapons Center (Building 20325) and south of the proposed 498th Nuclear Systems Wing facility.
Building Demolition at Kirtland AFB	The 377 ABW proposes to demolish 23 buildings on Kirtland AFB to make space available for future construction and to fulfill its mission as installation host through better site utilization. None of the buildings proposed for demolition are currently occupied or used by installation personnel. General demolition activities would include removal of foundations, floor, wall, ceiling, and roofing materials; and removing electrical substations providing power to these facilities; and removing, capping and rerouting sewer, gas, water, and steam lines outside of the work areas. Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, and generators would be required to support the proposed demolition activities.
Security Forces Complex	The 377 ABW proposes to construct, operate, and maintain a Security Forces Complex at Kirtland AFB to provide adequate space and modern facilities to house all 377th Security Forces Squadron administrative and support functions in a consolidated location. The 37th Security Forces Squadron functions that would be transferred to the new 377th Security Forces Complex include base operations center with command and control facility, administration and office space, training rooms, auditorium or assembly room, guard mount, hardened armory for weapons and ammunition storage, confinement facilities, law enforcement, logistics warehouse, general storage, vehicle garage with maintenance area, and associated communications functions. One existing building within the proposed footprint of the 377th Security Forces Complex would be demolished.
Military Working Dog Facility	The 377 ABW proposes to construct, operate, and maintain a military working dog facility according to the Air Force "Design Guide for Military Working Dog Facilities." Building construction would be reinforced concrete foundation, and reinforced masonry walls with insulated standing seam metal roofing. The kennel building would be approximately 2,600-square-feet, with 16 indoor/outdoor kennels and 2 isolation kennels, joined to a 2,500-square-foot administrative/support building by a covered walkway. Depending on the site, construction of a new obedience course might also be required. Three alternative sites have been proposed: (1) north of the existing military working dog building near the intersection of Barrack and Manzano roads, (2) in the southern portion of the cantonment area near the intersection of Wyoming Boulevard and Pennsylvania Avenue, and (3) in the cantonment area at the southeastern corner of M and Pennsylvania Avenues.

Project Name	Description
21st Explosive Ordinance Division Expansion	The 21st Explosive Ordinance Division proposes to construct a facility expansion and site improvements for the 21st Explosive Ordinance Division Weapons of Mass Destruction Company Complex at Kirtland AFB. The 21st Explosive Ordinance Division currently operates from a 90-acre property leased by the Army within Kirtland AFB. The current site has seven structures, six of which are substandard and do not have adequate fire protection. The 21st Explosive Ordinance Division proposes to expand this site to a total of 280 acres, add three permanent structures, demolish five of the six substandard structures, add two temporary storage containers, tie into nearby utilities, construct water tanks for fire suppression, and construct several concrete pads for training tasks.
Spacecraft Component Integration Lab	Proposed lease action to convert underutilized space, including a former military family housing area and a recreational use area, to use for office, commercial, and senior continuum care space at Kirtland AFB.

4.14.2 Cumulative Impact Analysis by Resource Area

4.14.2.1 Land Use

A significant impact on land use would occur if any action is inconsistent with adopted land use plans or would substantially alter those resources required for supporting or benefiting the current use of the site and adjacent property. The Proposed Action is consistent with the *2002 Kirtland Air Force Base, New Mexico General Plan*, and would not impact municipal plans or policies. The Proposed Action would result in less-than-significant impacts on land use compatibility related to noise production and safety issues. However, the Proposed Action, when considered with other potential alterations of land use, would not be expected to result in a significant cumulative adverse effect on land use compatibility. All reasonable past, present, and foreseeable actions on Kirtland AFB are consistent with the *2002 Kirtland Air Force Base, New Mexico General Plan*.

4.14.2.2 Noise

The noise generated by the Proposed Action, when considered with other existing and proposed projects on Kirtland AFB, would not be considered a significant cumulative impact. The cumulative effect of the proposed and future project would result in only temporary increases in ambient noise levels during demolition and construction activities.

4.14.2.3 Visual Resources

Although the collective implementation of various projects at Kirtland AFB could result in cumulative impacts on visual resources at Kirtland AFB, the impacts would not be significant. The exiting visual conditions at the installation consist of military and community infrastructure, and therefore, most projects would be consistent with these existing conditions. Impacts on visual resources from reasonably foreseeable projects, and thus cumulative impacts, would be controlled by following the *Kirtland Air Force Base Architectural Compatibility Plan*, which attempts to ensure that future development is performed in a way that limits effects on visual resources and is consistent with existing architectural and visual standards (AAFES 2008). Adherence to the architectural compatibility plan would prevent significant visual cumulative impacts from occurring in the future.

4.14.2.4 Air Quality

The Proposed Action would result in low levels of air emissions below *de minimis* thresholds that would not be regionally significant. The Proposed Action would generate short-term emissions below 10 percent of the emissions inventory for the AMRGI AQCR and negligibly contribute towards the New Mexico statewide GHG inventory. However, the Proposed Action would not contribute significantly to adverse cumulative impacts on air quality at Kirtland AFB or regionally.

4.14.2.5 Geology and Soils

The Proposed Action, when combined with other reasonably foreseeable projects, would not result in significant cumulative impacts on geology and soils. The Proposed Action would result in cumulative impacts on soil erosion and sedimentation, but would not reduce prime farmland soils or agricultural production. SWPPP measures and BMPs would be implemented to control erosion and sedimentation during demolition and construction activities, which would minimize impacts.

4.14.2.6 Water Resources

The cumulative effects of the Proposed Action would result primarily from soil erosion and sedimentation that could impact water quality and surface waters. When considered with potential disturbances on water resources from future actions, it would not be expected to have a significant cumulative impact on water resources. Implementation of BMPs would minimize potential for adverse effects on water resources associated with the Proposed Action and future actions.

4.14.2.7 Biological Resources

Implementation of the Proposed Action and other reasonably foreseeable projects would not result in a significant cumulative impact on biological resources. Because the Proposed Action would occur in a previously disturbed area that does not contain much vegetation or important biological habitats, it would not be expected to impact vegetation or wildlife habitats. The Proposed Action could have less than significant adverse impacts on burrowing owls and migratory birds, which when combined with other projects could result in cumulative impacts. Although growth and development can be expected to continue outside of Kirtland AFB and within the surrounding natural areas, significant cumulative adverse effects on these resources would not be expected when added to the effects of activities associated with the Proposed Action.

4.14.2.8 Cultural Resources

The Proposed Action would not result in a cumulative impact on cultural resources. There are no known cultural resources within the footprint of the proposed hot cargo pad, thus, no impacts are anticipated.

4.14.2.9 Infrastructure

The Proposed Action has the potential to result in adverse cumulative impacts on electrical, water supply, wastewater, storm water, and solid waste management services. The *2002 Kirtland Air Force Base, New Mexico General Plan* addresses the capacity and the need to upgrade all elements of infrastructure to support additional projects at Kirtland AFB. An upgrade of any infrastructure component to support future construction at Kirtland AFB would largely result in beneficial effects for the installation.

4.14.2.10 Hazardous Materials and Waste

Implementation of the Proposed Action and other reasonably foreseeable projects would not be expected to result in a significant cumulative impact on hazardous materials and waste. The Proposed Action would result in a negligible increase in the generation of hazardous materials and wastes; however, all materials would be handled and disposed of appropriately. Future projects would incorporate measures to limit or control hazardous materials and waste into their design and operation plans. Therefore, the effects of the Proposed Action, when combined with other ongoing and proposed projects on Kirtland AFB, would not be considered a significant cumulative effect.

4.14.2.11 Safety

No cumulative impacts on health and safety would be expected. The implementation of effective health and safety plans, including those for explosives safety, which follow Federal, state, and local OSHA policies, at the work site during demolition and construction and during facility operation would reduce or eliminate cumulative health and safety impacts on contractors, military personnel, and the general public.

4.14.2.12 Aircraft Safety

The Proposed Action would have beneficial impacts on aircraft safety due to reduction of aircraft safety concerns, such as FOD, aircraft tire-cut potential, and insufficient lighting, and improvement of the ability to schedule and complete hot cargo missions. It is unlikely any of the other reasonably foreseeable projects would affect aircraft safety; therefore, the Proposed Action would not result in any cumulative impacts.

4.14.2.13 Socioeconomics and Environmental Justice

Implementation of the Proposed Action would result in beneficial impacts on the region's economy. No impacts on residential areas, population, or minority or low-income families off-installation would occur. These effects, when combined with the other projects currently proposed or ongoing at Kirtland AFB, would not be considered a significant cumulative impact.

4.14.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action.

Geology and Soils. Demolition and construction activities would result in temporary soil disturbance; however, implementation of BMPs and erosion-control measures would limit the environmental consequences. Although these impacts would be unavoidable, the impact on soils would not be expected to be significant.

Hazardous Materials and Waste. The generation of hazardous materials and wastes during demolition and construction activities would be unavoidable; however, these wastes would be negligible and handled in accordance with Federal, state, and USAF policies and would not be expected to result in a significant impact.

4.14.4 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, and Local Land Use Plans, Policies, and Controls

The Proposed Action would occur entirely within Kirtland AFB. Demolition, construction, operation, and maintenance activities would not be incompatible with any current land uses on Kirtland AFB. The Proposed Action would not conflict with any applicable off-installation land use ordinances. The Proposed Action would follow all applicable permitting, construction, and safety requirements.

4.14.5 Relationship Between Short-term Uses and Long-term Productivity

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct effects associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those effects occurring over a period of more than 5 years, including permanent resource loss.

Implementation of the Proposed Action would not require short-term resource uses that would result in long-term compromises of productivity. The Proposed Action would not result in intensification of land use at Kirtland AFB and the surrounding area. Implementation of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts.

4.14.6 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, land, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources utilized for the Proposed Action include construction materials, concrete and asphalt, and various material supplies. Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. This includes petroleum-based products (such as gasoline and diesel) and electricity. During demolition and construction activities, gasoline and diesel would be used for the operation of vehicles and equipment. Electricity and minimal amounts gasoline and diesel would be used during operation and maintenance of the proposed hot cargo pad. Consumption of these energy resources would not place a significant demand on their availability in the region; therefore, no significant effects would be expected.

Biological Resources. The Proposed Action would result in minor loss of vegetation and wildlife habitat. Because the project area has been previously disturbed, the loss would be minimal and not considered significant.

Human Resources. The use of human resources for demolition, construction, operation, and maintenance activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

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APPENDIX A

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A
Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

General

EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [superseding EO 13123 and EO 13149]) directs Federal agencies conduct their activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. EO 13423 sets several Federal energy and environmental management requirements in areas such as energy efficiency, greenhouse gas reduction, renewable power, building performance, water conservation, alternative fuel/hybrid vehicles, petroleum conservation, alternative fuel, pollution prevention, environmentally sound procurement, and electronics management.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009) directs Federal agencies to improve water use efficiency and management; implement high performance sustainable Federal building design, construction, operation, and management; and advance regional and local integrated planning by identifying and analyzing impacts from energy usage and alternative energy sources. EO 13514 also directs Federal agencies to prepare and implement a Strategic Sustainability Performance Plan to manage its greenhouse gas emissions, water use, pollution prevention, regional development and transportation planning, and sustainable building design; and promote sustainability in its acquisition of goods and services. Section 2(g) requires new construction, major renovation, or repair and alteration of buildings to comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings. The CEQ regulations at 40 CFR 1502.16(e) direct agencies to consider the energy requirements and conservation potential of various alternatives and mitigation measures.

Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

A Memorandum issued by the Under Secretary of Defense on June 16, 2009, directed all DOD components to use the 80 Day-Night A-Weighted (DNL) noise contour to identify populations at the most risk of potential hearing loss in all future environmental impact statements. Per the Memorandum, DOD components will use as a part of the analysis, as appropriate, a calculation of the Potential Hearing Loss (PHL) of the at risk population. The PHL methodology is defined in U.S. Environmental Protection Agency (USEPA) Report No. 44/9-82-105, *Guidelines for Noise Impact Analysis*.

Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCRs). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a State Implementation Plan (SIP) or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Safety

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFPD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Geological Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland are soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, deep or thick effective rooting zones, and are not subject to periodic flooding. Under the Farmland Protection Policy Act, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the Farmland Protection Policy Act include Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010 all new construction (or demolition) sites that disturb 1 acre or more of land are required to meet the non-numeric effluent limitations and design, install, and maintain effective erosion and sedimentation controls, which include:

- Control storm water volume and velocity to minimize erosion
- Control storm water discharges including both peak flow rates and total storm water volume
- Minimize the amount of soil exposed during construction activities
- Minimize the disturbance of steep slopes
- Minimize sediment discharges from the site using controls that address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site
- Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration where feasible
- Minimize erosion at outlets and downstream channel and stream bank erosion
- Minimize soil compaction and preserve topsoil where feasible.

In addition, construction site owners and operators that disturb one or more acres of land are required to use BMPs to ensure that soil disturbed during construction activities does not pollute nearby water bodies.

Under the Final Rule for the CWA, USEPA is promulgating a series of non-numeric effluent limitations, as well as a numeric effluent limitation for the pollutant turbidity. USEPA is phasing in the numeric effluent limitation over 4 years to allow permitting authorities adequate time to develop monitoring requirements and to allow the regulated community time to prepare for compliance with the numeric effluent limitation. Effective August 1, 2011, construction activities disturbing a total of 20 or more acres at one time, including non-contiguous land disturbances that take place at the same time and are part of a larger common plan of development, must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation will be 280 nephelometric turbidity units. On February 2, 2014, construction site owners and operators that disturb 10 or more acres of land at one time are required to monitor discharges from the site and comply with the numeric effluent limitation. The USEPA’s limitations are based on its assessment of what specific technologies can reliably achieve. Permittees can select management practices or technologies that are best suited for site-specific conditions.

Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. Section 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint greater than 5,000 square-feet of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with the project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses shall be conducted to evaluate the effectiveness of the as-built storm water reduction features. As stated in a DOD memorandum dated January 19, 2010, these regulations will be incorporated into applicable DOD Unified Facilities Criteria within 6 months. Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (505-248-6920). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act [16 U.S.C. 668]).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 21, 1997), directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes; redesigning products, substituting raw materials; and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]) sets a goal for all Federal agencies that promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of, increase diversion of solid waste as appropriate, and maintain cost-effective waste prevention and recycling programs in their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to "incorporate pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA."

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for "cradle-to-grave" management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with "hazardous substances" or "extremely hazardous substances" to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as "owners." However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the "innocent purchaser" defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs Federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

APPENDIX B

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP) MATERIALS

Appendix B

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Materials

The 377th Air Base Wing (377 ABW) solicited comments on the Draft Environmental Assessment (EA) by distributing letters to potentially interested Federal, state, and local agencies; Native American tribes; and other stakeholder groups or individuals, and by publishing a Notice of Availability (NOA) in *The Albuquerque Journal* that provided notification that the Draft EA was available for review. Two government agency comments were received from the Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD) and the New Mexico Department of Game and Fish. The distribution lists of potentially interested parties, examples of the IICEP notification letters, the NOA, and the two comments received follow in this appendix.

Federal, State, and Local Agencies

Ms. Mary Lou Leonard
City of Albuquerque
Acting Environmental Health Department Director
P.O. Box 1293
Albuquerque, NM 87103

Ms. Georgia Cleverly
New Mexico Environment Department
Office of Planning and Performance
P.O. Box 5469
Santa Fe, NM 87502-5469

Ms. Terra Monasco
New Mexico Game and Fish
Assistant Chief of Conservation Services Division
P.O. Box 25112
Santa Fe, NM 87504

Mr. Robert Campellone
U.S. Fish and Wildlife Service
Division of Planning
P.O. Box 1306
Albuquerque, NM 87103

Ms. Jackie Andrew
Southwestern Region NEPA Coordinator
U.S. Forest Service
333 Broadway Boulevard SE
Albuquerque, NM 87102

Ms. Julie Alcon
U.S. Army Corps of Engineers
Chief of Environmental Resources Section
4101 Jefferson Plaza NE
Albuquerque, NM 87109

Example IICEP Letter to Federal, State, and Local Agencies

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

AUG 1 8 2010

Colonel Robert L. Maness
377 ABW/CC
2000 Wyoming Blvd SE Suite E-3
Kirtland AFB NM 87117-5000

Ms. Mary Lou Leonard
City of Albuquerque
Acting Environmental Health Department Director
PO Box 1293
Albuquerque NM 87103

Re: Construction, Operation, and Maintenance of a Hot Cargo Pad at Kirtland Air Force Base, New Mexico

Dear Ms. Leonard

The 377th Air Base Wing (377 ABW) Kirtland Air Force Base (KAFB) has prepared a Draft Environmental Assessment (EA) addressing construction, operation, and maintenance of a hot cargo pad at KAFB. A hot cargo pad is aircraft parking for the loading and unloading of explosive munitions. The 377 ABW proposes to construct a hot cargo pad at KAFB to ensure reliable support and backup for the existing hot cargo pad (Pad 5). The environmental impact analysis process for this proposal is being conducted in accordance with Council on Environmental Quality regulations pursuant to the requirements of the National Environmental Policy Act of 1969.

In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, I request your participation by reviewing the Draft EA and solicit your comments concerning the proposal and any potential environmental concerns you may have. Copies of the Draft EA and the proposed Finding of No Significant Impact are available at http://www.kirtland.af.mil under the environmental issues tab. Please provide written comments on the Draft EA or other information regarding the action at your earliest convenience but no later than 30 days from the receipt of this letter. Appendix B of the Draft EA contains a listing of those Federal, state, and local agencies that have been contacted. If there are any additional agencies that you feel should review and comment on the proposed activities, please include them in your distribution of this letter.

Please address questions or comments on this proposed action to the NEPA Program Manager, 377 MSG/CEANQ, 2050 Wyoming Boulevard SE, Suite 125, KAFB NM 87117, or via email to nepa@kirtland.af.mil.

Sincerely

ROBERT L. MANESS, Colonel, USAF
Commander

Native American Tribes

Isleta Pueblo
Governor Robert Benavidez
P.O. Box 1270
Isleta Pueblo, NM 87022

Pueblo of Zuni
Governor Norman Cooeyate
P.O. Box 339
Zuni, NM 87327

White Mountain Apache
Ronnie Lupe, Chairman
Tribal Council
P.O. Box 700
Whiteriver, AZ 85941

Ysleta del Sur Pueblo
Governor Frank Paiz
119 S Old Pueblo Road
P.O. Box 17579 – Ysleta Station
El Paso, TX 79917

Michael Burgess, Tribal Chairman
Comanche Indian Tribe
P.O. Box 908
Lawton, OK 73507

Jicarilla Apache Nation
President Levi Pesata
P.O. Box 507
Dulce, NM 87528

Mescalero Apache Tribe
President Carleton Naiche-Palmer
P.O. Box 227
Mescalero, NM 88340

Pueblo of Nambe
Governor Ernest Mirabal
Route 1, Box 117-BB
Santa Fe, NM 87506

Navajo Nation
President Joe Shirley, Jr.
P.O. Box 9000
Window Rock, AZ 86515

Ohkay Owingeh
Governor Marcelino Aguino
P.O. Box 1099
San Juan Pueblo, NM 87566

Pueblo of Acoma
Governor Chandler Sanchez
P.O. Box 309
Acoma, NM 87034

Pueblo of Cochiti
Governor John F. Pecos
P.O. Box 70
Cochiti Pueblo, NM 87072

Pueblo of Jemez
Governor David Toledo
P.O. Box 100
Jemez Pueblo, NM 87024

Pueblo of Laguna
Governor John Antonio, Sr.
P.O. Box 194
Laguna Pueblo, NM 87026

Pueblo of Picuris
Governor Gerald Nailor
P.O. Box 127
Penasco, NM 87553

Pueblo of Pojoaque
Governor George Rivera
78 Cities of Gold Road
Santa Fe, NM 87506

Pueblo of San Felipe
Governor Anthony Ortiz
P.O. Box 4339
San Felipe Pueblo, NM 87001

Pueblo of San Ildefonso
Governor Leon T. Roybal
Route 5, Box 315 –A
Santa Fe, NM 87506

Pueblo of Sandia
Governor Joe M. Lujan
481 Sandia Loop
Bernalillo, NM 87004

Pueblo of Santa Ana
Governor Bruce Sanchez
2 Dove Road
Santa Ana Pueblo, NM 87004

Pueblo of Santa Clara
Governor Walter Dasheno
P.O. Box 580
Espanola, NM 87532

Pueblo of Santo Domingo
Governor Everett F. Chavez
P.O. Box 99
Santo Domingo Pueblo, NM 87052

Pueblo of Taos
Governor Ruben A. Romero
P.O. Box 1846
Taos, NM 87571

Pueblo of Tesuque
Governor Mark Mitchell
Route 42, Box 360-T
Santa Fe, NM 87506

Pueblo of Zia
Governor Ivan Pino
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

Hopi Tribal Council
P.O. Box 123
Kykotsmovi, AZ 86039

Example IICEP Letter to Native American Tribes

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

Colonel Michael S. Duvall
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5000

Pueblo of Isleta
Governor Robert Benavidez
P.O. Box 1270
Isleta Pueblo NM 87022

Dear Governor Benavidez

To improve our government-to-government relationship with your tribe, we would like to develop a program with you to review current and future activities associated with the mission of Kirtland Air Force Base (Kirtland AFB). Our broad mission is to ensure safe, secure and reliable weapons systems to support the national command structure and the Air Force warfighter. Our responsibilities are to advocate the Air Force's weapon system and support programs. In order to achieve this mission Kirtland AFB is constantly changing and growing.

We have seven projects currently under planning and potentially of interest to your tribe. A list of these projects is attached. If you have potential interest or concerns related to these projects, please contact Ms. Valerie Renner at telephone number (505) 846-8840.

As a follow-up to this letter, Ms. Renner will be calling you to further discuss Kirtland AFB's intent to improve our consultation process and to determine if you wish to discuss any of the projects identified on the attached list. If you would like to personally meet with me to discuss these or other topics, please advise Ms. Renner and she will facilitate a meeting. Thank you for your time in consideration of our requests.

Sincerely

MICHAEL S. DUVALL, Colonel, USAF
Commander

Attachment:
1. Description of Proposed Actions at Kirtland AFB

HC/MC-130 Aircraft Recapitalization:

The 58th Special Operations Wing (58th SOW) proposes to get 12 new C-130 airplanes to replace 8 older ones they currently fly. No change in the mission of the 58th SOW will occur. The number of people that will come here to train will increase slightly.

Heavy Weapons Range:

The 377th Air Base Wing is proposing to establish and use a heavy weapons range in the southeast section of Kirtland AFB approximately 0.25 miles east of the Starfire Optical Range facilities along Mount Washington Road. The proposed range will encompass the existing M60 range. It would include two firing positions and firing lines and would use the existing targets at the M60 range. Firing distance would be approximately 7,300 feet. Firing position two would be used for sniper heavy weapons (.50 caliber) and would fire in a more southerly direction to the existing target area, approximately 3,800 feet.

Construct New Hot Cargo Pad:

Kirtland AFB has only one hot cargo pad that aircraft park on to load and unload supplies that are continuously flown in and out of Kirtland AFB. The new pad will consist of a cement concrete containing additives to reduce the effects of alkali-silica reactivity. The new pad will adjoin the existing. This project will include a new 6" asphalt taxiway and replace the deteriorated asphalt taxiway to Pad 5. The new pad will adjoin the existing Pad 5 to minimize enlargement of the clear zone and effects on other critical facilities.

Dormitory Master Plan:

This project proposes to construct three new permanent party dormitories to replace old substandard dormitories built in 1950. Kirtland AFB currently has a surplus of old substandard dormitory space this project will help eliminate. The proposed dormitories will be energy–efficient and more economical to maintain.

Construct New Shopping Center:

The Army and Air Force Exchange Service (AAFES) proposes to construct and operate a new Shopping Center at Kirtland AFB. This proposed project will include demolishing of existing facilities, closure of Pennsylvania Avenue, and the construction of a new road behind the new shopping center.

Construct Several New Facilities:

Kirtland AFB proposes to construct six new facilities that will support the fire department (two new fire stations), the newly formed 498th Nuclear System Wing, the newly formed Air Force Nuclear Weapons Center Sustainment Center, the Military Working Dog Facility, and a new Fitness Center. All of these proposed actions will be described in detail in separate Environmental Assessments for review.

Excavation of Five Archaeology Sites:

Kirtland AFB Cultural Resource Manager is developing a research design to excavate five archaeological sites (LA 155815, LA 156001, LA 107494, LA 53671, and LA 153888). Two of the sites (LA 155815 and LA 156001) are next to each other just south of Tijeras Arroyo. They have been exposed due to past flooding of the arroyo and are now eroding from wind and natural elements. The sites are dated as Classic Pueblo from AD 1625 – 1700. This is in the beginning stages of design and the exact procedure has not been determined.

LA 107494 had been damaged by a bulldozer and the cuts have exposed several features. It is a large habitation area with several structures dating from Late Developmental to Coalition (1050 – 1600 AD) time periods. The site is slowly being destroyed by this erosion. Therefore, we recommend stabilizing the site.

LA 53671 is a potentially extensive pithouse village dating to the Late Developmental to Early Classic period (AD 1050 – 1325). This site appears to have been damaged by a large bulldozer. We are estimating this happened during the construction of Coyote Springs Road. Several large trenches exist throughout the site and erosion of the site has been exacerbated by the trenches. The site is slowly being destroyed by this erosion. Therefore, we recommend stabilizing the site.

LA 153888 is a large biface cache. This site is also being damaged by erosion that is caused by a road that was put in near the site. We recommend stabilizing the site.

Notice of Availability

PUBLIC NOTICE

DRAFT ENVIRONMENTAL ASSESSMENT
Addressing Construction, Operation, and Maintenance of a Hot Cargo Pad at Kirtland Air Force Base, New Mexico

A Draft Environmental Assessment (EA) has been prepared to evaluate the potential impacts on environmental and human resources that would result from construction, operation, and maintenance of a hot cargo pad at Kirtland Air Force Base, New Mexico.

Copies of the Draft EA and the proposed Finding of No Significant Impact (FONSI) are available now at http://www.kirtland.af.mil/environment.asp or the following locations:

CNMCC Montoya Campus 4700 Morris NE Albuquerque, NM 87102	KAFB Library Bldg 20204 Kirtland AFB, NM 87117

The comment period is from **September 5, 2010** through **October 4, 2010**. All comments must be received by October 4, 2010. Individuals wishing further information, or to contribute comments, should contact the NEPA Program Manager, 377 MSG/CEANQ, 2050 Wyoming Blvd SE, Suite 125, Kirtland AFB, NM 87117 or send an email to NEPA@kirtland.af.mil.

Comments Received on the Draft Environmental Assessment

Responses to agency comments requiring clarification are included below in **Table B-1**.

CITY OF ALBUQUERQUE

September 22, 2010

Program Manager, KAFB
National Environmental Policy Act
377 MSG/CEANQ
2050 Wyoming Blvd. SE
Kirtland AFB, NM 87117-5270

Certified Mail No. 7007 1490 0003 5645 3084

Re: Construction and Operation of Hot Cargo Pad

KAFB NEPA Program Manager:

Thank you for providing the Air Quality Division (Division) the opportunity to review the KAFB preliminary EA (EA) which proposes the construction, operation and maintenance of a hot cargo pad. Based on review of the preliminary EA, dated September 2010, the Division has concluded that activities associated with this type of operation may require notifications and permit application submittals to the Division. KAFB base must ensure that all appropriate notifications and applications are submitted as required by 20.11 NMAC.

The EA states building demolition will occur as a result of this project. Inspection, notification requirements and asbestos removal will need to be done in accordance with 20.11.20.22 NMAC – Demolition and Renovation Activities; Fugitive Dust Control Construction Permit and Asbestos Notification Requirements and Title 40 CFR Subpart M—National Emission Standard for Asbestos §61.145 – Standard for demolition and renovation.

The EA reports that the planned construction will result in surface disturbance. Surface disturbance of ¾ of an acre or more will require a Fugitive Dust Permit. Buildings to be demolished that exceed 75,000 ft^3 will require a Fugitive Dust Permit. If a Fugitive Dust Permit is required, surface disturbance/demolition shall not occur before Division staff sign and issue a fugitive dust permit. Fugitive dust emissions resulting from this project must be mitigated and controlled as cited in 20.11.20 NMAC.

The EA states that concrete and asphalt construction debris will result from the project. The EA report does not state whether KAFB plans to use any crushing and screening equipment to further process on site, or if all will be disposed off site. If KAFB plans to crush and screen this material, KAFB must ensure that the appropriate permits are in place, and/or relocation requests have been approved before constructing crushing/screening equipment. The EA states that a generator will be used during construction. Those engines, not defined as a "Nonroad engine" under Title 40 CFR Part 89 or 90, and applicable to 20.11.41 NMAC, shall obtain a permit pursuant to Part 41. If applicable to 20.11.40 NMAC, the owner/operator shall obtain a Certificate of Registration pursuant to Part 40.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Albuquerque - Making History 1706-2006

Thank you for the time and the opportunity to review the EA Draft Report. Please do not hesitate to contact me with any questions or concerns you may have (dreyes@cabq.gov or 505-768-1958).

Sincerely,

Damon R. Reyes
Enforcement Section Supervisor
Air Quality Division
Environmental Health Department
City of Albuquerque

Xc: Mary Lou Leonard, Director, Environmental Health Department
Isreal Tavarez, Environmental Engineering Manager, Air Quality Permitting Section
William Gallegos, Environmental Health Manager, Environmental Service Department

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Tod Stevenson

Robert S. Jenks, Deputy Director

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
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Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: 505/476-8000
To order free publications call: 1-800-862-9310

September 27, 2010

NEPA Program Manager
377 MSG/CEANQ
2050 Wyoming Blvd. SE, Suite 125
Kirtland Air Force Base, NM 87117

Re: Construction, Operation and Maintenance of a Hot Cargo Pad Environmental Assessment
NMDGF Do. No. 13775

Dear Sir:

The Department of Game and Fish (Department) has reviewed the above referenced document (EA). The EA states on page 3:

> The burrowing owl *(Athene cunicularia)* is the only species of concern in the vicinity of the Proposed Action; three burrowing owl nesting locations have been observed near the proposed hot cargo pad and taxiway and the within the quantity distances arcs for the existing and proposed pads. At least one of these nests could be disturbed during demolition or construction activities. Surveys would be conducted prior to commencement of ground-disturbing activities, and if owls are present, ground disturbing demolition and construction activities would only commence after the owls have left from the area and nesting burrows would be flagged for avoidance. Compliance with these procedures would mean that any impacts on burrowing owls would be expected to be less than significant.

To mitigate for the potential to disturb nesting burrowing owls, the Department recommends that construction activities for the hot cargo pad occur outside of the nesting season, which occurs from 1 March through 31 August. Conducting construction activities within the dates of 1 September through 28 February would help to ensure that nest abandonment does not occur as a result of disturbance from project construction.

We appreciate the opportunity to comment on this project. Should you have any questions regarding our comments, please contact Mark Watson, Habitat Specialist, of my staff at (505) 476-8115, or <mark.watson@state.nm.us>.

Sincerely,

Matt Wunder, Ph.D.
Chief, Conservation Services Division

MW/MLW

CC: Wally Murphy (Ecological Services Field Supervisor, USFWS)
Bob Jenks (Deputy Director, NMDGF)
Brian Gleadle (Northwest Area Operations Supervisor, NMDGF)
Jan Ward (Conservation Services Asst. Div. Chief, NMDGF)
Mark Watson (Conservation Services Habitat Specialist, NMDGF)

Table B-1. Responses to Comments Received on the Draft Environmental Assessment

Section	Commenter	Comment Summary	Response
Air Quality	Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD)	The AEHD-AQD reviewed the EA and determined that some of the demolition activities may require notifications and permit application submittals. The AEHD-AQD describe the potential need for notification requirements for potential asbestos removal, a Fugitive Dust Construction Permit, crushing and screening equipment permits, and an air quality permit for the operation of non-road engines.	As stated in Sections 1, 2, and 3 of this EA, Kirtland AFB will obtain a Fugitive Dust Construction Permit and all other necessary air quality permits prior to the start of construction. Asphalt will only be crushed and screened if rebar is not present. Section 2 of the Final EA has been updated for clarification to include this information. The Kirtland AFB landfill will obtain any necessary air quality permits prior to initiating crushing and screening activities.

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APPENDIX C

AIR QUALITY SUPPORTING DOCUMENTATION

Summary	Summarizes total emissions.
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks removing materials from the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region Tier report for 2002, to be used to compare the project to regional emissions.

Air Quality Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Proposed Project	Construction Combustion	10.513	0.743	4.389	0.491	0.691	0.670	1,216.674
	Construction Fugitive Dust	-	-	-	-	34.436	2.858	-
	Haul Truck On-Road	0.092	0.067	0.271	0.007	0.109	0.028	23.307
	Construction Commuter	1.412	1.878	20.191	0.060	0.762	0.208	293.250
	TOTAL Proposed Project	***12.017***	***2.688***	***24.851***	***0.558***	***35.999***	***3.765***	***1,533.231***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons = ***1,390.641*** ***metric tons***

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152

	Point and Area Sources Combined					
Year	**NO_x (tpy)**	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
2002	36,778	31,651	245,346	2,619	137,376	16,676

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html).

Determination Significance (Significance Threshold = 10%)

Proposed Project	Point and Area Sources Combined					
	NO_x (tpy)	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Regional Emissions	36,778	31,651	245,346	2,619	137,376	16,676
Project Emissions	12.02	2.69	24.85	0.56	36.00	3.76
Proposed Project %	**0.0327%**	**0.0085%**	**0.0101%**	**0.0213%**	**0.0262%**	**0.0226%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction

General Construction Activities	**Area Disturbed**		
Construction of anti-terrorism force protection (AT/FP) measures	182,952	ft^2	Assume area disturbed is the same size as the proposed pad
Removal of existing aboveground infrastructure	182,952	ft^2	Assume area disturbed is the same size as the proposed pad
Demolish small asphalt parking and storage area NE of Pad 5	400	ft^2	Area determined from KAFB 2009 DOPAA, Figure 2-1
Construction of paved shoulder	10,000	ft^2	Assume 10 foot extension off the perimeter of the pad
Construction of a personal shelter	900	ft^2	Assume a building footprint of 30 ft. x 30 ft.
Hot Pad Construction and Demolition Activities			
Construction of hot pad	392,952	ft^2	Includes hot cargo pad, concrete area separator, and taxiway for both pads
Demolition of Pad 5 taxiway	70,000	ft^2	Area determined from KAFB 2009 DOPAA, Figure 2-1
Total General Construction Area:	377,204	ft^2	
	8.7	acres	
Total Hot Pad Construction and Demolition Area:	462,952	ft^2	
	10.6	acres	
Total Disturbed Area:	840,156	ft^2	
	19	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days/yr	Assume 12 months, 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	0.96	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	1	41.641	2.577	15.710	0.833	2.546	2.469	4941.526
Paving Equipment	1	45.367	2.606	18.578	0.907	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			2.445					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	587,204	13.48	5	
Paving:	402,952	9.25	45	
Demolition:	253,352	5.82	291	
Building Construction:	900	0.02	240	
Architectural Coating	900	0.02	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	208.21	12.88	78.55	4.16	12.73	12.35	24,708
Paving	2,041.53	117.26	836.03	40.83	124.92	121.18	253,078
Demolition	9,249.90	548.32	3,659.46	185.00	559.28	542.50	1,076,884
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	56.36	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**21,026.23**	**1,485.98**	**8,777.10**	**982.94**	**1,382.09**	**1,340.62**	**2,433,348**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	21,026.23	1,485.98	8,777.10	982.94	1,382.09	1,340.62	2,433,348
Total Project Emissions (tons)	10.51	0.74	4.39	0.49	0.69	0.67	1,216.67

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Hot Pad Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	9.0	acres

General Construction Activities (0.19 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	10.3	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	PM_{10} controlled	$PM_{2.5}$ uncontrolled	$PM_{2.5}$ controlled
Demolition and New Hot Pad Construction	45.47	22.73	4.55	2.27
Construction Activities	23.41	11.70	1.17	0.59
Total	**68.87**	**34.44**	**5.72**	**2.86**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 13.5 acres/yr (from Combustion Worksheet)

Qty Equipment: 5.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.

Terrain is mostly flat.

An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.

200 hp bulldozers are used for site clearing.

300 hp bulldozers are used for stripping, excavation, and backfill.

Vibratory drum rollers are used for compacting.

Stripping, Excavation, Backfill and Compaction require an average of two passes each.

Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	13.48	1.69
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	13.48	6.59
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	6.74	6.80
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	6.74	2.79
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	13.48	4.73
TOTAL								22.59

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 22.59

Qty Equipment: 5.00

Grading days/yr: 4.52

Haul Truck Emissions

Emissions from hauling construction and demolition debris are estimated in this spreadsheet.

Emission Estimation Method References: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

US EPA Estimating 2003 Building-Related Construction and Demolition Materials Amounts (March 2009).

Assumptions:

Haul trucks carry 20 cubic yards of material per trip.

The average distance from the project site to the base landfill is 10 miles, and from the project site to the offsite Cerro Colorado Landfill is 30 miles.

Assume 85% of demolition waste would go to the base landfill and 15% would be transported offsite. Therefore a haul truck will have a weighted average of 26 miles round trip.

Estimated number of trips required by haul trucks = total amount of material demolished on installation/20 cubic yards per truck

Typical non-residential demolition materials generation per unit area:	158	lb/ft^2	EPA 2009
Total demolition waste removed:	253,352	ft^2	From Project Combustion
Total demolition waste:	40,029,616	lbs	Density of demolition waste * project area
Density of demolition waste:	150	lbs/ft^3	Density of concrete (EPA 2009)
Total volume of demolition waste:	9,884	cubic yards	
Number of trucks required to haul demolition waste:	494		Heavy duty diesel haul trucks (20 CY)
Miles per round trip:	26	miles	Weighted average

Heavy Duty Diesel Vehicle (HDDV) Average Emission Factors (grams/mile)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
HDDV	**6.500**	**4.7000**	**19.10**	**0.512**	**7.7**	**2.01**	**1646**

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from HDDV in Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-41 through 4-43 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

Diesel fuel produces 22.384 pounds of CO_2 per gallon.

It is assumed that the average HDDV has a fuel economy of 6.17 miles per gallon, Table 4-51 (USAF IERA 2003)

CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb

HDDV Haul Truck Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**184.12**	**133.14**	**541.04**	**14.50**	**218.97**	**56.94**	**46614.63**
tons	**0.09**	**0.07**	**0.27**	**0.01**	**0.11**	**0.03**	**23.31**

Example Calculation: NO_x emissions (lbs) = 26 miles per round trip * 494 trips * NO_x emission factor (g/mile) * lb/453.6 g

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: United States Air Force (USAF) Institute for Environment, Safety and Occupational Health Risk Analysis (IERA) Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (Revised December 2003).

Assumptions:

Passenger vehicle emission factors for scenario year 2010 are used.

Assume up to 48 workers would be required at the site.

Passenger vehicle model year 2000 is used.

The average roundtrip commute for a construction worker =	50	miles
Number of construction days =	240	days
Number of construction workers (daily) =	48	people
Riders per vehicle =	1	person
Number of vehicles (daily) =	48	vehicles

Average On-Road Vehicle Emission Factors (grams/mile)

Vehicle Type Category	NO_x	VOC	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2	
LDGV	2.1	2.9	33.1	0.072	0.71	0.20	391.97	Light Duty Gasoline Vehicles
LDGT1	2.2	3.2	35.2	0.096	1.08	0.29	526.04	Light SUVs and Pickups
LDGT2	2.5	3.5	38.6	0.098	2.58	0.66	535.24	Heavy SUVs and Pickups
HDGV	2.9	3.5	41.1	0.154	5.51	1.42	843.56	Heavy Duty Gasoline Vehicles
LDDV	1.2	0.6	1.7	0.116	0.80	0.28	373.70	Light Duty Diesel Vehicles
LDDT	1.5	1.1	2.9	0.157	1.59	0.48	505.90	Light Duty Diesel Trucks
HDDV	6.5	4.7	19.1	0.512	7.73	2.01	1645.60	Heavy Duty Diesel Vehicles
MC	0.6	6.5	41.0	0.032	0.08	0.03	177.48	Motorcycles

Notes:

Emission factors for all pollutants except CO_2 are from USAF IERA 2003.

Emission factors for PM, PM_{10}, SO_x are from Table 4-50 (USAF IERA 2003).

Emission factors for VOC, CO, and NO_x are from Tables 4-2 through 4-49 for the 2010 calendar year, 2000 model year (USAF IERA 2003).

It is assumed that the average vehicle will produce 19.564 pounds of CO_2 per gallon of gas used and 22.384 pounds of CO_2 per gallon of diesel used (http://www.eia.doe.gov/oiaf/1605/coefficients.html).

Using the default fuel economy for the vehicle type categories in USAF IERA Table 4-51, the CO_2 emission factor was estimated.

Example: HDDV CO_2 emission factor = 22.384 lbs CO_2/gallon diesel * gallon diesel/6.17 miles * 453.6 g/lb = 1645.60 g/mile

Default Fuel Economies for On-Road Vehicles

Vehicle Type Category	Default Fuel Economy (mpg)
LDGV	22.64
LDGT1	16.87
LDGT2	16.58
HDGV	10.52
LDDV	27.17
LDDT	20.07
HDDV	6.17
MC	50.00

Notes:

Values from Table 4-51 (USAF IERA 2003).

On-Road Vehicle Emissions (Annual)

Vehicle Type Category	NO_x	VOC	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2
LDGV	1837.33	2537.27	28959.87	62.99	621.19	174.98	342943.79
LDGT1	318.48	463.24	5095.62	13.90	156.34	41.98	76150.00
LDGT2	269.84	377.78	4166.35	10.58	278.48	71.24	57771.62
HDGV	55.24	66.67	782.86	2.93	104.95	27.05	16067.77
LDDV	59.43	29.71	84.19	5.74	39.62	13.87	18506.96
LDDT	36.19	26.54	69.97	3.79	38.36	11.58	12205.80
HDDV	239.37	173.08	703.37	18.85	284.66	74.02	60600.05
MC	7.62	82.54	520.63	0.41	1.02	0.38	2253.77
Total (lbs)	2823.49	3756.83	40382.86	119.20	1524.62	415.10	586499.77
Total (tons)	1.41	1.88	20.19	0.06	0.76	0.21	293.25

Average On-Road Vehicle Mix

Vehicle Type Category	Average On-Road Vehicle Mix (%)
LDGV	68.9
LDGT1	11.4
LDGT2	8.5
HDGV	1.5
LDDV	3.9
LDDT	1.9
HDDV	2.9
MC	1

Notes:

Vehicle mix is from Table 6-1 (USAF IERA 2003).

Example Calculation: NO_x emissions (lbs) = 48 vehicles * percent of vehicle mix /100 * NO_x emission factor (g/mile) * 50 miles/day * number of construction days * lb/453.6 g

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152

			Point Source Emissions						Area Source Emissions (Non-Point and Mobile Sources)					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	NM	Bernalillo Co	1,179	1,199	177	119	43.6	310	184,071	23,731	61,715	8,064	1,524	24,000
2	NM	Sandavol Co	346	186	94.5	92.6	0.40	62.4	39,031	4,519	36,517	4,274	603	4,517
3	NM	Valencia Co	153	296	1.24	1.07	0	27.1	20,566	6,847	38,871	4,125	448	2,734
Grand Total			1,678	1,681	273	213	44	400	243,668	35,097	137,103	16,463	2,575	31,251

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2002)
Site visited on 19 Oct 2009.

Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152 (40 CFR 81.83)

Total 2002 Point Source and Area Source Emissions for
Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region

	CO	NOx	PM10	PM2.5	SO2	VOC
Bernalillo	185,250	24,930	61,892	8,183	1,568	24,310
Total	245,346	36,778	137,376	16,676	2,619	31,651

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