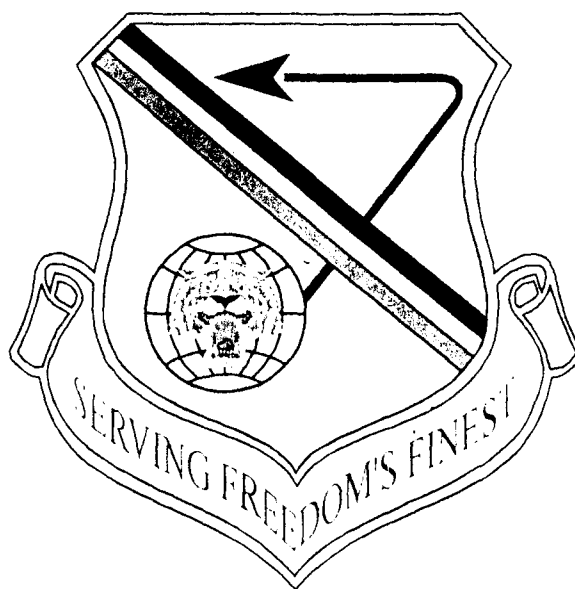


F I N A L

**ENVIRONMENTAL
ASSESSMENT
FOR
KIRTLAND AIR FORCE BASE
PRAIRIE DOG MANAGEMENT PROGRAM**



November 2003

**Prepared for
377th Air Base Wing Air Force Materiel Command**

Report Documentation Page

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SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS

Proposed Actions

Implementation of the Proposed Actions could result in minor short-term negative impacts to air quality, noise, and soils from construction-related activities. Beneficial impacts are expected to occur in the areas of human health and safety, and socioeconomics. No impacts are anticipated to occur to current land uses, water resources, floodplains, vegetation, wetlands, minority and low-income populations, cultural resources, visual resources, transportation, or hazardous wastes from the Proposed Actions. Insignificant impacts would affect wildlife around no-tolerance zones and buffer zones. This impact is due to the decrease of all living wildlife within the burrows during fumigation. However, a positive impact to wildlife is expected from the establishment of the translocated prairie dog colony by providing quality habitat for a variety of species if funding and the law allows.

Human Health and Safety. Removing prairie dogs from specified areas of the base in accordance with the Proposed Actions would benefit human health and safety in four primary areas:

- Reduced risk of human exposure to plague-carrying fleas;
- Reduced numbers of rattlesnakes around occupied areas of the base once prairie dogs are removed;
- Reduced potential for injuries caused by tripping or falling into prairie dog burrows that are located around housing, administration, and recreational areas; and
- BASH reduction by reducing the number of raptors foraging on prairie dogs around flight paths.

No negative impacts to human health and safety from the live capture and relocation of prairie dogs to a relocation site are expected as personnel involved would exercise appropriate caution when handling prairie dogs. Additionally, no negative impacts from the application of aluminum phosphide tablets would occur, as only licensed pesticide applicators would apply the rodenticide while adhering to all field safety protocols.

Air Quality. The absence of prairie dogs from no-tolerance zones would result in positive impacts to air quality from reduced wind erosion caused by prairie dog activities

around these sites. Fumigation involves releasing toxic gas inside the burrow system that has been sealed off. When aluminum phosphide tablets are applied in this manner, they release phosphine gas that migrates through the soil and dissipates gradually into the atmosphere. Once it reaches the surface, it quickly mixes with fresh air which eliminates its toxicity, rendering it harmless. Therefore, there will be no impacts to air quality from applying aluminum phosphate tablets. The establishment of a new relocation site may have negligible and short-term effects to air quality caused by the auguring of new burrows and the eventual establishment of a prairie dog colony.

Land Use. No negative impacts to land use are expected as the Proposed Actions reduce conflicts caused by prairie dog inhabitation. The proposed relocation site was inhabited in the past by prairie dogs and relocating prairie dogs to this site would not cause conflicts with military missions.

Geological Resources. Implementation of the Proposed Actions could result in short-term erosion impacts to soils by using the soap and water technique for capturing prairie dogs and auguring new burrows and the eventual establishment of a prairie dog colony in the north central portion of the base. Where applicable, impacts would be minimized by using best management practices to reduce continued erosion.

Water Resources. No negative impacts are expected to water resources from the Proposed Actions since the amount of water used for the soap and water capture method is negligible and no other water resources would be impacted. The aluminum phosphide tablets would have no effect on water resources because the gas from the tablets move upward and are released at the surface. It does not sink into the ground water.

Biological Resources. Implementation of the Proposed Actions could negatively impact the burrowing owl. To avoid significant impacts to the burrowing owl, several measures would be taken. First, fumigation would not be allowed within 150 feet of any burrowing owl hole. Additionally, these holes will be marked to prevent capping of the owl burrows during fumigation so that the owls may continue to use the site in following years. Artificial owl burrows may be installed in no-tolerance zones and the new relocation site to promote burrowing owl inhabitation. Once a prairie dog colony is established at the relocation site it is anticipated that burrowing owls would use abandoned burrows at the new location. No negative impacts are expected for other sensitive species since none are known to occur in the proposed project area. Wetlands would not be impacted, as none

are located within the project area. Vegetation at the relocation site would undergo successional changes due to the reintroduction of prairie dogs. While species composition would likely change, it would be under natural conditions providing local wildlife a place to find shelter and food. Local wildlife around the no-tolerance zones and buffer zones would likely decrease temporarily as fumigation kills everything living in prairie dog burrows. However, a positive impact to wildlife is expected from the establishment of the translocated prairie dog colony by providing quality habitat for a variety of species.

Cultural Resources. An evaluation of the area of potential ground disturbance for the Proposed Actions indicates that some significant resources could be affected. However, prairie dogs would not be released in areas identified as having significant cultural resources and prairie dog-proof fencing would be erected around such sites should it become necessary. As a result, no significant impacts to cultural resources are anticipated from the Proposed Actions.

Environmental Management. Several Installation Restoration Program (IRP) sites are located within the no-tolerance zones. Personnel familiar with the sites would determine if prairie dogs could be successfully removed without any risk to human health and safety from contaminants. Impacts from fumigation would not occur because phosphine gas reaching the surface quickly becomes nontoxic as it mixes with fresh air. Additionally, the residue left behind is considered to be non-toxic and does not persist in the food chain. Six active IRP sites are located within the proposed relocation site. Mitigation measures such as constructing prairie dog barriers around these areas would prevent adverse impacts to environmental management activities.

Alternative 1: Alternative Relocation Site

Implementation of Alternative 1 would result in impacts similar to those described for the Proposed Actions. Impacts from live capture and fumigation of prairie dogs would be the same since they include the same areas. Impacts associated with the alternative relocation site would be similar to those associated with the proposed relocation site, but due to its smaller size of approximately 370 acres, the overall impacts would be less. Since the alternative relocation site is larger than the area needed for prairie dog relocation, impacts to the site from prairie dog inhabitation is expected to be similar to that of the proposed relocation site. Fewer cultural and IRP sites are associated with the

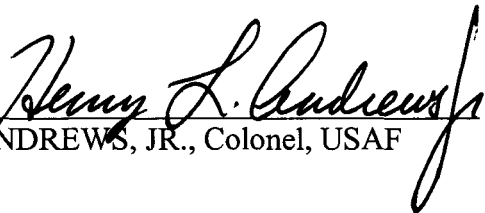
alternative relocation site, therefore impacts to these resources would also be less significant.

No-Action Alternative

Under this alternative, Kirtland AFB would continue to fumigate prairie dogs on an “as-needed” basis. No changes would occur to any environmental or human resources as a result of the implementation of this alternative. Concerns associated with human health and safety as well as potential conflicts with the military mission at Kirtland AFB would not be addressed under this alternative.

CONCLUSION

After careful review of the EA of the Proposed Actions, I have concluded that the Proposed Actions would not have a significant impact on the quality of the human environment and would not generate significant controversy. Therefore, issuance of a Finding of No Significant Impact is warranted, and an Environmental Impact Statement is not required. This analysis fulfills the requirements of the National Environmental Policy Act and the implementing regulations promulgated by the Council on Environmental Quality.

Approved By:  Date: _____
HENRY L. ANDREWS, JR., Colonel, USAF
Commander

JAN 18 2004

FINDING OF NO SIGNIFICANT IMPACT

PRAIRIE DOG MANAGEMENT PROGRAM AT KIRTLAND AIR FORCE BASE, NEW MEXICO

The 377th Air Base Wing of Air Force Materiel Command prepared the attached Environmental Assessment (EA) to assess the environmental consequences of Proposed Actions at Kirtland Air Force Base (AFB). The actions consist of: capture and relocation of prairie dogs to a site on base if funding and the law allows. Otherwise, prairie dogs will be fumigated in no-tolerance and buffer zones on Kirtland AFB. The Department of the Air Force has independently evaluated this EA and adopts it herein.

DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

Proposed Actions

Kirtland AFB proposes to eliminate prairie dogs from specific areas of the base (no-tolerance and buffer zones). Other non-specific areas that receive excessive prairie dog damage may also be subject to control (i.e. future conflicts between base missions and prairie dogs). No-tolerance zones include several small areas located north of Tijeras Arroyo, munitions storage complex, golf course, heliport, Explosive Ordnance Disposal (EOD) Range, Well No. 9 Complex (consists of riding stables, an administration area, the safeguard transportation driving area, and safety inspection pad), antennae array site, and four Department of Defense radioactive training areas. Buffer zones are 200-300 foot areas surrounding each of the no-tolerance zones that may also be subject to prairie dog control. The Proposed Actions include the establishment of a prairie dog relocation site in the north-central portion of the base if funding becomes available and the law allows for relocation. The base proposes to use non-lethal methods, when feasible, to remove prairie dogs from certain no-tolerance and buffer zones. Prairie dog control methods proposed for use at Kirtland AFB vary in success rate and safety to humans and other animal species that use prairie dog burrows for shelter. Soap and water would be one method used to capture prairie dogs in the no-tolerance and buffer zones. Live trapping may also be conducted to capture prairie dogs when time allots. However, at this time live capture and removal is prohibited by the Center for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) interim final rule restricting import, capture, transport, sale, barter, exchange, distribution, and release of African rodents,

prairie dogs, and certain other animals. Lethal control methods, using aluminum phosphide tablets, will be used while the law prohibits relocation and in the event of prairie dogs re-inhabiting no-tolerance and buffer zones.

The primary reason for the use of non-lethal capture methods is to relocate animals to an area where they would no longer pose conflicts with base personnel or missions. Although prairie dogs cause conflicts in certain areas of the base, there are large undeveloped areas where prairie dogs could co-exist with base activities. The north-central portion of the base is one such area consisting of approximately 3,500 acres. If funding is obtained and the law allows, this site would be prepared for prairie dog relocation by mowing the vegetation to less than six inches and by auguring burrows for the newly translocated prairie dogs. Prairie dogs would be released into an artificial burrow and covered with a retention cage for several days to protect them during the relocation process. During this time, they would be provided with food and water until the retention cages were removed 3-5 days later.

Alternative 1: Alternative Relocation Site

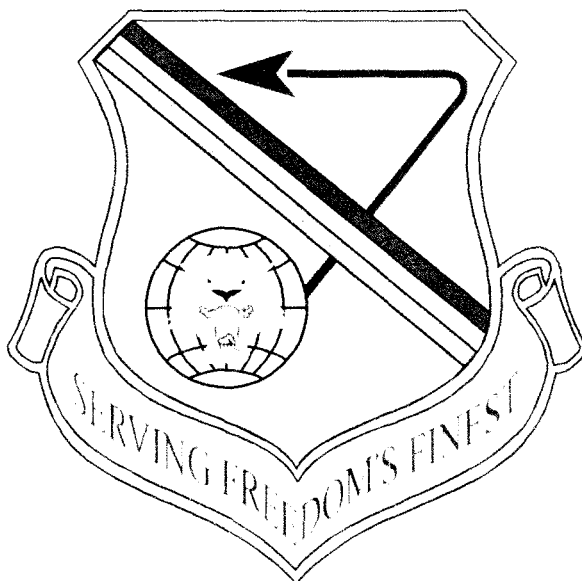
This alternative is virtually the same as the Proposed Actions except that the alternative relocation site is located east of the EOD Range and consists of approximately 370 acres. Capture and relocation protocol would be the same as for the Proposed Actions, as well as the use of aluminum phosphide tablets to control remaining or re-inhabiting prairie dogs in no-tolerance and buffer zones. Although the alternative relocation site is large enough to accommodate all of the prairie dogs proposed for relocation, it does not allow for the same degree of future colonization as the Proposed Actions.

No-Action Alternative

The No-Action Alternative consists of continuing the present prairie dog control effort on Kirtland AFB. Prairie dogs would not be captured and the prairie dog relocation site would not be created. Areas where prairie dogs conflict with military mission and operations are fumigated but not throughout any no-tolerance zones in a single effort. Although this alternative does not rectify health and safety concerns, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations § 1502.14 [CEQ 1978]) stipulate that the No-Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed action is not implemented.

F I N A L

**ENVIRONMENTAL
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FOR
KIRTLAND AIR FORCE BASE
PRAIRIE DOG MANAGEMENT PROGRAM**



November 2003

**Prepared for
377th Air Base Wing Air Force Materiel Command**

Erratum

To The Final Environmental Assessment For Kirtland Air Force Base Prairie Dog Management Program

On November 4th, 2003 the Food and Drug Administration and the Centers for Disease Control and Prevention published in the Federal Register an Interim Final Rule governing the capture and relocation of prairie dogs due to concerns associated with the spread of monkeypox. The Final Environmental Assessment for the Kirtland Air Force Base (AFB) Prairie Dog Management Program was finalized on November 5th, 2003 and, as a result, did not include the new rule in the document. This erratum discusses the purpose of the interim final rule and how it affects the Prairie Dog Management Program at Kirtland AFB. All information contained in this erratum came from the Federal Register Vol. 68, No. 213.

The summary in the interim final rule states: “The Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) are issuing this interim final rule to amend their regulations to establish new restrictions and modify existing restrictions of the import, capture, transport, sale barter, exchange, distribution, and release of African rodents, prairie dogs, and certain other animals. We are taking this action to prevent the spread of monkey pox, a communicable disease, in the United States.”

Monkeypox is a rare viral disease that was inadvertently transported to this country through a shipment of exotic African rodents brought to the U.S. for distribution into the pet trade. In May 2003, people from several midwestern states began contracting monkeypox, primarily as a result of contact with prairie dogs that had contracted monkeypox from diseased African rodents. Monkeypox is a form of other pox diseases such as chicken and small pox and is characterized by rashes, temperature at or above

99.3 degrees, chills and/or sweats, headache, backache, lymphadenopathy, sore throat, cough, and shortness of breath. Monkeypox has a mortality rate in humans ranging from 1-10 percent. Monkeypox can spread to humans from an infected animal through an animal bite or direct contact with the animal's lesions or body fluids (such as a bite) (CDC 2003). Transmission from person to person is possible but monkeypox is less infectious than smallpox.

This interim final rule states that the FDA will regulate the capture and release of prairie dogs, as well as other actions and species, to prevent the spread of monkeypox. Under 21 CFR 1240.63(a)(1)(i), all individuals, including state and federal entities, are not allowed to capture and/or release prairie dogs. However, under 21 CFR 1240.63(a)(2), one can capture and relocate prairie dogs after receiving permission from the FDA. 21 CFR 1240.63(a)(2)(ii)(A) describes the procedures for seeking written permission from the FDA for the capture and relocation of prairie dogs. 21 CFR 1240.63(a)(2)(ii)(B) requires Kirtland AFB to state why they need an exemption, describe the number of animals involved, describe how the animals will be transported, describe any holding facilities, quarantine procedures, and/or veterinarian evaluation involved in the animals' movement, and explain why an exemption will not result in the spread of monkeypox within the U.S. The FDA will grant exemptions on a case-by-case basis and only for specific purposes and in specific circumstances.

Although New Mexico has no known cases of monkeypox, Kirtland AFB would need to request written permission from the FDA to capture and relocate prairie dogs from no-tolerance zones to the proposed relocation site before implementing the 2003 Prairie Dog Management Program. If written permission is granted by the FDA, it is unlikely that the monkeypox virus would spread in the U.S. through the proposed action since monkeypox is not known to occur in the state of New Mexico. Furthermore, written permission would require either a veterinarian evaluation of the prairie dogs involved, or a quarantine period, both of which would help to determine if monkeypox was present. If monkeypox was found to be present, then capture and relocation of prairie dogs would not take place. Personnel involved with the capture and relocation of prairie dogs would

wear protective clothing (i.e. pants, long sleeved shirts, and leather gloves) to prevent infection with monkeypox. For the above-mentioned reasons, no significant impacts are expected to occur to personnel involved with the capture and relocation of prairie dogs at Kirtland AFB. Furthermore, monkeypox would not be spread due to the proposed action.

References:

Center for Disease Control and Prevention (CDC) 2003. *Questions and Answers About Monkeypox*. 4 November. <http://www.cdc.gov/ncidid/monkeypox/qa.htm>

Federal Register 2003. Vol. 68, No. 213. 4 November.

ACRONYMS AND ABBREVIATIONS

ABW	Air Base Wing	KUMMSC	Kirtland Underground Munition Maintenance and Storage Complex
AEHD	Albuquerque Environmental Health Department	NAAQS	National Ambient Air Quality Standards
AFB	Air Force Base	NEPA	National Environmental Policy Act
AFI	Air Force Instruction	NHPA	National Historic Preservation Act
AFMC	Air Force Materiel Command	NMAAQs	New Mexico Ambient Air Quality Standards
AICUZ	Air Installation Compatible Use Zone	NMDG&F	New Mexico Department of Game and Fish
BASH	Bird Aircraft Strike Hazard	NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
CAA	Clean Air Act	NO ₂	Nitrogen Dioxide
CEQ	Council on Environmental Quality	NRC	Nuclear Regulatory Commission
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	O ₃	Ozone
CFR	Code of Federal Regulations	Pb	Lead
CO	Carbon Monoxide	RAP	Revegetation Action Plan
CWA	Clean Water Act	RCRA	Resource Conservation & Recovery Act
DCGL	Derived Concentration Guideline Level	SIP	State Implementation Plan
DoD	Department of Defense	SO ₂	Sulfur Dioxide
DOE	Department of Energy	SVOC	Semi-Volatile Organic Compound
EA	Environmental Assessment	TAL	Target Analyte List
EIAP	Environmental Impact Assessment Process	USAF	US Air Force
EO	Executive Order	USACE	US Army Corps of Engineers
EOD	Explosive Ordnance Disposal	USDA	US Department of Agriculture
EPA	Environmental Protection Agency	USGS	US Geological Survey
ICM	Interim Corrective Measure	USFS	US Forest Service
INRMP	Integrated Natural Resources Management Plan	USFWS	US Fish and Wildlife Service
INWS	Interservice Nuclear Weapons School	VOC	Volatile Organic Compound
IRP	Installation Restoration Program		

EXECUTIVE SUMMARY

The potential environmental impacts associated with the capture and relocation of prairie dogs to a relocation site on base and fumigation of remaining prairie dogs in no-tolerance and buffer zones at Kirtland Air Force Base (AFB) were evaluated in this Environmental Assessment prepared for the 377th Air Base Wing (377th ABW) of Air Force Materiel Command (AFMC).

PURPOSE AND NEED FOR THE PROPOSED ACTIONS

AFMC's 377th ABW proposes to capture and relocate prairie dogs to a relocation site on base. Prairie dogs that could not be captured for relocation and those that reinhabit no-tolerance and buffer zones would be fumigated in order to:

- Reduce the risk of aircraft collisions with raptors foraging on prairie dogs inhabiting areas around the flight lines; this is referred to as Bird-Aircraft Strike Hazard (BASH).
- Reduce the risk to humans of contracting plague caused by exposure to prairie dogs infested with plague carrying fleas.
- Reduce the risk of injuries to residents, personnel, and visitors caused by tripping or falling into prairie dog burrows, especially around housing and recreational areas.
- Reduce the risk of human conflicts with rattlesnakes and poisonous spiders that often inhabit prairie dog burrows.
- Avoid impacts to important military missions caused by prairie dogs excavating burrows and gnawing through buried utility cables.
- Reduce damage to landscaped areas on base caused by prairie dog activities such as foraging and excavating.

DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

Proposed Action

Kirtland AFB proposes to remove prairie dogs from specific areas of the base (no-tolerance and buffer zones). No-tolerance zones include several small areas located north of Tijeras Arroyo, munitions storage complex, golf course, heliport, Explosive Ordnance Disposal (EOD) Range, Well No. 9 Complex (consists of riding stables, an administration area, the safeguard transportation driving area, and safety inspection pad),

antennae array site, and four Department of Defense radioactive training areas. Buffer zones are 200-300 foot areas surrounding each of the no-tolerance zones that may also be subject to prairie dog relocation and control on an as needed basis. The Proposed Actions include the establishment of a prairie dog relocation site in the north-central portion of the base. The base proposes to use non-lethal methods first to remove prairie dogs from certain no-tolerance and buffer zones. Prairie dog control methods proposed for use at Kirtland AFB vary in success rate and safety to humans and other animal species that use prairie dog burrows for shelter. Soap and water would be one method used to capture prairie dogs in the no-tolerance and buffer zones. Another non-lethal method used would be live trapping. After non-lethal methods have been attempted, aluminum phosphide tablets would be used to fumigate all remaining prairie dogs. Lethal control methods would be used in the event of future reinhabitation of prairie dogs into the no-tolerance and buffer zones.

The primary reason for the use of non-lethal capture methods is to relocate animals to an area where they would no longer pose conflicts with base personnel or missions. Although prairie dogs cause conflicts in certain areas of the base, there are large undeveloped areas where prairie dogs could coexist with base activities. The north-central portion of the base is one such area consisting of approximately 3,500 acres. This site would be prepared for prairie dog relocation by mowing the vegetation to less than six inches and by auguring burrows for the newly translocated prairie dogs. Prairie dogs would be released into an artificial burrow and covered with a retention cage for several days to protect them during the relocation process. During this time they would be provided with food and water until the retention cages were removed 3-5 days later.

Alternative 1: Alternative Relocation Site

This alternative is virtually the same as the Proposed Actions except that the alternative relocation site is located east of the EOD Range and consists of approximately 370 acres. Capture and relocation protocol would be the same as for the Proposed Actions, as well as the use of aluminum phosphide tablets to control remaining or reinhabiting prairie dogs in no-tolerance and buffer zones. Although the alternative relocation site is large enough to accommodate all of the prairie dogs proposed for relocation, it does not allow for the same degree of future colonization as the site chosen in the Proposed Actions.

No-Action Alternative

The No-Action Alternative consists of continuing the present prairie dog control effort on Kirtland AFB. Prairie dogs would not be captured and the prairie dog relocation site would not be created. Areas where prairie dogs are an immediate problem are fumigated on an "as-needed" basis but not throughout any no-tolerance zones in a single effort. Although this alternative does not rectify health and safety concerns, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations § 1502.14 [CEQ 1978]) stipulate that the No-Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed action is not implemented.

Alternatives Considered, But Not Carried Forward

Four additional alternatives were considered including shooting the prairie dogs with a .22 caliber pellet gun, vacusuction, fumigation as a stand-alone method, and live trapping and relocation as a stand-alone method. These alternatives were eliminated from further consideration for several different reasons. Shooting was eliminated because it would create unnecessary health and safety problems from ricocheting bullets, as well as not being an effective means of control. Vacusuction was eliminated because its success on Gunnison's prairie dogs is undocumented and it is considered by many to be inhumane. The final two alternatives were eliminated because neither alternative achieved the goal of establishing a non-conflicting prairie dog colony on base, coupled with prairie dog control in no-tolerance and buffer zones. Fumigation as a stand-alone method does not include a prairie dog relocation site and the live capture and relocation method does not address prairie dog eradication in no-tolerance and buffer zones.

SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS

Proposed Actions

Implementation of the Proposed Actions could result in minor short-term negative impacts to air quality, noise, and soils from construction-related activities. Beneficial impacts are expected to occur in the areas of human health and safety, land uses, and socioeconomics. No significant impacts are anticipated to occur to water resources, floodplains, vegetation, wetlands, minority and low-income populations, cultural resources, visual resources, transportation, or hazardous wastes from the Proposed

Actions. Insignificant impacts would affect wildlife around no-tolerance zones and buffer zones. This impact is due to the decrease of all living wildlife within the burrows during fumigation. However, a positive impact to wildlife is expected from the establishment of the translocated prairie dog colony by providing quality habitat for a variety of species.

Human Health and Safety. Removing prairie dogs from specified areas of the base in accordance with the Proposed Actions would benefit human health and safety in four primary areas:

- Reduced risk of human exposure to plague-carrying fleas;
- Reduced numbers of rattlesnakes around occupied areas of the base once prairie dogs are removed;
- Reduced potential for injuries caused by tripping or falling into prairie dog burrows that are located around housing, administration, and recreational areas; and
- BASH reduction by reducing the number of raptors foraging on prairie dogs around flight paths.

No negative impacts to human health and safety from the live capture and relocation of prairie dogs to a relocation site are expected as personnel involved would exercise appropriate caution when handling prairie dogs. Additionally, no negative impacts to human health and safety from the application of aluminum phosphide tablets would occur, as only licensed pesticide applicators would apply the rodenticide while adhering to all field safety protocols.

Air Quality. The absence of prairie dogs from no-tolerance zones would result in a minor positive impact to air quality from reduced wind erosion caused by prairie dog activities. The establishment of a new relocation site may have negligible and short-term effects to air quality caused by the auguring of new burrows and the eventual establishment of a prairie dog colony. Fumigation involves releasing toxic gas inside the burrow system that has been sealed off. When aluminum phosphide tablets are applied in this manner they release phosphine gas that migrates through the soil and dissipates gradually into the atmosphere. Once it reaches the surface it quickly mixes with fresh air, which eliminates its toxicity, rendering it harmless. Therefore, impacts to air quality from applying aluminum phosphate tablets are unlikely.

Land Use. No negative impacts to land use are expected as the Proposed Actions reduce conflicts caused by prairie dog inhabitation. The proposed relocation site was inhabited in the past by prairie dogs and relocating prairie dogs to this site would not cause conflicts with military missions. Furthermore, the site is capable of accommodating the relocated prairie dog population.

Geological Resources. Implementation of the Proposed Actions could result in minor short-term negative impacts to soils by using the soap and water technique for capturing prairie dogs and auguring new burrows and the eventual establishment of a prairie dog colony in the north central portion of the base. Impacts would be minimized by using best management practices to reduce continued erosion.

Water Resources. No negative impacts are expected to water resources from the Proposed Actions since the amount of water used for the soap and water capture method is negligible and no other water resources would be impacted. The aluminum phosphide tablet would have no effect on water resources because the gas from the tablets move upward and are released at the surface. It does not sink into the ground water.

Biological Resources. Implementation of the Proposed Actions could negatively impact the burrowing owl. To avoid significant impacts to the burrowing owl several measures would be taken. First, fumigation would not be allowed within 150 feet of any burrowing owl hole. Additionally, these holes will be marked to prevent capping of the owl burrows during fumigation so that the owls may continue to use the site in following years. Artificial owl burrows may be installed in no-tolerance zones and the new relocation site to promote burrowing owl inhabitation. Once a prairie dog colony is established at the relocation site it is anticipated that burrowing owls would use abandoned burrows at the new location. No negative impacts are expected for other sensitive species since none are known to occur in the proposed project area. Wetlands would not be impacted, as none are located within the project area. Vegetation at the relocation site would undergo successional changes due to the reintroduction of prairie dogs. While species composition would likely change, it would be under natural conditions providing local wildlife a place to find shelter and food. Local wildlife around the no-tolerance and buffer zones would likely decrease temporarily as fumigation kills everything living in prairie dog burrows. A positive impact to wildlife is expected from the establishment of the translocated prairie dog colony by providing quality wildlife habitat.

Cultural Resources. An evaluation of the area of potential ground disturbance for the Proposed Actions indicates that some significant resources could be affected. Therefore, prairie dogs would not be released in areas identified as having significant cultural resources and prairie dog-proof fencing would be erected around such sites should it become necessary. As a result, no significant impacts to cultural resources are anticipated from the Proposed Actions.

Environmental Management. Several Installation Restoration Program (IRP) sites are located within the no-tolerance zones. Personnel familiar with the sites would determine if prairie dogs could be successfully removed without any risk to human health and safety from contaminants. Impacts from fumigation would not occur because phosphine gas reaching the surface quickly becomes nontoxic as it mixes with fresh air. Additionally, the residue left behind is considered to be non-toxic and does not persist in the food chain. Six active IRP sites are located in the proposed relocation site. Mitigation measures such as constructing prairie dog barriers around these areas would prevent adverse impacts to environmental management activities.

Alternative 1: Alternative Relocation Site

Implementation of Alternative 1 would result in impacts similar to those described for the Proposed Actions. Impacts from live capture and fumigation of prairie dogs would be the same since they include the same areas. Impacts associated with the alternative relocation site would be similar to those associated with the proposed relocation site, but due to its smaller size of approximately 370 acres, the overall impacts would be less. Since the alternative relocation site is larger than the area needed for prairie dog relocation, impacts to the site from prairie dog inhabitation is expected to be similar to that of the proposed relocation site. Fewer cultural and IRP sites are associated with the alternative relocation site, therefore impact to these resources would also be less significant.

No-Action Alternative

Under this alternative, Kirtland AFB would continue to fumigate prairie dogs on an “as-needed” basis. There would be no changes to any environmental or human resources as a result of the implementation of this alternative. Concerns associated with human health

and safety as well as potential conflicts with the military mission at Kirtland AFB would not be addressed under this alternative.

**FINAL
ENVIRONMENTAL ASSESSMENT
FOR
KIRTLAND AIR FORCE BASE
PRAIRIE DOG MANAGEMENT PROGRAM**

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SECTION 1

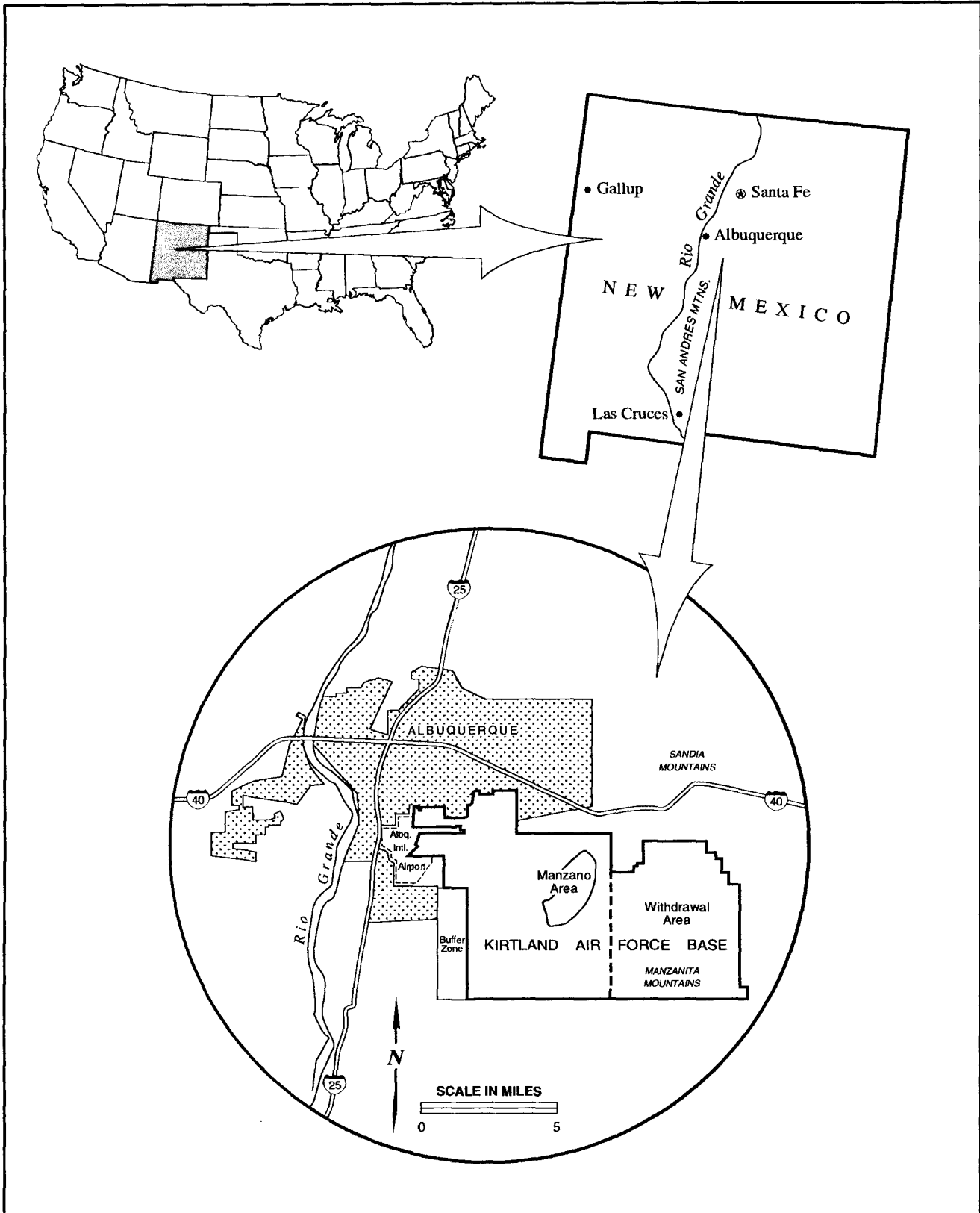
PURPOSE AND NEED FOR THE PROPOSED ACTIONS

This Environmental Assessment (EA) evaluates the potential impacts on environmental and human resources associated with management of prairie dogs on Kirtland Air Force Base (AFB). This EA also describes how the No-Action Alternative would affect the resources and factors analyzed in this document. This document is part of the Environmental Impact Analysis Process (EIAP) set forth in Title 32 National Defense, Chapter VII Department of the Air Force, Code of Federal Regulations (CFR) Part 989, which implements the National Environmental Policy Act (NEPA) of 1969; and the regulations implementing NEPA promulgated by the President's Council on Environmental Quality (CEQ) as Title 40 of the CFR Parts 1500-1508; and Department of Defense (DoD) Directive 6050.1, *Environmental Effects in the United States of DoD Actions*.

1.1 BACKGROUND

Kirtland AFB is located just southeast of Albuquerque, New Mexico at the foot of the Manzanita Mountains (Figure 1-1). These mountains rise to over 10,000 feet and define the eastern boundary of the area. Kirtland AFB encompasses over 52,000 acres of East Mountains with elevations ranging from 5,200 feet to almost 8,000 feet above mean sea level (US Geological Survey 1990 a, b, c; 1991 a, b, c). Land use for areas adjacent to the base includes Cibola National Forest to the northeast and east, the Manzano Mountains and the Isleta Indian Reservation to the south, and residential and business areas of the City of Albuquerque to the west and north.

Kirtland AFB was originally 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 B-18 bomber, Kirtland AFB's first military aircraft, arrived. Troops soon followed, and Kirtland AFB grew rapidly with US involvement in World War II. The base served as a training site for aircrews for many of the country's bomber aircraft, including the B-17, B-18, B-24, and the B-29. After the war, 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 Army Base (Sandia National Laboratories). Kirtland AFB and its adjoining neighbor to the east, Sandia Army Base,



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FIGURE

EA

Kirtland Air Force Base Location

1-1

were combined in 1971. The two divisions of the base are still referred to as Kirtland West and Kirtland East, respectively.

Kirtland AFB is now operated by the 377th Air Base Wing (377th ABW) of Air Force Materiel Command (AFMC), the proponent of the action analyzed in this document. The 377th ABW's prime mission, as the host unit at Kirtland AFB, is munitions maintenance and storage, readiness and training, and base operating support for approximately 200 associate organizations with personnel, resources, equipment, and facilities. The 377th ABW also provides fire protection and crash and rescue services for Albuquerque International Sunport.

Kirtland AFB serves as a center for research and development for Air Force Research Laboratory and Sandia National Laboratories. The base functions as a test and evaluation center for the Space and Missile Systems Center and Air Force Operational Test and Evaluation Center. It is also the headquarters for operational organizations such as the Air Force Inspection Agency, the Air Force Safety Center, and the National Nuclear Security Administration Service Center of the US Department of Energy (DOE). Kirtland AFB functions as a training base for the 58th Special Operations Wing of Air Education and Training Command's 19th Air Force and the 150th Fighter Wing of the New Mexico Air National Guard is stationed on the base.

The US Air Force (USAF) owns most of the land at Kirtland AFB, but several other ownership's and leases apply to many areas of the base both large and small. The eastern portion of Kirtland AFB is primarily Cibola National Forest land withdrawn to the USAF by the US Forest Service (USFS). These lands have been withdrawn from public use and are known as the Withdrawal Area (refer to Figure 1-1). The DOE owns certain areas of the base and withdrawn other areas from the USAF and the USFS (USAF 1995).

1.2 COMMUNITY CHARACTERISTICS

The area surrounding Kirtland AFB ranges from urban to unpopulated wilderness. Albuquerque, the largest city in the State of New Mexico, is adjacent to the base on the northwest. The Albuquerque Metropolitan Statistical Area is now over 723,000 people (US Census Bureau 2003). Kirtland AFB's host and associate units comprise the largest single employer in New Mexico and have a major economic impact on the surrounding communities: organizations at Kirtland AFB currently employ over 31,000 people

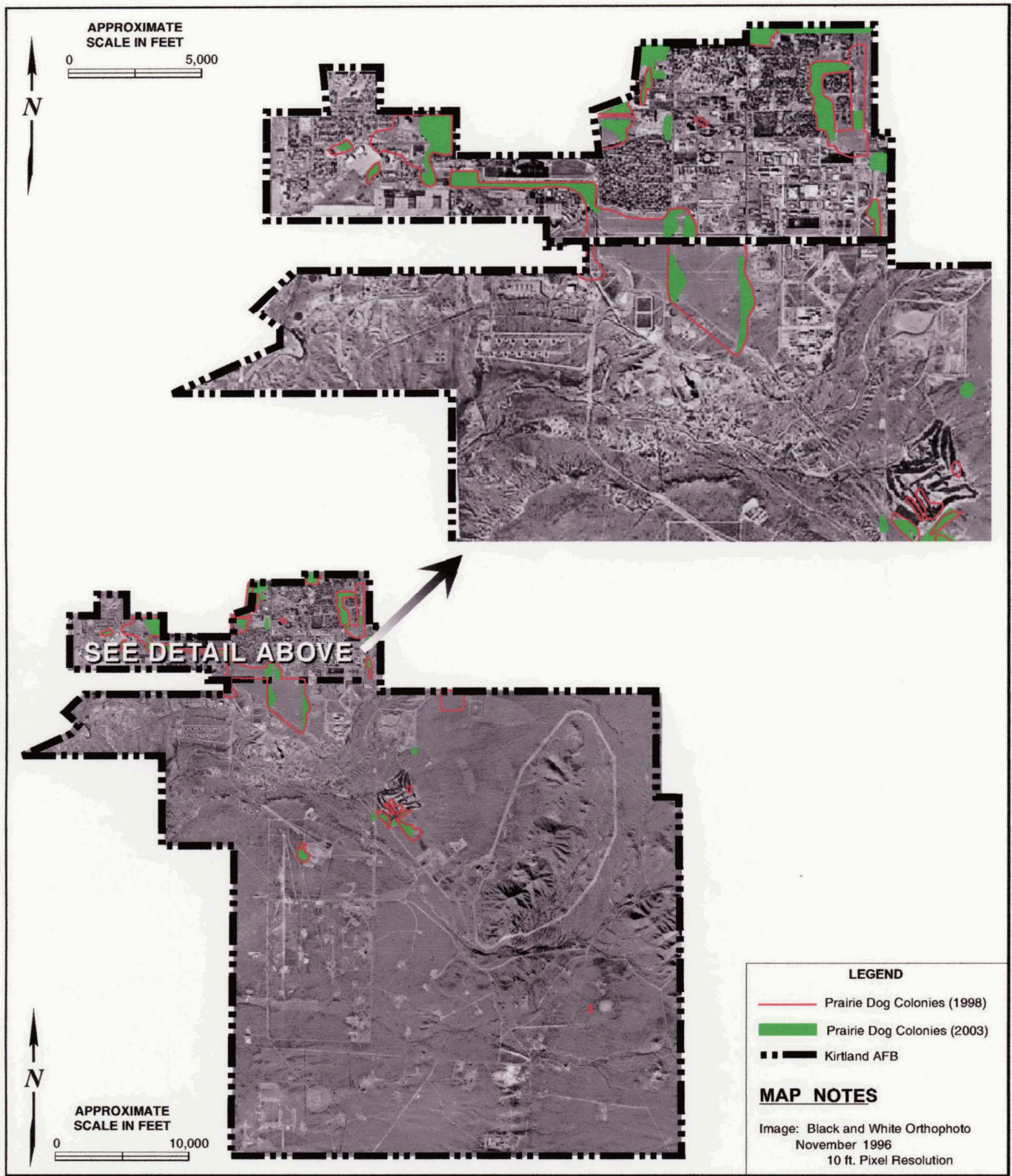
(USAF 2002). Kirtland AFB's estimated annual economic contribution to the Albuquerque metropolitan area exceeds \$5.6 billion (USAF 2002a).

1.3 PRAIRIE DOGS AT KIRTLAND AFB

Five species of prairie dogs are found in North America: black-tailed (*Cynomys ludovicianus*), white-tailed (*C. leucurus*), Gunnison's (*C. gunnisoni*), Utah (*C. parvidens*), and Mexican (*C. mexicanus*) (Hygnstrom and Virchow 1994). Slight physical characteristics distinguish each species, as does location, since none of their ranges overlap (Hoogland 1995). However, a farmer near Clovis, New Mexico has identified both Gunnison and black-tailed prairie dogs on his property leading him to believe that prairie dog species can occur where the ranges border one another (Stockton 2003). Only the Gunnison's prairie dog is known to occur on Kirtland AFB. The Gunnison's prairie dog differs from all other prairie dogs by having a white tail and no dark eye patches. Gunnison's prairie dogs form smaller less organized towns than other members of the prairie dog group. In the State of New Mexico, the Gunnison's prairie dog is internally designated as sensitive. This informal designation does not provide the Gunnison's prairie dog with any legal status.

Kirtland AFB contains over 23,000 acres of primarily undeveloped grasslands that provide excellent habitat for prairie dogs. As shown in Figure 1-2, prairie dogs inhabit numerous areas throughout the base. To minimize adverse impacts to missions at the base, the 1997 Prairie Dog Management Program, which uses fumigation, is currently being implemented at Kirtland AFB, particularly in areas identified as no-tolerance zones. In September 1997, a prairie dog inventory was conducted at Kirtland AFB and approximately 1,090 acres of the base contained active colonies (USAF 1997). During an inventory conducted by the LOPEZGARCIA GROUP in May 2003, the amount of occupied habitat was found to be around 650 acres. Reasons for the decline are not clearly understood. Possible explanations may consist of one or more of the following: new construction (paving and buildings), increased predation, fumigation (on a limited basis), and/or a disease outbreak, and differences in surveying techniques.

Gunnison's prairie dogs require grassland or short shrubland habitat, with soil types conducive to burrowing (e.g., sandy loams). Tunnels are dug to an average depth of 3.5 feet and some burrows may interconnect with the burrow systems of their neighbors. Prairie dogs construct mounds of dirt up to 2 feet high and 10 feet in diameter, which



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**Prairie Dog Locations at
Kirtland Air Force Base**

FIGURE

1-2

serve as lookout stations, prevent water from entering tunnels, and may enhance tunnel ventilation (Hoogland 1995). These mounds usually have only one entrance, but two or more is not uncommon for Gunnison's prairie dogs. Dirt around these mounds is generally pushed higher on one side. All species of prairie dogs are active during the day, retreating to their burrows during the night. Burrows are essential for survival since they provide escape from many predators and extreme temperatures. In the summer, prairie dogs remain underground during the hottest part of the day to escape the heat. Many other species such as the burrowing owl (*Athene cunicularia*), rabbits, snakes, lizards, insects, and spiders are known to inhabit prairie dog burrows (New Mexico Department of Game and Fish 2002). Burrowing owls at Kirtland AFB are only known to inhabit prairie dog colonies. On-going studies and research for the past five years has shown that burrowing owls are dependent on prairie dogs for maintaining nesting sites at Kirtland AFB (Finley 2003).

At Kirtland AFB, prairie dogs are currently found in vacant lots and some landscaped areas throughout the cantonment area, around Tijeras Golf Course, and in the grasslands and shrublands on base. Vegetation at these sites consists of grama grass (*Bouteloua spp.*) ring muhly (*Muhlenbergia torreyi*), broom snakeweed (*Gutierrezia sarothrae*), Russian thistle (*Salsola iberica*), and prickly-leaf dogweed (*Dyssodia acerosa*). There are also areas of bare ground. Grasses are the prairie dogs primary food source, but they will also consume forbs and insects. Water requirements are met by metabolizing grazed vegetation.

Predation is a major cause of prairie dog mortality. Some of the species on Kirtland AFB known to prey on prairie dogs include the badger (*Taxidea taxus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), long-tailed weasel (*Mustela frenata*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and great-horned owl (*Bubo virginianus*) (Hygnstrom and Virchow 1994; Forrest et al. 1985; Turner 1974; Hoogland 1995). Prairie rattlesnakes (*Crotalus viridis*) and bull snakes (*Pituophis melanoleucus*) may take young, but rarely prey on adult prairie dogs.

1.4 PURPOSE AND NEED FOR THE PROPOSED ACTIONS

AFMC's 377th ABW at Kirtland AFB proposes to manage prairie dogs using the best available methods to enhance their survival and to protect the mission.

1.4.1 Purpose of the Proposed Actions

Air Force Instruction (AFI) 32-7064 requires that installations develop and implement an Integrated Natural Resources Management Plan (INRMP). Section 6.6 of the AFI requires that wildlife damage control be addressed as part of the INRMP or as a supporting document. Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to assess the potential effects of proposed actions on children.

The presence of prairie dogs on different parts of Kirtland AFB is not always compatible with public health and safety or with the ongoing mission requirements. However, the prairie dog is a keystone species and therefore an important part of the prairie ecosystem found on the base. The purpose of the Proposed Actions is to better manage the prairie dog population to ensure ecosystem stability, population control, genetic diversity, and successful mission operations including the protection of human health and safety. Therefore, prairie dog management at Kirtland AFB involves control measures using fumigation in areas identified as no-tolerance zones and in other areas, as needed, such as in emergency situations. Another control measure is to capture and relocate prairie dogs, as determined feasible, to an area identified as the prairie dog relocation site, also located on base. A third control measure that has been used successfully at Kirtland AFB, is the use of barriers, as needed, along existing fencing to prevent habitation or rehabilitation into areas requiring control of prairie dogs. The areas identified as no-tolerance zones have been chosen based on the need to control existing and expanding hazards to public health and safety, and to control impacts on operational missions. The area proposed for prairie dog relocation has been chosen based on the availability of suitable habitat compatible with surrounding mission uses.

1.4.2 Need for the Proposed Actions

The Proposed Actions are necessary to enable Kirtland AFB to continue fulfilling its missions, reduce risks to human health, and enhance safety by reducing problems associated with prairie dog habitation. Prairie dogs are not contained by above ground chain-link fences, they regularly undermine these fences and gain access to areas incompatible with their presence. Problems associated with prairie dogs and their habitat could be minimized or avoided through removal of prairie dogs entirely from specific areas of the base. Health, safety, and operational hazards are described in detail below.

Prairie dog numbers are declining in the region from various kinds of prairie dog control. The 377th ABW has taken a stance to preserve prairie dogs where possible, as part of a commitment to preserve and enhance the natural resources under its stewardship. Thus, Kirtland AFB is proposing a prairie dog relocation area on the base to help maintain this important part of the prairie ecosystem.

1.4.2.1 Human Health and Safety

At Kirtland AFB, prairie dogs regularly gain access to areas deemed incompatible with their presence for a variety of health and safety reasons. Disease, rattlesnakes, spiders, and tripping hazards are all undesirable components of prairie dog colonies. An additional concern is Bird Aircraft Strike Hazards (BASH), which occur around airfields due to raptors foraging for prairie dogs. These hazards, and how they relate to human health and safety, are discussed below.

Periodic disease outbreaks cause prairie dog populations and their distribution on base to fluctuate greatly. Prairie dogs are susceptible to sylvatic (bubonic) plague, caused by the organism *Yersinia pestis*. While prairie dogs may become infected with plague, they do not spread it. Several species of fleas associated with prairie dogs and other mammals are the major vectors responsible for transmitting plague. In large continuous prairie dog colonies, flea infection rates are often high, with prairie dog mortality reaching up to 99 percent as prairie dogs investigate each other's burrows and become exposed to infected fleas (USAF 1999). Several species of mammals have been documented at Kirtland AFB and the Withdrawal Area as having been infected with plague including the Gunnison's prairie dog, ringtail cat (*Bassariscus astutus*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), coyote, cottontail rabbit (*Sylvilagus spp.*) and rock squirrel (*Spermophilus variegatus*) (USAF 1997). During the early 1980s, Gunnison's prairie dogs and their fleas were found to be plague positive near the Four Hills Subdivision, which is located just north of the base (USAF 1997). A natural die off in the area during this time was attributed to plague based on documented occurrences of plague in the colony and a nearly 100 percent mortality of the prairie dog town. In the mid-1980s a prairie dog and a cottontail rabbit were found dead on Tijeras Golf Course and tested plague positive (USAF 1997). The rock squirrel is the predominant natural reservoir host of plague in the Albuquerque Basin, but the Gunnison's prairie dog is the most abundant species susceptible to plague inhabiting developed areas of Kirtland AFB (USAF 1997).

While humans rarely become infected with plague, it is possible to contract plague from flea infested prairie dogs. In 1996, a Flagstaff, Arizona resident died from plague caused by *Yersinia pestis*. An epidemiological investigation by public health officials indicated that the patient most likely became infected from plague infected fleabites while walking through a Gunnison's prairie dog colony in Navajo County (Morbidity and Mortality Weekly Report 1997). Domestic dogs and cats passing through prairie dog towns are susceptible to infection and may carry fleas to residential areas where humans can be infected. The first two cases of plague in Santa Fe County, New Mexico, were reported in July 1998. The first case involved a veterinarian who received a minor bite wound from a plague-infected cat and the second case involved a woman with flea bites on her arms (Journal of the American Veterinary Medical Association 1998). Recently, in 2002, a Santa Fe couple became infected with plague (ABC 2002; CNN 2003). It is suspected that the couple contracted plague from either a wood rat or its fleas as both species tested plague positive from the couple's property. Fortunately, the strain of plague carried by prairie dogs is treatable if detected early.

Rattlesnakes and black widow spiders constitute another hazard associated with prairie dog colonies because they are known to inhabit prairie dog burrows and can be a threat to personnel who work or recreate nearby.

Prairie dog burrows also pose a tripping hazard. Burrows are often excavated in dirt roads, along walking/jogging paths, and in dirt/gravel parking lots on Kirtland AFB. Base personnel have twisted ankles by accidentally stepping in prairie dog burrows at the golf course, in the Zia Park housing area, and in the area adjacent to Bullhead Park (USAF 1999). On average, one tripping incident per year requires medical attention (Flint 2003).

BASH is another safety issue of special concern. Several species of large raptors are attracted to prairie dog towns and circle above them while hunting. When sucked into a jet engine, a large bird such as a hawk is capable of downing a single engine aircraft, such as the F-16s that fly out of Kirtland AFB. This can result in the loss of the aircraft, and possibly the pilot, as well as cause collateral damage, injury and/or death where the aircraft crashes.

1.4.2.2 Impacts on Operations

Like other burrowing rodents, prairie dogs have sharp teeth adapted for cutting through roots they encounter while digging or foraging. Prairie dogs at Kirtland AFB have severed lines servicing power and communications systems (USAF 1999). According to Civil Engineering personnel, there have been at least three incidents of damage to electrical wiring at the ball fields between the West Gym and Truman Gate (USAF 1997). Breaks in underground power lines are difficult to locate and repair, and may temporarily suspend some base operations. Communication systems are also difficult to repair and are vital to the operational capabilities on base. Security systems at Kirtland AFB could be compromised by interruptions of power and communications, which could be detrimental to overall base security.

Base personnel must also monitor and repair prairie dog damage to vegetation, roads, and trails. Prairie dogs require clear areas around their burrows so they can see and avoid predators. They clear these areas by chewing down grasses and small herbaceous plants near their burrows, usually to a height of less than 6 inches. When prairie dogs move into improved areas of the base, their burrowing and chewing destroys native trees and shrubs, as well as ornamental vegetation planted for landscaping purposes. Burrowing also may undermine roads and trails; therefore, base personnel must constantly monitor and repair those areas to prevent automobile and pedestrian traffic from breaking through pavement or the ground surface. Currently, prairie dogs are impacting landscaped areas located west of the ball fields as well as areas located east of the Eubank Gate (Dunn 2003).

1.5 DECISION TO BE MADE AND DECISION-MAKER

The installation commander will make a decision regarding the best alternative to support AFMC and Kirtland AFB.

1.6 ALTERNATIVE IDENTIFICATION

The CEQ guidelines implementing NEPA, and 32 CFR 989, which implements the USAF NEPA process, require the consideration of reasonable alternatives to a proposed action. Only those alternatives that are determined to be reasonable relative to their ability to fulfill the need for the action warrant a detailed environmental analysis. The

identification of such alternatives involves defining a set of criteria based on the need for the action that an alternative must meet. Once defined, these criteria must be applied consistently to each of the candidate alternatives. For these Proposed Actions, alternatives were required to address the need for an adequately sized prairie dog relocation site in an area where the colony would not cause health and safety or operational problems.

1.7 REGULATORY COMPLIANCE

The following section provides a brief summary of the laws, regulations, EOs, and other requirements that are routinely considered in an environmental analysis for these types of Proposed Actions.

1.7.1 National Environmental Policy Act

NEPA requires federal agencies to consider the potential environmental consequences of proposed actions in their decision-making process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA to implement and oversee federal policy in this process. In 1979, the CEQ issued the Regulations for Implementing the Procedural Provisions of NEPA. The CEQ regulations encourage federal agencies to develop and implement procedures that address the NEPA process in order to avoid or minimize adverse effects on the environment. DoD Directive 6050.1 established DoD policies and procedures to supplement the CEQ regulations promulgated under NEPA.

32 CFR 989 establishes the EIAP and the specific procedural requirements for the implementation of NEPA on USAF projects. EO 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, *Relating to Protection and Enhancement of Environmental Quality*, set policy for directing the federal government in providing leadership in protecting and enhancing the quality of the nation's environment.

1.7.2 Air Quality

The Clean Air Act (CAA) (42 US Code, Sections 7401-7671, et seq., as amended) establishes federal policy to protect and enhance the quality of the nation's air resources

to protect human health and the environment. The CAA requires that adequate steps be taken to control the release of air pollutants and prevent significant deterioration in air quality. The 1990 amendments to the CAA require federal agencies to determine the conformity of proposed actions with respect to State Implementation Plans (SIPs) for attainment of air quality goals. The US Environmental Protection Agency has set forth regulations in 40 CFR 51, Subpart W, that require the proponent of an action potentially affecting air quality to perform an analysis to determine if implementation of the action would conform with the SIP.

The State of New Mexico has adopted additional standards for air quality, the New Mexico Ambient Air Quality Standards, which apply a more stringent standard for carbon monoxide, sulfur dioxide and for the 24-hour standard for nitrogen dioxide.

The Albuquerque metropolitan area and Kirtland AFB are within New Mexico's Air Quality Control Region No.2, which is one of 8 regions in the state. Region No. 2 includes all of northwestern New Mexico. The Albuquerque Environmental Health Department performs air quality functions in Albuquerque, and they are governed by the Albuquerque-Bernalillo County Air Quality Control Board.

1.7.3 Water Quality

The Clean Water Act (CWA) of 1977 and the Water Quality Act of 1987 (33 US Code 1251, et seq., as amended) establish federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and, where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water.

1.7.4 Biological Resources

The Endangered Species Act requires federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed threatened or endangered species, and to avoid destroying or adversely affecting their critical habitat. Federal agencies must evaluate the effects of their actions through a set of defined procedures, which can include preparation of a biological assessment and formal consultation with the US Fish and Wildlife Service.

The Migratory Bird Act of 1918, protects migratory birds from willful destruction including their nests from human activities.

Section 404 of the CWA regulates development in streams and wetlands and requires a permit from the US Army Corps of Engineers for dredging and filling in wetlands.

EO 11990, *Protection of Wetlands*, requires that federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

1.7.5 Cultural Resources

AFI 32-7065 implements Air Force Policy Directive 32-70 and DoD Directive 4710.1. It sets guidelines for the protection and management of cultural resources, and requires compliance and coordination with NEPA, the National Historic Preservation Act (NHPA) of 1966, as amended, and related federal standards and authorities.

NEPA directs agencies to administer federal programs and resources to foster environmental quality and preservation. NEPA establishes federal policies to preserve important historic and cultural aspects of our national heritage and requires consideration of environmental concerns during project planning and execution. Compliance with NEPA may be done in coordination with compliance with the NHPA under the regulations of the Advisory Council on Historic Preservation, 36 CFR Part 800. Section 106 of the NHPA requires that every federal agency "take into account" how each of its undertakings could affect historic properties. An agency must afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the agency's project.

The NHPA establishes policies that support and encourage the preservation of historic and prehistoric resources for present and future generations. The NHPA directs federal agencies to assume responsibility for considering historic properties (i.e. significant cultural resources) in their activities.

The Archaeological and Historic Data Preservation Act of 1974 directs federal agencies to notify the Secretary of the Interior of historic and archaeological data that may be lost as a result of federal construction or other federally licensed or assisted activities. When

undertakings may cause irreparable damage to historic or archaeological resources, the agency must notify the Secretary, in writing, of the situation. The agency may undertake recovery, protection, and preservation of data with their own project funds, or they may request the Secretary to undertake preservation measures.

The Archaeological Resources Protection Act of 1979 requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. Excavations must be undertaken for the purpose of furthering archaeological knowledge in the public interest, and resources removed remain the property of the US. The act provides both civil and criminal penalties for violation of the permit requirements.

1.7.6 Land Use

EO 11988, *Floodplain Management*, requires each federal agency to take actions to reduce the risk of flood damage; minimize the impacts of floods on human safety, health and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains. Where information is unavailable, agencies are encouraged to delineate the areal extent of floodplains at their site.

1.7.7 Environmental Justice and Safety Risks to Children

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to assess the effects of their actions on minority and low-income populations within their region of influence. Agencies are encouraged to include demographic information related to race and income in their analysis of environmental and economic effects associated with their actions and to identify any potential impacts that may disproportionately affect minority or low-income communities.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to assess the effects of their actions on children within the agencies' region of influence. Therefore, to the extent appropriate, permitted by law, and consistent with the agency's mission, federal agencies shall:

- Make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children, and
- Ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

1.7.8 Public Involvement

Section 1.6.8 of EO 12372, *Intergovernmental Review of Federal Programs*, directs federal agencies to consult with and solicit comments from state and local government officials whose jurisdictions would be affected by federal actions. In addition, NEPA procedures and USAF policy are intended to ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. In order to comply with these requirements, this document will be released for public review.

1.8 ORGANIZATION OF THIS DOCUMENT

Section 1 of this EA describes the Purpose and Need for the Proposed Actions. Section 2 provides the Description of the Proposed Actions and Alternatives. Section 3 describes the Affected Environment and Environmental Consequences on a resource and factor basis. Section 4, lists Persons and Agencies contacted in the preparation of this EA. Section 5 is the List of Preparers and Section 6 contains the References and Bibliography.

SECTION 2

DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

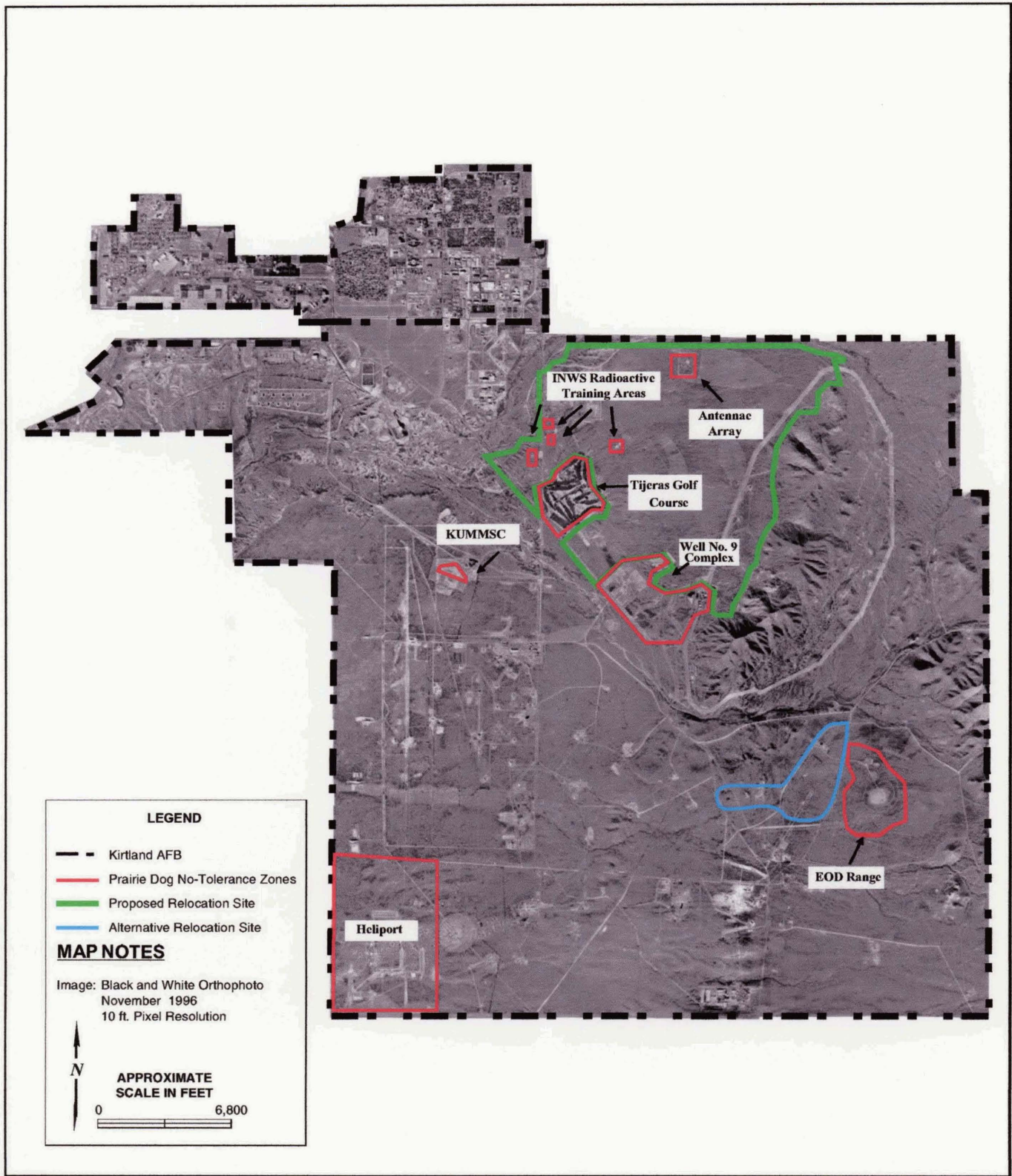
The Air Force Materiel Command's 377th Air Base Wing located at Kirtland Air Force Base (AFB) New Mexico, is proposing to capture prairie dogs from certain portions of the base (no-tolerance zones and buffer zones), release these animals into an on-base relocation site, and fumigate any prairie dogs remaining in the no-tolerance and buffer zones. In unforeseen emergency situations that conflict with base missions, prairie dogs may be controlled in other areas by using any of the described methods. The following sections describe the Proposed Actions and alternatives to these actions.

2.1 PROPOSED ACTIONS

The Proposed Actions involve eliminating prairie dogs from 11 areas throughout Kirtland AFB, called no-tolerance zones, where risks to human health and safety and impacts to operational missions from prairie dogs are greatest. Buffer zones, 200-300 foot areas surrounding no-tolerance zones, would also have prairie dogs removed on an as needed basis. Prairie dogs would be captured from six of these no-tolerance and buffer zones and released in a relatively remote area on base, referred to as the Kirtland AFB prairie dog relocation site. After capturing and relocating as many prairie dogs as reasonably possible, the no-tolerance and buffer zones would be fumigated in accordance with current prairie dog management practices employed at Kirtland AFB. Any prairie dogs re-inhabiting these sites would be fumigated. The relocation site and no-tolerance zones are shown on Figure 2-1 and Figure 2-2. Barriers will be established on an as needed basis to prevent rehabilitation of prairie dogs into the no-tolerance and buffer zones. Revegetation of no-tolerance and buffer zones would be done in accordance with the Kirtland AFB Revegetation Action Plan (RAP). The RAP addresses how to revegetate an area with minimal impacts to burrowing owls and other sensitive species of wildlife.

2.1.1 Capture Methods

Capture methods proposed for use at Kirtland AFB vary in success rate and in safety to humans and other animal species that use prairie dog burrows for shelter. Capture methods include the use of live traps that are pre-baited and set in such a way as to lure a prairie dog inside the trap (cage) and once inside, the trap automatically closes. Another method that has been used involves flushing prairie dogs from out of their burrows using



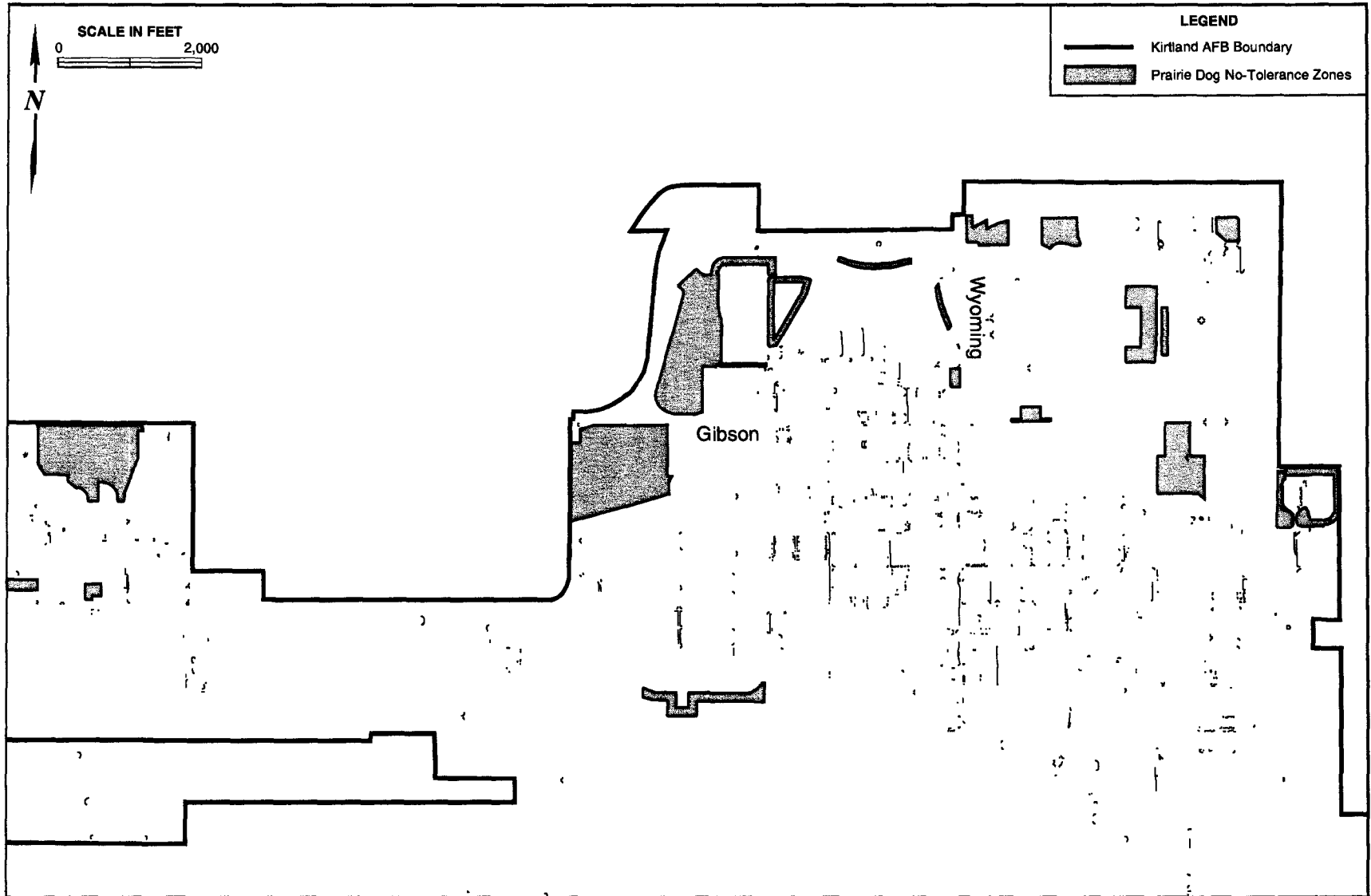
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**Proposed and Alternative Prairie Dog Relocation Sites and
Prairie Dog No-Tolerance Zones at
Kirtland Air Force Base**

FIGURE

2-1



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Prairie Dog No-Tolerance Zones on Kirtland Air Force Base

FIGURE

2-2

soap and a steady force of water, with personnel located near the burrow opening awaiting their emergence for capture. Once prairie dogs are captured, they would be dusted with flea powder to reduce the potential of spreading plague and then relocated to the relocation site. These capture and relocation techniques are described in the following sections.

2.1.1.1 Soap and Water Method

Implementation of this method requires the use of a water truck or fire truck with an auxiliary pump. Water from the truck is pumped into burrows using a hose with a spray attachment at a pressure that allows prairie dogs to escape the burrow. The water mixes with a nontoxic, biodegradable liquid detergent that has been poured into the entrance of the burrow. This produces a soapy foam, which drives prairie dogs from their burrows. Personnel stationed at different burrow entrances catch the prairie dogs as they emerge, towel them dry, add saline solution to their eyes, dust them with flea powder and place them in cages for relocation.

It is difficult to achieve a 100 percent success rate with these methods. Some prairie dogs occupying towns in previously disturbed areas have been known to respond to disturbances by quickly digging a new chamber and temporarily sealing themselves off from the remainder of the burrow system (Kirtland AFB 1999). In addition, some prairie dogs may drown or suffocate in the burrows if too much water is used or if prairie dogs become confused and flee deeper into the burrow rather than upward and out. Other species of animals that use the burrows for shelter can also drown during this process.

The best time of year to use the soap and water method is in June and July when temperatures are warm, thus reducing the chance of prairie dogs developing hypothermia. Also, prairie dog pups are active above ground and can be captured as well. However, Kirtland AFB may use this method during other times of the year if prairie dogs need to be relocated quickly based on mission conflicts in the no-tolerance zones.

2.1.1.2 Live Capture

Trapping is cost effective, although time-consuming, and its success rate is somewhat seasonal. It is most successful in early spring after snowmelt and before new vegetation growth begins, although it may be used any time that prairie dogs are active. Since

prairie dogs emerge from their burrows early in the day, traps need to be set in predawn light. The first day of trapping is usually the most successful as prairie dogs quickly learn to avoid traps (US Air Force [USAF] 1999). Live traps occasionally capture other species such as skunks, rabbits, and ground squirrels.

For live trapping to work effectively, no-tolerance and buffer zones must be pre-baited to allow prairie dogs to become accustomed to the type of food used in the traps. During pre-baiting, clean baited traps are set out with the doors locked in the "open" position. After a couple of days, the traps are set. Traps must be checked continually. Fear and high temperatures can cause trapped individuals to go into shock resulting in death within 15 minutes of capture (USAF 1999). Prairie dogs that go into shock can sometimes be revived if they are placed in a cool, dark place and given time to recover. Traps need to be rendered nonfunctional overnight.

2.1.2 Establishment of the Prairie Dog Relocation Site

Although prairie dogs constitute a problem in certain areas of the base, there are other large undeveloped areas where prairie dogs could coexist with base activities. Implementation of the Proposed Actions involve establishing the prairie dog relocation site in the north-central portion of the base (refer to Figure 2-1). This site is located south of Four Hills Road, along the northern base boundary; it is situated north and east of Tijeras Golf Course, west of Manzano Base, and north of the stables and Central Training Academy. Artificial owl burrows may be created at the relocation site to facilitate burrowing owl occupation of the site.

The proposed relocation area is approximately 3,500 acres in size and elevations at the site range from approximately 5,330 feet to 5,960 feet above mean sea level with the land gently rising to the east (US Geological Survey [USGS] 1990 a, c). Vegetation at the site consists of native grassland and includes species such as three-awns (*Aristida* spp.), grama grasses (*Bouteloua* spp.), dropseeds (*Sporobolus* spp.), ring muhly (*Muhlenbergia torreyi*), needle-and-thread grass (*Stipa comata*), tree cholla (*Opuntia imbricata*), plains prickly pear (*Opuntia polyacantha*), broom snakeweed (*Gutierrezia sarothrae*), and globemallows (*Sphaeralcea* spp.). The soils in the area are primarily sandy loams including Tijeras gravelly fine sandy loam, Embudo gravelly fine sandy loam, and Tijeras complex (US Department of Agriculture [USDA] 1977). These soils are moderately

permeable, and the area is drained primarily by sheet flow and small drainage channels that run from the northeast to the southwest (USDA 1977; USGS 1990 a, c).

The prairie dog relocation site was chosen based on Gunnison's prairie dog habitat requirements, which were determined from field observations, research, and consultation with experts. The portion of the base selected for relocation was inhabited by Gunnison's prairie dogs around 1976; however, plague most likely eliminated the majority of this population during the early to mid 80s (USAF 1999; USAF 1997). Buried communication lines run across the site from the northwest to the southeast; use of this site would require these lines to be fenced off or placed in conduit to avoid possible damage caused by prairie dog activity. Other fencing activities may occur on an as needed basis to prevent conflicts between prairie dogs and mission requirements.

The success of relocation efforts is often difficult to determine. Releasing prairie dogs into an established colony increases stress on both resident and released prairie dogs. Although relocated prairie dogs are dusted with flea powder to prevent the spread of plague, plague can still destroy a relocated colony, even after a colony has become successfully established. It is often difficult to determine why relocation failed and whether or not plague was the primary factor attributable to animal deaths.

Mr. Joe Truett, of the Turner Ranch Foundation, is considered to be a leader in developing sound prairie dog relocation techniques. The techniques described below are based on his years of relocation experience.

Well-ventilated trailers and/or trucks would be used to transport prairie dogs from the point of capture to the relocation site. Transportation of the prairie dogs may be conducted at night if daytime temperatures are too high. Prairie dogs would also be protected during inclement weather (i.e. snow, wind, rain).

The location where the prairie dogs are to be released would be prepared by reducing vegetation height (mowing) to 15 centimeters or less. Since the proposed relocation site has few existing burrows, new burrows would need to be created. New burrows would be 7-13 centimeters in diameter and augured at a 45-degree angle to a depth of 1 to 1½ meters to help prairie dogs avoid predation. This technique would be used in combination with a retention basket, which is placed over the burrow. At Vermejo Park Ranch, Havahart rabbit hutches have been used as retention baskets (Truett et al.

unpublished). These baskets would be in place during site preparation before prairie dogs are released into the cage. Food and water would be provided within the baskets until the retention baskets are removed, two or three days later. This technique can yield a 40-50 percent success rate after the first two months of relocation, which is considered high. When possible, relocation efforts would be conducted in June or July as to give the time to acclimate to the new area prior to entering hibernation (e.g. mid-October though mid-November).

Predation by coyotes and badgers represents a big challenge for prairie dogs after relocation. Other predators such as rattlesnakes, golden eagles, and red-tailed hawks generally constitute less of a threat to the newly translocated prairie dogs. Badgers have been observed digging underneath retention baskets to prey on prairie dogs. However, when these cages are well constructed, badger predation is minimized (Truett et al. unpublished). Predation by coyotes is generally greatest during the first couple of days after retention baskets are removed. Coyote predation decreases after prairie dogs learn to retreat to their new burrows.

To minimize the loss of prairie dogs to predation, coyotes observed at the relocation site would be harassed. This harassment would only occur following the first few days after the relocation effort, giving the prairie dogs additional time to become oriented with their new surroundings. Coyotes would be chased and pursued out of the relocation area by either base personnel or volunteers. Personnel with the Turner Ranch Foundation have had success with erecting an electric fence around prairie dog relocation sites. The fence is removed once the newly relocated prairie dogs have adjusted to their new environment. This technique may also be used to minimize the loss of prairie dogs due to predation.

2.1.3 Fumigation in No-Tolerance Zones

Prairie dogs would be eliminated from 11 areas, (no-tolerance zones), located throughout the base (refer to Figure 2-1). The no-tolerance zones include the following sites:

- Subject Areas Within the Highly Populated Cantonment Area;
- Kirtland Underground Munitions Maintenance and Storage Complex (KUMMSC) operational area;
- Tijeras Golf Course;
- Heliport Auxiliary Field;

- Explosive Ordnance Disposal (EOD) Range;
- Well No. 9 Complex (this area includes the riding stables, Central Training Academy administration area, safeguard transportation driving area, and safety inspection pad);
- Antennae Array site; and
- Four Department of Defense (DoD) Interservice Nuclear Weapons School Radioactive Training Areas.

Prairie dogs would not be allowed in these areas due to land use conflicts, risk to human health and safety, and threat to military operations. Additionally, prairie dogs would not be allowed on the EOD Range due to the risk that burrowing owls (which often inhabit prairie dog towns) could be harmed by exploding ordnance. Prairie dogs located in the following no-tolerance zones would not be relocated prior to fumigation due to conflicts with military missions; the KUMMSC, heliport auxiliary field, EOD range, antennae array site, and the four DoD Interservice Nuclear Weapons School radioactive training areas. Currently, only the KUMMSC contains a small prairie dog colony. Following the initial capture and relocation effort, no-tolerance zones and associated buffer zones would be fumigated and re-inhabiting prairie dogs would be subject to fumigation. Prairie dog expansion would only be tolerated outside of these no-tolerance zones.

Prairie dog population control methods currently being used at Kirtland AFB include the fumigant aluminum phosphide, a poison gas. Aluminum phosphide is a restricted-use pesticide and may be applied only by persons certified to apply restricted use pesticides. Aluminum phosphide tablets or pellets are applied by placing them as far down the burrow opening as possible. This application procedure requires the burrow opening to be immediately plugged with moist soil or a plug of sod placed grass side down to form an airtight seal. Crumpled newspaper is placed in the burrow entrance before sealing to prevent dirt from smothering the pellets or tablets, rendering them ineffective. Non-target species such as snakes, rabbits, and mice living in treated prairie dog burrows are also killed by this method.

Aluminum phosphide does not produce any harmful residue (Paynter 2003; Degesch America Inc. no date). Eventually (depending on soil compaction and moisture content) the gas migrates through the soil and escapes slowly into the atmosphere, leaving residual aluminum hydroxide, a gray dust that is not classified as a hazardous waste. Aluminum phosphide is not absorbed by plants and will not persist in the food chain (Paynter 2003).

Although secondary poisoning of a predator or scavenger from aluminum phosphide is possible, it is very unlikely. Prairie dogs exposed to aluminum phosphide generally remain in the burrows, thereby eliminating the potential secondary poisoning threat to above ground carnivores. A scavenger or predator could be harmed only if it consumed a prairie dog soon after the prairie dog was exposed to the aluminum phosphide (Paynter 2003). Fumigation with aluminum phosphide typically reduces a target prairie dog population by 85 to 95 percent (Hygnstrom and Virchow 1994; Boren 1996). An additional benefit of this method is that the gas is also toxic to fleas in larval, pupal, and adult stages. Although total elimination of fleas may not occur from gaseous concentrations attained in the burrows, fumigation would reduce flea numbers, thereby reducing the possibility of exposure to plague. Fumigation is most effective during the spring or during the monsoon season (July and August) when soil moisture is high and soil temperatures are greater than 60 degrees Fahrenheit. Failures are most likely to occur in dry, porous soils (Hygnstrom and Virchow 1994; Boren 1996; Paynter 2003).

Fumigation is a satisfactory method to control prairie dogs; however, it is toxic to all animals in a burrow system. Although fumigants can be used year-round, certain seasonal restrictions would need to be established to protect burrowing owls (*Athene cunicularia*). Surveys for burrowing owls and other sensitive species would be conducted before using any capture or control methods that could harm nontarget species. In the event that a burrowing owl is found in a no-tolerance zone, fumigation would not occur within 150 feet of any active burrow while burrowing owls are present (i.e. March-October). Prairie dog holes located more than 150 feet away from the owl holes can be fumigated with little danger to the burrowing owl (Colorado Division of Wildlife 1997). Once burrowing owls have left the area burrows containing prairie dogs may be fumigated. Burrows that were used by the burrowing owl will remain open as to encourage them to use the site in following years. Burrowing owls are monitored by Kirtland AFB personnel.

2.1.4 Barriers

In order to prevent future habitation of prairie dogs into no-tolerance and buffer zones, two barrier methods may be used on an as needed basis. (The barriers would be established on an as needed basis in areas incompatible with prairie dog inhabitation.) The two barrier type methods are described below.

The first type of artificial barrier involves erecting a two-foot high vinyl fence. Chicken wire may be used instead where existing fencing is present. This involves trenching a line for the fence and burying at least 3 inches of the material underground. This material can either be attached directly to an existing fence or support structures would need to be provided for the plastic fencing material. Typical support structures include wooden and T-posts, which are used to attach a heavy gauged wire that has been strung from post to post at a height of 2 feet. The top of the material is then attached to the wire using heavy gauge wire ties (i.e. hog-nosed rings), to give the fence support. Constant maintenance of this structure is necessary if it is to work. Frequent inspection would be required to identify and fix any holes or gaps in the fence, as prairie dogs will readily exploit any weakness in the fence. This barrier type can provide good control as long as it is frequently maintained (Witmer 2002).

A more secure type of artificial barrier involves trenching and burying a galvanized hardware cloth four feet deep (Witmer 2002). This would prevent most prairie dogs from undermining the fence. This underground fence would be used in conjunction with the aforementioned vinyl fence. Future barrier methods may be implemented once they are researched and proven effective.

2.2 ALTERNATIVES

2.2.1 Establishment of the Alternative Relocation Site

Under this alternative to the Proposed Actions, Kirtland AFB would establish the prairie dog relocation site in the southeast portion of the base (refer to Figure 2-1). This site was chosen based on Gunnison's prairie dog habitat requirements, which were determined from field observations, research, and consultation with experts. This portion of the base is not used for any military training or any other activities. No prairie dogs are known to inhabit this area. At present, this alternative site is large enough to accommodate all prairie dogs proposed for relocation at Kirtland AFB. In order to prevent prairie dogs from accessing the EOD Range, prairie dog proofed fencing, as described in Section 2.1.2 for the north security fence line, would be erected.

The alternative relocation site for the prairie dogs is south of the Manzano Base, west of the EOD Range, and east of Loveless Road (refer to Figure 2-1). The site has an elevation range of 5,650 feet to 5,800 feet above mean sea level and is roughly 370 acres

in size (USGS 1990a, 1991b). The vegetation present at the alternative relocation site is native grassland similar to that found at the proposed relocation site. The soils in the area are Tijeras gravelly fine sandy loam (USDA 1977). These soils are moderately permeable and surface water is drained as sheet flow (USGS 1990a, 1991b; USDA 1977).

As with the Proposed Actions, fumigation would be used to clear the no-tolerance and buffer zones of prairie dogs remaining after capture and relocation efforts have been completed. Prairie dogs reinhabiting no-tolerance zones would be captured and relocated or fumigated.

2.2.2 No-Action Alternative

The No-Action Alternative consists of continuing the present prairie dog control effort on Kirtland AFB. Prairie dogs would not be captured and the prairie dog relocation site would not be created. No changes from current conditions would occur to any environmental resources on base. Areas where prairie dogs are an immediate problem are fumigated on an "as-needed" basis but not throughout any no-tolerance zones in a single effort. Although this alternative does not rectify health and safety concerns, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations § 1502.14 [CEQ 1978]) stipulate that the No-Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed action is not implemented.

2.2.3 Alternatives Considered But Not Carried Forward

2.2.3.1 Shooting as a Stand Alone Method

Using a .22 caliber pellet gun as a stand alone method to kill prairie dogs was eliminated from further consideration for two reasons. First, it creates its own health and safety problems from ricocheting pellets. Second, shooting prairie dogs may reduce prairie dog numbers but it is not an effective means of eradication.

2.2.3.2 Vacusuction as a Stand Alone Method

Vacusuction involves using a large vacuum machine truck that has been converted to capture live prairie dogs. Prairie dogs are suctioned from their burrows through a hose

and ejected into a padded holding tank located on the truck. This method is expensive and some animals are missed while others are accidentally killed or injured during the process (Kirtland AFB 1999). Therefore, as a stand alone method it is an alternative not carried forward.

2.2.3.3 Fumigation as a Stand Alone Method

Fumigation is an efficient means of controlling prairie dogs. However, Kirtland AFB would like to establish a new prairie dog colony using those already inhabiting the base. Fumigating candidate prairie dogs for relocation efforts would conflict with Kirtland AFB's goal.

2.2.3.4 Live Capture and Relocation as a Stand Alone Method

Live trapping and relocation of prairie dogs on a continuous basis was not considered a reasonable option. Using this method as a stand-alone is very cost and labor intensive, and those animals that are not caught during the initial live trapping and relocation effort learn avoidance measures to capture techniques. Therefore, attempting to live trap and relocate all prairie dogs from select portions of the base would not be feasible using this method.

SECTION 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes relevant existing environmental conditions and potential environmental consequences for each resource potentially affected by the Proposed Actions and alternatives. In compliance with the National Environmental Policy Act (NEPA) of 1970 as amended (42 US Code 4371 et seq.), the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508) and Air Force regulations implementing NEPA (32 CFR 989, *Environmental Impact Analysis Process*), the description of the affected environment focuses on only those resources potentially subject to impacts.

Resources and factors analyzed in this document focus on the following areas: human health and safety including protection of children; air quality; land use; soils; water resources; biological resources; cultural resources; and environmental management including hazardous waste and materials use. Noise, transportation and circulation, visual resources and socioeconomics would not be affected by the Proposed Actions, therefore, they have been excluded from further discussion to keep the analysis relevant and concise.

The subsections titled Environmental Consequences under each resource section describe potential impacts related to the implementation of the proposed relocation and fumigation, the alternative relocation site, and the No-Action Alternative. The Proposed Actions discussions are subdivided with descriptions of potential impacts from the no-tolerance zones (i.e. elimination of prairie dogs from the no-tolerance zones), removal methods (i.e. soap and water, live trapping, and fumigation), and establishing the relocation site (i.e. augering new holes, releasing prairie dogs at the site, prairie dog colony expansion at the site, and creation of an observation area).

3.1 HUMAN HEALTH AND SAFETY

3.1.1 Definition of Human Health and Safety

Health and safety issues are defined as those that directly affect the continued ability to protect and preserve life and property. Health and safety issues pertain to hazards that arise from physical conditions in the workplace and the actions of people working. The

field of safety is focused on prevention of accidents and mitigation of damages resulting from accidents. An accident is an undesirable, unplanned event resulting in physical harm to people, damage to property, or interruption of business. An accident may be the result of an unsafe act or unsafe condition. Each worker must make a conscious effort to work safely, despite any adverse conditions of the work environment. A high degree of safety awareness must be maintained so that safety factors involved in a task become an integral part of that task.

Safety issues typically associated with and specific to military airfields include the potential for mid-air aircraft mishaps, aircraft collisions with objects on the ground (e.g., towers, buildings, or mountains), weather-related accidents, and bird-aircraft collisions. However, since the Proposed Actions analyzed in this Environmental Assessment (EA) would not affect the type or frequency of aircraft operations, the majority of the safety analysis in this document focuses on ground-based safety issues, although the distribution and significance of accident potential zones surrounding the airfield complex are discussed because bird-aircraft collisions could be decreased by the Proposed Actions.

Because children may suffer disproportionately from environmental health risks and safety risks, Executive Order (EO) 13045, *Protection of Children from Environmental Health and Safety Risks*, was signed in 1997. EO 13045 identifies risks to health and safety that are attributable to products or substances with which a child is likely to come in contact or be exposed to (air, food, water, soil and products). This EO was designed to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that federal agencies policies, programs, activities, and standards address environmental risks and safety risks to children. This section identifies the distribution of children and locations where numbers of children may be proportionately high (e.g., schools, child care center, family housing, etc.) in areas potentially affected by implementation of the Proposed Actions. The use of aluminum phosphide tablets, a restricted use pesticide, is addressed in this resource section. Removing prairie dogs from these areas would reduce health and safety risks to children by reducing potential exposure to plague, rattlesnakes, and spiders.

3.1.2 Existing Human Health and Safety Conditions

3.1.2.1 Human Health

There are a number of potential health impacts associated with prairie dog colonies. Although rodents also are susceptible to infectious diseases such as rabies, plague is the primary disease associated with prairie dogs (US Air Force [USAF] 1997). Plague is a serious, sometimes fatal disease caused by the *Yersinia pestis* bacterium and is most commonly transmitted to humans through the bites of infected fleas (USAF 1997).

Rattlesnakes and black widow spiders represent another health and safety hazard associated with prairie dog colonies. Rattlesnakes and spiders may inhabit prairie dog burrows and can be a threat to personnel, residents and visitors who work or recreate in the vicinity of the burrows. Prairie dog burrows also pose a tripping hazard to personnel on base. According to Kirtland Air Force Base (AFB) personnel, people have twisted ankles by stepping in prairie dog burrows at the golf course, in the Zia Park housing area, and adjacent to Bullhead Park (USAF 1999).

3.1.2.2 Industrial Hygiene

Industrial hygiene involves the protection of the public and workers from chemical, microbiological and physical health hazards that emanate from the workplace. Exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets are managed under industrial hygiene programs. Industrial hygiene is the joint responsibility of bioenvironmental engineering and contractor safety departments, as applicable. These responsibilities include: reviewing all potentially hazardous workplace operations; monitoring exposure to workplace chemical (e.g., asbestos, lead [Pb], and hazardous materials), physical (e.g., noise and radiation), and biological agents (e.g., infectious waste); recommending and evaluating controls (e.g., ventilators and respirators) to ensure personnel are properly protected and not overexposed; and ensuring a medical surveillance program is in place to perform occupational health physicals for those workers subject to workplace hazards.

The fumigant aluminum phosphide, used to control prairie dog populations, is an agent that requires licensed certified applicators. Contractor personnel responsible for conducting the Proposed Actions at Kirtland AFB would be responsible for ensuring

ground safety and compliance with all applicable and occupational health and safety regulations and worker compensation programs, and would be required to conduct relocation activities in a manner that would not pose any risk to personnel currently occupying any existing facilities.

3.1.2.3 Accident Potential and Aircraft Safety

Most aircraft mishaps (75 percent) involve an airfield takeoff or landing incident. Risks associated with takeoffs and landings at an airfield complex are summarized in the Air Installation Compatible Use Zone (AICUZ) Program (USAF 2002b). The AICUZ Program promotes compatible land use development in areas subject to aircraft noise and accident potential while also protecting the operational capability of the base.

A primary safety concern associated with prairie dogs near active runways is bird-aircraft strike hazards (BASH). According to the Bird Strike Committee USA, more than half of all bird aircraft strikes occur below 100 feet above ground level. Approximately one-half of reported bird-strikes occur in the airfield environment, and one-quarter occur during low-altitude training. Raptors represent a safety hazard at Kirtland AFB because of their predation on prairie dogs especially when prairie dog towns are located near the runways.

3.1.3 Environmental Consequences to Human Health and Safety

3.1.3.1 Significance Criteria

An impact to safety would be considered significant if implementation of an action would substantially increase risks associated with mishap potential or safety relevant to the public or the environment. For example, if implementation of a proposed action would expose personnel to unnecessary health risks (e.g., toxic inhalation from applying fumigants) safety impacts would be considered significant.

An impact to children from environmental health risks or safety risks would be considered significant if a proposed action would result in a disproportionate adverse impact to the health or safety of children.

3.1.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Removing prairie dogs from specified areas of the base in accordance with the Proposed Actions would benefit human health and safety in four primary areas:

- Less likelihood of human exposure to plague-carrying fleas;
- Reduce the risk of human conflicts with rattlesnakes that often inhabit prairie dog burrows;
- Reduced potential for injuries from people falling into prairie dog burrows that are just below the surface in recreation areas, housing areas, and along walking/jogging trails; and
- BASH reduction: Removing prairie dogs from areas near runways and aircraft traffic patterns would reduce the number of raptors hunting in those areas and thereby reduce BASH potential.
- Reduce potential for impacts to security, communications, and base missions from severed electrical wires.

Removal of prairie dogs from the vicinity of the Child Development Center, family housing area, and schools would result in reduced environmental health risks or safety risks to children. Risks associated with the presence of prairie dog burrows in the cantonment area (e.g., rattlesnakes) would be eliminated following removal of prairie dogs from the area.

Removal Methods. Proper use of phased population control methods (nonlethal followed by lethal) would have no negative impact on human health and safety. Individuals involved with use of soap and water foam and live trapping would minimize risk of exposure to prairie dog bites and plague-carrying fleas by wearing protective clothing, exercising caution during prairie dog handling, and strictly adhering to field safety protocols.

Use of aluminum phosphide is unlikely to have negative impacts on human health and safety. Individuals involved with application of rodenticides would be required to strictly adhere to field safety protocols. Only licensed certified pesticide applicators and entomology staff under the direct supervision of a certified pesticide applicator would

conduct application of aluminum phosphide. Aluminum phosphide is a highly acute poison that kills through inhalation (Degesch no date). Aluminum phosphide pellets or tablets work by reacting with existing moisture to create phosphine gas, which is the toxic fumigant. After decomposition a gray-white powder composed almost entirely of non-poisonous aluminum hydroxide is left along with a small amount of un-reactive aluminum phosphide (i.e. 2 to 3 percent). If a person or animal is exposed to a nonlethal dose, the individual can quickly recover by breathing fresh air (Degesch no date; Paynter 2003). Workers can eliminate the risk of immediate health and safety hazards by wearing protective clothing and respiratory protection when applying aluminum phosphide. Application of aluminum phosphide in outdoor areas does not typically require use of air-purifying respirators since aboveground concentrations of phosphine gas generally do not exceed safety threshold levels. Respiratory protection is required only for applications indoors or in poorly ventilated areas.

If prairie dogs are found within an active Installation Restoration Program (IRP) site, base personnel would determine which removal method could be implemented without risk to human health and safety from contaminants. This decision would be made based on the degree and type of contamination at the site.

Short-term environmental health risks or safety risks could occur to children if they are unattended during prairie dog removal activities; however, standard site safety precautions (e.g., presence of licensed personnel, and other security measures) would keep potential risks to a minimum.

Relocation Site. Relocating prairie dogs to the north-central portion of the base would enable the prairie dogs to coexist with base activities. Additionally, risk of human exposure to plague-carrying fleas and venomous reptiles would be reduced in the cantonment area and other no-tolerance zones. Although an increased potential for exposure to plague and rattlesnakes would occur in areas adjacent to the relocation site, this risk would also occur following the natural reestablishment of prairie dogs to this location (which is already occurring). Installation of a prairie dog proof fence along the north security fence would reduce these associated risks to people living north of the proposed actions.

Relocating prairie dogs to the north-central portion of the base would not impact aircraft safety in terms of the potential for BASH. As indicated in Figure 2-1, prairie dogs

located in specified areas north of Tijeras Arroyo would be removed and relocated to the prairie dog relocation area (several miles east and southeast of the airport). In response to this relocation, raptors would be expected to forage at this new site and would be less likely to forage adjacent to the airport. Implementation of the Proposed Actions is expected to decrease the potential for BASH in the vicinity of the Albuquerque International Sunport.

Six of the active IRP sites occur within the relocation site; therefore, there would be risks to human health and safety from augering holes in a contaminated site. Prairie dogs would be released into the proposed relocation site even if unknown contaminated sites occur there. Due to health and safety concerns, however, no holes would be augered within the active site. Some of the sites are fenced and could be easily avoided, while other sites would have their boundaries delineated to avoid impacts.

The proposed relocation site is situated away from base schools, housing areas, and the Child Development Center, but it is located just to the south of the FootHills housing area. To avoid unnecessary health risks to children in this area, prairie dog proof fencing would be established along the north security fence. Prairie dogs relocated at the site would be dusted with flea powder to prevent the unintentional spread of plague carrying fleas. Therefore, the release of prairie dogs in the proposed relocation site would not result in environmental health risks or safety risks to children.

3.1.3.3 Alternative Relocation Site

Impacts to human health and safety from removal of prairie dogs from the no-tolerance zones would be identical to those described for the Proposed Actions. The potential for BASH would be expected to decrease in the vicinity of Albuquerque International Sunport, slightly more than under the Proposed Actions because the alternative relocation site is farther from the airport than the Proposed Actions.

There is one active IRP site (the Explosive Ordnance Disposal [EOD] Range) near the alternative relocation site. There could be the potential for risks to human health and safety with personnel relocating prairie dogs to this site. To reduce potential risk to human health and safety prairie dogs would only be relocated at the site while the EOD Range is inactive.

3.1.3.4 No-Action Alternative

Selection of the No-Action Alternative would result in no changes to human health and safety. Prairie dogs would continue to be fumigated on an “as needed basis” as outlined in the 1997 Prairie Dog Management EA. The risk to humans from plague-carrying fleas, rattlesnakes, and tripping hazards would continue. The current BASH threat would continue from raptors hunting over prairie dog towns near the runways.

3.1.3.5 Other Future Actions on the Base

The Proposed Actions would have a beneficial impact to human health and safety. Therefore, when considered with the health and safety effects of the other future actions, they are not expected to have any significant cumulative negative impacts to health and safety at the base.

3.2 AIR QUALITY

3.2.1 Definition of Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The US Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than ten microns in diameter, and Pb. The Clean Air Act (CAA) requires that all states attain compliance through adherence to the NAAQS, as demonstrated by the comparison of measured pollutant concentrations and the NAAQS.

The NAAQS represent the maximum levels of background pollution that are considered acceptable, with an adequate margin of safety to protect public health and welfare. The State of New Mexico has adopted additional standards for air quality, the New Mexico Ambient Air Quality Standards (NMAAQs), which apply a more stringent standard for CO, SO₂, and for the 24-hour standard for NO₂. See Title 40, Part 50 of the CFR for the NAAQS. The State of New Mexico uses the NAAQS for attainment determinations; the NMAAQs are used for permitting purposes only.

For the purposes of this EA, Bernalillo County forms the region of concern for air quality.

3.2.2 Existing Air Quality Conditions

3.2.2.1 Climate and Regional Air Quality

The Albuquerque metropolitan area and Kirtland AFB are within New Mexico's Air Quality Control Region No. 2, which is one of 8 regions in the state. Region No. 2 includes all of northwestern New Mexico. The Albuquerque Environmental Health Department Air Quality and Vehicle Pollution Management Divisions administer local, state and federal air quality control regulations for Bernalillo County, and the Albuquerque-Bernalillo County Air Quality Control Board governs them.

In the past, NAAQS and NMAAQs violations have occurred at major intersections and in uptown Albuquerque as a result of high volumes of automobile emissions. The City of Albuquerque has been designated as being in maintenance status for CO as of 15 June 1996 and is currently in attainment for all other federally regulated pollutants (EPA 2002). CO levels are currently at their lowest since the 1970s (CO levels were consistently violated during the 1970s and 1980s). O₃ levels have been increasing since 1990 and exceeded standards twice in 1999 (Albuquerque Environmental Health Department [AEHD] 2000).

3.2.2.2 Air Quality in the Project Area

Air quality in and around the project area is a function of normal climatic conditions in the region, combined with airborne pollutants from a variety of sources. An inventory was completed at Kirtland AFB in which a list of facilities with air emissions (both criteria pollutants and hazardous pollutants) was developed. All of the pollutants were then quantified for facilities on the list. There are a number of facilities located on the installation that generate periodic emissions. The inventory calculated the total potential air emissions using the quantities of hazardous and toxic pollutants maintained at each facility. Based upon the results of the emissions study, Kirtland AFB is subject to Title III and Title V permitting requirements of the CAA, respectively. Kirtland AFB is currently a minor source of Hazardous Air Pollutants under Title III of the CAA.

A Title V permit application was submitted in December 1995 to the Albuquerque-Bernalillo County Air Pollution Control District and deemed complete in June 1996. Table 3-1 summarizes the air emissions inventory for Kirtland AFB.

Table 3-1. Summary of Calendar Year 2001 Air Emissions for Non-exempt Sources at Kirtland AFB

Pollutant	Emissions	
	Actual ^b (tpy)	Allowable ^b (tpy)
CRITERIA POLLUTANTS AND PRECURSORS		
CO	33.7	171.9
NO _x	57.2	176.4
PM	12.7	48.4
PM ₁₀ ^a	12.5	47.8
SO _x	5.4	23.0
VOC	95.2	166.5
Total HAPs	6.9	12.0

Notes: ^aParticulate matter $\leq 10 \mu\text{m}$ is a subset of particulate matter.

^b These cumulative totals include emissions from 20 New Mexico Administration Code Title, Section 11.41 Authority to Construct permitted sources and Title V sources.

tpy = tons per year

PM = particulate matter

VOC – volatile organic compounds

CO = carbon monoxide

PM₁₀ = particulate matter equal to or less than 10 microns in diameter

NO_x = oxides of nitrogen

SO_x = sulfur oxides

HAP = hazardous air pollutants

3.2.2.3 State Implementation Plan

Estimated air quality measurements that apply to the air quality in the vicinity of Kirtland AFB are taken from air monitoring stations located near the installation. The closest of these stations, is located about a mile northwest of the base and monitors CO, total suspended particulates and winds. These air-monitoring stations are operated and maintained by the AEHD.

The primary source of air pollutants at Kirtland AFB is privately owned vehicles. Kirtland AFB, through its transportation management program, is engaged in a phased conversion of government-owned gasoline-powered vehicles to natural gas. Other primary emission sources on the installation include aircraft operations and maintenance, EOD, fuel storage, corrosion control, emergency generators, and fire fighting training. Major hydrocarbon emission sources include fuel evaporative losses from fuel storage, transfer and use.

3.2.3 Environmental Consequences to Air Quality

3.2.3.1 Significance Criteria

The 1990 amendments to the CAA require federal agencies to conform to the affected State Implementation Plan (SIP) with respect to achieving and maintaining attainment of NAAQS and addressing air quality impacts. An air quality impact resulting from a proposed action would be significant if it would: (1) increase concentrations of ambient criteria pollutants or O₃ precursors to levels exceeding NAAQS, (2) increase concentrations of pollutants already at nonattainment levels, (3) lead to establishment of a new nonattainment area by the governor of the state or the EPA, or (4) delay achievement of attainment in accordance with the SIP criteria pollutant standards.

3.2.3.2 Proposed Actions

Although prairie dog excavations can increase dust during wind events, moving prairie dogs from one region to another would not impact the overall air quality in the region.

No-Tolerance and Buffer Zones. The absence of prairie dogs from no-tolerance and buffer zones would eventually decrease the potential for wind erosion as disturbed ground becomes revegetated. This subsequently could result in minor improvements to local air quality.

Removal Methods. Use of nonlethal and lethal prairie dog control measures would have no significant negative impacts on air quality. Fumigation involves releasing toxic gas inside the burrow systems that have been sealed off. The gas then slowly migrates through the soil and dissipates gradually into the atmosphere. Use of aluminum phosphide results in the release of phosphine gas and would not significantly affect the air quality because it is trapped in the tunnels until it dissipates. Once it mixes with fresh air it is rendered harmless. Soap and water extraction and live trapping would have no impact on air quality.

Relocation Site. Relocation of prairie dogs to the north-central portion of the base could result in temporary degradation of the vegetation in this area. Fugitive dust from wind erosion may increase slightly and could have a minor, but insignificant, impact on local air quality.

3.2.3.3 Alternative Relocation Site

Under this alternative, air quality would be affected in much the same manner as the Proposed Actions addressed above.

3.2.3.4 No-Action Alternative

Under the No-Action Alternative, there would be no changes to air quality from current conditions. Prairie dogs would continue to be fumigated on an “as needed basis” as outlined in the 1997 Prairie Dog Management EA, therefore fugitive dust from their burrowing activities would not increase since their population is being controlled.

3.2.3.5 Other Future Actions on the Base

The combined emissions from the Proposed Actions, when considered with potential emissions from other future actions at the base, are not expected to have any significant cumulative negative impacts to air quality.

3.3 LAND USE

3.3.1 Definition of Land Use

Land use is the classification of either natural or human-modified activities occurring at a given location. Natural land use includes rangeland and other open or undeveloped areas. Human-modified land use classifications include residential, commercial, industrial, communications and utilities, agricultural, institutional, recreational, and other developed areas. Land use is regulated by management plans, policies, regulations, and ordinances (e.g., zoning) that determine the type and extent of land use allowable in specific areas and protect specially designated or environmentally sensitive areas.

3.3.2 Existing Land Use Conditions

In the vicinity of Kirtland AFB, land use varies from urban to open rangeland. Kirtland AFB is bordered on the north and west by the City of Albuquerque and its suburbs and on the south by the Isleta Pueblo, with the National Forest bordering the east. Immediately north of the installation, land use is predominantly urban. Open spaces and forestland are

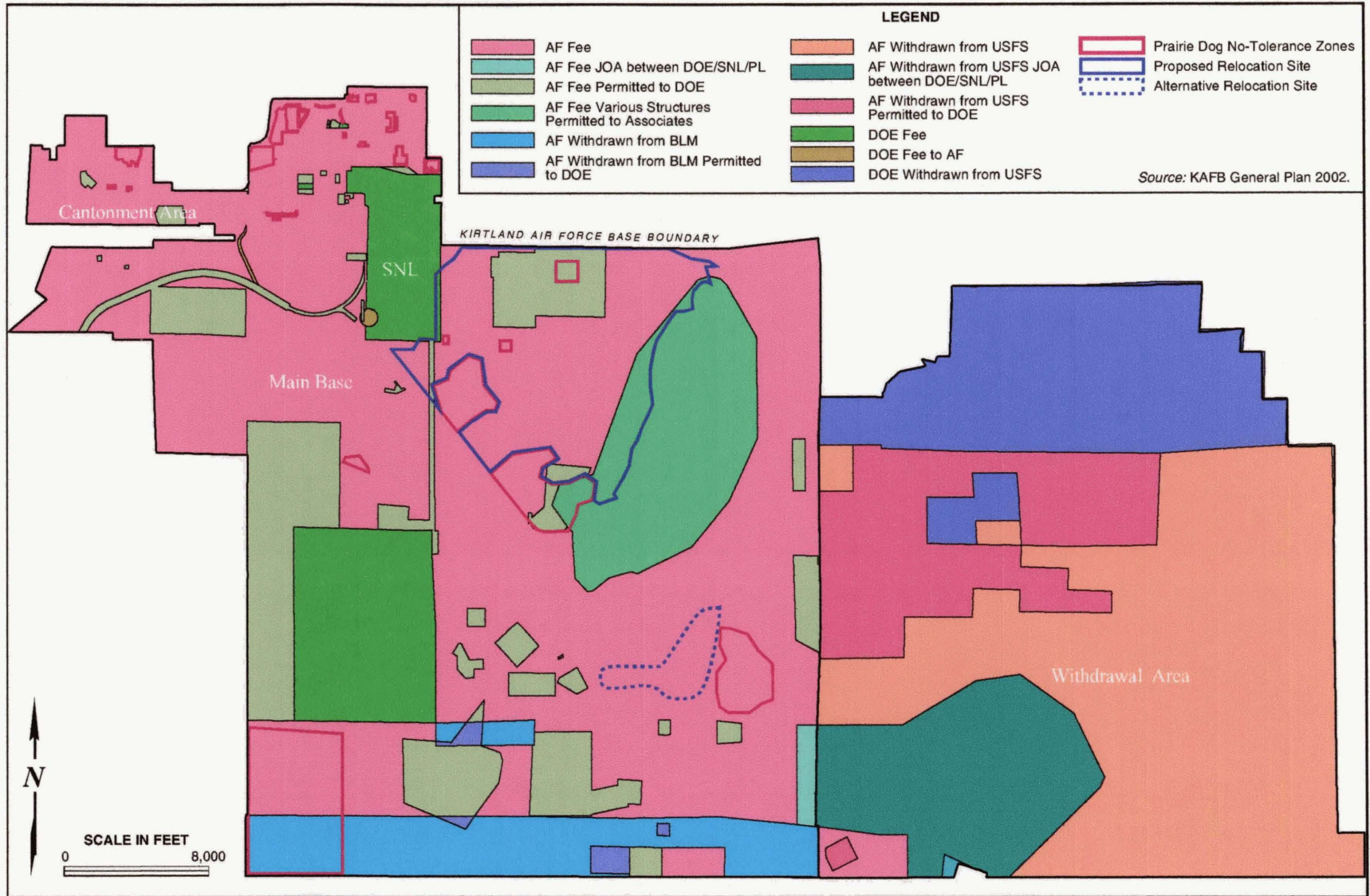
present northeast of the base. West of Kirtland AFB, land use is a mixture of urban areas and open space. South of the installation, the Isleta Pueblo lands are generally open space and forest or vacant land. These lands are utilized by the Isleta Pueblo for a variety of highly sensitive cultural practices.

3.3.2.1 Kirtland AFB Land Use

Kirtland AFB is among the largest bases (land area) owned by the USAF with 51,558 acres of land (over 802 square miles). Kirtland AFB manages a wide variety of land ownerships and land use agreements with multiple state and federal agencies (Figure 3-1). According to Kirtland AFB's 2002 General Plan, the land at Kirtland AFB is primarily owned by the USAF (20,783 acres unimproved and 7,311 acres improved), but several other ownerships and leases apply. The eastern portion of Kirtland AFB is primarily Cibola National Forest land (15,891 acres) withdrawn from public use by the US Department of Energy (DOE) and the USAF. These lands are known as the Withdrawal Area. The DOE owns certain areas of the base (7,533 acres) and leases other areas from the USAF (USAF 2002c).

The airfield complex serving Kirtland AFB is shared with Albuquerque International Sunport, located adjacent to the northwest corner of the base. Airfield operations and aircraft support facilities, including aircraft maintenance, are concentrated in the airfield complex area. The remainder of the intensive development on base consists of administrative and research, industrial, medical, open space/recreation, and housing located north and east and south of the airfield complex in the northwest corner of the base in the cantonment area. The Proposed Actions would occur in the northwest and north-central portions of the base.

The no-tolerance zones are disturbed sites with a variety of land uses. Much of the area north of Tijeras Arroyo is heavily developed; some of the prevalent land uses in this portion of the base include housing, office buildings, recreational areas and aircraft facilities (see Figure 2-2). The remaining no-tolerance zones (see Figure 2-1) contain a munitions storage complex, a golf course, a heliport, an EOD range, a testing operations area, riding stables, administrative facilities, a driver's training area, a safety inspection pad, an Antennae Array Site, and a weapons training area. The proposed prairie dog relocation site is primarily open grassland and would occupy approximately 3,500 acres.



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Kirtland Air Force Base Land Agreements

FIGURE

3-1

The alternative relocation site is currently vacant land. It is primarily open grassland and is similar to the proposed relocation site. The alternative site is approximately 370 acres.

3.3.3 Environmental Consequences to Land Use

3.3.3.1 Significance Criteria

Potential impacts to land use are evaluated by determining if an action is compatible with existing land use and in compliance with adopted land use plans and policies. In general, land use impacts would be considered significant if they would: (1) be inconsistent or noncompliant with applicable land use plans and policies, (2) prevent continued use or occupation of an area, or (3) be incompatible with adjacent or nearby land use to the extent that public health or safety is threatened.

3.3.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Removal of prairie dogs from no-tolerance and buffer zones would not adversely affect land use on base. These areas would be able to be used for their intended land use as a result of prairie dog removal. The Proposed Actions would allow base operations to occur in a safe manner at the munitions storage complex, heliport, EOD Range, Well No. 9 Complex, Antennae Array Site, and training areas. Other no-tolerance zones, including the golf course, riding stables, administrative offices, housing areas, and roadways, could function safely and without disruption from prairie dog activities if the Proposed Actions were implemented.

Removal Methods. Access to no-tolerance zones may be limited while prairie dogs are being captured or fumigated. Any impacts to land use would be short term.

Relocation Site. The proposed relocation site is on a 3,500-acre site located in the north-central portion of the base. Prairie dogs would be released in the northeastern portion of this site. Prairie dogs inhabited this area prior to the current land use. The site is a large undeveloped area consisting of native grassland. A residential area is located off-base north of the proposed relocation site. The existing security fencing along the Kirtland AFB border would be retrofitted to keep prairie dogs from entering adjoining properties. Land use in this area would not be adversely affected by the Proposed Actions if

mitigation measures such as prairie dog fencing and barriers were installed and maintained.

3.3.3.3 Alternative Relocation Site

The alternative relocation site is in the southeast portion of the base and consists of 370 acres of grassland. Land surrounding the alternative relocation site has been disturbed by previous human activity and prairie dogs do not currently occupy this area. Impacts to land use would be similar to those described for the Proposed Actions, except that there are no adjoining residential properties.

3.3.3.4 No-Action Alternative

Changes to land use would not occur if the No-Action Alternative were implemented. The No-Action Alternative would result in continued prairie dog degradation of the no-tolerance zones on base. Prairie dog digging could render parks, athletic fields, the golf course, housing units, and jogging paths unusable.

3.3.3.5 Other Future Actions on the Base

No significant impacts to current land use would occur from the Proposed Actions addressed in this document. Therefore, the cumulative effects of the Proposed Actions, when considered with potential disturbances to land use from the other future actions, are not expected to have a significant cumulative negative impact on land use.

3.4 GEOLOGICAL RESOURCES

3.4.1 Definition of Geological Resources

The geologic resources of an area consist of all soil and rock materials. For the purposes of this study, the terms soil and rock refer to unconsolidated and consolidated earth materials, respectively. The geology of an area includes mineral deposits, notable landforms, tectonic features, and fossil remains.

3.4.2 Existing Geological Resource Conditions

3.4.2.1 Geology

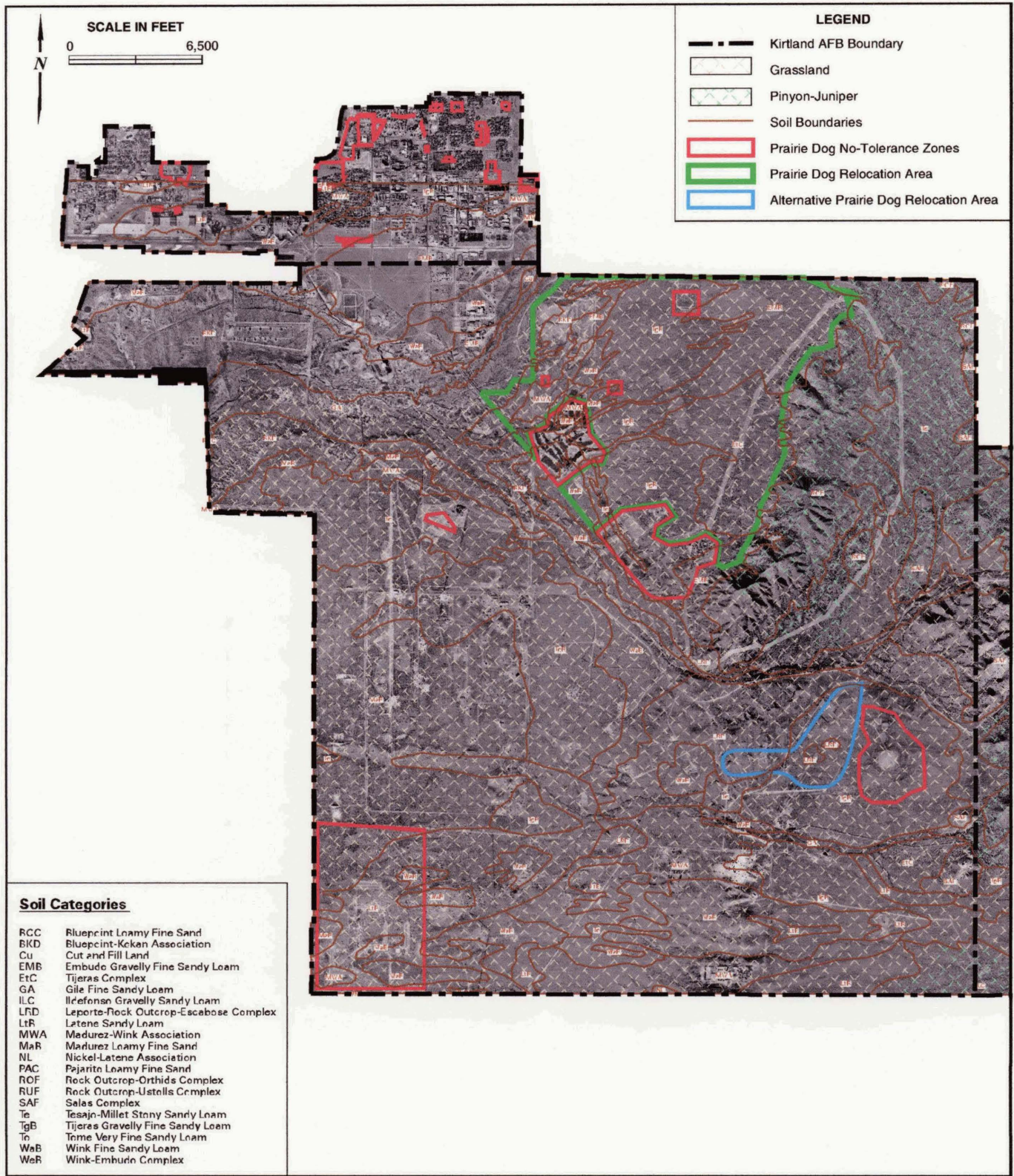
Kirtland AFB is situated in the eastern portion of the Albuquerque Basin, which is one of the largest of a series of north-trending basins and measures 90 miles long and 30 miles wide (Fenneman 1931). The basin extends from the gently sloping area near the Rio Grande River to the steep foothills and slopes of the Manzanita and Manzano Mountains. Different landforms within the basin include mesas, benches, stream terraces, low hills, ridges, and graded alluvial slopes (Lozinsky et al. 1991; Kelley 1977; Kelley and Northrup 1975). Elevations at Kirtland AFB range from 5,200 feet in the west to almost 8,000 feet in the Manzanita Mountains. Several canyons are found within the boundary of Kirtland AFB including Lurance and Sol se Mete Canyons which are located in the northeastern portion of the base, near the boundary of the Cibola National Forest.

Most of the Albuquerque Basin consists of poorly consolidated sediments that eroded from the surrounding mountains following previous faulting and geologic activity. 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. In certain places, Rio Grande River and volcanic deposits are interspersed.

3.4.2.2 Soils

The dominant soils of the Albuquerque Basin are well drained and loamy, with minor amounts of gravelly and stony soils along the mountains and arroyos. A variety of soil associations occur on Kirtland AFB's grasslands: Gila-Vinton-Brazito association, Bluepoint-Kokan association, Madurez-Wink association, and Tijeras-Embudo association (US Department of Agriculture [USDA] 1977). Each association contains several specific soil series that differ in composition and individual characteristics. Primary soil associations on Kirtland AFB are presented in Figure 3-2.

The predominant soil series found in the cantonment area of Kirtland AFB are Tijeras gravelly fine sandy loam, Madurez-Wink association, and Embudo gravelly fine sandy loam (USDA 1977). The dominant soil types present in the western grasslands are Madurez loamy fine sand, Tijeras gravelly fine sandy loam, Madurez-Wink association,



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Kirtland Air Force Base Soils

FIGURE

3-2

and Wink fine sandy loam. Soil series found in the piñon-juniper hills include Rock-outcrop-Orthid complex, Tesajo-Millet sandy loams, and Salas complex.

The primary soil types found at the proposed relocation site are primarily sandy loams including Tijeras gravelly fine sandy loam, Embudo gravelly fine sandy loam, and Tijeras complex. These soils are moderately permeable and have a moderate level of water erosion hazard (USDA 1977). The primary soil series found at the alternative relocation site include Tijeras gravelly fine sandy loam with inclusions of Laporte-Rock outcrop-Escabosa complexes. The soils in this area are moderately permeable and the hazard of water erosion is moderate for the Tijeras and Laporte soils (USDA 1977).

3.4.3 Environmental Consequences to Geological Resources

3.4.3.1 Significance Criteria

An impact to geological resources would be considered significant if a proposed action would violate a federal, state or local law or regulation protecting geological resources (e.g., impacted unique landforms or rock formations), or result in uncontrolled erosion over a larger area than that allowed by regulations protecting soil resources.

3.4.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Elimination of prairie dogs from no-tolerance zones and buffer zones would eventually result in decreased potential for erosion as disturbed ground becomes revegetated.

Removal Methods. Use of nonlethal and lethal prairie dog control measures would not adversely affect geological resources. Although use of soap and water could result in some minor localized soil erosion, best management practices would be implemented to minimize these impacts. This is accomplished by ensuring the nozzle is in the burrow before water is turned on and through placement of hay bales around the burrow to slow the water enough for it to drop its sediment load. Trapping would not affect geological resources.

Relocation Site. Minor degradation of the area's vegetation from augering holes and transporting prairie dogs to the holes, as well as from prairie dog activity, could also

degrade the local vegetation, thereby increasing the potential for erosion. Erosion from these activities is expected to be minor and insignificant since similar soils are present at the current areas of prairie dog activity and soil erosion issues there are trivial.

3.4.3.3 Alternative Relocation Site

Impacts to geological resources from use of the alternative relocation site would be similar to those described for the Proposed Actions.

3.4.3.4 No-Action Alternative

Implementation of the No-Action Alternative would result in no changes to geological resources from current conditions. Prairie dogs located in no-tolerance zones would continue to degrade these sites from their foraging and burrowing activities.

3.4.3.5 Other Future Actions on the Base

Insignificant impacts to regional geological resources would occur from the Proposed Actions addressed in this document or other currently known future actions. Therefore, the cumulative effects of the Proposed Actions, when considered with potential disturbances to geological resources from the other future actions, are not expected to have a significant cumulative negative impact on geological resources.

3.5 WATER RESOURCES

3.5.1 Definition of Water Resources

Water resources include all surface waters and groundwater and their availability for human use. For this analysis, those water resources located within the proposed project area and the watershed areas affected by existing and potential runoff, including an area's potential for flooding (100-year floodplains), were investigated. Surface water resources comprise lakes, rivers, and streams and are important for economic, ecological, recreational, and human health reasons. Groundwater comprises the subsurface hydrologic resources of the physical environment and is an essential resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in

terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Other issues relevant to water resources include watershed areas affected by existing and potential runoff and hazards associated with 100-year floodplains. Floodplains are often belts of low, level ground present on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by floodwater. Inundation dangers associated with floodplains have prompted federal, state, and local legislation that limit development in these areas largely to recreation and preservation activities. The 100-year floodplain on Kirtland AFB is shown on Figure 3-3.

3.5.2 Existing Water Resource Conditions

3.5.2.1 Surface Water

The Rio Grande River is the major surface hydrologic feature in central New Mexico, flowing north to south through Albuquerque approximately 5 miles west of Kirtland AFB. Minor surface water bodies exist on the East Mesa as small wetlands, such as Coyote Springs and Sol se Mete Spring or as small reservoirs such as the ponds located at Tijeras Arroyo Golf Course.

East Mesa surface water occurs in the form of storm water sheet flows that drain into small gullies when it rains. The primary surface channels that drain runoff from Kirtland AFB to the Rio Grande River are the Tijeras Arroyo and Arroyo del Coyote. These arroyos are both water-carved channels that are dry for most of the year. Precipitation reaches these arroyos through a series of storm drains, flood canals, and unnamed smaller arroyos. Surface water enters Tijeras Arroyo where it crosses the northeast corner of Kirtland AFB and then flows south of Albuquerque International Sunport, draining eventually into the Rio Grande River (USAF 1991). Arroyo del Coyote collects water from Madera, Lurance and Sol se Mete Canyons in the Manzanita Mountains and drains into Tijeras Arroyo approximately one mile west of the Tijeras Arroyo Golf Course.

Both Arroyo del Coyote and Tijeras Arroyo flow intermittently during heavy thunderstorms and spring snowmelt (US Army Corps of Engineers [USACE] 1979). However, nearly 95 percent of the precipitation that flows through the Tijeras Arroyo evaporates before it reaches the Rio Grande River. The remaining 5 percent is equally

divided between runoff and groundwater recharge (USAF 1991). The Proposed Actions and alternative relocation sites contain un-named smaller arroyos that drain into these major arroyos.

3.5.2.2 Floodplains

Flooding on Kirtland AFB generally occurs between May and October during high-intensity thunderstorms (USACE 1979a). Tijeras Arroyo and Arroyo del Coyote floods are characterized by high peak flows, small volumes, and short duration. Although flooding occurs infrequently, vegetation can encroach into these arroyos' channels, obstructing the flow of water and causing flooding. A 100-year floodplain encompasses these arroyos and follows their paths. The western boundary of the proposed prairie dog relocation site abuts the Tijeras Arroyo 100-year floodplain.

3.5.2.3 Groundwater

Kirtland AFB is located within the limits of the Rio Grande Underground Water Basin, which has been defined by the State of New Mexico as a natural resource area and has been designated as a "declared underground water basin." The state regulates it as a sole source of potable water. The average depth to groundwater beneath Kirtland AFB is 450 to 550 feet. The Rio Grande Basin's source of groundwater is the Santa Fe Aquifer. Albuquerque relies on groundwater as its sole potable water source.

3.5.2.4 Kirtland AFB

Water Supply

Water on base is supplied by seven installation water wells and two separate but interconnected distribution systems. These systems were developed separately for Sandia Base and Kirtland AFB before they were combined into a single installation. Water is also purchased from the City of Albuquerque. Water purchased from the city is primarily for use in meeting peak demands, for providing water when wells are out of service and to keep water production within water rights allocations.

3.5.3 Environmental Consequences to Water Resources

3.5.3.1 Significance Criteria

Criteria for determining the significance of impacts to water resources are based on water availability, quality, and use; existence of floodplains and wetlands; and associated regulations. An impact to water resources would be significant if it: 1) reduced water availability to or interfered with the supply of existing users; 2) created or contributed to overdraft of groundwater basins or exceeded safe annual yield of water supply sources; 3) adversely affected water quality or endangered public health by creating or worsening adverse health hazards or safety conditions; 4) threatened or damaged unique hydrologic characteristics; or 5) violated established laws or regulations adopted to protect or manage water resources of an area. Impacts to flood plains from a proposed action would be significant if they would negatively alter flow within the floodplain.

3.5.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Removal of prairie dogs from no-tolerance and buffer zones is not expected to affect water resources. The Tijeras Golf Course contains two man-made ponds. These surface water resources are surrounded by rip-rap material which prevents prairie dogs from occurring in the immediate area.

Removal Methods. Use of nonlethal and lethal prairie dog control measures would have no negative impacts on water resources. Use of biodegradable soap is not expected to impact the Rio Grande, groundwater, or the floodplain. Aluminum phosphide dissipates into the atmosphere and would not reach groundwater or surface water.

Relocation Site. Establishment of a prairie dog reserve could result in temporary degradation of the area's vegetation. Due to the lack of surface water in the area, adverse impacts would not occur. Most of the relocation site is found outside of the 100-year floodplain. Release of prairie dogs into this area is not expected to adversely impact the floodplain due to their negligible effects to existing landforms.

3.5.3.3 Alternative Relocation Site

Implementation of this alternative would affect water quality in the same manner as the Proposed Actions addressed above.

3.5.3.4 No-Action Alternative

Implementation of the No-Action Alternative would result in no changes to water quality from the current conditions.

3.5.3.5 Other Future Actions on the Base

Insignificant impacts to water resources would occur from the Proposed Actions addressed in this document. Therefore, the cumulative effects of the Proposed Actions, when considered with potential disturbances to water resources from other future actions, are not expected to have a significant cumulative negative impact on water resources in the area.

3.6 BIOLOGICAL RESOURCES

3.6.1 Definition of Biological Resources

Biological resources include native, naturalized, or introduced plants and animals and the habitats in which they occur. Protected species are defined as those listed as threatened, endangered, or proposed or candidate for listing by the US Fish and Wildlife Service (USFWS); New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD); and/or the New Mexico Department of Game and Fish (NMDG&F). Federal species of concern, formerly known as candidate category two species, are not protected by law; however, these species could become listed, and therefore are considered when addressing biological resource impacts of an action. The New Mexico Natural Heritage Program also maintains a listing of threatened or endangered species. NMEMNRD holds the responsibility for identifying and listing sensitive plant species considered in this analysis. Animal species of special concern to the NMDG&F are also considered.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the Endangered Species Act 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).

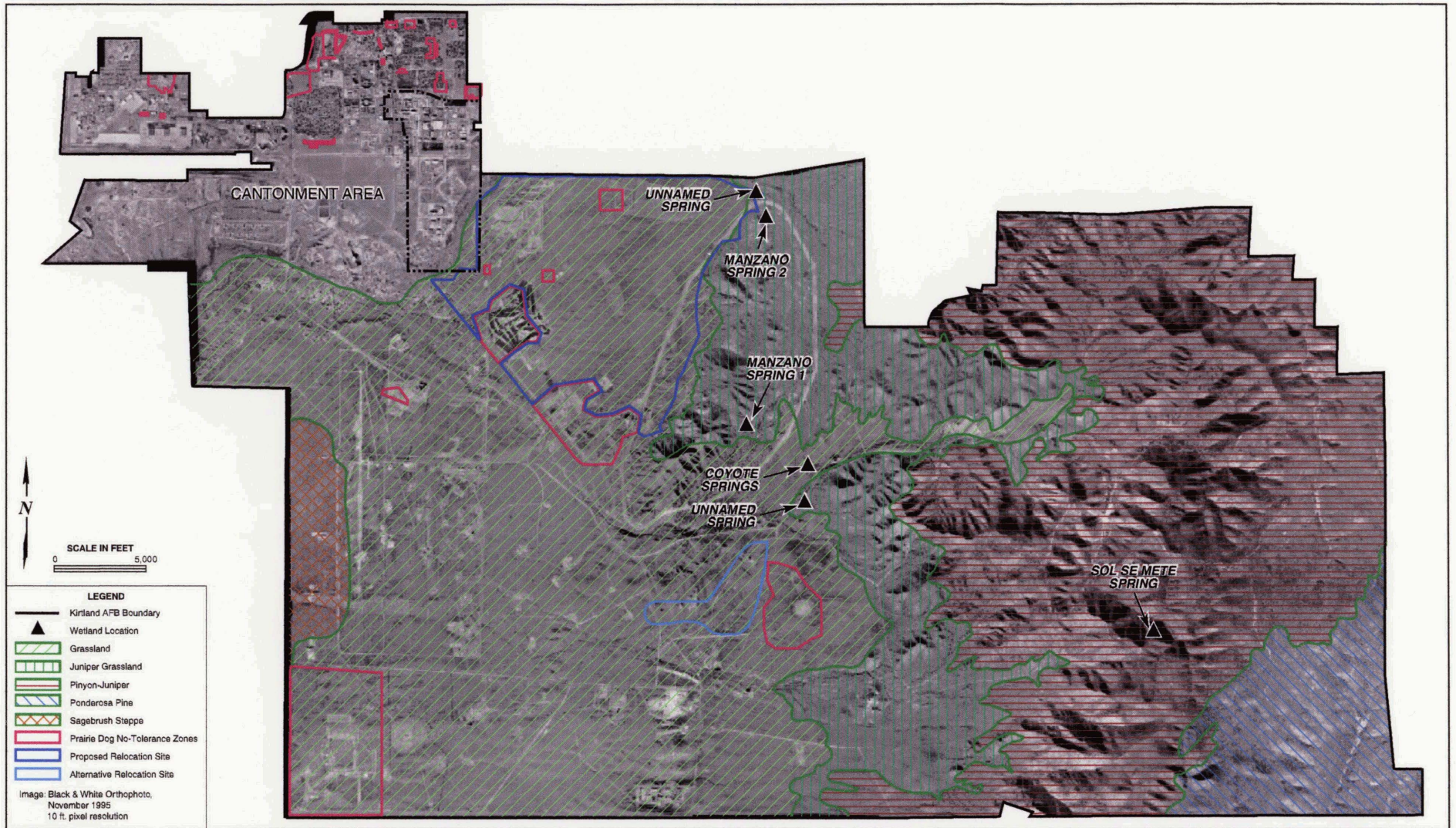
Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990, *Protection of Wetlands*. Wetlands are defined by the USACE (Federal Register 1982) and EPA (Federal Register 1980) as “those areas that are inundated or saturated by surface or groundwater 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), 1984).

3.6.2 Existing Biological Resource 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.

3.6.2.1 Vegetation

The vegetation scheme at Kirtland AFB consists of four main plant communities: grassland, piñon-juniper, ponderosa, and riparian/wetland/arroyo. Transitional areas are found between these communities and contain a mixture of representative species from the bordering areas. Two transitional zones have been delineated in the grassland community and include the juniper-grassland and sagebrush steppe. Both the grassland and piñon-juniper are the dominant vegetative communities at Kirtland AFB. The riparian/wetland/arroyo community is confined to isolated areas inundated by surface water during at least some part of the year. Only the grassland and piñon-juniper communities will be discussed as the Proposed Actions and relocations sites are either located on or near these vegetation associations. Native vegetation communities are shown in Figure 3-4.



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Native Vegetation and Wetland Locations on
Kirtland Air Force Base

FIGURE

3-4

The grassland community occurs between elevations of 5,200 and 5,700 feet in the southwestern and north-central portions of Kirtland AFB, although in some areas of the base it can be found as high as 6,900 feet. Vegetation typical of the grassland community at Kirtland AFB includes broom snakeweed (*Gutierrezia sarothrae*), Great Plains yucca (*Yucca glauca*), Indian ricegrass (*Oryzopsis hymenoides*), purple tree-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 trifurca*), New Mexican bitterweed (*Senecio neomexicanus*), ring muhly (*Muhlenbergia torreyi*), plains prickly-pear (*Opuntia polyacantha*), and bottlebrush squirrel tail (*Elymus longifolius*). The juniper-grassland transitional zone contains many of the same species as the surrounding grasslands but develops into a savanna type habitat with a presence of one-seeded juniper (*Juniperus monosperma*). All of the no-tolerance zones and both of the relocation sites are found in the grassland community.

Another important plant community found at Kirtland AFB is the piñon-juniper community. The piñon-juniper community ranges in elevation from 6,300 to 7,700 feet. This dominant plant community is composed of Colorado pinyon pine (*Pinus edulis*) and one-seeded juniper with an understory of grasses and shrubs including blue grama, side oats grama (*Bouteloua curtipendula*), banana yucca (*Yucca baccata*), alderleaf mountain mahogany (*Cercocarpus montanus*), and squawberry (*Rhus trilobata*). This plant community occurs primarily in the far eastern portions of Kirtland AFB and the Withdrawal Area. The eastern boundary of the proposed relocation site abuts the piñon-juniper association.

3.6.2.2 Wetlands

The USACE Albuquerque District has delineated wetlands on Kirtland AFB, including a description of waters of the US regulated pursuant to Section 404 of the CWA, and a restatement of the location of the 100-year floodplain determined in a 1979 study (USACE 1995). (Floodplains are discussed in Section 3.5, Water Resources.) There are no wetlands or riparian areas within the area of the proposed project. Two small springs and their associated wetlands are located approximately 200 meters from the northeast corner of the proposed relocation site. The nearest wetland to the alternative relocation area is found approximately 1 mile to the northeast of the site.

3.6.2.3 Wildlife

Wildlife communities at Kirtland AFB are typical of woodland and grassland types of habitat within the central New Mexico region.

Common birds associated with the grassland association at Kirtland AFB include horned lark (*Eremophila alpestris*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), American crow (*Corvus 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 grasslands include northern harrier (*Circus cyaneus*), western burrowing owl, 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 is the turkey vulture (*Cathartes aura*).

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*).

A variety of amphibians and reptiles are found within the grassland association. Many of these species have extensive periods of dormancy during dry conditions and rapid breeding cycles when temporary ponds occur after rains. Amphibians and reptiles found on the grasslands at Kirtland AFB include the Woodhouse 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*).

Much of the wildlife found in the grassland community also occurs in the piñon-juniper woodlands. Additional bird species found in the woodland association include the scrub jay (*Aphelocoma coerulescens*), white-breasted nuthatch (*Sitta carolinensis*), Downy woodpecker (*Picoides pubescens*), and sharp-shinned hawk (*Accipiter striatus*). Mammals known to inhabit the piñon-juniper community include the common porcupine (*Erethizon dorsatum*), black bear (*Ursus americanus*), rock squirrel (*Spermophilus variegatus*), mule deer (*Odocoileus hemionus*), and mountain lion (*Felis concolor*). Additional reptiles include the mountain patchnosed snake (*Salvadora grahamiae*) and the tree lizard (*Urosaurus ornatus*).

3.6.2.4 Threatened and Endangered Species

Thirty-two state and federally listed species could occur in Bernalillo County. Several state and federally listed species have the potential to occur on Kirtland AFB or within the Withdrawal Area. Federally threatened and endangered species are legally protected under the Endangered Species Act. In New Mexico, threatened and endangered animal species are protected by the New Mexico Wildlife Act. The NMEMNRD maintains listings of state threatened and endangered plants, which are protected under the New Mexico Endangered Plant Species Act. Table 3-2 lists species found in Bernalillo County and their potential for occurring on base or in the Withdrawal Area.

Of the seventeen species listed as threatened or endangered for Bernalillo County, seven of these species could not occur on Kirtland AFB or in the Withdrawal Area due to habitat restrictions. The federally endangered Rio Grande silvery minnow is found only within its critical habitat in the Rio Grande River. The state threatened neotrophic cormorant is attracted to large water bodies, such as Elephant Butte Reservoir in Sierra County, south of Kirtland AFB (NMDG&F 2001). Farther to the north, the neotrophic cormorant is only found along the Rio Grande River. No large water bodies that could attract neotrophic cormorants are located at Kirtland AFB. The state threatened common black-hawk occupies dense, well-developed riparian corridors along permanent streams and rivers (NMDG&F 2001). These habitats contain the necessary prey base to support this bird species. Surface drainages at Kirtland AFB are sporadic and do not contain water year round; therefore, well-developed riparian areas are not found at Kirtland AFB. The Bell's vireo a state threatened bird, prefers riparian habitats similar to that of the common black-hawk. This species prefers dense riparian corridors along permanent grassland streams (NMDG&F 2001). Permanent streams are not present

Table 3-2. Special Status Species, Bernalillo County

Common Name	Scientific Name	Status	Occurrence at Kirtland AFB	Occurrence Within Withdrawal Area	Habitat	Season	Behavior
FISH							
Rio Grande silvery minnow	<i>Hybognathus amarus</i>	FE, SE, PCH	No	No	AQ	AY	Breeds
REPTILES							
Texas horned lizard	<i>Phrynosoma cornutum</i>	FSC	Potential	Potential	G, PJ	AY	Breeds
BIRDS							
Neotrophic cormorant	<i>Phalacrocorax brasilianus</i>	ST	No	No	R, AQ	SP, SM	Breeds
White-faced ibis	<i>Plegadis chihi</i>	FSC	No	No			
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT, ST	Potential	Potential	G, PJ, P	SP, F	Transient
Northern goshawk	<i>Accipiter gentilis</i>	FSC	No	Potential	PJ, P	SP, SM, F	Transient, breeds in summer
Common black-hawk	<i>Buteogallus anthracinus anthracinus</i>	ST	No	No	R	SM	Breeds
Ferruginous hawk	<i>Buteo regalis</i>	FSC	Potential	Potential	G, PJ, P		
Whooping crane	<i>Grus americana</i>	FE, SE	No	No	G, R, AQ	W	Transient
Black tern	<i>Chlidonias niger surinamensis</i>	FSC	No	No			
Burrowing owl	<i>Athene cunicularia hypugaea</i>	FSC	Yes	Yes	G, PJ	SP, SM, F	Transient, nest in summer
Mexican spotted owl	<i>Strix occidentalis lucida</i>	FT, CH	Potential	Potential	PJ, P	AY	Transient, breeds in summer
White-eared hummingbird	<i>Hylocharis leucotis borealis</i>	ST	No	Potential	P	SM	Transient
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	FE, SE, CH	No	No	R	SP, SM, F	Breeds
Loggerhead shrike	<i>Lanius ludovicianus</i>	FSC	Yes	Yes	G, PJ, R	AY	Transient, nests in summer, winter resident
American peregrine falcon	<i>Falco peregrinus anatum</i>	ST	Potential	Potential	G, PJ, P	SP, SM, F	Transient
Bell's vireo	<i>Vireo bellii</i>	ST	No	No	R	SM	Breeds
Gray vireo	<i>Vireo vicinior</i>	ST	Potential	Yes	PJ	SP, SM	Transient, breeds in summer
Baird's sparrow	<i>Ammodramus bairdii</i>	ST	Potential	No	G, PJ	F	Transient

Table 3-2. Special Status Species, Bernalillo County (continued)

Common Name	Scientific Name	Status	Occurrence at Kirtland AFB	Occurrence Within Withdrawal Area	Habitat	Season	Behavior
MAMMALS							
Black-footed ferret	<i>Mustela nigripes</i>	FE	No	No	G, PJ	AY	Breeds
Spotted bat	<i>Euderma maculatum</i>	ST	No	Potential	R, PJ, P	SM	Transient
Western small-footed myotis bat	<i>Myotis ciliolabrum melanorhinus</i>	FSC	No	Potential	R	SM	Breeds
Yuma myotis bat	<i>Myotis yumanensis yumanensis</i>	FSC	No	No			
Occult little brown myotis bat	<i>Myotis lucifugus occultus</i>	FSC	No	No			
Long-legged myotis bat	<i>Myotis volans interior</i>	FSC	No	Potential	PJ, P	SM	Breeds
Fringed myotis bat	<i>Myotis thysanodes</i>	FSC	No	No			
Pale Townsend's big-eared bat	<i>Plecoyus townsendii pallescens</i>	FSC	No	No			
Big free-tailed bat	<i>Nyctinomops macrotis</i>	FSC	No	No			
Arizona black-tailed prairie dog	<i>Cynomys ludoficianus arizonicus</i>	C	No	No	G, PJ		
Pecos River muskrat	<i>Ondatra zibethicus ripensis</i>	FSC	No	No			
New Mexican jumping mouse	<i>Zapus hudsonius luteus</i>	ST	Potential	No	R	AY	Breeds
PLANTS							
Great Plains ladies'-tresses orchid	<i>Spiranthes magnicamporum</i>	SE	No	Potential	R, PJ	AY	Grows

Sources: New Mexico Department of Game and Fish 1999, New Mexico Department of Game and Fish 2002, New Mexico Natural Heritage Program 2002

Notes:

FE = Federal Endangered	ST = State Threatened	G = Grassland	AY = All Year
FT = Federal Threatened	FSC = Federal Species of Concern	PJ = piñon/Juniper	SP = Spring
C = Federal Candidate	PCH = Proposed Critical Habitat	P = Ponderosa	SM = Summer
SE = State Endangered	CH = Critical Habitat	R = Riparian	F = Fall

within the grasslands at Kirtland AFB. Lack of adequate riparian habitat also prevents the federally endangered southwestern willow flycatcher from occurring at Kirtland AFB. During a survey for southwestern willow flycatchers conducted in 1994 to 1996, this species was discovered in riparian habitat along the Rio Grande River near Albuquerque, but not at Kirtland AFB (USAF 1998).

The last two of the seven species that could not occur on Kirtland AFB due to habitat restrictions are the whooping crane and the black-footed ferret. The federally endangered whooping crane is only known in New Mexico from three experimental populations. The

populations that migrate through New Mexico primarily travel to the shores of the Gulf of Mexico (NMDG&F 2001). These birds are known to frequent riparian and aquatic habitats along the Rio Grande River, but are not known to occur at Kirtland AFB. The federally endangered black-footed ferret could occur within a 50-mile radius of Kirtland AFB, but it has never been reported in the area (USAF 1991). This species is presumed to be extirpated from Bernalillo County (NMDG&F 2001).

Two federal species of concern are known to occur at Kirtland AFB and the Withdrawal Area. The western burrowing owl inhabits the disturbed grasslands at Kirtland AFB and is typically associated with Gunnison's prairie dog towns. Burrowing owls have the potential to be found throughout Kirtland AFB but typically inhabit the disturbed grasslands surrounding Albuquerque's Sunport flight lines as well as other open areas about the cantonment area. Most burrowing owl nesting sites known to occur at Kirtland AFB are located about the cantonment area. The loggerhead shrike, another federal species of concern, is also commonly observed throughout Kirtland AFB. This species can be found throughout the grassland community as long as there is a shrub component present. It is a year round resident and likely breeds on base during the summer.

Nine of the threatened or endangered species listed for Bernalillo County occur, or have the potential to occur, at Kirtland AFB or in the Withdrawal Area. These species are: the bald eagle, Mexican spotted owl, American peregrine falcon, white-eared hummingbird, gray vireo, Baird's sparrow, spotted bat, New Mexican jumping mouse, and the Great Plains ladies'-tresses orchid. Further information on these species can be found in the Kirtland AFB Southern Perimeter Fence EA, Final December, 2002.

3.6.3 Environmental Consequences to Biological Resources

3.6.3.1 Significance Criteria

Determination of the significance of impacts to biological resources is based on: 1) the importance (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 proposed activities; and 4) the duration of ecological ramifications. Impacts to biological resources would be considered significant if species or habitats of high concern would be adversely affected over relatively large

areas, or disturbances would cause reductions in population size or distribution of a species of special concern.

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 to wetland resources are considered significant if high value wetlands would be adversely affected.

3.6.3.2 Proposed Actions

To minimize adverse impacts to nontarget biological resources (i.e. species other than Gunnison's prairie dogs), Kirtland AFB proposes to use nonlethal population control methods (i.e. soap and water foam, and live trapping) in a first attempt to remove prairie dogs from selected areas. After these methods are implemented, remaining prairie dogs would be fumigated with aluminum phosphide. This section describes potential impacts to biological resources (vegetation, wetlands, wildlife, and special status species) from implementation of the Proposed Actions as a whole, with discussions of only those removal methods that may affect the specific resource under consideration. This section also describes potential impacts from relocating prairie dogs to the prairie dog relocation site in the north-central portion of the base and subsequent fumigation of prairie dogs that reinhabit no-tolerance zones.

Vegetation

No-Tolerance and Buffer Zones. Vegetation in areas cleared of prairie dogs is expected to eventually undergo successional changes that have been prevented by selective grazing by the prairie dogs. Forbs (e.g., Russian thistle and globemallows), invasives (e.g., broom snakeweed), and other weedy species would continue to thrive for the first 2 to 4 years following removal of prairie dogs, but grasses would later reestablish in these areas (USAF 1999). Also, there would likely be a shift toward taller species. Studies indicate that these successional changes could take several years to occur (Fagerstone and Ramey 1996). Areas rendered devoid of vegetation by digging and other types of prairie dog activity would eventually become vegetated, thereby decreasing the erosion potential. Once prairie dogs are eliminated from the no-tolerance zones some areas may be revegetated following the guidelines in Kirtland AFB's Revegetation Action Plan, which

is currently being developed. This plan will describe proven techniques for revegetating sites previously inhabited by prairie dogs.

Removal Methods. Use of soap and water to capture prairie dogs would result in few, if any, adverse impacts to vegetation. Prairie dog colonies are sparsely vegetated and impacts to plants from truck tires or introduction of a nontoxic, biodegradable soap in and around burrows would be negligible. Best management practices would be implemented to minimize the chance that soapy water might flow away from the prairie dog colony. This is accomplished by ensuring the nozzle is in the burrow before water is turned on and through placement of hay bales to control runoff. Although some plants could be crushed if the water truck were driven off established roads, these impacts are expected to be negligible, especially since vegetation at these sites tends to be degraded already.

Live trapping of prairie dogs is not expected to affect the vegetation in the no-tolerance zones.

Fumigation used initially to clear no-tolerance and buffer zones of all prairie dogs and later to maintain these areas free from prairie dogs, is not expected to adversely impact vegetation. Plants do not absorb aluminum phosphide and fumigation would not leave harmful residues in the burrow (Paynter 2003; Fagerstone 1997). Application of aluminum phosphide leaves residual aluminum hydroxide, a dust that is nonhazardous to plants (Paynter 2003).

Relocation Site. Before prairie dogs are released, vegetation would be mowed at the relocation site. Following the initial mowing and the subsequent maintenance activities by prairie dogs, vegetation at the prairie dog relocation site would undergo successional changes. Vegetation at the relocation site would change to forbs, short grass species, and other shorter types of vegetation.

Minor degradation of the area's vegetation could result from augering holes and transporting prairie dogs to the holes. Digging and other prairie dog activity would render some portions of the prairie dog town devoid of vegetation, increasing the potential for insignificant to minor erosion.

Wetlands

No-Tolerance and Buffer Zones. Removal of prairie dogs from no-tolerance zones is not expected to affect wetlands. No wetlands or springs occur near any of the no-tolerance zones. Coyote Springs is the closest wetland to a no-tolerance zone; it is located approximately 1 mile north of the EOD Range (refer to Figure 3-4). Currently, no prairie dogs occur near the EOD Range; therefore, any fumigation measures used would be limited to isolated prairie dogs that gained access to the site.

Removal Methods. Use of soap and water to capture prairie dogs in the no-tolerance zones would not adversely impact wetlands. As described above, no wetlands or springs occur near any of the no-tolerance zones. Soapy water is not expected to migrate to the Coyote Springs wetland over flat terrain since the volume of water involved would soak into the ground, well before it reached the wetland.

Relocation Site. Two springs are located near the northeast border of the proposed prairie dog relocation site (refer to Figure 3-4). These springs are surrounded by piñon-juniper habitat, which is not typically occupied by prairie dogs. Additionally, the soils surrounding the springs are rocky and not conducive for burrowing, thus not allowing prairie dogs to colonize the area. Increased erosion from water due to ground disturbance by prairie dogs within the prairie dog relocation site would not impact the spring because the relocation site is downslope of the springs (US Geological Survey 1990a, c).

Wildlife

No-Tolerance and Buffer Zones. Local wildlife composition may change in response to the elimination of prairie dogs from portions of Kirtland AFB. Species that rely heavily on prairie dogs as prey, such as the red-tailed hawk, would likely forage less in the no-tolerance zones (USAF 1999). Opportunistic species, such as the coyote, may remain in the area and feed on other prey items (USAF 1997). Other wildlife species inhabiting prairie dog towns include the horned lark, western meadowlark, mourning dove, northern harrier, and badger (Hoogland 1995). These species also occur in areas not occupied by prairie dogs and, therefore, are not expected to abandon the area following elimination of prairie dogs. Under natural conditions, periodic outbreaks of plague can render areas free of prairie dogs for several years, resulting in the same habitat changes expected to occur following the Proposed Actions. Even those species dependent upon prairie dogs are not

expected to abandon the base because prairie dogs would still be present at the proposed relocation site and elsewhere on and around Kirtland AFB. Therefore, adverse impacts to wildlife are expected to be insignificant.

Removal Methods. Rabbits, snakes, lizards, and other wildlife occupying prairie dog burrows could drown from application of soap and water. Many invertebrates would drown in the flooded burrows, as well. Small mammals that get water in their lungs could contract pneumonia. The risk of hypothermia would be minimized by not using this method during cold weather. Because of the relatively small numbers of animals potentially affected, adverse impacts to local nontarget animal populations are expected to be negligible.

Some nontarget animals or prairie dogs may accidentally be killed or injured during live trapping. Prairie dogs, rabbits, skunks, and other animals could be injured or may die from exposure while in traps. Due to the small numbers of animals potentially affected, adverse impacts to local nontarget animal populations are expected to be insignificant. The number of animals affected would be minimized through proper maintenance and regular checking of traps and by using personnel experienced in live trapping techniques.

Fumigation with aluminum phosphide kills all wildlife in the tunnel system (Hygnstrom and Virchow 1994; Paynter 2003). Fumigation would adversely affect localized populations of wildlife inhabiting prairie dog burrows such as rabbits, skunks, reptiles, and invertebrates. Because many of these species exhibit a relatively high reproductive rate, and since these species also occupy nearby areas on and off base that are not colonized by prairie dogs, adverse impacts to wildlife populations, with the exception of prairie dogs, are not expected to be long-term.

Aluminum phosphide is an effective poison that kills primarily through inhalation (Degesch no date; Paynter 2003). The gas migrates slowly through the soil and dissipates gradually into the atmosphere, leaving aluminum hydroxide, a nonhazardous residual dust, and trace amounts of uncreative aluminum hydroxide. Aluminum phosphide does not persist in the food chain (Paynter 2003). Although secondary poisoning of a predator or scavenger is possible, it is unlikely for the following reasons (Paynter 2003; Knight 1996). Prairie dogs killed by aluminum phosphide generally remain in burrows, thereby eliminating the potential threat to above-ground carnivores. Prairie dogs that do find their way to the surface would be exposed to fresh air and may recover, and would pose

no threat to nontarget species (Degesch no date; Paynter 2003). If a prairie dog happens to die above ground, the toxic gas rapidly dissipates from the body. A scavenger or predator could be harmed only if it consumed a prairie dog soon after the prairie dog was exposed to the aluminum phosphide (Paynter 2003).

Depending on a number of conditions (soil moisture, temperature, concentration of fumigant, and humidity) many of the fleas (adults, larvae, and pupae) and flea eggs also may be killed by aluminum phosphide (Paynter 2003). Fumigation could provide a beneficial impact to local wildlife by eliminating or reducing the number of plague-carrying fleas in the no-tolerance zones.

Relocation Site. Relocating prairie dogs to the north-central portion of Kirtland AFB would mitigate some of the adverse population impacts resulting from the elimination of prairie dogs elsewhere on base. Species wholly or partially dependent on the prairie dog ecosystem (i.e. burrowing owls) would benefit from establishing a prairie dog colony in this location. For example, the relocation site would provide an additional prey base for raptors, badgers, coyotes, and other predators. Just as under natural conditions, this site may periodically become infected with plague, which could cause adverse impacts to local wildlife populations. Prairie dogs would be dusted for fleas before being released to prevent the introduction of plague into an established colony.

Although the proposed relocation site is primarily open grassland, it is also used to test unmanned robotic vehicles that resemble dune buggies. Following release of prairie dogs at the relocation area, robotic vehicle testing would continue. Since these vehicles are relatively lightweight and prairie dog burrows initially descend vertically, prairie dogs in their burrows would be unaffected if the burrows were driven over during testing. Prairie dogs are constantly alert to predators and intruders, therefore, collisions between the vehicles and prairie dogs are unlikely.

Special Status Species

The burrowing owl is the only sensitive species potentially impacted by the Proposed Actions. None of the other special status species potentially occurring at Kirtland AFB would be adversely affected by the Proposed Actions. Although they could occur in grassland habitat, peregrine falcons and loggerhead shrikes do not feed on prairie dogs and are not commonly associated with prairie dog towns. Bald eagles and ferruginous

hawks are known to feed on prairie dogs; however, the Proposed Actions involve relocating prairie dogs to a more favorable foraging area and are not expected to result in a marked decrease in the base's prairie dog population. Also, since none of these raptors have been observed on Kirtland AFB, these species are obviously not dependent on the prairie dog population there.

To avoid adversely impacting the mountain plover, a proposed federally threatened species, personnel trained in mountain plover identification would check each area prior to initiation of relocation activities. If a mountain plover is found in an area that may be affected by the Proposed Actions, the USFWS would be contacted immediately for further instruction.

No-Tolerance and Buffer Zones. The species most likely to be affected by the Proposed Actions is the burrowing owl. Prairie dogs provide nest sites for these owls and removing them from the area would prevent them from creating additional burrows in the future. Although holes used by the owls would remain open even after the fumigation effort, these burrows would eventually collapse in rendering them unusable. To compensate for these collapsed holes, artificial owl burrows may be created in areas currently or previously occupied by burrowing owls. Burrowing owls displaced by successional changes resulting from elimination of prairie dogs in no-tolerance zones are expected to gradually relocate to other nearby prairie dog towns and could inhabit vacant burrows at the relocation site.

Removal Methods. Burrowing owls could be killed or injured by each of the lethal and nonlethal prairie dog removal methods. If any of the removal activities occur between March 1 and October 31, the affected prairie dog towns would first be surveyed for burrowing owls. If burrowing owls were discovered in any of the no-tolerance zones, measures would be implemented to avoid harming the owls. Soap and water application and fumigation would not be used in areas where owls are present. Fumigation would be restricted to areas greater than 150 feet away from any hole being used by a burrowing owl as this is the minimum distance required to avoid accidental fumigation. Live trapping would be closely monitored to ensure the immediate release of trapped owls. Burrows occupied by burrowing owls would not be plugged so that they might return the following year and continue to use the site. As a result, burrowing owls are not expected to be adversely affected by any of the removal methods.

Relocation Site. Burrowing owls occupied the relocation site in 1998 and currently continue to use the site (personal observation, Frei 2003). After the relocated prairie dogs become established in this area, it is possible that more burrowing owls could inhabit this site. To facilitate burrowing owl occupation of the relocation site, artificial owl burrows may be created throughout the area.

3.6.3.3 Alternative Relocation Site

Implementation of this alternative would affect biological resources in much the same manner as the Proposed Actions addressed above. Although the alternative relocation site is less than half the size of the proposed relocation site, the area is large enough to accommodate the prairie dogs presently occupying the no-tolerance zones. No wetlands are located near the alternative relocation site.

3.6.3.4 No-Action Alternative

A previous EA found no evidence of significant environmental impacts when base personnel fumigate prairie dogs on an as-needed basis (USAF 1997). Implementation of the No-Action Alternative would continue to fumigate prairie dogs and therefore, would not likely result in changes to biological resources from current conditions. If prairie dogs were not adequately controlled, however, the No-Action Alternative could result in adverse impacts to biological resources in the no-tolerance zones. Vegetation (including ornamentals planted throughout the base) would continue to be clipped short by prairie dogs. If prairie dogs were to expand into the EOD Range, animals associated with prairie dog towns (including burrowing owls) may be killed or injured by exploding ordnance.

3.6.3.5 Other Future Actions on the Base

No impacts to biological resources would occur from the Proposed Actions addressed in this document. Therefore, the cumulative effects of the Proposed Actions, when considered with potential disturbances to biological resources from other future actions, are not expected to have a significant cumulative negative impact on biological resources in the area.

3.7 CULTURAL RESOURCES

3.7.1 Definition of Cultural Resources

Historic properties (i.e. significant cultural resources) are classified as buildings, sites, districts, structures, or objects. A building is created to shelter any form of human activity. A structure is distinguished from a building in that it is a construction designed for purposes other than creating human shelter. Objects are constructions that are primarily artistic in nature or are relatively small and simply constructed. A site is the location of a significant event, a prehistoric or historic activity, or a building or structure whose location possesses value. A district is a concentration or linkage of sites, buildings, structures, or objects that are united historically or aesthetically by plan or development.

The criteria for establishing significance are set forth in Title 36 CFR Part 60.4. Procedures for the application of the National Register criteria for evaluation are found in various National Park Service bulletins. These bulletins provide guidelines so that decisions concerning significance, integrity, and treatment can be reliably made.

3.7.2 Existing Cultural Resource Conditions

Records available through the New Mexico Cultural Resources Inventory System administered by the Archaeological Resources Management Section were queried for current information regarding previous studies and known cultural resources within the proposed and alternative prairie dog relocation areas. Over 500 historic and prehistoric cultural resources are known to exist on Kirtland AFB. These include historic buildings, structures, and sites dating from European contact, ca. AD 1540, through the Cold War, ca. AD 1945-1991. Prehistoric sites dating from the Paleo-Indian Period to the Pueblo Period have been recorded.

3.7.2.1 Proposed Actions

Four major archaeological studies have been completed in the vicinity of the proposed prairie dog relocation area. These surveys found a total of 20 historic and prehistoric archaeological sites located within the proposed relocation area, 10 of which have been recommended as eligible for inclusion in the National Register of Historic Places

(Sullivan et al. 2002). These sites are concentrated primarily in the northern and western portions of the area.

3.7.2.2 Alternative

Two archaeological inventories have been completed that include the alternative prairie dog relocation area. The Center for Anthropological Studies (Rogers 1980) completed an intensive archaeological survey of a second portion of Kirtland AFB. The project area included 3,955 acres. Fifty-nine isolated loci and 12 archaeological sites were recorded that collectively represent a cultural history of about 10,700 years, although none of those sites were within the proposed relocation site. Eleven of the sites were recommended as eligible for the National Register.

The recent study by Sullivan et al. (2002) also encompassed this area. This study recorded 11 previously unrecorded sites, located primarily in the western portion of the alternative relocation area, 10 of which have been recommended eligible for inclusion in the National Register of Historic Places.

3.7.3 Environmental Consequences to Cultural Resources

3.7.3.1 Significance Criteria

The National Historic Preservation Act of 1966, as amended, establishes the National Register of Historic Places and Title 36 Code of Federal Regulations Section 60.4 defines the criteria used to establish significance and eligibility to the National Register.

3.7.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Removal of prairie dogs from the no-tolerance zones would not affect cultural resources in the area.

Removal Methods. Fumigation or prairie dog trapping efforts within the no-tolerance zones would not affect cultural resources.

Relocation Site. Augering and release of prairie dogs in the relocation site would adversely impact cultural resources if the proper controls are not implemented.

Archaeological resources exist in the northern and western portions of the relocation area. Colony relocation sites would be chosen so that augering does not impact archaeological resources.

Archaeological resources can be impacted by bioturbation if the proper controls are not implemented. Bioturbation refers to physical or biological activities (e.g., burrowing) that can cause mixing of sediments. This is a common problem at archaeological sites and the introduction of prairie dogs to sites would adversely impact the sites, unless they are protected.

Archaeological sites would be treated as no-tolerance zones in order to protect them. Prairie dog colonies would be located away from archaeological sites so that burrowing activities would not impact the sites. Further, expansion or movement of the colonies would be monitored to preclude encroachment upon archaeological sites. If potential encroachment is identified, fencing similar to that proposed for the north security fence and the Antennae Array would be placed as a barrier at the sites.

3.7.3.3 Alternative Relocation Site

Impacts to cultural resources from removal of prairie dogs in the no-tolerance zones and relocation of these animals to the alternative site would be identical to those described for the Proposed Actions. Placement of the auger holes and prairie dog colonies would result in adverse impacts if the proper measures are not implemented.

Ten archaeological sites are located in or near the western portion of the alternative relocation area. If this alternative is selected, the colonies would be relocated to within the eastern and northern portions of the area and monitored for potential encroachment.

3.7.3.4 No-Action Alternative

No changes to cultural resources would result from selection of the No-Action Alternative.

3.7.3.5 Other Future Actions on the Base

No impacts to cultural resources would occur from the Proposed Actions addressed in this document. Therefore, the cumulative effects of the Proposed Actions, when considered with potential disturbances to cultural resources from the other future actions, are not expected to have significant cumulative negative impacts.

3.8 ENVIRONMENTAL MANAGEMENT

3.8.1 Definition of Environmental Management Activities

Environmental management activities at Kirtland AFB include the treatment and/or disposal of sanitary sewage, municipal solid waste, and industrial waste, including hazardous waste. In addition to the activities related to currently generated waste, the IRP is intended to identify, confirm, quantify, and remediate problems caused by past management of hazardous wastes at USAF facilities.

Hazardous wastes are defined as any solid, liquid, semisolid, or gaseous waste, or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment.

To protect people and habitats from inadvertent and potentially harmful releases of hazardous substances, the Department of Defense (DoD) has dictated that all facilities develop and implement Hazardous Waste Management Plans or Spill Prevention, Control, and Countermeasure Plans. Also, the DoD has developed the IRP, intended to facilitate thorough investigation and cleanup of contaminated sites located at military installations. These plans and programs, in addition to established legislation (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] of 1980) are intended to protect the ecosystems on which living organisms depend.

3.8.2 Existing Environmental Management Conditions

IRP sites located within 1,000 feet or within the buffer zones of the Proposed Actions sites are listed below.

There are six IRP sites that are potentially located within the proposed relocation area. These include Landfill Nos. 4, 5, 6, Interim Corrective Measure (ICM) Radioactive Training Areas, Sewage lagoons and Golf Course Pond, Radioactive Burial 11, Manzano Sewage Treatment Facility, and the Manzano AFB Landfill.

IRP Site 8: Landfill Nos. 4, 5, 6. This site is located in the northwest region of Kirtland AFB, within the proposed prairie dog relocation area. It is approximately 76 acres. Prairie dogs do not currently inhabit this site. In 2002, a supplemental assessment was conducted. Examination of the site included mapping, active and soil gas surveying, test pit excavation and risk evaluation. Soil samples taken at the site showed methane along the southern portion of the site (former Landfill 4). Volatile Organic Compound (VOC) concentrations sampled less than residential soil-screening levels. Trichloroethane and tetrachloroethane concentrations exceeded screening levels for groundwater. It was noted that the probability of these contaminants leaching to groundwater was low because of limited infiltration (USAF [In Press]).

IRP Site 9: Interservice Nuclear Weapons School (INWS) Radioactive Training Areas. This site is located in the northwest portion of the base and south of the solid waste dump. There are four active training areas and four inactive training areas. Inactive training areas 5–8 are considered high risk. The entire area encompassing all of the training areas occupies approximately 43.2 acres. There are approximately 9.4 acres of this site that are contaminated with thorium oxide sludge at levels above the derived concentration guideline level (DCGL). The concentrations of thorium oxide sludge are limited to the area of the training sites and surveys of the areas show no contamination into surface water drainages. There are approximately 25,779 cubic yards of soils that are radiological contaminated above the DCGL and site characterization data show that the thorium-contaminated soil represents high levels of risk to human health (USAF [In Press]). In August 2002, a Decommissioning Plan was created and includes excavating and packaging contaminated soil, vegetation, and debris, and transporting waste to a Nuclear Regulatory Commission (NRC) licensed radioactive waste disposal facility. The plan is pending the approval of the NRC. The decommissioning activities will be finalized once final status surveys, and closure reports are completed and the NRC approves the final status surveys (USAF [In Press]).

IRP Site 10: Main Golf Course Pond and Sewage Lagoons. The sewage lagoons and golf course pond is located in the northwest area of the Tijeras Arroyo Golf Course

within the golf course no-tolerance zone. Prairie dogs are present in the vicinity of this site. In 1998, elevated levels of chromium, nitrate, and gross alpha were found in groundwater. Nitrate/nitrites were detected above action levels in all wells. Three organic compounds were detected in three wells at low levels: chloroform, trichloroethylene, and toluene (USAF 1999b). This site was listed as post-closure and underwent an ICM plan to treat nitrate-contaminated groundwater. An exception was obtained from the required discharge permit from the Groundwater Quality Bureau. A recovery well and liner have been installed (USAF 1999b). Groundwater monitoring continues at this site including water level measurements and sampling. Post closure reporting continues at this site (USAF 2000).

IRP Site 11: Radioactive Burial 11. Located in the northwest portion of the base. It is within the southwest quadrant of the riding club area. Groundwater monitoring of this site began in December 1999. The site is monitored for VOCs, groundwater quality parameters (chloride, iron, manganese, phenols, sodium, and sulfate), contaminant indicator parameters (conductivity, potential of hydrogen, total organic compound and total organic halogens, as well as parameters that are listed in Appendix III of 40 CFR Part 265. An ecological assessment has been completed for this site. A Corrective Measures Study report has also been completed. In 2000, Trichlorofluoromethane, a VOC was detected in low levels. Monitoring in March and September 2002 did not show any releases of VOCs (USAF [In Press]). Analytical results from this site including groundwater results show that all constituents including VOCs, semi-volatile organic compounds (SVOCs), mercury and cyanide concentrations were below applicable action levels and below the New Mexico Solid Waste Management Regulations groundwater standards, respectively. Gross alpha and beta concentrations were shown to have elevated concentrations and radioactive nuclide data collected show the potential doses and cancer risk at this site do not exceed EPA guidelines (USAF [In Press]).

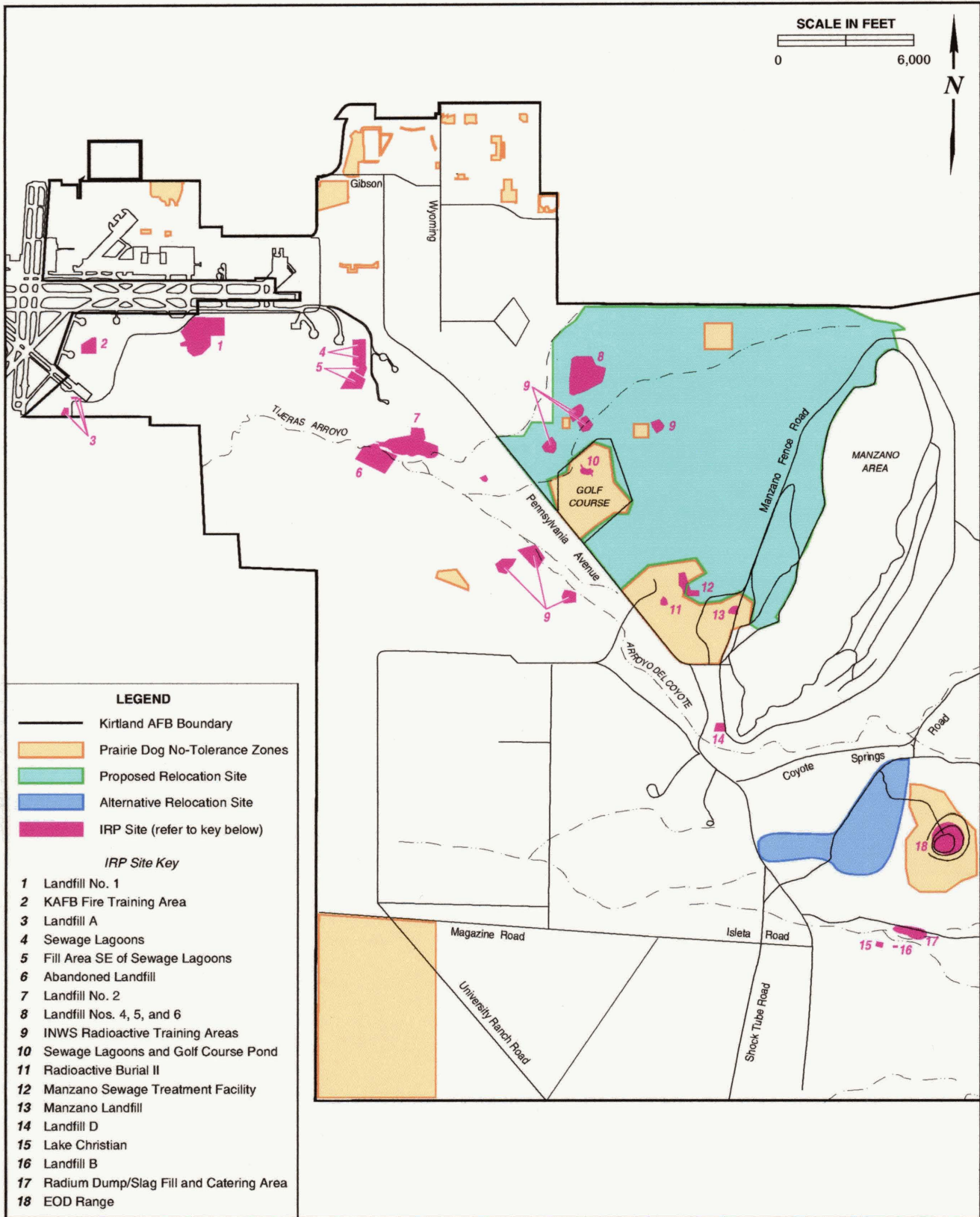
IRP Site 12: Manzano Sewage Treatment Facility. This site is located in the central portion of Kirtland AFB adjacent to the Riding Club. It occupies approximately 22 acres. In 1996, a Phase II Resource Conservation & Recovery Act (RCRA) Facility Investigation was conducted for sampling of the site. Soil samples analyzed showed that concentrations of VOCs, SVOCs, target analyte list (TAL) metals, pesticides, and poly chlorinated biphenyls were below EPA Region 6 human health media-specific screen levels for residential soil ingestion. One pesticide (4,4 dichlorodiphenyldichloroethylene) and two metals (beryllium and manganese) were above the EPA screening levels. These

two metals naturally occur at Kirtland AFB in high concentrations. The 1996 ICM removed hazards from the Imhoff tank and sludge drying bed, as well as all hydrocarbon-contaminated waste. All disturbed areas have been reseeded with native grasses at this site (USAF [In Press]).

IRP Site 13: Manzano Landfill. This site is located in the central portion of the base within the fenced cantonment area in the southwest corner of the mixed waste storage area. This site is approximately 11 acres. During the 2002 Supplemental Assessment, samples were taken and analyzed for VOCs, SVOCs, TAL metals, high explosives, gross alpha and beta, and gamma spectroscopy. Samples exceeding the New Mexico Environmental Department DAF-20 levels included one VOC, chloromethane, one SVOC, pyrene and metals including aluminum, beryllium, cobalt, iron, Pb, magnesium, and vanadium. The risk ratio calculated showed 0.22 noncarcinogenic, and 0.16 carcinogenic. Groundwater monitoring in March and September 2002 indicated high levels of nitrate and low-levels of VOCs. Some of which may have come from application of fertilizer and irrigation. A down gradient well was planned for installation during fiscal year 2003. This well would monitor the source of trichloroethylene and elevated nitrates in Kirtland's regional aquifer. Annual sampling was recommended for this site for a 5-year period (USAF [In Press]).

The Alternative Relocation Site is within 1,000 feet of the EOD Range IRP site. This site is located in the southeastern portion of Kirtland AFB, and is southeast of the Manzano area, and north of the Starfire Optical Range. The EOD Range has a radius of 2,500 feet. The area surrounding the range is mostly a buffer zone. In 1996, contaminated soil at this site was removed and replaced with clean soil. Currently, discussions are going on with the New Mexico Environmental Department to have the site removed from the RCRA Part B permit (USAF 1997).

The IRP at Kirtland AFB forms the basis for assessment and response actions under the provisions of CERCLA. As of March 2002, 77 IRP sites and 15 Areas of Concern had been identified at the base (Sillerud 2002). Figure 3-5 shows the IRP sites in and around the no-tolerance zones and the prairie dog relocation and alternative relocation area.



NOV 2003

FIGURE

EA

**Active Installation Restoration Program Sites
Kirtland Air Force Base**

3-5

3.8.3 Environmental Consequences to Environmental Management

3.8.3.1 Significance Criteria

Numerous local, state, and federal laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect public health and the environment. The significance of potential impacts associated with hazardous substances is based on toxicity, ignitability, reactivity, and corrosivity. Generally, impacts associated with hazardous materials and wastes would be considered significant if implementation of a proposed action would involve the storage, use, transportation, or disposal of hazardous substances that would substantially increase human health risks or environmental exposure. For example, if implementation of a proposed action would exacerbate conditions at an existing area of contamination associated with an IRP, impacts would be considered significant.

A reduction in the quantity of hazardous substances used and/or generated would be a beneficial impact: a substantial increase in the quantity and/or toxicity of hazardous substances used or generated could be potentially significant. Significant impacts would result if a substantial increase in human health risks and/or environmental exposure were generated and such impacts could not be mitigated to acceptable local, state, and federal levels.

3.8.3.2 Proposed Actions

No-Tolerance and Buffer Zones. Numerous active IRP sites are located within the no-tolerance zones. If prairie dogs are found within an active IRP site, base personnel would determine whether prairie dogs can be relocated without risk to human health and safety from contaminants. This decision would be made based on the degree and type of contamination at the site.

Removal Methods. Use of nonlethal and lethal prairie dog control measures would not affect environmental management activities. The Proposed Actions would result in application of pesticides already used on base. Only licensed certified pesticide applicators and entomology staff under the direct supervision of a certified pesticide applicator would conduct application of aluminum phosphide. Although fumigation involves the release of toxic gas inside the burrow systems, burrow entrances are sealed

off and the gas slowly migrates through the soil, breaks down into harmless by-products and dissipates gradually into the atmosphere.

Relocation Site. Six of the active IRP sites on base (Landfill Nos. 4, 5, 6, INWS Radioactive Training Areas, Sewage Lagoons and Golf Course Pond, Manzano Sewage Treatment Facility, Manzano Landfill, and Radioactive Burial 11) occur within the relocation site. Mitigation measures, such as constructing barriers around these areas, would prevent adverse impacts to environmental management activities.

3.8.3.3 Alternative Relocation Site

Impacts to environmental management activities from use of the alternative relocation site would be similar to those described for the Proposed Actions. There is one IRP site (EOD Range) located adjacent to the alternative relocation site. Mitigation measures similar to those suggested for the Proposed Actions would prevent adverse impacts to environmental management activities.

3.8.3.4 No-Action Alternative

Implementation of the No-Action Alternative would result in no changes to environmental management activities from current conditions.

3.8.3.5 Other Future Actions on Base

There are no currently planned or anticipated future actions at Kirtland AFB that would affect or be affected by the Proposed Actions assessed in this document. As a result, no cumulative impacts to environmental and human resources are anticipated to occur from these actions.

SECTION 4
PERSONS AND AGENCIES CONTACTED

Steve Anderson
Wildlife Biologist
New Mexico Department of Game and
Fish

Jon Boren
Wildlife Specialist
New Mexico State University

Dr. Ben Brown
Animas Foundation/Gray Ranch

Valerie Butler
377 MSG/CEVQ
Cultural Resources Management
Kirtland AFB

Carol Finley
Wildlife Biologist
Environlogical Services Inc.

Andrew Frye
Albuquerque Environmental Health
Dept./Air Quality Division
City of Albuquerque

Cynthia L. Gooch
Chief, Environmental Quality
377 MSG/CEVQ
Kirtland AFB

Susan Gregory
NEPA Program Manager
377 MSG/CEVQ
Kirtland AFB

Johnny Jacobs
Entomologist
Chugach Environmental

Carl Lanz
Restoration Branch Chief
Restoration Program Branch
377 ABW/EM

Dustin Long
Prairie Dog Relocator
Turner Ranch Foundation

Paula Martin
Prairie Ecosystem Conservation Alliance

Maureen Murphy
Wildlife Biologist
US Fish and Wildlife Service

Mike Paynter
Degesch America, Inc.

Gary Romer
New Mexico State University

Stephanie Salinas
Wildlife Biologist
US Department of Energy

Joe Truett
Prairie Dog Relocator
Turner Ranch Foundation

Linda Watson
Prairie Dog Specialist

Dr. Gary Witmer
Wildlife Biologist
US Department of Agriculture

SECTION 5
LIST OF PREPARERS

This report was prepared for and under the direction of the 377th Air Base Wing Command of Kirtland Air Force Base by the LOPEZGARCIA GROUP. The members of the professional staff of the LOPEZGARCIA GROUP who participated in the development and technical review of this document are listed below.

<u>Preparers</u>	<u>Education</u>	<u>Environmental Experience</u>
Walter L. Moore Manager Colorado/ New Mexico Operations	<i>B.S., Zoology</i>	<i>23 years</i>
Robert D. Frei Environmental Scientist/ Biologist	<i>B.S., Biology</i>	<i>5 years</i>
Kristine J. Andrews Environmental Scientist/ Noise Analyst	<i>B.A., Geography/ Environmental Studies and Energy Science</i>	<i>5 years</i>
Rebecca L. Klundt Document Editor and Preparer	<i>Document Manager</i>	<i>6 years</i>
Deirdre Stites Technical Illustrator	<i>A.S., Geology</i>	<i>23 years</i>

SECTION 6
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