PERMIT ATTACHMENT 1: GENERAL FACILITY INFORMATION

1.0 INTRODUCTION

This Attachment presents a general description of the Open Burn (OB**)** and Open Detonation (OD) Units, which are located at the Kirtland Air Force Base's (KAFB's) Explosive Ordnance Disposal (EOD) Range. It also presents the general waste management practices for wastes treated at the Open Burn Unit and Open Detonation Unit. The following subject areas are addressed herein:

(a) A general description of KAFB (the Facility) and the EOD Range, and a description of the Open Burn Unit and Open Detonation Unit.

(b) Traffic patterns, volume, and control.

(c) Location information on seismic standard and floodplain standard requirements.

(d) Topographic map requirements.

(e) Additional information requirements.

(f) The geology, hydrology, meteorology, fauna and flora found at the Facility.

1.1. GENERAL DESCRIPTION OF THE FACILITY

The KAFB Facility, which is owned and operated by the U.S. Department of Defense, is located adjacent to the city of Albuquerque in Bernalillo County, north-central New Mexico. The Facility comprises an area of approximately 52,233 acres (about 82 square miles). The regional location of KAFB is shown on Figure 1-1. The central mission of KAFB is the administration of defense programs for the U.S. Department of Defense.

The EOD Range (the collective name for the Open Burn Unit and Open Detonation Unit) is located in the south-central portion of the KAFB Facility. It is southeast of the former Manzano Base, east of Demolition Range Road, and approximately two miles north of the southern perimeter of KAFB (Figure 1-2). The EOD Range occupies generally flat, gently west-sloping land located between the Rio Grande Valley to the west and the base of the Manzano Mountains to the east. The nearest major surface water body is the Rio Grande, located about 10 miles west of the EOD Range.

1.2. DESCRIPTION OF THE OB/OD TREATMENT UNITS

The Open Burn Unit and Open Detonation Unit are used to treat (i.e., by open burning or detonation) reactive (D003) and ignitable (D001) hazardous wastes, such as Explosive Wastes including damaged, defective, expired, and unserviceable munitions; and explosive-contaminated wastes. These waste types are typically generated during mission and research and development activities. Other reactive and ignitable hazardous wastes are also treated that contain metals and organic compounds. Tables 4-1 and 4-2 of Attachment 4 of this Permit list the wastes authorized for treatment at the Open Burn Unit and Open Detonation Unit.

Hazardous wastes treated at the Open Burn Unit and Open Detonation Unit are mostly in solid form; however, on occasion, wastes in liquid form (e.g., picric acid) may be treated at these

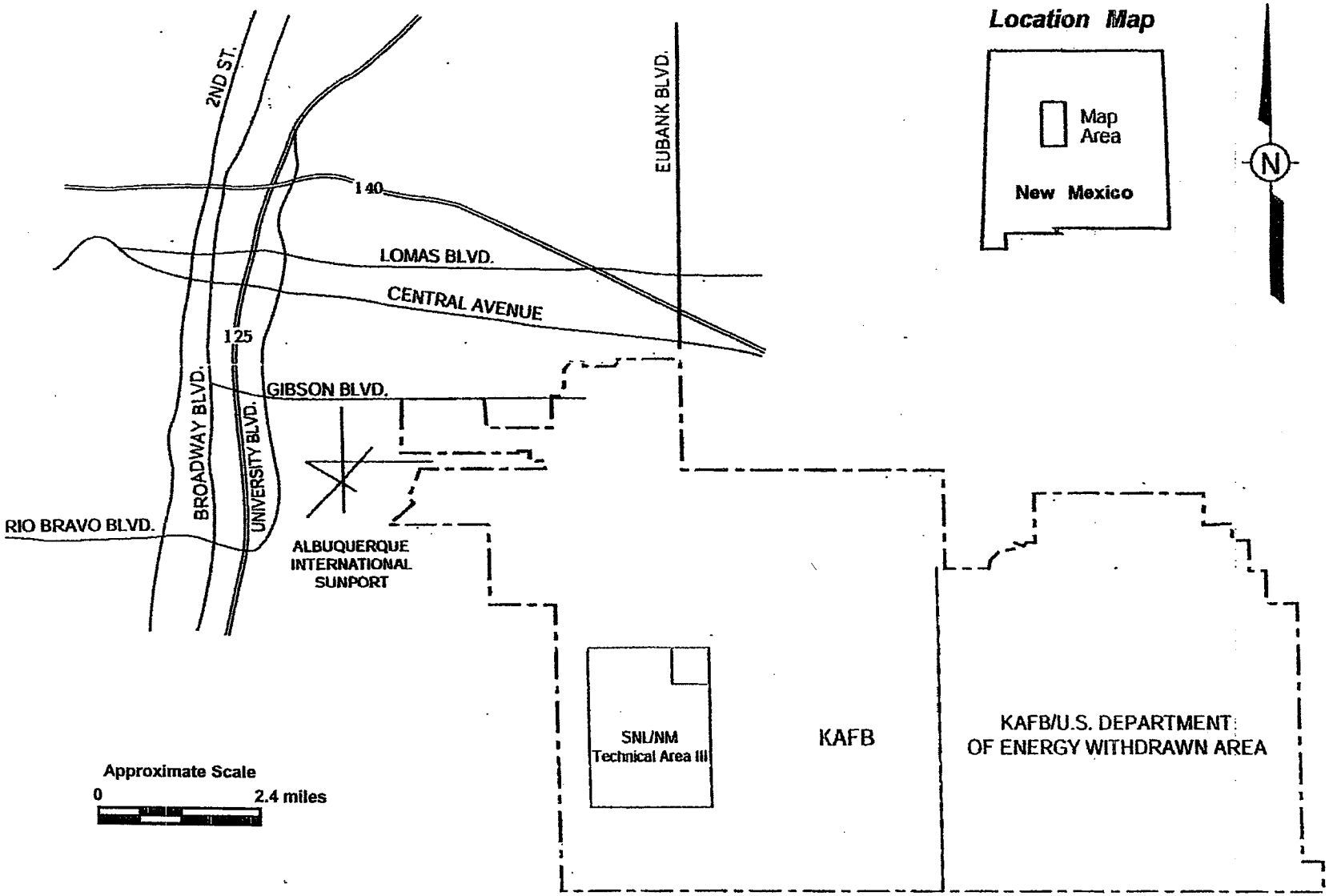

FIGURE 1-1
Regional Location of Kirtland Air Force Base (KAFB)

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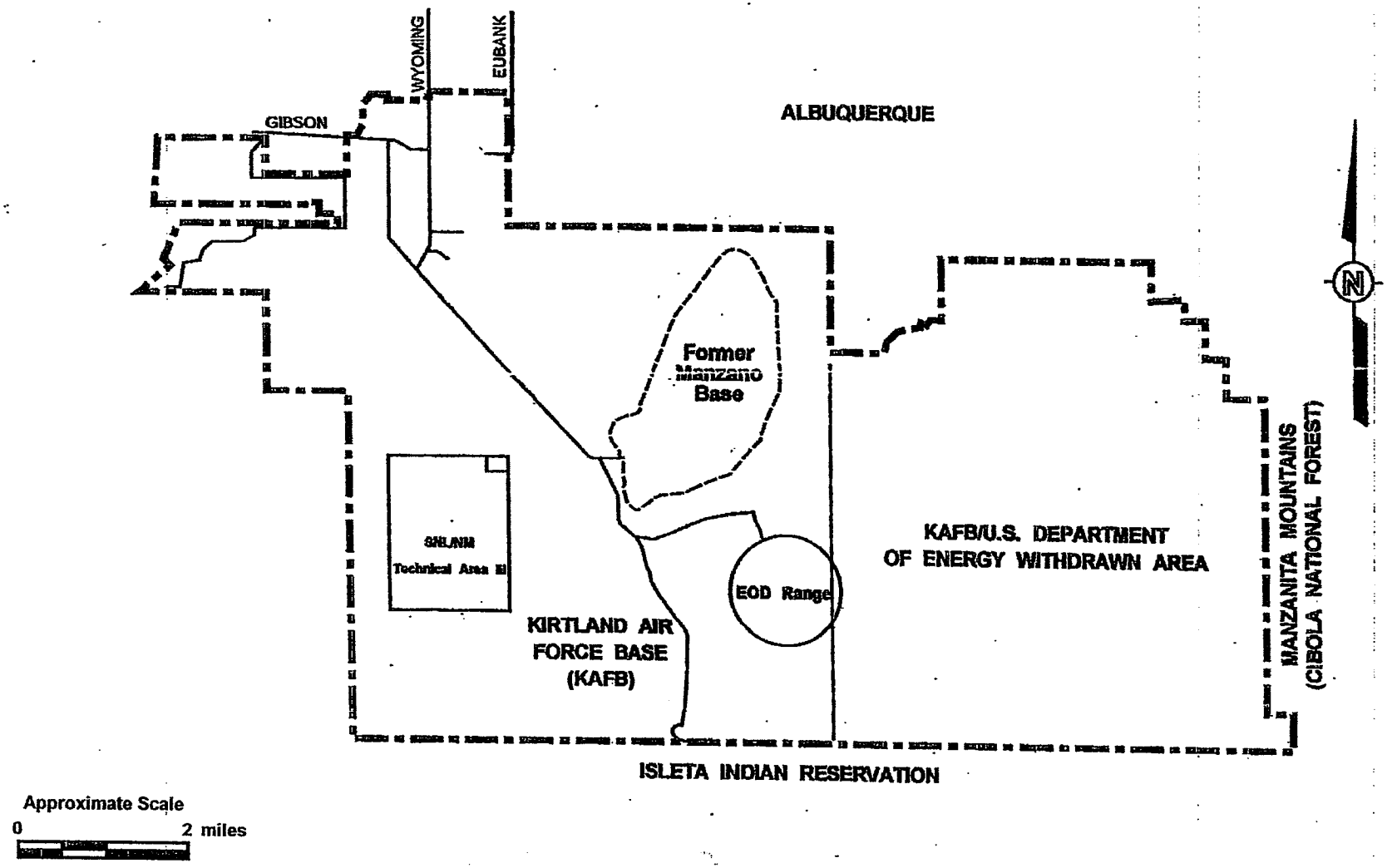


FIGURE 1-2

Location of the Explosive Ordnance Disposal (EOD) Range

Units. Non-hazardous wastes (contraband, firearms) received from off-site are also treated at the Open Burn Unit and Open Detonation Unit as a service in support of the various agencies listed in Table 5-1 of Attachment 5, Waste Analysis Plan.

The maximum hazardous waste treatment capacity of each unit per treatment event is 1,500 pounds, as indicated in Permit Attachment 4, Lists of Authorized Wastes. At the OB Unit (Photo 1), hazardous waste and non-hazardous waste may be treated together during a single treatment event, and the maximum total quantity of combined waste during such treatments is 5,000 pounds per treatment event. Non-hazardous waste shall not be treated unless it is used as a fuel to sustain an open burning event or serves as packaging for the hazardous wastes that are treated in the Open Burn Unit and Open Detonation Unit. Open burning is facilitated by using wood and a flammable liquid, such as diesel fuel, to initiate and sustain the burn and effectively remove the characteristics of reactivity and/or ignitability of the hazardous waste undergoing treatment. Most waste burns well enough that no additional source of heat is needed. If any reactive waste remains after an open burning treatment event, it is burned again to ensure that the characteristic of reactivity is removed. Open detonation is performed using bulk explosives to countercharge hazardous wastes and effectively remove their characteristics of reactivity and/or ignitability.

The OB Unit shall be used to treat only up to a maximum of 80,000 pounds of hazardous wastes per year. The OD Unit (Photo 2) shall be used to treat up to a maximum of 18,000 pounds of hazardous wastes per year. The frequency of operations at each Unit varies, as treatment events are conducted on an as-needed basis.

The Permittee shall minimize the impact to the environment in part by conducting only authorized treatment operations at the Open Burn Unit and Open Detonation Unit. Treatment operations shall not be conducted during adverse weather conditions. The operational and waste management practices for the Open Burn Unit and Open Detonation Unit are more fully described in Attachment 2 of this Permit.

1.3. TRAFFIC PATTERNS

An estimated 24,000 people are employed at the Facility and at the U.S. Department of Energy and other facilities located within the Facility (KAFB, 2002). Access to the KAFB Facility is provided through continuously guarded entrance gates controlled by security guards. Only personnel with proper credentials are allowed access to enter the Facility.

Only personnel with appropriate clearance and escorted visitors are allowed access to the EOD Range. Vehicles and personnel entering the EOD Range are subject to search by security personnel. The Open Burn Unit and Open Detonation Unit are surrounded by two three-strand barbed-wire fences, which limit any traffic through or other access to these Units.

1.3.1. Routes of Travel

A system of interior roads, shown on Map 1-1, is maintained at KAFB. About 78 total miles of roadway exist, of which about 33 miles are paved.

Traffic access to and egress from the Open Burn Unit and Open Detonation Unit is along the roads shown on Map 1-1. The roads along which wastes are transported to the EOD Range

within KAFB include Southgate Avenue, Hardin Boulevard, Pennsylvania Street, Wyoming Boulevard, Lovelace Road, and Demolition Range Road.

1.3.2. Traffic Volume

During an official traffic study in 1984, the average numbers of vehicles passing through the KAFB entrance gates during normal workday hours from Monday through Friday were estimated by Meyers (1991) to be:

Carlisle-Gibson gate - 5,200 vehicles

Truman-Gibson gate - 10,200 vehicles

Louisiana-Gibson gate - 18,000 vehicles

Wyoming gate - 21,600 vehicles

Eubank gate - 12,200 vehicles.

During a monitoring study conducted in 2001 (URS, 2001), the maximum numbers of vehicles passing through the three main gates in a 24-hour period were:

Louisiana - Gibson gate - 17,758 vehicles

Wyoming gate - 18,955 vehicles

Eubank gate - 13,296 vehicles.

These numbers compare well with the 1984 traffic information estimates. The majority of traffic consists of commuting employees in personal automobiles and light-duty trucks.

Due to the nature of operations at the EOD Range, the traffic volume at the range is kept to an absolute minimum to conduct safe treatment operations. Vehicle types are generally cars and light and medium duty trucks. At the EOD Range, vehicles may be parked adjacent to the Open Burn Unit and Open Detonation Unit while unloading wastes for treatment, driven on the EOD Range roads, and parked next to the personnel bunker north of the Open Burn Unit and Open Detonation Unit during treatment events.

The maximum quantity of waste transported to the Open Burn Unit and Open Detonation Unit per vehicle varies per treatment event, but shall not exceed 5,000 pounds per treatment event at the OB Unit and 1,500 pounds per treatment event at the OD Unit. Quantities transported and treated are recorded in the Operating Record maintained at the EOD Shop.

1.3.3. Traffic Control Signals

Traffic lights, stop signs, and yield signs control traffic flow within KAFB on major roads. The locations of traffic control signs at the EOD Range are shown on Figure 1-3.

1.3.4. Road Surfacing and Load-Bearing Capacity

The paved roads at KAFB were built in conformance with the New Mexico State Highway Standards or the "City of Albuquerque Development Process Manual, Standards for Residential Streets." These standards are in conformance with national specifications prepared by the American Association of State Highway and Transportation Officials. Paved roads at KAFB are

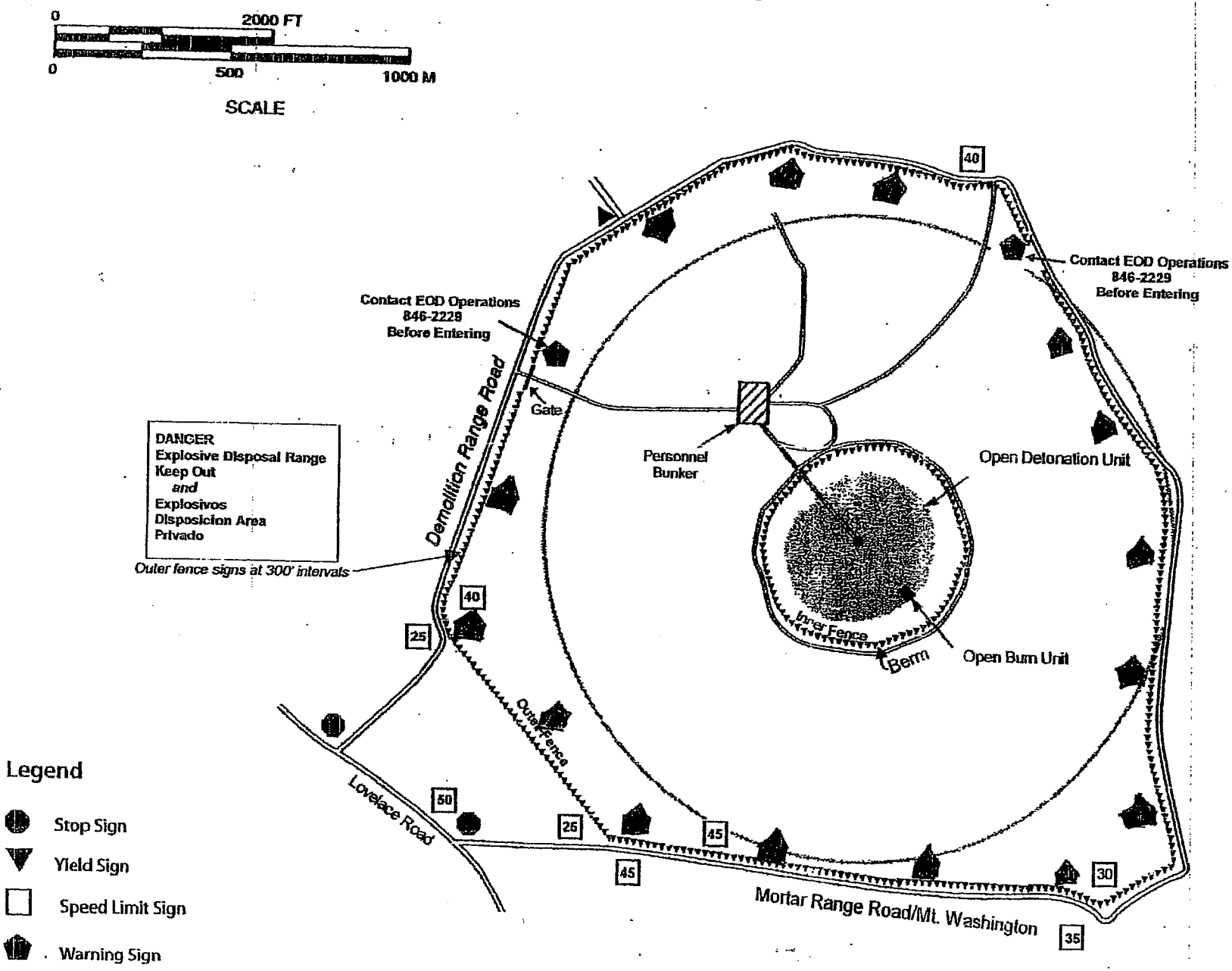


FIGURE 1-3

Locations of Traffic Control Signs, Access Controls, and Runoff Control Berm in the Vicinity of the Explosive Ordnance Disposal Range

generally designed and constructed to accommodate truck traffic.

1.4. LOCATION INFORMATION

The location information addressing the seismic standards and the 100-year floodplain standard is presented below, in accordance with the requirements of the New Mexico Hazardous Waste Management Regulations at 40 C.F.R. § 270.14(b)(11).

1.4.1. Seismic Standards

Although Bernalillo County (where the Open Burn Unit and Open Detonation Unit are located) is in an area listed in Appendix VI of 40 C.F.R. Part 264, there are no faults in the vicinity of the EOD Range that are known to have had displacement in Holocene time; KAFB is in compliance with the seismic standards under 40 C.F.R. § 264.18(a).

1.4.2. Floodplain Standard

The extent of the 100-year floodplains of Tijeras Arroyo and Arroyo del Coyote is shown on Map 1-1. Map 1-1 includes information from a U.S. Army Corps of Engineers (COE) map (COE, 1979), which was prepared using Federal Emergency Management Administration (FEMA) guidelines. The FEMA guidelines are equivalent to the mapping techniques used to prepare Federal Insurance Administration floodplain maps. As shown on Map 1-1, the EOD Range is not located within a 100-year floodplain, as defined in 40 C.F.R. § 264.18(b)(2)(i), and as regulated under 40 C.F.R § 264.18(b) (1).

The Permittee samples storm water in accordance with a Storm Water Pollution Prevention Plan. A stationary sampler at “Outfall E” (located just west of the EOD Range) collects samples if and when there is a sufficient quantity of storm water to sample. Data shall be submitted to the Department on a quarterly basis.

1.5. TOPOGRAPHIC MAP

Due to the large size of the KAFB Facility, several maps and figures are provided to meet the regulatory requirements of 40 C.F.R. § 270.14(b) (19) and § 270.23(b). Maps and figures show a map scale, date of preparation, wind rose (i.e., prevailing wind speed and direction), and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following.

- A topographic map showing all areas at a distance of 1,000 ft from the KAFB Facility is provided as Map 1-1.
- The 100-year floodplain area (i.e., portions of Tijeras Arroyo and Arroyo del Coyote) is shown on Map 1-1.
- Intermittent streams are shown on Map 1-1. There are no large permanent natural surface water features within the Facility boundary. Tijeras Arroyo and Arroyo del Coyote carry water intermittently as a result of rainfall and snowmelt at KAFB and in the Manzanita and Sandia mountains east of the KAFB Facility. There are springs, which yield localized surface-water flow to arroyos, in Lurance Canyon and Sol Se Mete Canyon in the eastern part of KAFB. These localized surface-water flows infiltrate into

the alluvium within a very short distance downstream of the springs. There are also springs (or rock seeps) in and north of the former Manzano Base area.

- Surrounding land uses are shown on Figure 1-4, and land uses within the KAFB Facility boundary are shown on Figure 1-5. Land use in the vicinity of the KAFB Facility is urban to the immediate northwest, north, and northeast. The urbanized area is predominantly residential, with commercial development along more heavily traveled streets. Undeveloped grazing land of the Isleta Indian Reservation is located to the south. Undeveloped public grazing land lies to the west and southwest of KAFB. Military (base) housing is located within the KAFB Facility. The Albuquerque International Sunport is located just west of the KAFB Facility. U.S. Forest Service land forms the eastern boundary.
- A wind rose is shown on Figure 1-6. The wind rose data are from Technical Area III of Sandia National Laboratories (see Figure 1-2), which is located within the KAFB boundary approximately three miles west of the EOD Range.
- The legal boundary of the KAFB Facility is shown on Map 1-1.
- Access controls (fences, gates) for the KAFB Facility are shown on Figure 1-7. KAFB is a secure Facility enclosed by chain-link and barbed wire fences. Security guards routinely patrol the Facility boundary. Five entrance gates provide access to KAFB. Three of the entrance gates (Truman, Louisiana, and Wyoming) are normally open at all times and are continuously guarded by Air Force or contract personnel. The other gates (Carlisle and Eubank) are normally open for Facility access during scheduled periods of the day, during which they are guarded by Air Force or contract personnel, and are securely closed and locked at other times. Access controls for the EOD Range are shown on Figure 1-3.
- Wells, both on-site and off-site, are shown on Map 1-1. There are no injection wells at the KAFB Facility. Drinking water-supply wells located at the KAFB Facility are shown on this map. The EOD Range is located over four miles south-southwest of the nearest drinking water-supply well. A few water-supply wells on the KAFB Facility have been impacted by releases of contaminants from SWMU/AOCs.
- The locations of buildings, treatment operations, and other structures (i.e., recreation areas, access and internal roads) at the KAFB Facility are shown on Map 1-1. The location of the runoff control system (i.e., the earthen berm) at the EOD Range is shown on Figure 1-3. An earthen berm provides a barrier to prevent drainage from leaving the area of the Open Burn Unit and Open Detonation Unit; the location of this berm is shown on Figure 1-3. The two-foot high earthen berm shall be routinely maintained for preventing run-on, runoff, or flooding that may result from storm events, which are the most likely sources of surface-water flow.
- The location of the EOD Range is shown on Map 1-1, and the locations of the operational units (i.e., the OB and OD units) where hazardous waste is treated are shown on Figure 1-3.

Contour lines on the topographic map are in intervals sufficient to determine natural drainage

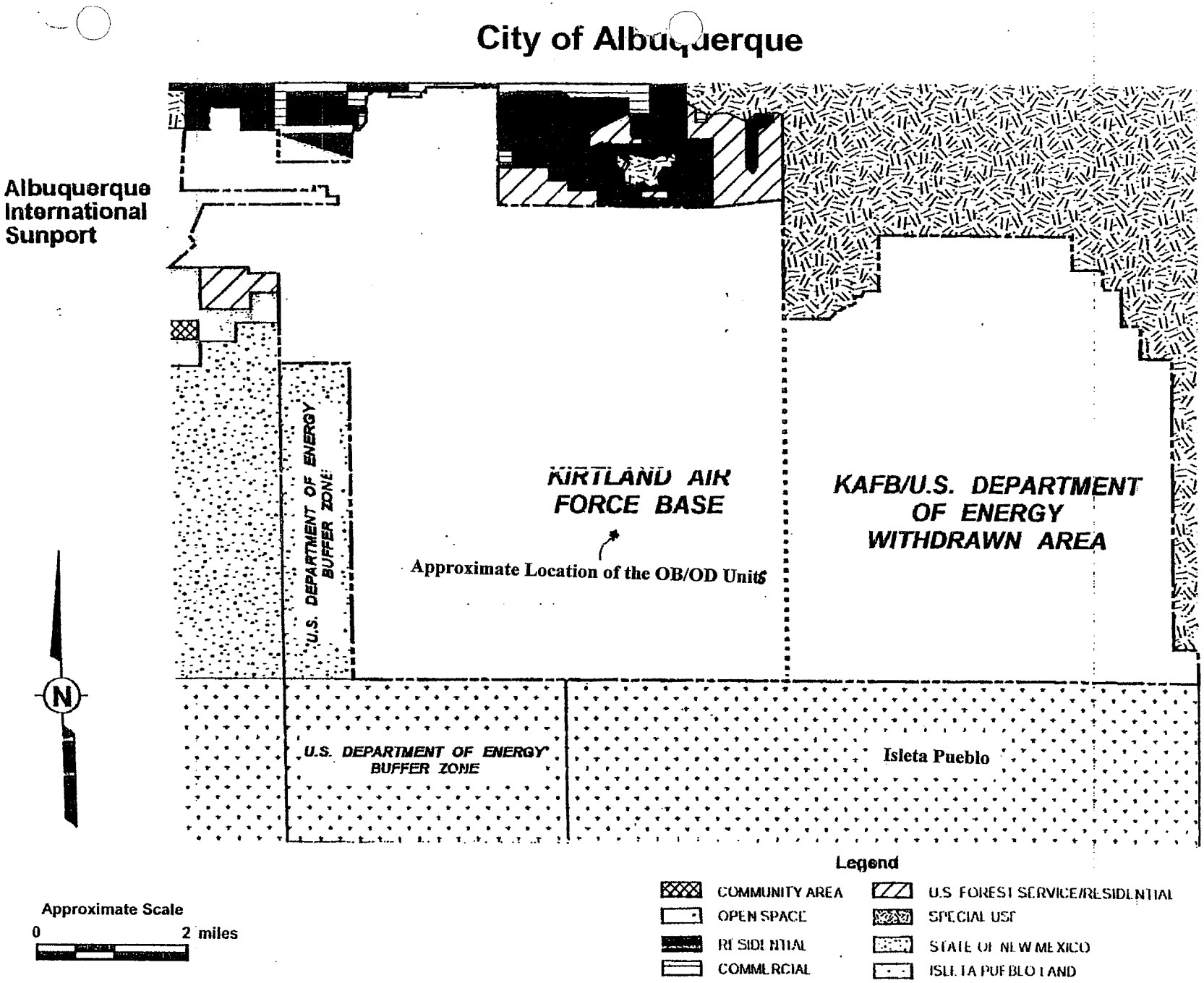


FIGURE 1-4

Land Uses Adjacent to Kirtland Air Force Base

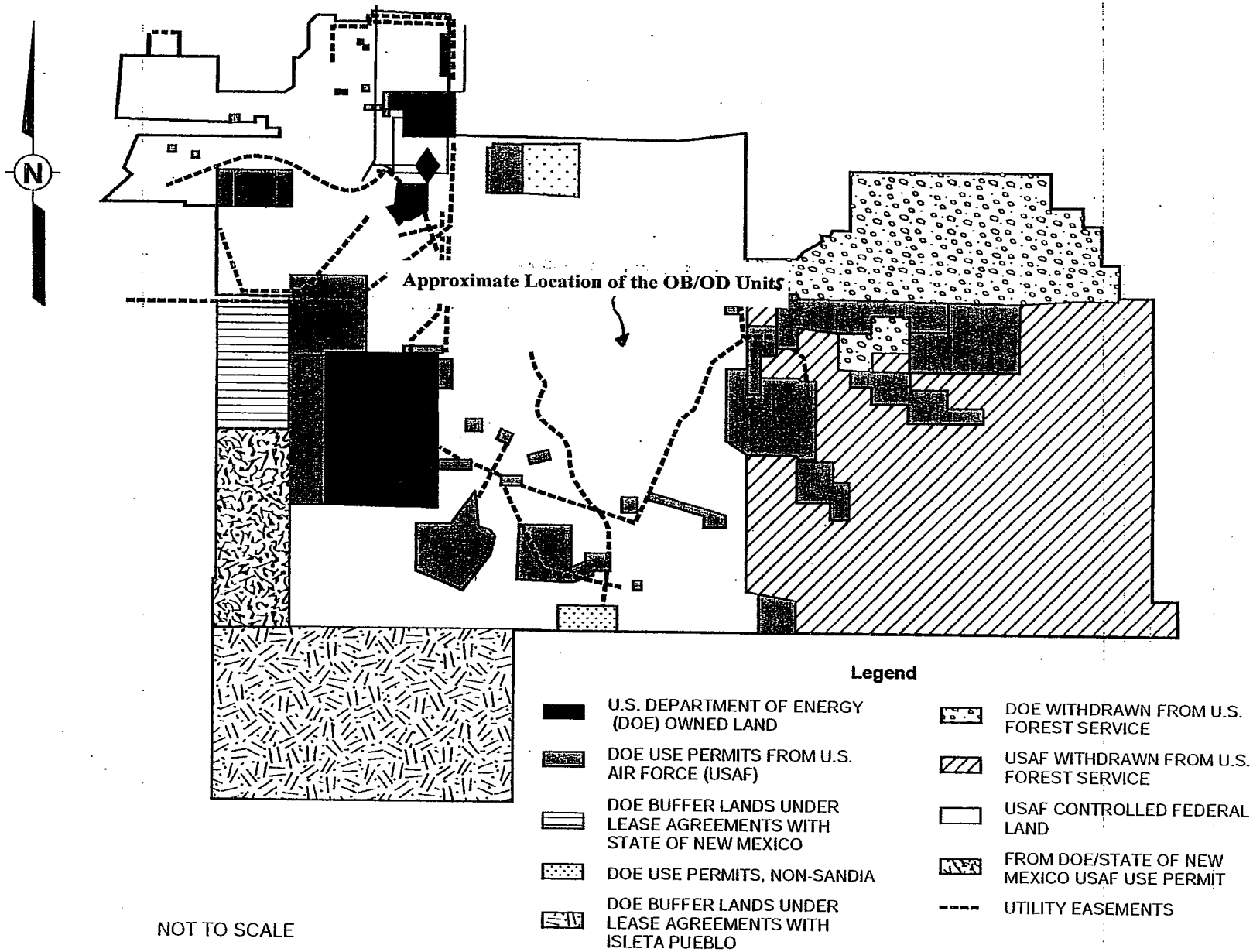
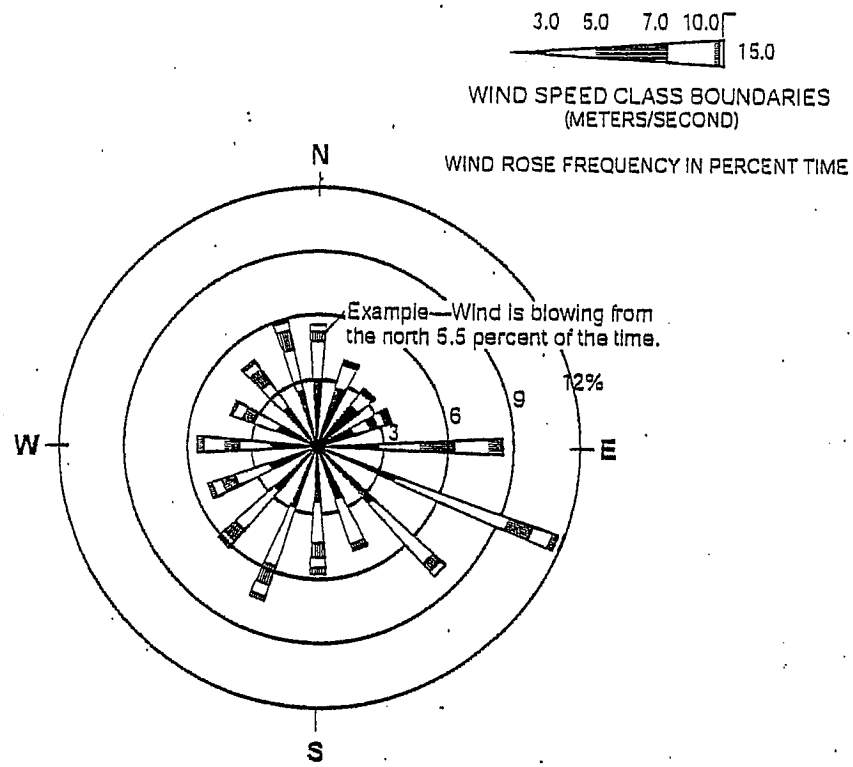


FIGURE 1-5

Land Uses Within the Kirtland Air Force Base Boundary



Technical Area III

FIGURE 1-6

Wind Rose Data

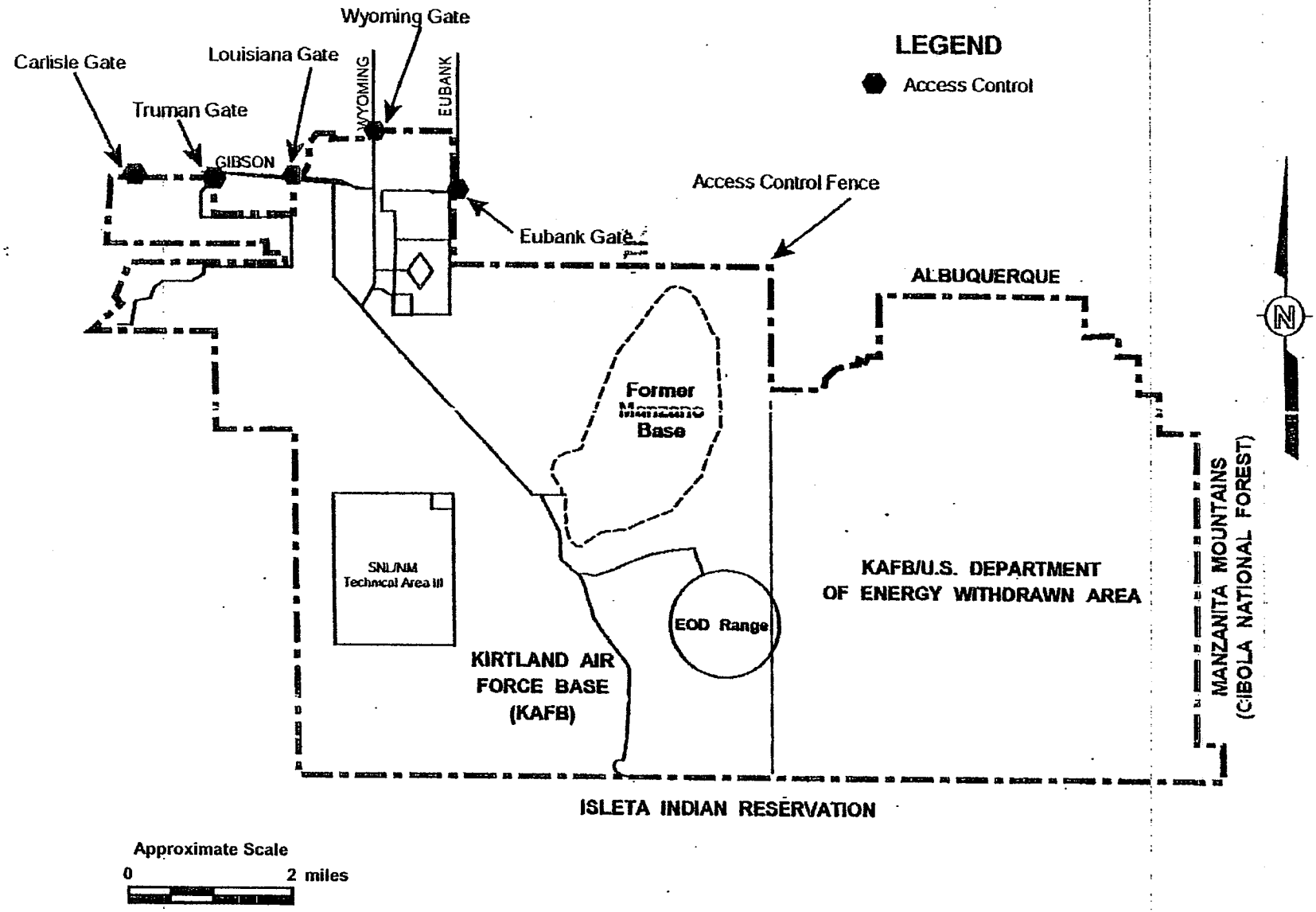


FIGURE 1-7

Kirtland Air Force Base Access Controls

patterns at the KAFB Facility and in the vicinity of the Open Burn Unit and Open Detonation Unit. As required by 40.C.F.R. § 270.14(b)(19), the Permittee has submitted the map at a scale of one inch equals 0.5 mile and with contour intervals of 50 ft due to the large extent of the KAFB Facility and mountainous terrain.

1.6. GEOLOGY

KAFB lies within the northern portion of the Mexican Highland section of the Basin and Range physiographic province (Hawley, 1986). KAFB is located along the eastern margin of the Albuquerque basin. This basin is a major structural feature of the Rio Grande rift, which is approximately 620 miles long. The Albuquerque basin is one of the largest of a series of north-trending, en echelon basins and is about 90 miles long and 31 miles wide. The basin is bounded by basement uplifts to the east (e.g., the Sandia, Manzanita, Manzano, and Los Piños uplifts). Numerous faults are located within the Albuquerque basin (Woodward, 1977; Russell and Snelson, 1994).

The uppermost stratigraphic units composing the Albuquerque basin are described in Section 1.6.2. Precambrian rocks underlie the entire basin, and are exposed in the uplifted former Manzano Base region and the Manzanita Mountains, located in the central and eastern portions of KAFB, respectively. Landforms within the basin include mesas and structural benches, low hills and ridges, inset stream terraces, and graded alluvial slopes (Lozinsky et al., 1991; Kelley, 1977; Kelley and Northrop, 1975).

The East Mesa, where KAFB is located, has a generally west-southwestward ground-surface slope, ranging from about 250 ft per mile (ft/mi) near the mountains to 20 ft/mi near the Rio Grande.

1.6.1. Structural Geology

KAFB is located in a structurally complex area with several major regional faults displaying a diverse pattern of fault trends and displacements (Figure 1-8). Rift-bounding faults present at KAFB include the Sandia, Coyote, Tijeras, and Hubbell Springs faults. These normal faults are west dipping and exhibit down-to-the-west displacement. The northeast-trending Tijeras Fault Zone crosses KAFB and intersects/merges with the Sandia and Hubbell Springs faults.

The Sandia Fault is a north- to northwest-trending, west-dipping normal fault. The location and lateral continuity of this 25 mile long fault along the eastern margin of the central Albuquerque basin are poorly constrained. However, an exposure in Tijeras Arroyo showing Precambrian granitic rocks faulted against Pleistocene alluvial fan sediments gives an example of the fault's offset. To the south, this fault intersects or merges with the Tijeras Fault Zone and the Hubbell Springs Fault; therefore, its southern extent is difficult to ascertain.

The Coyote Fault, which passes through a portion of the EOD Range, is a north- to northwest-trending fault with an inferred length of 4.5 miles and approximately 1,300 ft of down-to-the-west displacement (Reiche, 1949; Kelley, 1977). This fault, located along the base of the Manzanita Mountains in the southeast portion of KAFB, forms the eastern margin of the Hubbell structural bench.

The northeast-trending Tijeras Fault Zone is a series of several anastamosing subparallel fault

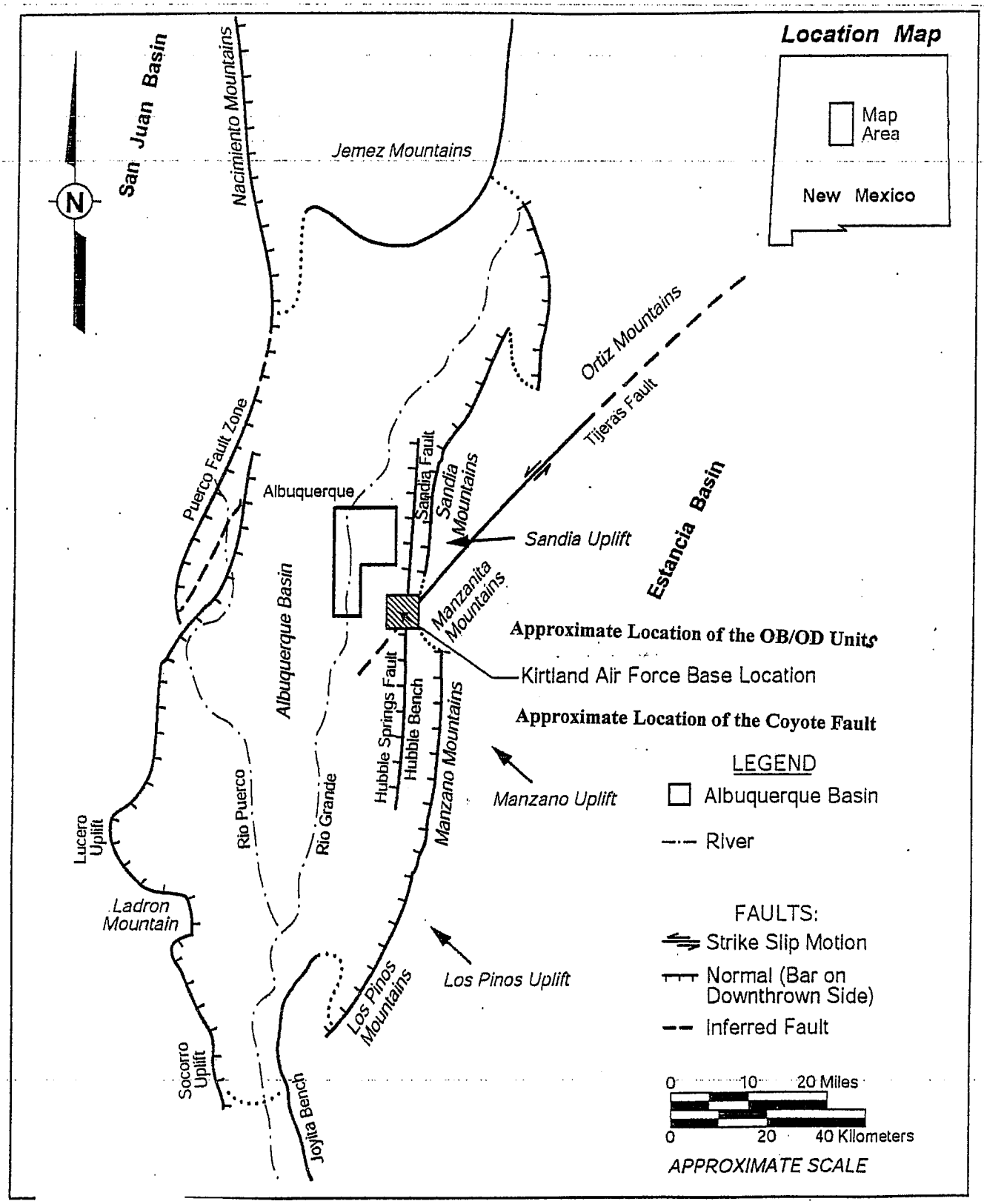


FIGURE 1-8

Location Map Of Major Faults In Relation To Kirtland Air Force Base

strands and is a major structural feature that crosscuts the Rio Grande Rift. It extends about 58 miles from the central KAFB area northeast to the Cañoncito area within the Sangre de Cristo Mountains. On KAFB, this fault zone extends from an area southwest of the former Manzano Base, where it intersects or merges with the Sandia and Hubbell Springs faults, to the northeast through Tijeras Canyon, where it separates the Sandia and Manzanita mountains. Several subparallel faults with near-vertical dips and normal to left-lateral displacements compose the Tijeras fault zone (Lisenbee et al., 1979; Maynard et al., 1991).

The north-trending Hubbell Springs Fault is a series of west-dipping normal fault strands along the western margin of the Hubbell structural bench. The fault intersects or merges with the Tijeras Fault Zone and the Sandia Fault in the south-central portion of KAFB. The Hubbell Springs Fault is located approximately one mile southwest of the EOD Range.

1.6.2. Stratigraphy

The Neogene/Quaternary Santa Fe Group and Quaternary post-Santa Fe Group stratigraphic units are discussed in this Section. Descriptions of underlying units (Precambrian basement complex, upper Paleozoic strata, lower Mesozoic strata, and Paleogene strata) can be found in the "Site-Wide Hydrogeologic Characterization Project Calendar Year 1995 Annual Report" (Sandia National Laboratories/New Mexico [SNL/NM], 1996).

The Santa Fe Group comprises complexly interstratified gravels, sands, silts, and clays representing synchronous basin filling and basin rifting from 30 to 5 million years ago (Ma). In the center of the rift, near the western margin of KAFB, the Santa Fe Group is over 14,500 ft thick. This sequence of sediments thins toward the edges of the basin where it is truncated by uplifted fault blocks. Based on depositional environments and age, Hawley and Haase (1992) subdivided the group into three major hydrostratigraphic units.

The lower Santa Fe unit represents deposition in an internally drained basin prior to deep subsidence and uplift of the rift-margin ranges. It is comprised primarily of interfingered piedmont-slope alluvial fan deposits, eolian deposits, and fine-grained basin-floor deposits (Hawley and Haase, 1992). The lower unit ranges in age from 30 to 15 Ma and is up to 3,500 ft thick.

The middle Santa Fe unit is the thickest of the three units, and in places is 10,000 ft thick. This unit, deposited between 15 and 5 Ma when rift tectonism was most active, was formed by rapid sedimentation related to the active tectonism. Overall, the depositional environments were primarily alluvial, eolian, and playa-lake.

The upper Santa Fe unit was deposited from approximately 5 to 1 Ma, and possibly as late as 0.5 Ma. This 1,200-ft-thick unit was divided into three subunits by Hawley and Haase (1992), based on sediment source terrains. Only two of these subunits are relevant at KAFB and are described herein. The first relevant subunit contains coarse-grained alluvial fan and piedmont-veneer facies extending westward from the bases of the Sandia, Manzanita, and Manzano uplifts. It is characterized by poorly sorted and weakly stratified sand and conglomerate with an abundant matrix of silt and clay. The second relevant subunit is composed of cross-stratified, thick, clean sand and pebbly gravel deposits of the ancestral Rio Grande. In the KAFB area west of the fault complex, these two subunits of the upper Santa Fe unit interfinger.

The Quaternary post-Santa Fe Group sediments include alluvial fan, fluvial, eolian, playa, colluvial, and floodplain deposits (Lambert, 1968; Hawley and Haase, 1992). These sediments were deposited approximately 0.5 to 1 Ma, and their depositional episodes may be related to Quaternary glacial-interglacial cycles. The multiple alluvial fans present throughout much of KAFB are derived from the former Manzano Base area and the Manzanita Mountains and related drainages.

1.7. SOILS

The soil stratigraphy on KAFB is complex. Surficial soils generally exhibit progressively greater soil development on progressively older deposits. Pleistocene deposits typically have moderately- to well-developed calcic horizons within five or six feet of the surface, whereas Holocene deposits generally lack calcic horizons. Development of calcic horizons is strongly dependent on the depth and rate of near-surface infiltration and reflects the long-term average depth of wetting.

Soil profiles may contain evidence of abundant bioturbation, which influences infiltration rates by providing near-surface pathways for vertical migration of water.

Tijeras Series soil is present at and in the vicinity of the EOD Range. These soils are described as yellowish-brown, gravelly fine sandy loam. Soils in this series are found at elevations ranging from 5,000 to 6,500 ft, and on slopes ranging from 1 to 5 percent (%). Runoff and soil/water erosion hazards from Tijeras Series soil are described as moderate (U.S. Department of Agriculture [USDA], 1977). Soils of the Embudo, Madurez, and Latene Series comprise up to 20% of the Tijeras Series soils. Embudo Series soils consist of deep, well-drained, gravelly fine sandy loam. Elevations range from 5,000 to 6,000 ft with 1 to 5% slopes. Wink and Madurez soils make up about 15% of the Embudo Series, and Tijeras soils are associated with this series. Madurez Series soils also consist of deep, well-drained, gravelly fine sandy loam, and elevations range from 4,900 to 5,900 ft, with 1 to 5% slopes. Limited amounts of Bluepoint, Latene, and Wink soils are associated with the Madurez Series. The Latene Series soils consist of deep, well-drained, loamy to fine sandy soils (USDA, 1977), with elevations ranging from 5,000 to 6,000 ft and 1 to 5% slopes.

1.8. HYDROLOGY

The water table beneath the KAFB Facility is located in the uppermost Santa Fe Group in the ancestral Rio Grande fluvial facies to the west and alluvial fan facies to the east (SNL/NM, 1996). Hawley and Haase (1992) estimated that hydraulic conductivities in the upper Santa Fe Group could range from less than 0.3 ft per day (ft/day) in the alluvial fan facies to more than 30 ft/day in the fluvial facies.

Pumping test data obtained for the fluvial facies show that hydraulic conductivities can range from 12.0 to 147.1 ft/day (SNL/NM, 1996). Porosity values derived empirically from grain-size distribution data range from 0.26 to 0.45 for the fluvial facies (SNL/NM, 1995a). The uppermost water-bearing unit in the alluvial fan facies south of Tijeras Arroyo consists of up to 50 ft of silty clay, underlain by about 85 ft of sediments that include several approximately 10- to 15-ft-thick coarser-grained layers (SNL/NM, 1995b). The upper fine-grained unit in this area generally has a low hydraulic conductivity and acts semi confined (SNL/NM, 1996). Overall,

hydraulic conductivity values for the alluvial fan facies of the Santa Fe Group range from 0.01 to 27.4 ft/day, based on pumping test data collected for SNL/NM environmental restoration projects (SNL/NM, 1996).

In the perched aquifer in the alluvial fan facies in the vicinity of Tijeras Arroyo, hydraulic conductivities range from 17.6 to 50.2 ft/day, based on slug tests and pumping tests. Porosity data for the alluvial fan facies range from 0.17 to 0.64 (SNL/NM, 1996). Porosity of samples collected and measured directly from locations along Tijeras Arroyo and Arroyo del Coyote range from 0.35 to 0.48 (SNL/NM, 1995c).

At KAFB, the local groundwater system is divided into three distinct hydrogeologic regions by the north-to-south trending fault complex (SNL/NM, 1996). The two regions associated with the area of the EOD Range are Hydrogeologic Regions (HR) 2 and 3. HR-2 is the region associated with the fault system, and HR-3 is located east of the fault system. The Coyote Fault crosses the EOD Range; thus, the hydrologic information for both HR-2 and HR-3 are described herein (SNL/NM, 1996).

HR-2 comprises the area that straddles the Sandia, Tijeras, and Hubbell Springs Fault complex. In the region of the EOD Range, the subsurface geology for HR-2 includes Santa Fe Group sediments. HR-3 is east of HR-2; it includes the eastern portion of KAFB and the area west of the Coyote Fault bounded approximately by Coyote Springs Road and Lovelace Road. Faulting complicates the general stratigraphy for HR-3; piedmont alluvial material overlies portions of bedrock in this region.

Lateral hydraulic gradients east of the fault zone vary significantly; they appear to be about equal to or greater than the topographic gradients. Lateral hydraulic gradients in the Lake Christian well area, approximately one mile southwest of the EOD Range, are approximately 0.02 ft/ft.

1.8.1. Surface Water

The major surface water feature in central New Mexico is the Rio Grande, which flows north to south through Albuquerque. The surface water at KAFB consists primarily of ephemeral flows in direct response to precipitation in the immediate area. There are also several known springs, which yield localized wetlands.

The major surface drainages at KAFB are Tijeras Arroyo, Arroyo del Coyote, and an unnamed drainage channel south of Arroyo del Coyote (SNL/NM, 1993a). These arroyos typically exhibit ephemeral flow, except for two very short reaches of channel, which flow intermittently (SNL/NM, 1996). However, most of the water rarely reaches the lower portions of the arroyos or the Rio Grande (SNL/NM, 1996; U.S. Geological Survey [USGS], 1977) because of evapo-transpiration and percolation into permeable alluvial deposits. Tijeras Arroyo (above the confluence with Arroyo del Coyote) drains about 81 square miles, while Arroyo del Coyote (above the confluence with Tijeras Arroyo) drains about 27 square miles (U.S. Army Corps of Engineers [USACE], 1979). The upper reaches of the arroyos cut through mountainous terrain at an average slope of about 130 ft/mi. As the arroyos enter onto the alluvial fan, bed slope decreases to an average of about 100 ft/mi.

Floods and runoff in the Albuquerque area typically occur between July and September, during

high-intensity thunderstorms (SNL/NM, 1996). Floods in Tijeras Arroyo and Arroyo del Coyote are characterized by high peak flows, small volumes, and short durations.

The USACE provides information on the areas within KAFB that are subject to flooding from Tijeras Arroyo and Arroyo del Coyote. The areas that are predicted to be inundated by a 100-year flood are shown on Map 1-1 in Attachment 1 of this Permit. The EOD Range is located outside the 100-year floodplain, as shown on Map 1-1.

1.8.2. Vadose Zone

At the EOD Range, the depth to groundwater and, thus, the thickness of the vadose zone, ranges from approximately 80 to 143 ft (SNL/NM, 1996). In general, at KAFB, water enters the vadose zone as infiltrating rainfall and channel losses from flows in arroyos, and leaves via evapotranspiration to the atmosphere and recharge to the underlying aquifer (SNL/NM, 1996). The climate at KAFB implies low recharge rates to the groundwater system as a result of low precipitation and high evapotranspiration. The largest localized natural recharge sources in the KAFB vicinity are probably Tijeras Arroyo and Arroyo del Coyote, which flow ephemerally, primarily during or after large thunderstorms (USGS, 1992). Other sources of recharge are the golf course, leaking water and sewer lines, and active septic systems.

A study was conducted to identify vadose zone hydrogeologic settings in the KAFB area. The results of this study indicate that recharge rates are quite small, with estimates ranging from 1 to 6 millimeters per year (Parsons et al., 1993). The mean values for the vadose zone obtained during this study are gravimetric moisture content (5.5%), bulk density (1.66 grams per cubic centimeter), saturated hydraulic conductivity (7E-3 centimeters per second), total organic carbon (539 milligrams per kilogram), and porosity (34.39%) (SNL/NM, 1996).

1.8.3. Groundwater

KAFB and the Albuquerque metropolitan area rely on groundwater from the Albuquerque basin as the principal water-supply source. The primary freshwater aquifers in the basin are located within the upper unit of the Santa Fe Group and, to a lesser extent, in the middle unit of the Santa Fe Group (SNL/NM, 1996). The regional aquifer is recharged primarily from the Rio Grande and, to a lesser degree, at the foot of the mountains through coarse alluvium at the openings of small canyons (Kues, 1986). Recharge is small from percolation through soils located distal from the mountain front.

Most of the water production wells for the City of Albuquerque are completed in the upper unit of the Santa Fe Group. From the foothills of the Sandia and Manzanita Mountains, the water table slopes at a low gradient diagonally down valley. The direction of groundwater flow has been altered in the areas influenced by groundwater pumping in the city's well fields, and pumping in excess of recharge has resulted in significant decline of the regional water table. Although this lowering is not uniform, it is most pronounced in the eastern portion of the basin. Cones of depression at the wells in this area are bounded by the Sandia Fault.

The groundwater settings for HR-2 and HR-3 are described herein. In the southern portion of HR-2, the regional aquifer is a porous media aquifer in the upper unit of the Santa Fe Group. In the alluvial fan facies of this unit, field data indicate that the uppermost part of the aquifer is semi confined (SNL/NM, 1993b). Shallow, unconfined alluvial aquifers, particularly in the

foothill canyons, and confined bedrock aquifer systems are present in HR-3 (SNL/NM, 1996). In the southern portion of HR-3, the uppermost aquifer is found in shallow alluvium, occurring locally in the foothill canyons and on the gently sloping piedmont surface. Where this shallow alluvium is saturated, the aquifer will be unconfined and in porous media (SNL/NM, 1996).

The potentiometric surface for the regional groundwater system in the KAFB area is shown on Figure 1-9. East of the Tijeras fault zone, groundwater generally flows from the northeast to the southwest (SNL/NM, 1996). As the groundwater moves westward into areas with gentler topography, the flow direction appears to shift to the west. Where groundwater crosses the Tijeras fault zone, the flow direction shifts slightly to the north-northwest until reaching a north-trending elongated trough west of the fault complex. In this trough region, created over several decades by pumping of the water-supply wells located along the northern boundary of KAFB, the groundwater flow direction changes to the north (SNL/NM, 1996).

The depth to groundwater at KAFB varies from approximately 54 to 582 ft. Neutron/gamma logs taken at the KAFB 1901 and KAFB 1902 boreholes showed water levels at a depth of approximately 80 ft below ground surface. At a USGS well on the southern edge of the EOD Range, the depth to groundwater is also about 80 ft. At the School House Mesa well on the north side of the EOD Range, the depth to groundwater is approximately 100 ft, and at the EOD Hill well west of the EOD Range, the depth to groundwater is about 143 ft. Thus, the overall depth to groundwater at the EOD Range varies from approximately 80 to 143 ft.

In 2002, 1.24 billion gallons of water were pumped from KAFB's eight drinking water-supply wells, which are all located in the north and northwest portion of the Facility (KAFB, 2003). The locations of these wells are shown on Map 1-1 of Permit Attachment 1. To meet all regulatory requirements, the Permittee monitors its drinking water supply for various constituents.

1.9. METEROLOGY

The climate in the Albuquerque area is characterized by low precipitation; wide temperature extremes; and generally clear, sunny days, which are typical of a high desert plateau. Frequent, drying winds; heavy rain showers, usually of short duration and often with erosive effects; and erratic, seasonal distribution of precipitation are also characteristic of the local climate. The annual normal daily mean temperature in Albuquerque is 56.8° Fahrenheit (°F) (National Oceanographic and Atmospheric Administration [NOAA], 2004). The average daily temperature range is relatively high, but extreme temperatures are rare. In Albuquerque, the temperature reaches 90°F an average of 62 days a year, with most of these days occurring from May through September. Freezing temperatures occur an average of 113 days each year, with the majority of these days occurring from November to early April. The air is normally dry, with an average relative humidity ranging from nearly 59% in the early morning to approximately 29% in the afternoon (NOAA, 2004). The average number of clear days per year is 167.

1.9.1. Precipitation

The valley and mesa areas are arid, having an average annual precipitation of approximately 9.5 inches (NOAA, 2004). The average annual precipitation in the mountains is considerably

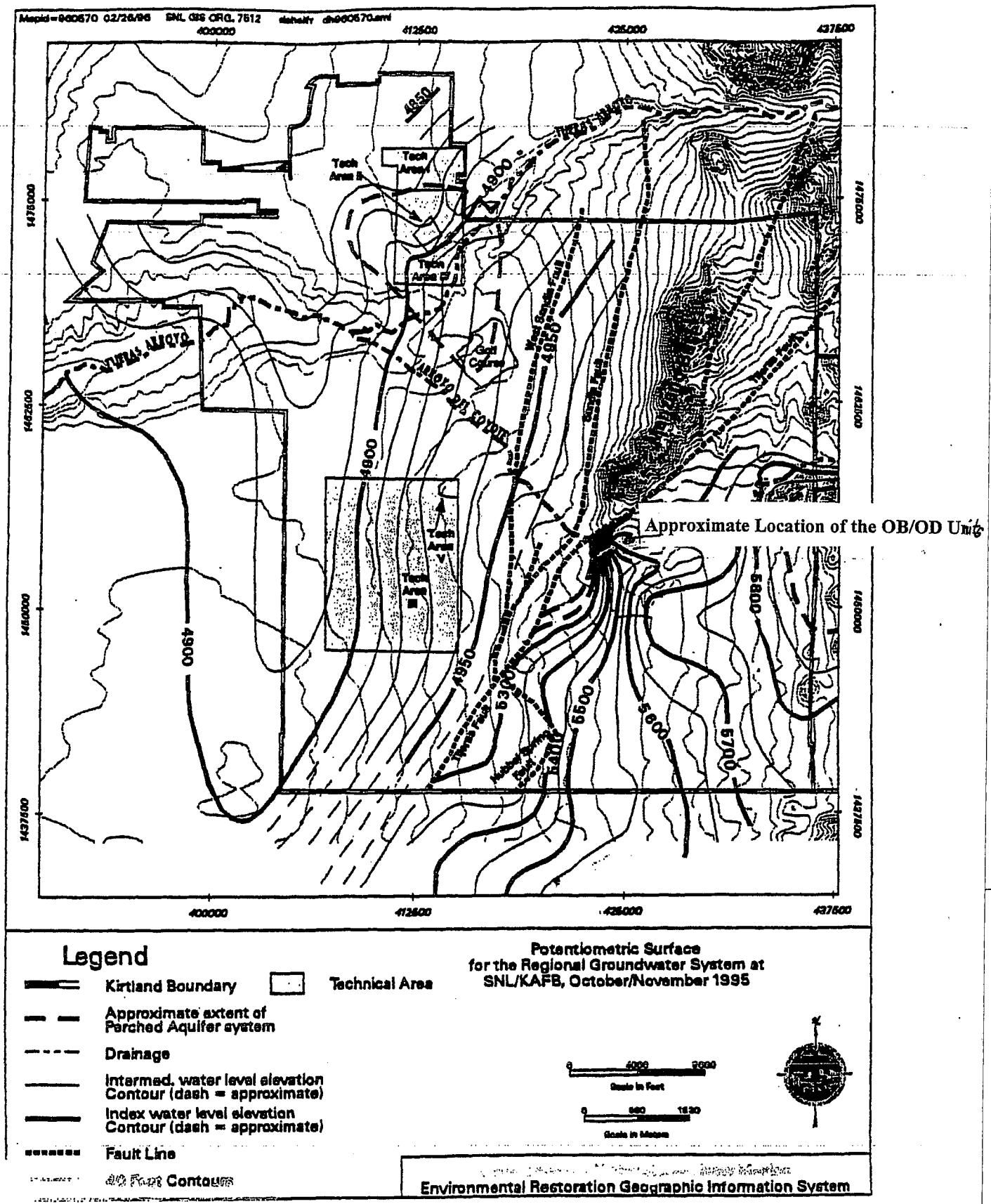


FIGURE 1-9

Potentiometric Surface for the Regional Ground water system at Kirtland Air Force Base

higher, with up to 20 inches. (SNL/NM, 1996). Precipitation amounts generally increase with increasing elevation. Much of the average annual precipitation occurs in the form of brief but heavy thunderstorms during the summer period, July through September; the intensity of summertime rainfall varies substantially over short distances. The average number of days per year having 0.10 in. or more precipitation for the Albuquerque area is 61 (NOAA, 2004). Evapotranspiration in the area has been estimated at 95 percent of the annual rainfall (Thomson and Smith, 1985).

The winter months, November through March, are generally very dry, with the cumulative moisture for these months averaging approximately 2.5 inches (NOAA, 2004). The average annual snowfall for the Albuquerque area is 11.0 inches (NOAA, 2004). At the lower elevations, snow rarely remains on the ground for more than 24 hours. However, snow cover in the mountains is common from mid-November to early spring.

1.9.2. Winds

The average annual wind speed for the Albuquerque area is 8.9 miles per hour (mph) (NOAA, 2004). Sustained winds of 12 mph or less occur approximately 80% of the time at the Albuquerque International Airport/Sunport, while sustained winds greater than 25 mph have a frequency less than 3% (NOAA, 1990). Winds blow most frequently from the north in winter and from the south along the river valley in summer. Winds are generally stronger in the late winter and early spring months, and occasionally dusty days occur due to blowing soils. At the EOD Range, winds are almost equally probable from all directions, with speeds generally less than 8 mph (Figure 1-6 in this Attachment).

A network of eight meteorological monitoring towers located near KAFB was established in the 1960s and 1970s to monitor weather conditions. Ten years of monitoring data from this network indicate that the prevailing winds at KAFB are from the east, but winter winds at the 100-ft elevation are from the north. Rapid nighttime ground cooling after sunset on cloudless or near-cloudless nights produces strong temperature inversions. This rapid cooling effect generates drainage winds (katabatic winds) out of the mountains, which are strongest at the mouths of the larger canyons (Olsen et al., 1970).

A solar-powered meteorological tower is located near the personnel bunker at the EOD Range. Before conducting a treatment operation, a measurement of wind speed is obtained to ensure that the operational limits for wind speed are not exceeded.

1.10. AIR QUALITY

The Albuquerque/Bernalillo County Air Quality Control Board regulates air quality in Bernalillo County.

1.11. ARCHEOLOGICAL SITES, VEGETATION, AND WILDLIFE

There are no known archeological sites at or in the proximity of the EOD Range. The vegetation and wildlife of KAFB are described in this Section, with an emphasis on threatened, endangered, and sensitive species and habitats.

1.11.1. Vegetation

KAFB is located at the juncture of four major North American physiographic and biotic provinces: the Great Basin; the Rocky Mountains; the Great Plains, and the Chihuahua Desert. The biotic communities, or biomes, within KAFB exhibit influences from each of these provinces, with the Great Basin influence generally dominating.

Based on Brown's (1982) hierarchical system for the classification of biomes in the southwestern United States (U.S.), four vegetation formations are recognized at KAFB: grassland; woodland; riparian scrubland; and riparian woodland. The grassland type is present at the EOD Range.

Grassland vegetation covers the lower alluvial slopes and flat terrace surfaces of the western half of KAFB. Soils supporting grassland vegetation are typically sandy loams to gravelly sandy loams, with slopes of less than 5%. These soils include the Latene, Wink, Madurez, Tijeras, Embudo, and Tome (USDA, 1977). The latter is found in the southwestern quadrant of KAFB, where small drainages from the Manzano Mountains reach the flat internal basins near the McCormick Ranch, causing sediment deposition along broad fans. These sandy soils form dunes stabilized by grasses and shrubs.

The influences of three biomes are evident in the grasslands at KAFB: the Great Basin Grassland Biome, the Semi-desert Grassland Biome, and the Plains Grassland Biome. The influence of the Great Basin Grassland Biome predominates in the grassland community. Galleta (*Hilaria jamesii*) is the dominant grass species in the KAFB area that is associated with the Great Basin Grassland Biome. Others include sand dropseed (*Sporobolus cryptandrus*), ring muhly (*Muhlenbergia torreyi*), and Indian rice grass (*Oryzopsis hymenoides*).

The influence of the Semi desert Grassland Biome is typified by the presence of black grama (*Bouteloua eriopoda*). This grass species is commonly found as a subdominant or codominant species with galleta and is, in places, the dominant grass, sometimes forming near monocultures. Other grasses associated with this biome are mesa dropseed (*Sporobolus flexuosus*), bush muhly (*Muhlenbergia porteri*), and fluffgrass (*Tridens pulchellus*). The Semi desert Grassland Biome is climatically classified within the Warm-Temperate Climatic Zone. The other biotic communities at KAFB are classified in the Cold-Temperate Climatic Zone. For this reason, species associated with the Semi desert Grassland Biome are more frequent on sites with a warmer, drier microclimate, such as south-facing slopes, calcareous soils, and sites exposed to high winds.

The third component influencing the grassland vegetation at KAFB is the Plains Grassland Biome, which is centered in the Great Plains. Although none of the species associated with this biome reach dominance in the grassland communities, some of the important species with affinities to this biome include little bluestem (*Andropogon scoparius*), side-oats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), and soap weed yucca (*Yucca glauca*).

Several of these species are also common in the Great Basin Grassland Biome. Species associated with the Plains Grassland Biome are more common on sites with cooler, moister microclimates, such as those protected from the influences of sun or wind by virtue of slope and direction of exposure.

Where the soil has not been disturbed by construction, the grassland vegetation on KAFB is

generally in excellent condition and is relatively free of shrubs and sub shrubs. This is due to the long period of protection from grazing within the KAFB boundaries. Periodic burns, both natural and human-caused are evident in the grassland areas. These fires are fueled and carried by the accumulated dead grass material from previous years and are probably important in maintaining the dominance of grasses over woody plants. The dominant shrub species in the grasslands are sand sagebrush (*Artemisia filifolia*) and four-wing saltbush (*Atriplex canescens*), both of which are widespread in the western U.S.

1.11.2. Wildlife

Wildlife communities, which include amphibians, reptiles, birds (both breeding and migratory), and mammals, are dependent on the quality and quantity of available habitat that meets the needs of individual wildlife species in the community. The basic requirements of any wildlife species are food, water, and shelter. Each individual species has specific habitat requirements for these three basic factors, as well as behaviorally controlled requirements, such as corridors of travel, breeding sites, and freedom from human intrusion. The wildlife communities at KAFB are typical of the equivalent woodland and grassland habitat types in central New Mexico.

The poor availability of water has probably been a limiting factor to the wildlife communities in this area. The lack of permanent water sources is particularly prevalent in the grasslands where wildlife populations appear smaller and less diverse than the forage production could potentially support.

The following provides general descriptions of the wildlife known or expected to occur in grassland wildlife communities on KAFB. These descriptions are based on species lists presented in the published works of Brown (1982), Fischer (1990), Biggs (1991a, 1991b), and Sullivan (1991).

Amphibians of the grasslands are limited to those species that are adapted to long periods of dormancy during dry conditions and rapid breeding cycles when ephemeral water is available. These include the western spadefoot (*Spea hammondi*), plains spadefoot (*S. bombifrons*), Woodhouse's toad (*Bufo woodhousei*), and Great Plains toad (*B. cognatus*). Common reptiles in the grasslands include the western box turtle (*Terrapene ornata*), many-lined skink (*Eumeces multivirgatus*), Great Plains skink (*E. obsoletus*), whiptail lizard (*Cnemidophorus*), side-blotched lizard (*Uta stansburiana*), short-horned lizard (*Phrynosoma douglassi*), lesser earless lizard (*Holbrookia maculata*), bull snake (*Pituophis melanoleucus*), coach whip (*Masticophis flagellum*), western diamondback rattlesnake (*Crotalus atrox*), and western rattlesnake (*C. viridis*).

Raptors use the grassland areas for hunting throughout the year, but the lack of nesting sites (e.g., trees and cliffs) limits the use of this habitat type for breeding. Manmade structures may occasionally be used by some species for nesting. Raptor species known or expected to occur in the grassland type are northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*B. swainsoni*), ferruginous hawk (*B. regalis*), American kestrel (*Falco sparverius*), prairie falcon (*F. mexicanus*), barn owl (*Tyto alba*), long-eared owl (*Asio otus*), great horned owl (*Bubo virginianus*), and burrowing owl (*Athene cunicularia*). Turkey vultures (*Cathartes aura*) are common scavengers in this habitat.

Other common grassland birds are the scaled quail (*Callipepla squamata*), mourning dove

(*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), crissal thrasher (*Toxostoma dorsale*), loggerhead shrike (*Lanius ludovicianus*), lark sparrow (*Chondestes grammacus*), black-throated sparrow (*Amphispiza bilineata*), western meadowlark (*Sturnella neglecta*), brown-headed cowbird (*Molothrus ater*), and house finch (*Carpodacus mexicanus*).

The mammal community in the grasslands is dominated by rodents and lagomorphs (rabbits and hares). These include desert cottontail (*Sylvilagus auduboni*), black-tailed jack rabbit (*Lepus californicus*), spotted ground squirrel (*Spermophilus spilosoma*), Gunnison's prairie dog (*Cynomys gunnisoni*), Botta's pocket gopher (*Thomomys bottae*), silky pocket mouse (*Perognathus flavus*), Ord's kangaroo rat (*Dipodomys ordii*), banner-tailed kangaroo rat (*D. spectabilis*), Merriam's kangaroo rat (*D. merriami*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), white-footed mouse (*P. leucopus*), and northern grasshopper mouse (*Onychomys leucogaster*).

Mammalian predators in the grassland community include the coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), long-tailed weasel (*Mustela frenata*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*). Although the black-footed ferret (*Mustela nigripes*) once may have occurred in this area, this species is not on the federal endangered species list for New Mexico (U.S. Fish and Wildlife Service, 2004). No large prairie dog "towns," upon which the ferret depends, remain on KAFB, although some small prairie dog colonies are present.

Mule deer (*Odocoileus hemionus*) are the only large herbivores that use the grasslands. However, because this species is primarily a browser and not a grazer, mule deer are infrequent users of the grasslands.

1.11.3. Threatened, Endangered, and Sensitive Species and Habitats

There are no federally listed threatened or endangered species known to occur within KAFB. State-listed threatened and endangered wildlife species that occur or potentially occur are the peregrine falcon (*Falco peregrinus*), willow flycatcher (*Empidonax traillii*), gray vireo (*Vireo vicinior*), and Baird's sparrow (*Ammodramus bairdii*) (New Mexico Department of Game and Fish, 2002). The gray vireo was observed in Sol se Mete Canyon in October 1991 (Sullivan, 1991). It is not known whether this species breeds in the area. No records of the other species exist for this area. There are no state-listed endangered plants at KAFB (19.21.2 NMAC).

PERMIT ATTACHMENT 2: DESIGN AND OPERATION OF THE OPEN BURN AND OPEN DETONATION UNITS

2.0 INTRODUCTION

This Attachment describes the operations and waste management practices for the Open Burn (OB) and Open Detonation (OD) Units at the Explosive Ordnance Disposal (EOD) Range at Kirtland Air Force Base (KAFB) and compliments the information provided in Attachment 1 of this Permit. It includes descriptions of the Open Burn Unit and Open Detonation Unit and the current operational and waste management practices associated with them. Requirements for treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; and preparedness and prevention are also discussed herein.

The KAFB EOD Branch manages the Open Burn Unit and Open Detonation Unit. EOD personnel are responsible for the safe handling, management, and treatment of hazardous waste at the Open Burn Unit and Open Detonation Unit.

All hazardous waste treated by the Open Burn Unit and Open Detonation Unit has the potential to detonate or is a propellant which cannot be safely disposed of through other modes of treatment, pursuant to 40 C.F.R. § 265.382. In accordance with 40 C.F.R. § 261.23(a) (6), the high explosive (HE) waste streams are capable of detonation if subjected to a strong initiating source or if heated under confinement. The remaining HE waste streams have the potential to detonate because they are Hazard Classes 1.1 through 1.6 explosives as defined in 49 C.F.R. §173.53, pursuant to 40 C.F.R. §261.23(a)(8). As stated in Chapter 7 of "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*" (EPA, 1986) (SW-846), Section 7.3, the definition of reactivity "is intended to identify wastes that, because of their extreme instability and tendency to react violently or explode, pose a problem at all stages of the waste management process".

Primary to the EOD Range mission is the safe handling, management, and treatment of all reactive and ignitable hazardous wastes. HE, when accidentally exposed to even a small initiating source such as friction, a pinch point, electrical discharge, heat, or impact, can potentially detonate. HEs typically managed at the Open Burn Unit and Open Detonation Unit have detonation velocities averaging 4 to 6 miles per second and pressures as high as 300,000 times atmospheric pressure for short periods. Fickett and Davis (1979) explain that a good solid explosive converts energy at a rate of 1010 watts per square centimeter at its detonation front.

Detonation rates for common Hazard Classes 1.1 through 1.6 HE types that may be contained in the hazardous wastes treated at the Open Burn Unit and Open Detonation Unit exceed the regulatory requirement in 40 C.F.R. § 265.382 (i.e., 0.33 kilometers per second [km/sec] at sea level). For example, the detonation rate for ammonium nitrate and fuel oil (ANFO) is 4.80 km/sec, and the detonation rate for HMX is 9.11 km/sec. Other Hazard Classes 1.1 through 1.6 HE types typically fall between these detonation rates. The detonation rates were taken from the "LLNL Explosives Handbook--Properties of Chemical Explosives and Explosive Stimulants" (Dobratz and Crawford, 1985).

Each waste's potential for reactivity shall be evaluated separately (e.g., using MIDAS, MSDSs, other databases/technical manuals, sampling and analysis data). In situations where the

materials are relatively homogenous and the concentrations are uniform and typically less than 10% by weight HE, these waste types may not propagate a detonation when initiated with boosters. However, this example does not address heterogeneous mixtures where chunks or "high HE concentration regions" might be located within a waste to be treated. This type of situation could occur with any type of HE or HE-contaminated hazardous waste.

Most likely, this 10% by weight criterion was established using TNT-contaminated soils and TNT-contaminated waste. TNT is relatively "less hazardous" or somewhat less sensitive when compared to some of the other types of HE that may be treated at the Open Burn Unit and Open Detonation Unit, such as pentaerythritol tetranitrate (PETN), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX).

2.1. OPEN BURN/OPEN DETONATION UNITS

The EOD Range at the KAFB Facility is located southeast of the former Manzano Base approximately two miles north of the southern boundary of KAFB (Figure 2-1). The Open Burn Unit and Open Detonation Unit are located at the EOD Range (Figure 2-2), and are used to treat (i.e., open burning or open detonation) hazardous waste, including Explosive Wastes, to remove the characteristics of reactivity (D003) and ignitability (D001). Wastes to be treated include explosives, propellants, and pyrotechnics in the form of pure substances; expired or unserviceable munitions, and explosive-contaminated waste items. Hazardous wastes authorized to be treated at the Open Burn Unit and Open Detonation Unit are presented in Tables 4-1 and 4-2 in Attachment 4 of this Permit. Hazardous wastes treated at the Open Burn Unit and Open Detonation Unit are mostly in solid form; however, on occasion, wastes in liquid form (e.g., picric acid) may be treated at these Units. The design and construction of both Units are described below. Releases from the EOD Range that may be harmful to human health or the environment are minimized by the location, design, and/or construction of both hazardous waste treatment units.

2.1.1. The Open Burn Unit

The location of the OB Unit is shown on Figure 2-2. The OB Unit consists of a stationary steel container located on a concrete pad, which is surrounded by concrete walls on three sides. The eight-inch-thick concrete pad is 30.5 ft long by 10.5 ft wide, and the one-foot-thick concrete walls are 21.5 ft long, 10.5 ft wide, and 9 ft high. The northern portion (approximately 19 ft) of the reinforced concrete pad is level, and a two-ft-wide by approximately six-inch-high containment “hump” is located at the southern extent of the level portion of the pad to prevent run-on into or runoff from the concrete pad. The remaining portion (approximately 9 ft) of the concrete pad is sloped gently to the south, which allows ease of vehicular access to unload wastes for treatment at the Unit (See Figure 2-3 for additional details of the concrete pad and walls). On the northwest side of the OB Unit is a soil berm, approximately 10 ft high, which protects the unit from shock waves resulting from detonations at the nearby OD Unit.

The OB Unit design was modified and upgraded in 2002, and this upgrade was approved by the Department on August 29, 2002. The upgrades included modifying the cover to be sloped for drainage of precipitation and to be manually rolled to open and closed positions, and installing the steel container.

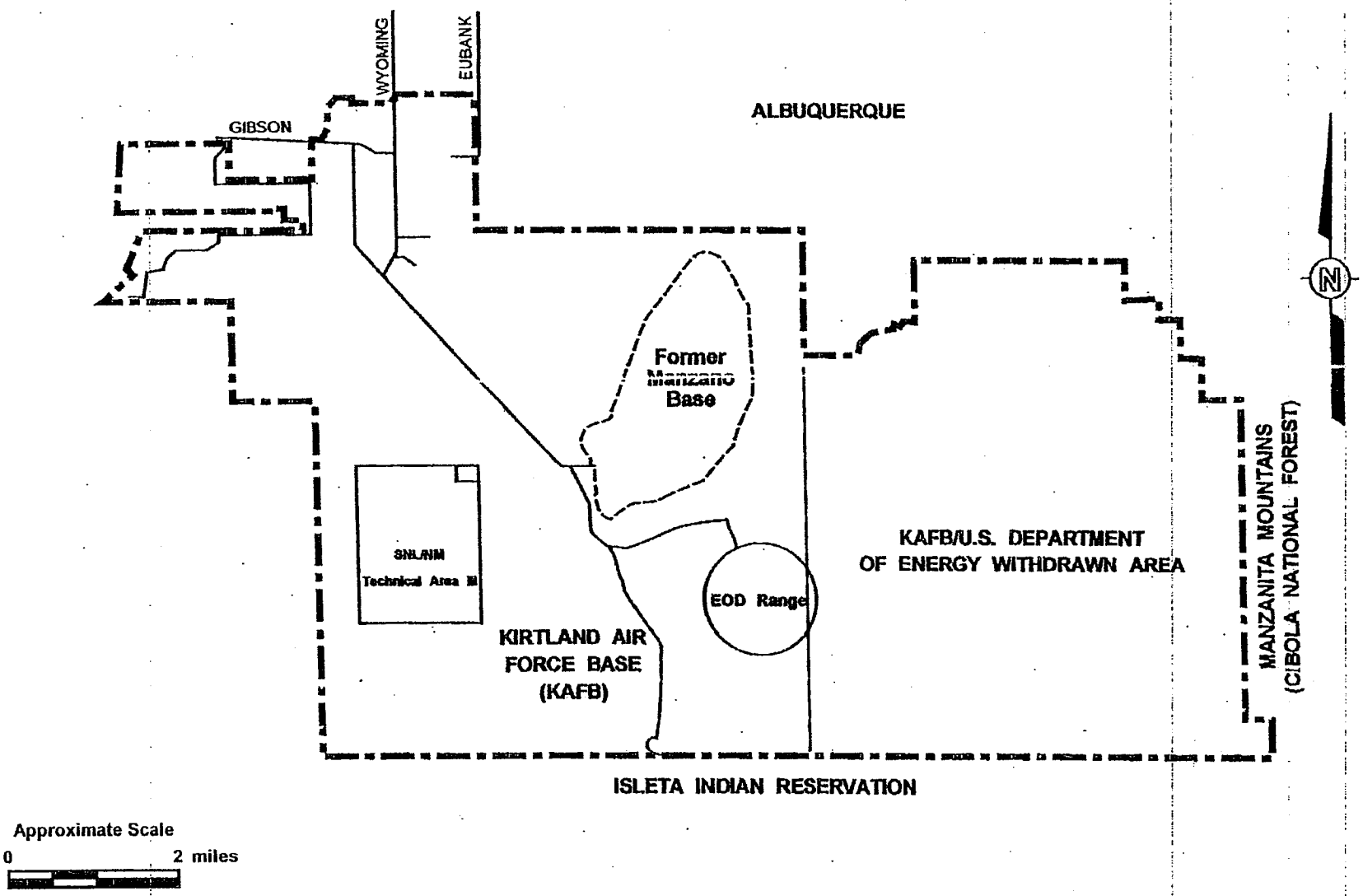


FIGURE 2-1

Location of the Explosive Ordnance Disposal (EOD) Range

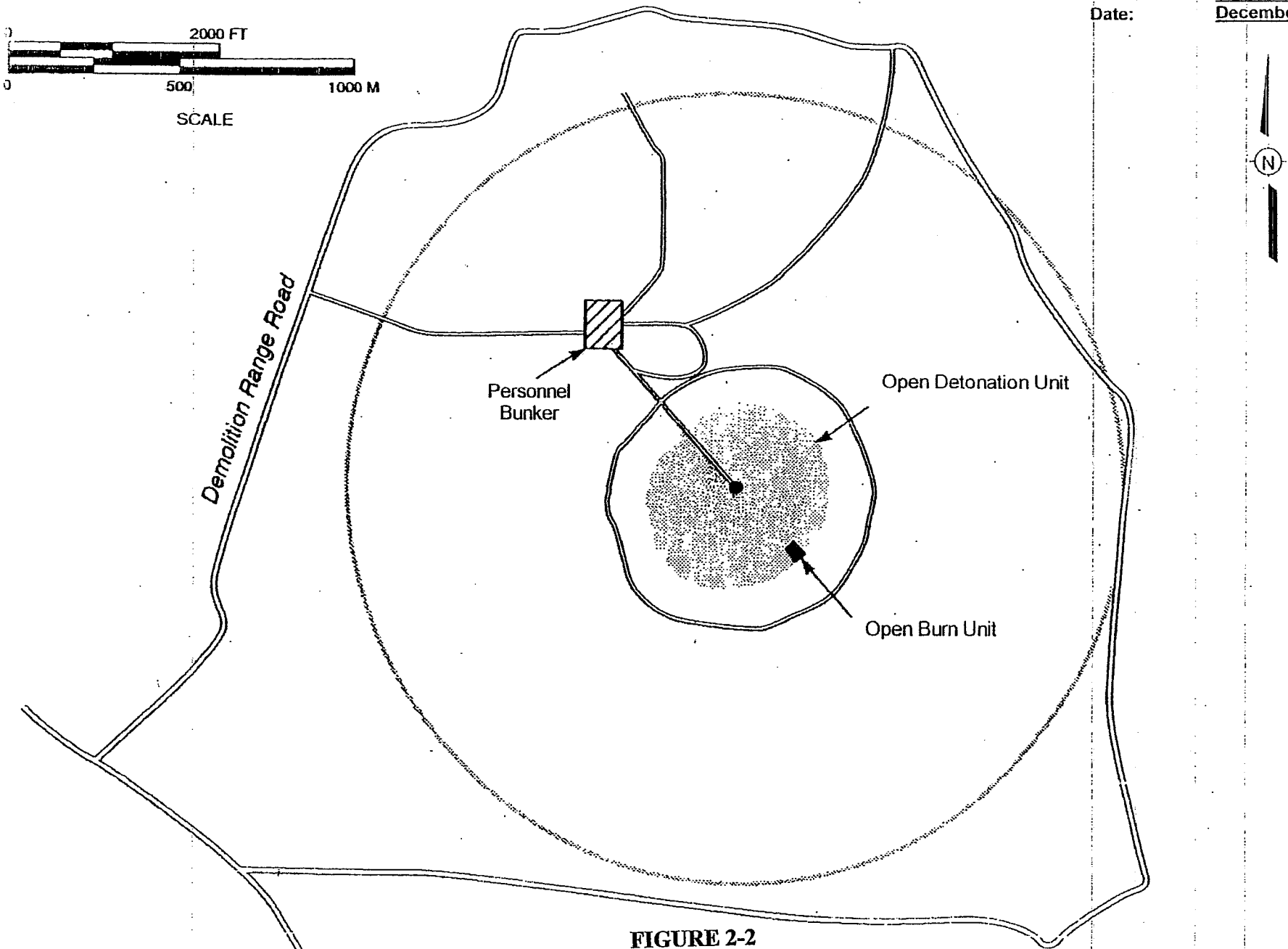


FIGURE 2-2
Location of the Open Burn (OB) and Open Detonation (OD) Units at the Explosive Ordnance Disposal (EOD) Range

CG0006.04.02

FIGURE 2-3
OPEN BURNING UNIT ENGINEERING DRAWINGS

KIRTLAND

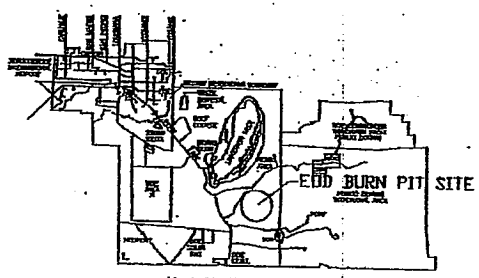
AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO

PROJECT NO. & TITLE: EOD BURN PIT COVER

PREPARED BY: CHUGACH MANAGEMENT SERVICES, JV
MHMV 011928, WORK ORDER 90556

DRAWING INDEX

SHEET NO.	GENERAL INFORMATION SHEETS	SED. NO.
T-1	TITLE SHEET AND INDEX OF DRAWINGS	1 OF 4
S-1	BURN PIT COVER PLAN VIEW, FRONT VIEW AND SECTION "A"	2 OF 4
S-2	BURN PIT COVER SECTIONS "B" AND "C"	3 OF 4
S-3	BURN PIT COVER PLYWOOD AND DECKING LAYOUT PLAN	4 OF 4



KEY PLAN–MAIN BASE

4/19/2002

KAFB

CHUGACH MANAGEMENT SERVICES, JV

KIRTLAND AFB, ALBUQUERQUE, NEW MEXICO
EOD BURN PIT COVER
TITLE SHEET &
INDEX OF DRAWINGS

SHEET No. T-1

SEQUENCE No. 01 of 04

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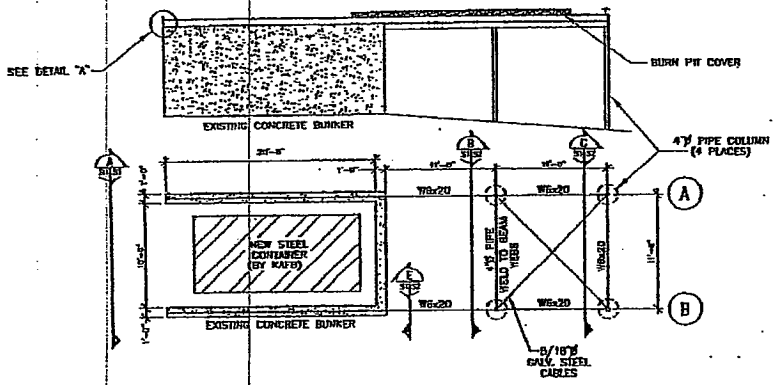

BURN PIT BUNKER PLAN VIEW & ELEVATION

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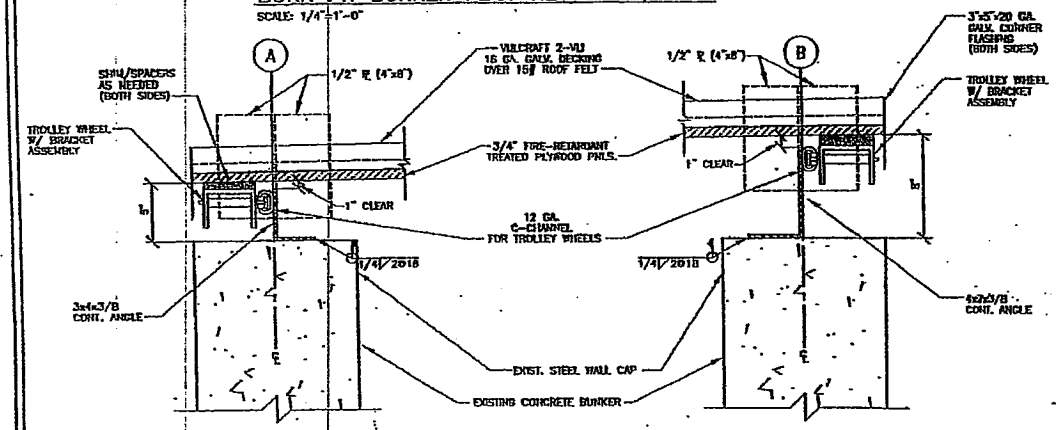
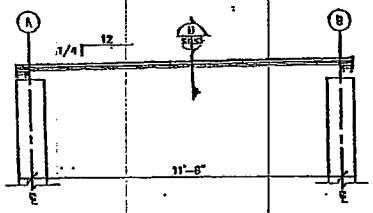


BURN PIT SECTION "A"—ENLARGED

SCALE: 3"=1'-0"



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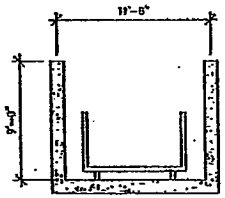

BURN PIT BUNKER—FRONT VIEW

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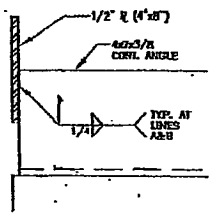

DETAIL "A"

SCALE: 3"=1'-0"

STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NINTH EDITION OF THE AISC "MANUAL OF STEEL CONSTRUCTION—ALLOWABLE STRESS DESIGN".
2. STRUCTURAL AND MISCELLANEOUS STEEL MEMBERS, SHAPES AND CONNECTIONS SHALL BE ASTM A36 PROVIDING A MINIMUM YIELD STRENGTH OF 36 KSI, UNLESS OTHERWISE NOTED.
3. ALL STRUCTURAL STEEL TUBE SHAPES SHALL BE ASTM A500, GRADE B PROVIDING A MINIMUM YIELD STRENGTH OF 46 KSI, UNLESS OTHERWISE NOTED.
4. ALL CONNECTION BOLTS SHALL BE ASTM A325, UNLESS OTHERWISE NOTED. TIGHTEN BY THE "SNUG TIGHT" METHOD.
5. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS AND SHALL BE IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE AWS AND AISC. ALL WELDS SHALL HAVE A MINIMUM TENSILE STRENGTH OF 70 KSI AND A SHEAR STRENGTH OF 21 KSI.
6. ALL ANCHOR BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE. PROVIDE NUTS AND WASHERS WITH EACH ANCHOR BOLT. EXPANSION-TYPE ANCHOR BOLTS (BY HILTI OR APPROVED EQUAL) ARE PERMITTED.

COLD FORMED METAL:

1. ALL COLD FORMED METAL FRAMING MEMBERS SHALL HAVE A MINIMUM YIELD STRENGTH OF 33 KSI. ALL FRAMING MEMBERS SHALL BE SUPPLIED BY DIETRICH INDUSTRIES (OR APPROVED EQUAL) & BE OF THE TYPE & SIZE SHOWN ON THE PLANS. THE PHYSICAL & STRUCTURAL PROPERTIES LISTED BY DIETRICH SHALL BE CONSIDERED THE MINIMUM PERMITTED FOR ALL FRAMING MEMBERS. SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER AS PART OF THE SHOP DRAWING/SUBMITTAL PROCESS.
2. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF ANSI/AWS D1.1 WHICH IS INCLUDED IN UBC STANDARD NO. 27-8 AND ANSI/AWS D1.3 WHICH IS INCLUDED IN UBC STANDARD 27-13. WHERE THE WELD THROAT IS NOT SHOWN ON THE DRAWINGS, THE THROAT SHALL BE AT LEAST AS LARGE AS THE THICKNESS OF THE THINNEST SHEET JOINED. ALL WELDS SHALL PROVIDE COMPLETE FUSION OF THE SHEET WITHOUT "BLOW-OUTS".
3. ALL STUDS SHALL HAVE A FULL BEARING AGAINST THE INSIDE OF TRACKS. SPLICES IN STUDS ARE NOT PERMITTED.
4. AT TRACK BUTT JOINTS, ABUTTING PIECES OF TRACK SHALL BE SECURELY ANCHORED TO A COMMON STRUCTURAL ELEMENT OR THEY SHALL BE SPLICED TOGETHER.

CONCRETE NOTES:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AS LISTED BELOW:
   - F'c = 3000 PSI – ALL CAST-IN-PLACE CONCRETE FOR FOOTINGS
   - F'c = 4000 PSI – BUILDING SLABS-ON-GRADE
   - F'c = 4000 PSI – EXTERIOR SLABS-ON-GRADE
2. ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60, MINIMUM YIELD STRENGTH OF 60 KSI FOR PRIMARY REINFORCING AND ASTM A615, GRADE 40, MINIMUM YIELD STRENGTH OF 40 KSI FOR TIES.
3. ALL HORIZONTAL REINFORCING STEEL IN FOOTINGS OR GRADE BEAMS SHALL BE CONTINUOUS AROUND CORNERS OR HAVE CORNER BARS THE SAME SIZE AND SPACING AS THE HORIZONTAL BARS AND LAP 30 BAR DIAMETERS OR 24" MINIMUM.
4. ALL LAPPED SPLICES IN REINFORCING STEEL SHALL LAP 30 BAR DIAMETERS OR 24" MINIMUM.
5. MINIMUM REINFORCING STEEL COVERAGE SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

CONCRETE PLACED AGAINST EARTH	3"
CONCRETE EXPOSED TO EARTH OR WEATHER: #3 BARS AND SMALLER	1-1/2"
TOP COVER IN 4" AND 6" SLAB	1-1/2"

6. PROVIDE STEEL BAR SUPPORTS AND BAR SPACERS IN ACCORDANCE WITH ACI 315. PROVIDE STEEL CHAIRS WITH 22 GAUGE SAND PLATES FOR SUPPORT OF ALL REINFORCING STEEL ABOVE GRADE. NO PLASTIC, WOOD, OR BRICK SUPPORTS WILL BE PERMITTED.
7. ALL EXTERIOR CONCRETE SHALL BE AIR ENTRAINED 5% MINIMUM.

4/19/2002

KAFB

CHUGACH MANAGEMENT SERVICES, LLC

KIRTLAND AFB, ALBUQUERQUE, NEW MEXICO
ECD BURN PIT COVER
BURN PIT COVER PLAN VIEW, FRONT VIEW & SECTION "A"

SHEET NO. S-1

SEQUENCE NO. 02 of 04

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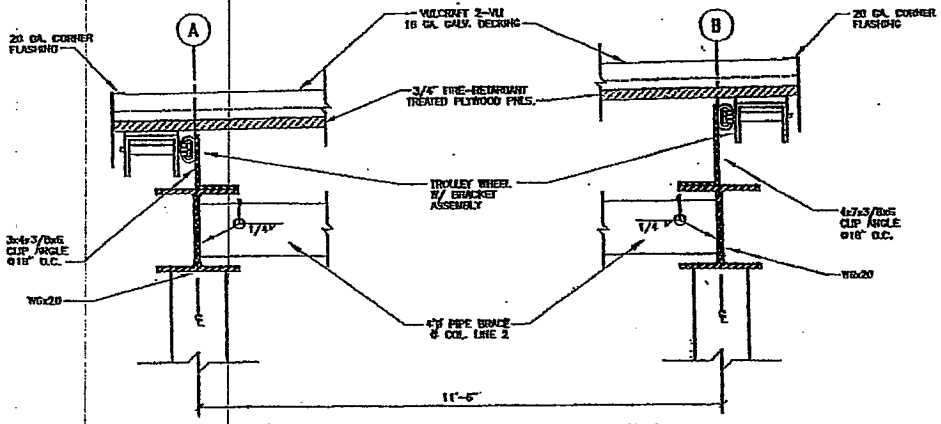

BURN PIT COVER FRAME—SECTION "B"

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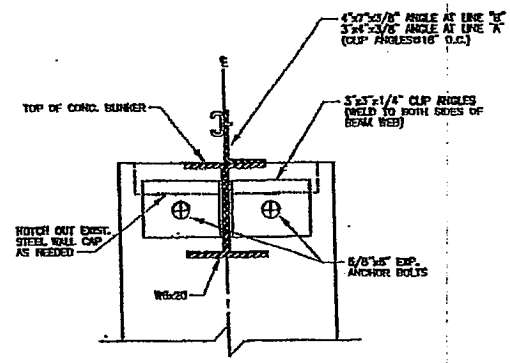

SECTION—"EE"

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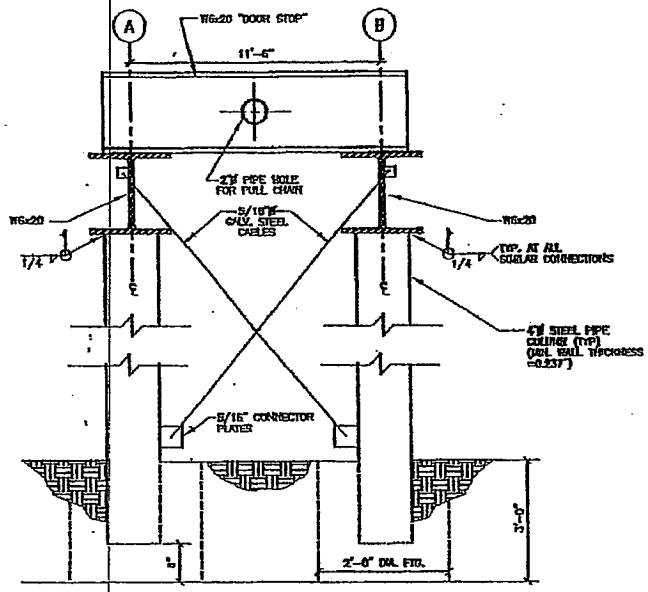

BURN PIT COVER FRAME—SECTION "C"

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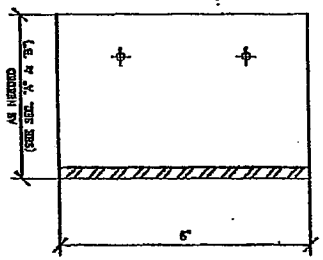

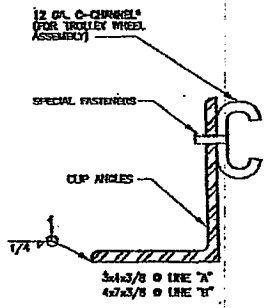

* CRITICAL FRAMING ELEMENT TO RESIST WIND UPLIFT.

CLIP ANGLES—WELD TO W6x20 TROLLY BEAMS

SCALE: N.T.S.

4/19/2002

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KAFB

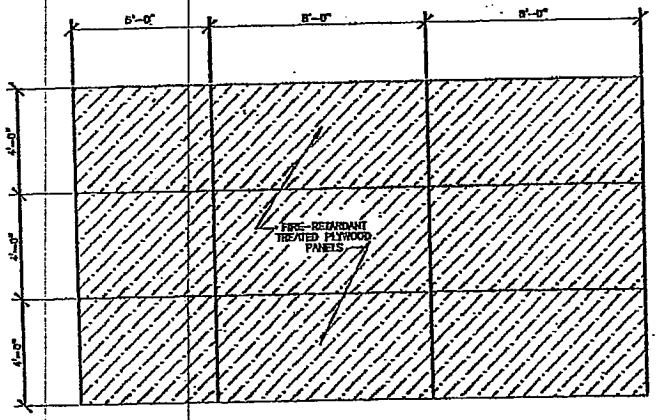
REVISIONS

CH2MHILL

NORTHLAND AFB, ALBUQUERQUE, NEW MEXICO
EOD BURN PIT COVER
BURN PIT COVER
SECTIONS "B" AND "C"

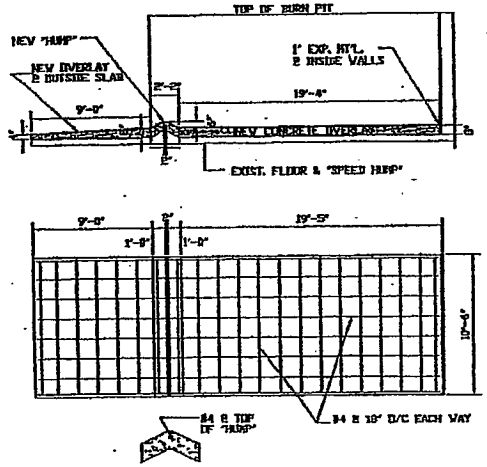
SHEET NO. S-2

EOD DISTRICT NO. 03 of 04



BURN PIT COVER–PANEL LAYOUT PLAN

SCALE: 3"=1'-0"



NEW CONCRETE FLOOR–ALTERNATE #2

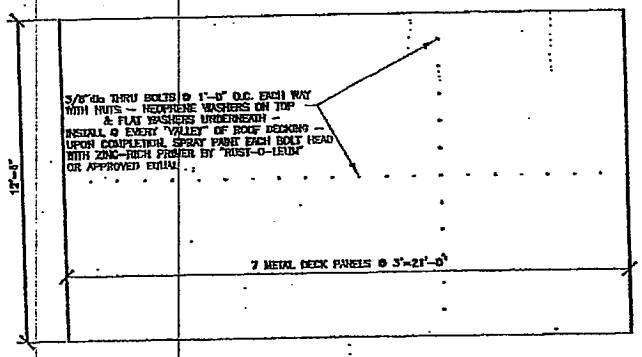
SCALE: 3/4"=1'-0"

GENERAL NOTES

1. CONTRACTOR TO INSTALL PULL CHAINS AT BOTH ENDS OF NEW PIT COVER ASSEMBLY.
2. CONTRACTOR TO INSTALL CLASPS OR CLIPS (FOR PULL CHAINS) TO SECURE THE PIT COVER IN BOTH THE OPEN & CLOSED POSITIONS.
3. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF TROLLEY WHEEL/BRACKET ASSEMBLY TO ENGINEER FOR APPROVAL.

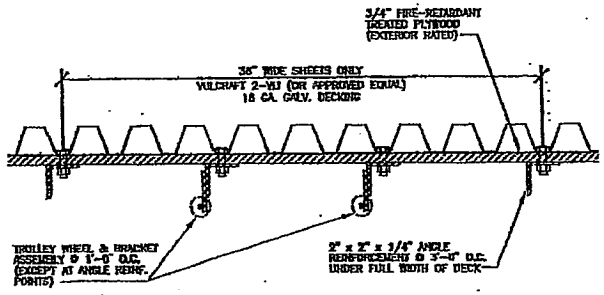
SPECIAL NOTE: ALTERNATE #1

1. REMOVE ALL EXISTING HEAVY STEEL PLATES LINING THE WALLS AND FLOOR OF THE BURN PIT.
2. REMOVE THE EXISTING HEAVY STEEL DOORS FROM THE FRONT OF THE BURN PIT BUNKER.



BURN PIT COVER–FASTENER LAYOUT PLAN

SCALE: 3"=1'-0"



BURN PIT COVER–SECTION "D"

SCALE: 3"=1'-0"

4/19/2002

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KAFB

CHUGACH MANAGEMENT & TECHNOLOGY

KIRTLAND AFB, ALBUQUERQUE, NEW MEXICO
EOD BURN PIT COVER
BURN PIT COVER PLYWOOD & DECKING LAYOUT PLAN

SHEET NO. S-3

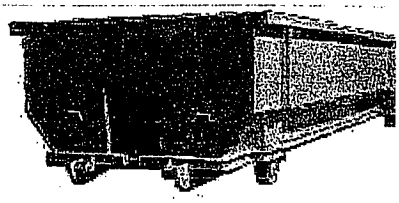
SEQUENCE NO. 04 of 04

Cooper Tank

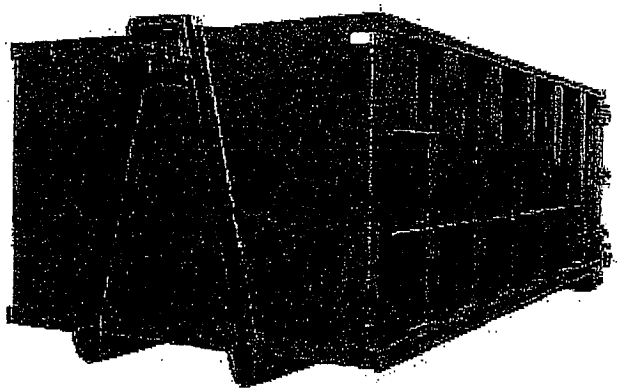
Categories
Dumpsters
Roll Off Containers
Front Load Containers
Rear Load Containers
Compactors
Compaction Containers
Plastic Lids
Replacement Parts

Roll-Off Containers

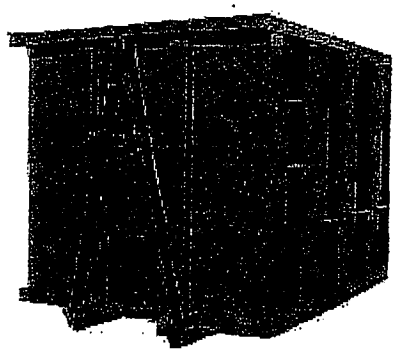
Series KT-ORO
Rectangular Style Roll-Off Containers
Standard Specifications(click here)
Heavy Duty Specifications(click here)



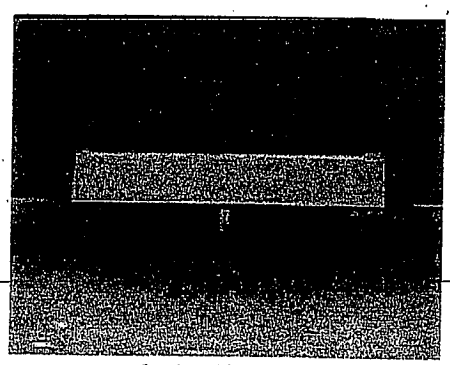
Series KT-OBH
Tub Style Roll-Off Containers
Standard Specifications(click here)
Heavy Duty Specifications(click here



Series KT-OHL
Hooklift Style Roll-Off Containers



Series KT-ODH
Dual Hooklift/Cable Containers



Series KT-ODD
Dempster Style Understructure Also Available

Home Page

Quotation Form

The rectangular steel container is constructed of heavy-duty steel. The steel container currently in use is the equivalent of a Cooper Tank Roll-Off Container, with a capacity of 12 cubic yards. It is 11 ft long, with an inner height of 4.3 ft and an overall height of 5.25 ft (See Figure 2-4 for additional engineering specifications of the steel container). The walls of the container are constructed of 11-gauge steel. A heavy-duty steel door is located at one end of the container, which is opened during waste placement and treatment residue removal. When necessary (e.g., if the container becomes irreparably damaged), the steel container shall be replaced with a new, equivalent container.

The OB Unit has a retractable, galvanized steel cover, which shall be rolled manually into place with pull chains along a steel framework (C-channels) during non-operational periods. Figure 2-1 illustrates additional details of the retractable cover. The cover is slightly inclined to prevent precipitation from entering the Unit. When rolled into place after a treatment event, the cover also acts to prevent treatment residue from being blown from the Unit by wind until the residue can be safely removed from the Unit for subsequent treatment and/or disposal. During inclement weather (e.g., heavy rain or snow), accumulated precipitation in the OD Unit cannot be prevented, and road conditions do not allow access to the Unit. Any accumulated precipitation shall be removed in accordance with Section 3.2.5.1 of Part 3 of this Permit. Should a treatment event at the OB Unit be delayed, the cover will be rolled into place to cover and protect the wastes until treatment can take place.

2.1.2. Open Detonation Unit

The OD Unit consists of a cleared area surrounded and delineated by an approximately two-ft-high earthen berm. Detonations are conducted in pits about 30 ft long, 15 ft wide and about 12 ft deep. A three-strand barbed-wire fence is located just inside the earthen berm. The cleared area shall be bladed routinely to minimize fire danger, and a series of four concentric firebreaks shall be maintained beyond the inner fenced area. The location of the OD Unit is shown on Figure 2-2.

2.2. OPERATIONAL PROCEDURES AND WASTE MANAGEMENT PRACTICES

This Section describes the operational procedures used to stage and treat hazardous waste at the Open Burn Unit and Open Detonation Unit. Waste management practices used to manage the OB Unit treatment residues are also discussed. In addition, information on treatment effectiveness; ignitable, reactive, and incompatible wastes; security and access; and preparedness and prevention are presented herein.

The Permittee shall minimize the impact to the environment while conducting OB/OD treatment operations. The safe conduct of each treatment operation is the responsibility of the designated Range Safety Officer (RSO).

Treatment of hazardous waste at the Open Burn Unit and Open Detonation Unit is conducted using a non-continuous batch thermal treatment process that requires a complete thermal cycle to treat a discrete quantity of hazardous waste, in accordance with 40 C.F.R. § 265.373.

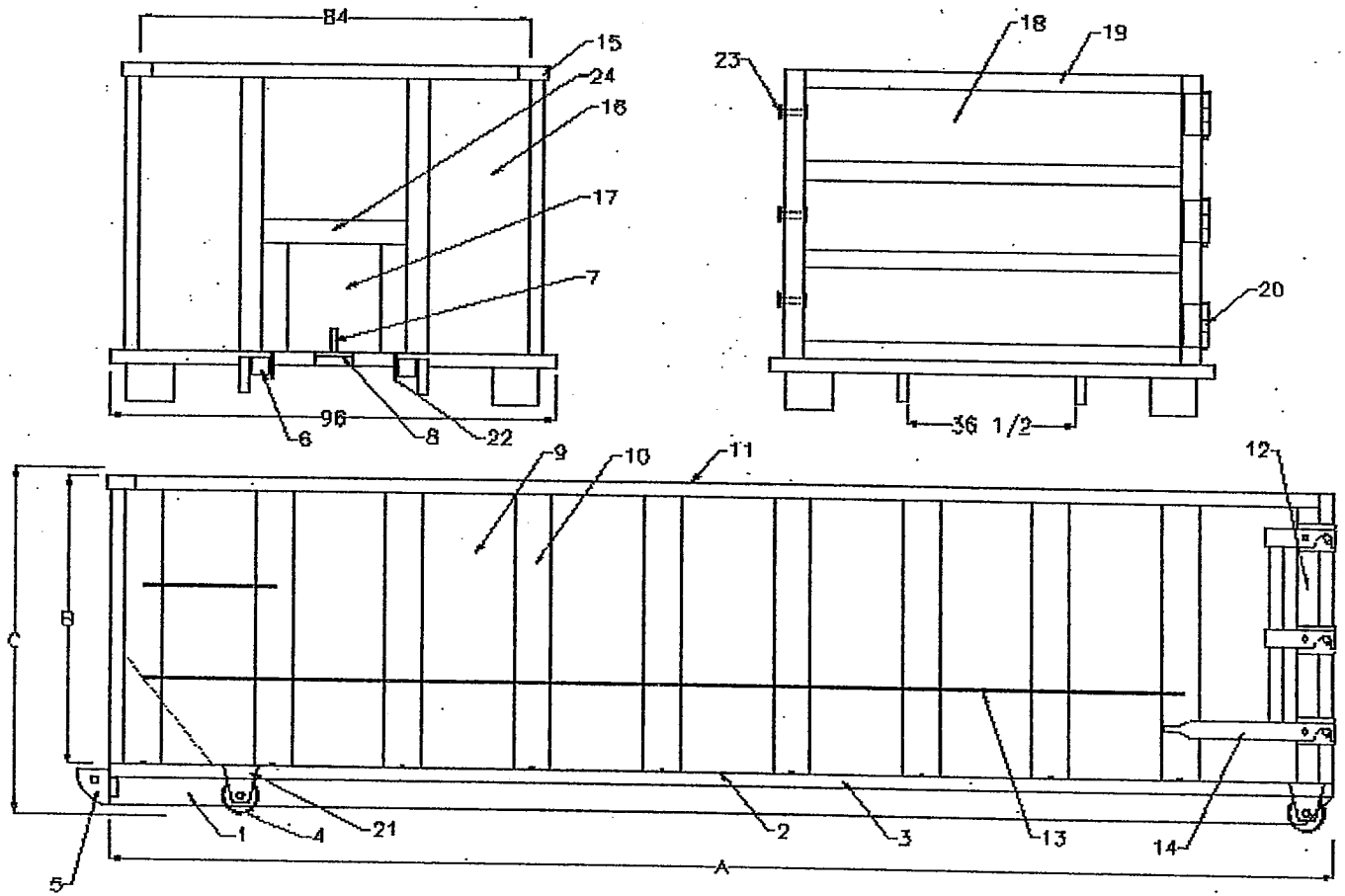
Conducting treatment activities in this remote part of the Facility mitigates noise levels to the general public resulting from treatment activities. The Permittee does not measure ground vibration during OD treatment operations. Due to the remote location of the OD Unit, potential

FIGURE 2-4
OPEN BURNING UNIT STEEL CONTAINER SPECIFICATIONS

Cooper Tank

Categories
Dumpsters
Roll Off Containers
Front Load Containers
Rear Load Containers
Compactors
Compaction Containers
Plastic Lids
Replacement Parts

Standard Rectangular Style Container Specifications



HEAVY RECT. O/R/O BILL OF MATERIALS	
NO	PART NAME
1	MAIN RAIL - 6x2x3/16 S.T.
2	3/16" FLOOR - 2 PCS
3	3" S.C. CROSSMEMBER ON 12" CENTERS
4	8x10 WHEEL WITH 1.5" GREASE-FITTED AXLE
5	1.5" SOLID BULLNOSE WITH RAIL INTERLOCK
6	4x4 NOSE ROLLER WITH 1.5" GREASE-FITTED AXLE
7	1.25" HOOK DOUBLE WELDED TO HOOK PLATE
8	1" HOOK PLATE DOUBLE WELDED TO UNDERSTRUCTURE
9	11 GA SIDE WALL
10	SIDE RIB- 8x3x11 GA 4 BEND CHANNEL ON 28" CTRS
11	TOP RAIL- 4x3x11 GA S.T.
12	DOOR POST- 5x3x7 GA 4 BEND FORMED CHANNEL
13	TARP ROD- 0.5" RND BAR
14	KT LOCK WITH SAFETY CHAIN
15	3/16" REINFORCING CORNER GUSSET
16	11 GA BULKHEAD
17	10 GA DOGHOUSE
18	11 GA TAILGATE
19	TAILGATE FRAME- 4x3x11 GA S.T.
20	0.5" HINGE PLATE WITH 1" GREASE-FITTED PIN
21	0.5" WHEEL EAR
22	0.5" ROLLER EAR WITH 0.5" GUSSET
23	LOCK BAR- 1.25" RND WELDED BOTH SIDES OF FRAME
24	BULKHEAD RIB- 5x3x11 GA4 BEND FORMED CHANNEL

HEAVY TUB ROLL-OFF CONTAINER					
	10 YD.	12 YD.	20 YD.	30 YD.	40 YD.
A.	11 FT.	11 FT.	22 FT.	22 FT.	22 FT.
B.	43"	52"	43"	63"	83"
C.	54"	63"	54"	74"	94"

(*)

Home Page

Quotation Form

impacts to human health resulting from ground vibration are predicted to be minimal.

2.2.1. Standard Operating Procedures

The OD Unit may be used to treat up to 180,000 lbs of hazardous wastes per year. The maximum authorized hazardous waste treatment capacity of the OD Unit shall not be greater than 1,500 pounds uncased explosives or 200 pounds cased munitions per treatment event. This amount requires a minimum distance of 1,730 ft from the property of others, in accordance with 40 C.F.R. § 265.382. The closest property not owned by the Facility is at a distance greater than 1,730 ft. Therefore, the required distance for safety is maintained between the treatment units and the property of others, pursuant to the above-cited regulations. The frequency of operations at the Open Burn Unit and Open Detonation Unit varies since treatment events are conducted on an as-needed basis.

Hazardous and non-hazardous waste may be treated together during a single OB event, and the maximum total quantity of combined waste during such treatments shall not exceed 5,000 lbs. Non-hazardous waste shall not be treated unless it is used as a fuel to sustain an open burning event or serves as packaging for the hazardous wastes that are treated in the Open Burn Unit and Open Detonation Unit. The OB Unit may be used to treat up to 80,000 lbs of hazardous wastes per year.

Only the minimum number of EOD personnel necessary to safely perform operations shall be allowed to conduct treatment at the Open Burn Unit and Open Detonation Unit. When escorted visitors are present to observe treatment operations, there shall be one EOD Technician or Specialist present for every three visitors.

2.2.2. Waste Screening at the EOD Range

All waste to be treated shall be visually screened and verified prior to treatment to ensure that the waste is authorized for treatment in accordance with Attachment 4 of this Permit. Screening shall be performed prior to transport to the Open Burn Unit and Open Detonation Unit. Only waste that meets the operating acceptance limits shall be transported to the Open Burn Unit and Open Detonation Unit and accepted for treatment. Verification shall be performed at the Open Burn Unit and Open Detonation Unit in two phases to ensure that the shipping documentation is complete and that the waste delivered corresponds to the documentation provided for the waste. Waste shall not be accepted until all verification is complete. For Phase 1, the shipping document shall be checked upon receipt of a waste shipment at the Open Burn Unit and Open Detonation Unit to verify the quantity of the waste, the number and type of containers, and the type of waste. Any discrepancies shall be resolved with the waste generator before EOD personnel sign the shipping document. A waste shipment shall be rejected and returned to the generator if discrepancies cannot be resolved. For Phase 2, the appointed EOD Team Chief shall visually compare the contents of the waste upon removal from its outer container at the Open Burn Unit and Open Detonation Unit with the description on the documentation provided by the generator. The visual inspection shall include content identification and quantity estimation. If any waste fails the screening and/or verification process, it shall not be accepted at the Open Burn Unit and Open Detonation Unit and shall be returned to the generator.

Waste shall not be transported to or accepted for treatment at the Open Burn Unit and Open

Detonation Unit unless all preparations for treatment have been completed in advance. Consequently, use of the treatment Units is scheduled, and an RSO and a Team Chief for treatment operations are assigned. Prior to conducting operations at the EOD Range, the Team Chief shall verify that the appropriate agencies have been notified of the treatment operation and that required permits and clearances have been obtained. In addition, EOD personnel shall assemble the equipment, tools, communication devices, operating instructions, and explosives (if required) needed for treatment operations.

The EOD Range has an annually calibrated meteorological station that measures wind speed and direction (described in Attachment 1), and detonations shall be conducted only when the climatic conditions described in Permit Condition 2.3.6 of this Attachment (2) are met. Emissions from all detonation/burn events shall be estimated each year using EPA-approved emission factors and shall be reported as part of KAFB's annual air emissions inventories.

2.2.3. Pre-Treatment Preparation

Upon arrival at the Open Burn Unit and Open Detonation Unit, an inspection of the appropriate Unit is conducted. Next, the range flag shall be raised and the wastes to be treated shall be secured in a designated holding area in the vicinity of the treatment unit to be used for the treatment event. The Team Chief shall then identify the designated RSO and brief other EOD team members and escorted visitors (if present) on the operation to be performed, required safety precautions, and emergency procedures, and instruct all those present to be watchful for unsafe conditions at all times. The Team Chief assigns specific tasks to the EOD team members.

2.2.4. Transportation of Waste to the Open Burn Unit and Open Detonation Unit and Container Specifications

Hazardous wastes shall be packaged for transport to the Open Burn Unit and Open Detonation Unit in an appropriate container that provides protection equivalent to U.S. Department of Transportation (DOT)-authorized containers. Appropriate containers include the following.

- DOT-authorized containers.
- Reinforced ammunition containers.
- Strong fiberboard boxes.
- Strong, cleared wooden boxes.

Waste to be treated shall be transported to the Open Burn Unit and Open Detonation Unit only on the day of the planned treatment event via roads within KAFB, including the Southgate Avenue, Hardin Boulevard, Pennsylvania Street, Wyoming Boulevard, Lovelace Road, and Demolition Range Road. Waste containers shall be secured to the vehicle during transport. Vehicles transporting hazardous wastes for treatment shall bear the appropriate "Explosives" placard at the front, on both sides, and at the rear of the vehicle. These signs may be covered or removed when the vehicle no longer carries the hazardous wastes. Each transport vehicle shall carry two ABC-type portable fire extinguishers that are in operational condition. Each transport vehicle shall have equipment to communicate with the KAFB Command Post and the emergency coordinator.

2.2.5. Waste Staging

Containerized hazardous wastes shall be transported to the Open Burn Unit and Open Detonation Unit and staged for treatment by appropriately trained EOD personnel. Waste containers shall be unloaded from the transport vehicle by qualified personnel. Unloading and waste placement may be done manually or with heavy equipment (e.g., a forklift). Safety concerns dictate that these wastes shall be treated as soon as possible after arrival at the Open Burn Unit and Open Detonation Unit.

Typically, wastes are not staged unless they can be treated promptly. The outer waste containers are removed, and the waste is placed in the appropriate treatment unit by qualified EOD Technicians/Specialists. The inner containers, if present, shall be removed from the outer containers just before placement into the appropriate treatment unit. The outer containers may be returned to the generator for reuse. Inner containers shall be staged at the appropriate treatment unit and managed appropriately as waste if not reusable. At the OB Unit, wastes may be placed on wooden pallets or other wood to help facilitate the burn.

Waste shall not be stored at the Open Burn Unit and Open Detonation Unit and shall only be present on site during a planned treatment event. However, if for some reason a treatment event is aborted after the OB Unit is loaded with waste and it is deemed unsafe to remove the waste, the OB Unit shall be covered with the retractable cover, and the waste will remain at the Unit and shall be watched continuously by KAFB security personnel until it is possible to perform the treatment or safely remove the waste. If waste is placed in the OD Unit and site conditions are deemed unsafe to detonate, the waste shall be immediately removed and sent back to the generator.

2.2.6. Waste Treatment

Prior to the initiation of treatment, the Team Chief shall ensure that the EOD Range is clear of unauthorized personnel, that aircraft are not approaching, and that unauthorized vehicles and persons are not within or in the vicinity of the EOD Range. The Team Chief shall also ensure that all authorized personnel at the EOD Range are at the personnel bunker, which provides protective cover and is located approximately 900 ft north of the inner fenced area. The personnel bunker is a reinforced concrete structure under an earthen cover. In addition, the Team Chief shall obtain final wind speed information from the solar-powered meteorological tower located near the personnel bunker to ensure that the wind speed does not exceed operating limits. The team chief shall also ensure that treatment operations comply with all restrictions on operations listed in this Permit, including Section 3.2.3 of Part 3. Initiation for all treatment operations shall be performed remotely by the RSO or his designee from the personnel bunker.

Treatment operations shall not be conducted during adverse climatic conditions. Operations shall not be conducted if lightning is within ten miles of the Open Burn Unit and Open Detonation Unit or when extreme fire hazard conditions exist and wind speeds exceed 10 miles per hour (mph). Operational procedures require that treatment at the OB Unit shall not be undertaken if wind speeds exceed 15 mph or on “No Burn” days designated by the City of Albuquerque Environmental Health Department Air Pollution Control Division. Operational procedures require that treatment at the OD Unit shall not be undertaken when wind speeds exceed 15 mph; during sand, dust, or snow storms; when the cloud ceiling is less than 1,000 ft

(303 meters) above the highest altitude of expected fragmentation; or when visibility is less than five miles.

Open burning of waste in the OB Unit is often facilitated by using wood and a flammable liquid, such as diesel fuel, to initiate and sustain the burn. Burn temperatures typically range from 1,500 to 2,000 degrees Fahrenheit (°F) (815 to 1,093 degrees Celsius [°C]). Most waste burns well enough that no additional source of heat is needed. The burn operation shall be monitored until complete. Treatment at the OB Unit may be considered complete when there is no longer any audible or visual (i.e., visible flame observed above the rim of the OB Unit steel container) evidence of waste destruction.

Detonation of waste in the OD Unit shall be performed using bulk explosives to countercharge the hazardous waste. Detonations typically create temperatures up to 3,000°F (1,649°C). Treatment at both Units shall be initiated by preparing an ignition train and effecting ignition from the personnel bunker. Electrical and non-electrical firing systems can be used to effect ignition at both Units. Treatment at the OD Unit is considered complete once the wastes have been detonated.

The EOD Team Chief or his designee shall be responsible for clearing any misfires, should one occur. In such an event, a second qualified person shall serve as a safety backup. A post-detonation inspection of the OD Unit shall be conducted to ensure that no fires have been caused from treatment operations and to determine if any kick-out of waste is present.

After a treatment event, the OB Unit shall be cleared of treatment residue. For safety reasons, an inspection for treatment residue at the OB Unit shall not be conducted for at least 12 hours after a treatment operation has been completed, and removal of treatment residue or reuse of either Unit shall not occur for a minimum of 24 hours. The door to the OB Unit shall remain closed and the cover shall remain retracted for 24 hours after a burn. If any hazardous waste remains untreated after burning, it shall be segregated, stored off-site of the EOD Range and treated again with the next scheduled burn or shipped off-site for treatment. In the unlikely event that complete destruction of hazardous wastes is not achieved at the OD Unit, these wastes shall be treated again. Hazardous wastes shall not be stored at the OB or OD Units.

2.2.7. Waste Management Practices

Hazardous wastes are treated at the Open Burn Unit and Open Detonation Unit to remove the characteristics of reactivity and, for some wastes, ignitability. Metals and organic compounds may be present in the wastes treated at the Open Burn Unit and Open Detonation Unit, and any metals will not be destroyed. Treatment residues, in the OB Unit shall be characterized by sampling and analysis for appropriate characteristic metals and organic compounds, and underlying hazardous constituents, as needed. Treatment residues in the OB Unit shall be managed appropriately. If analysis indicates that the treatment residues from the OB Unit are hazardous, the residues shall be containerized and sent to a permitted off-site Subtitle C facility for subsequent treatment and disposal. If analysis indicates that the residues are not hazardous, they shall be containerized and sent to a permitted Subtitle D facility for disposal.

Major open detonation reaction products include N_2, CO_2, and H_2O. Small quantities of net elemental carbon (or soot), CO, H_2, CH_4, NO, NO_2, HCN, HCl, HF, C_2H_2, C_2H_4, C_2H_6, and CH_2O may also be produced. However, as the detonation proceeds, all or most all of the latter

products react with oxygen in air or with each other to form the major reaction products.

Volatile organic compounds (VOCs) are expected to be consumed during burning. The OB Unit shall operate in accordance with the conditions imposed by this Permit and open burn permits granted by the City of Albuquerque Environmental Health Department Air Pollution Control Division.

Operating procedures require that no treatment residue be collected or removed for 24 hours following a burn. In accordance with this requirement, treatment residue shall be sampled after the 24-hour period, provided it is safe to collect samples, unless a visual inspection indicates that the waste must be treated again. If the collection of samples is unsafe for any reason, samples shall be collected immediately after safe conditions have been achieved. If waste must be treated again, waste requiring additional treatment shall be left in the OB Unit, covered, and shall be treated as soon as conditions allow. Containers of treatment residue may be stored in a designated less-than 90 day storage area, pending analysis, after which the residues shall be managed for treatment and/or disposal. Treatment residues shall be removed from the OB Unit within two (2) working days after a burn.

2.2.8. Treatment Effectiveness

In order to address applicable 40 C.F.R. Part 264 Subpart X, *Miscellaneous Units*, regulatory requirements a demonstration of treatment effectiveness shall be included for the Open Burn Unit and Open Detonation Unit. As indicated in 40 C.F.R. § 270.23(d), a demonstration of treatment effectiveness shall be based on laboratory or field data. Detonation creates temperatures in excess of 3000°F (1649°C), and burn temperatures typically reach 1500 to 2000°F (815 to 1093°C). A minimum temperature of 752°F (400°C) is generally sufficient to treat hazardous wastes authorized for treatment at the Open Burn Unit and Open Detonation Unit.

2.3. IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

Prior to treatment at the Open Burn Unit and Open Detonation Unit, wastes shall be protected from sources of ignition or reaction. Ignitable or reactive waste shall be separated and protected from welding activities, hot surfaces, frictional heat, and sources of sparks. A “No Smoking” sign posted in English and Spanish shall be located at the entrance to the inner fenced area of the EOD Range. Waste characterization information (e.g., knowledge of process, Material Safety Data Sheets, and other technical information, as appropriate) shall be used to document compliance with these precautionary measures, as required by 40 C.F.R. § 264.17(c). Incompatible wastes shall not be managed at the Open Burn Unit and Open Detonation Unit.

2.4. PREPAREDNESS AND PREVENTION REQUIREMENTS

The following sections present how operations at the Open Burn Unit and Open Detonation Unit comply with regulatory requirements for preparedness and prevention:

2.4.1. Required Equipment

The Open Burn Unit and Open Detonation Unit shall be equipped with or personnel shall have access to adequate emergency equipment, which includes internal communication equipment,

fire extinguishers, and fire control and decontamination equipment. The emergency equipment available for use at the Open Burn Unit and Open Detonation Unit is discussed in the following sections and is summarized in Tables 8-2 and 8-3 in the Contingency Plan under Attachment 8 of this Permit.

An internal communications or alarm system capable of providing immediate emergency instructions (voice or signal) to Facility personnel shall be available on-site. In addition, a telephone or two-way radio capable of summoning emergency assistance shall also be available on-site. Treatment activities at the Open Burn Unit and Open Detonation Unit shall be conducted only after notifying the KAFB Command Post (KCP). EOD personnel shall be equipped with two-way radios to provide immediate emergency instructions and to summon assistance, if required. Two-way radios and cellular phones shall be carried by EOD personnel for internal communications with EOD Control, the KCP, and the KAFB Fire Department.

All vehicles used at the Open Burn Unit and Open Detonation Unit shall carry portable fire extinguishers and shovels which may be used should an unplanned fire occur at the Open Burn Unit and Open Detonation Unit. Portable fire extinguishers and shovels shall also be kept at the EOD personnel bunker for response to unusual conditions, including unplanned fires that might be caused by hazardous wastes ejected during OB/OD treatment events.

Shovels carried in the vehicles utilized at the Open Burn Unit and Open Detonation Unit and at the personnel bunker shall also be used to manage spills. Appropriate personal protective equipment shall also be available for use at the Open Burn Unit and Open Detonation Unit to clean up spills should any occur.

Eyewash solutions shall be included in the first-aid kits carried in the vehicles used at the Open Burn Unit and Open Detonation Unit. These solutions shall be used, as appropriate, to decontaminate the eyes or skin of EOD personnel in the event that an exposure to hazardous waste occurs.

Due to the isolated location of the Open Burn Unit and Open Detonation Unit, there are no continuous supplies of fire control water. Instead, the KAFB Fire Department shall be on call during any open burning or open detonation treatment operations, and shall provide tanker trucks equipped with water at adequate volume and pressure to fight any unplanned fires that occur.

2.4.2. Testing and Maintenance of Equipment

All communications systems, fire protection equipment, and decontamination equipment associated with the Open Burn Unit and Open Detonation Unit shall be tested and maintained according to the inspection schedule detailed in Attachment 7 of this Permit. Emergency equipment, communications equipment, fire protection equipment, and decontamination equipment shall be immediately repaired or replaced as needed.

2.4.3. Access to Communications or Alarm Systems

Whenever treatment operations are conducted at the Open Burn Unit and Open Detonation Unit, personnel shall have immediate access to an emergency communication device, either directly or through visual or voice contact with another individual. In the event of an emergency, two-way radios and cellular telephones shall be used to contact the KCP and the Contingency Plan in

Attachment 8 of this Permit shall be immediately implemented.

2.4.4. Space Requirements

Adequate space shall be maintained at the Open Burn Unit and Open Detonation Unit to allow the unobstructed movement of personnel, fire-protection equipment, and decontamination equipment to any area of the Open Burn Unit and Open Detonation Unit in the event of an emergency.

2.4.5. Support Agreements with Outside Agencies

The Permittee shall maintain support agreements with various outside facilities (e.g., medical facilities, ambulance services, Albuquerque Fire Department) for emergency response assistance. A copy of these agreements, or documentation that such agreements were attempted by the Permittee but could not be reached, shall be kept at the KAFB Facility. A medical facilities agreement ensures that in the event of a major catastrophe or other events affecting major portions of the community population, medical care will be available at a number of facilities and, thus, will not exceed any one facility's capacity. An ambulance services agreement provides for coordination and coverage of such services at the Facility in the event of an emergency involving injuries or illness. An agreement with the Albuquerque Fire Department for mutual aid in fire protection assures that assistance will be provided, as needed.

2.4.6. Preventive Procedures, Structures, and Equipment

Descriptions of the preventive procedures, structures, and equipment at the Open Burn Unit and Open Detonation Unit are presented below. Adherence to the procedures and proper use of the structures and equipment shall be done to prevent hazards associated with unloading operations, prevent runoff from escaping hazardous waste management areas, prevent contamination of water supplies, mitigate the effects of equipment failures and power outages, prevent undue exposure of personnel to hazardous waste, prevent releases of hazardous wastes or hazardous constituents to soil, sediment, surface water, and groundwater, and prevent unacceptable releases of contaminants to the atmosphere.

Only properly trained EOD Technicians/Specialists shall transport waste to the Open Burn Unit and Open Detonation Unit for treatment. Unloading of the waste may be performed manually or with appropriate heavy equipment, such as forklifts. At the OB Unit, vehicles used to transport the waste shall approach the Unit from the gently sloped portion of the concrete pad to promote safe unloading and handling. At the OD Unit, vehicles shall park adjacent to the pit where the detonation will occur, and the waste shall then be unloaded and placed into the pit. Additionally, personnel involved in waste management at the Units shall be knowledgeable about the physical and chemical properties of the waste managed and shall take all precautions, as necessary, to ensure that wastes are managed safely.

Engineering and operational controls shall ensure that run-on and run-off are minimized to protect human health and the environment. A two-foot earthen berm surrounds the Open Burn Unit and Open Detonation Unit to prevent run-off from flowing to other areas outside of the treatment areas. In addition, the concrete pad at the OB Unit has a hump at one end to prevent run-off from escaping and run-on from entering the Unit. Run-off at the OB Unit is further

controlled and minimized by the steel container, which provides containment and has a retractable cover to prevent precipitation from entering the Unit.

The depth to groundwater at the EOD Range is predicted to range from approximately 80 to 143 ft (Sandia National Laboratories/New Mexico [SNL/NM], 1996) -- the actual depth is currently unknown. The nearest drinking water supply well is over four miles north-northwest of the EOD Range.

No electrical power is supplied to the EOD Range. Equipment used at the Open Burn Unit and Open Detonation Unit for unloading and/or placement of wastes (i.e., forklifts) is self-contained. If such heavy equipment were to experience failure, the equipment shall be repaired or replacement equipment shall be obtained immediately.

Personnel exposure shall be minimized by restricting the management of hazardous waste. Only properly trained EOD Technicians/Specialists shall manage waste to be treated at the Open Burn Unit and Open Detonation Unit. EOD Technicians/Specialists shall wear appropriate protective clothing, which may include safety glasses. Hazardous waste destined for treatment shall be packaged in containers that had been inspected before receipt and again before loading the waste into the appropriate treatment unit. In case of exposure to the hazardous waste, first aid equipment, which includes eyewash solutions, shall be readily available.

Unacceptable releases of contaminants to the atmosphere resulting from treatment activities at the Open Burn Unit and Open Detonation Unit shall be prevented. Treatment operations are conducted in a remote, sparsely populated location. Treatment at the Open Burn Unit and Open Detonation Unit shall be performed only under the conditions included in the applicable permit obtained from the City of Albuquerque Environmental Health Department Air Pollution Control Division and under the conditions of this Permit.

Containment at the OB Unit shall be used to prevent releases during waste staging, burning, and the management of treatment residues. The steel container provides primary containment, and the hump located near the front of the concrete pad helps to ensure that any releases of waste or hazardous constituents to the pad surface will be contained on the pad for removal and proper treatment and disposal. The OB Unit shall be covered after treatment events to prevent any treatment residues from escaping to the atmosphere or other media before the residues are removed.

The Permittee shall clear and keep clear, at all times, all combustible materials, including wood, grass, brush, and trees located within 200 feet of the Open Burn Unit and Open Detonation Unit. Wood or other fuel intended to sustain a burn may be temporarily stored next to the OB Unit on the day a treatment event is scheduled. However, any wood or other fuel temporarily stored and not used in the treatment operation must be removed prior to initiation of the treatment operation.

2.5. PREVENTION OF ACCIDENTAL IGNITION OR REACTION OF IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

This Section details the precautions that shall be taken to prevent accidental ignition or reaction of ignitable and reactive wastes at the Open Burn Unit and Open Detonation Unit.

Wastes shall never be stored at the Open Burn Unit and Open Detonation Unit prior to or after

treatment, and the wastes shall be treated promptly upon transport to and acceptance at the Open Burn Unit and Open Detonation Unit. Ignitable or reactive wastes shall be located at least 50 ft from the wire fence surrounding the EOD Range at all times and shall be protected from any and all sources of ignition, such as open flames, or reaction with other wastes or products. A sign indicating "No Smoking" in English and Spanish shall be placed conspicuously at the entrance to the inner fenced area of the EOD Range. Aggressive vegetation control measures shall be taken in the treatment portion of the EOD Range, in order to prevent brush fires.

Incompatible wastes shall not be managed at the Open Burn Unit and Open Detonation Unit. Only containers made of or lined with materials that will not react with and are otherwise compatible with the waste to be managed shall be used.

2.6. SECURITY PLAN

2.6.1. Introduction

The following sections describe the site-wide and OB/OD Unit-specific security provisions at the KAFB Facility that shall be implemented to prevent unknowing or unauthorized entry of persons or livestock onto the Open Burn Unit and Open Detonation Unit.

2.6.2. Barriers and Means to Control Entry

The Open Burn Unit and Open Detonation Unit, situated within the EOD Range are located within KAFB, which has 24-hour security surveillance and controls entry at all times to the Facility through entrance gates. Access to the KAFB Facility is provided through five controlled entrance gates. Access control procedures are designed to ensure that only properly identified and authorized persons, vehicles, and property are allowed entrance to and exit from KAFB. Surveillance is provided by KAFB Security Police, who continuously monitor and control entry inside the KAFB perimeter. The major duties of the KAFB security personnel are to control vehicle, personnel, and material access/egress. KAFB is enclosed by a 7.5-ft chain-link fence and in places by barbed-wire fence. During non-working hours, security personnel routinely patrol the KAFB perimeter fence.

Two three-strand barbed-wire fences surround the Open Burn Unit and Open Detonation Unit. The outer fence is located along the outer perimeter of the EOD Range, and the inner fence is located just inside the berm that surrounds the Open Burn Unit and Open Detonation Unit. A gate is located at the entrance road to the EOD Range. This gate shall be locked except when EOD personnel enter the area for inspections or treatment operations. The locations of the security fences and the access gate for the Open Burn Unit and Open Detonation Unit are shown on Figure 1-3, in Attachment 1 of this Permit.

2.6.3. Warning Signs

Warning signs shall be posted near the entrance gate to the EOD Range and at a maximum spacing of 300-ft intervals along the outer fence. The signs shall be legible from a distance of 25 ft and shall be large enough to be seen from any approach toward the Open Burn Unit and Open Detonation Unit. The warning signs shall state “Danger--Explosive Disposal Range--Keep Out” in English and Spanish.

During treatment operations, the gate shall remain open in case emergency vehicle access is required; however, unauthorized entry is prevented because any vehicle entering the area would pass by the EOD Range personnel bunker, where it would be stopped.

In addition, security personnel shall periodically monitor the EOD Range entrances/gates during non-operational hours.

2.7. RECORD KEEPING

2.7.1. Introduction

The following operating records and documents shall be maintained at the Facility EOD Branch office.

1. A current copy of this Permit that governs the OB/OD Unit operations, including the closure plan (Attachment 10).
2. A written or electronic operating record that describes:
    a. The type and quantity of each hazardous waste received and treated in the Open Burn Unit and Open Detonation Unit, and the date the hazardous waste was treated;
    b. The location of hazardous waste and the quantity at each location;
    c. The method(s) of treatment of the hazardous waste;
    d. Off-site treatment facility notices and certifications, and on-site treatment Facility information,
    e. Off-site storage facility notices and certifications and on-site storage Facility information,
    f. Training records for EOD personnel;
    g. Written inspection log and schedule;
    h. Air emissions records. These include a list of process equipment at the Units that were used for less than 300 hours per year for management of hazardous wastes with organic concentrations ≥ 10 percent by weight.
3. Correspondence and other documents from government agencies.
4. Notices to off-site generators.
5. Waste minimization certification.
6. Training records for former EOD employees (maintained for a minimum of three years from the date the employee last worked at a treatment unit).
7. Historical and current training records (including refresher seminars) for current EOD employees.
8. Manifest documents for hazardous waste shipped off-site.
9. A copy of the Hazardous Waste Biennial Report.

10. Copies of unmanifested waste reports.
11. Copies of air emission reports submitted to City of Albuquerque Air Quality Division and the Department.
12. Historical information from the written or electronic operating record.
13. Waste characterization information and data.
14. A copy of the Waste Analysis Plan.
15. Reports of any incidents that required activation of the Contingency Plan.
16. Inspection logs for the last three years.
17. A copy of the Contingency Plan.
18. Disposal requests and Land Disposal Restriction certifications for hazardous waste treated on site or transported to an off-site permitted facility for subsequent treatment and/or disposal.
19. Records of soil and groundwater monitoring, testing, analytical data, and any corrective actions taken to prevent or mitigate releases of hazardous waste or hazardous constituents to the environment.
20. Correspondence and other documents from government agencies.

A current copy of the Contingency Plan shall also be maintained at the EOD Range personnel bunker.

2.7.2. Biennial Report

The Permittee shall prepare and submit a biennial report to the Department by March 1 of each even-numbered year, in accordance with 40 C.F.R. § 264.75. The report shall document Facility activities during the previous calendar year and shall include.

1. EPA identification number, name, and address of the Facility.
2. The calendar years covered by the report.
3. A description and the quantity of each hazardous waste type the Facility received that year.
4. The method of treatment for each hazardous waste type.
5. A description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated.
6. A description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent such information is available for the years prior to 1984.
7. Treatment notices and their certifications signed by responsible Facility representatives.

2.7.3. Unmanifested Waste Report

Hazardous waste from off-site sources listed in Permit Attachment 5, Table 5-1, may be accepted

at the Facility provided that such wastes have been properly characterized and manifested, and the wastes are authorized for treatment in accordance with Attachment 4 of this Permit.

If the Permittee accepts any hazardous wastes for treatment from an off-site facility without an accompanying manifest (if required), or without an accompanying shipping paper as described in 40 C.F.R. § 264.76, the Permittee shall prepare and submit an Unmanifested Waste Report to the Department within fifteen calendar days after receiving the waste. The report shall include the following.

1. EPA identification number, name, and address of the off-site facility.
2. The date the KAFB Facility received the waste.
3. EPA identification number, name, and address of the generator and transporter.
4. A description and the quantity of each unmanifested hazardous waste received.
5. The method of treatment for each hazardous waste.
6. The certification signed by an authorized representative of the KAFB Facility.
7. An explanation of why the waste was unmanifested, if known.

2.7.4. Additional Reports

In accordance with the requirements of 40 C.F.R. § 264.77, the Permittee shall also report the following to the Department.

1. Releases of hazardous waste, hazardous constituents, or contaminants, and any unplanned fires.
2. Manifest discrepancies that cannot be resolved within 15 calendar days after receiving the waste.
3. Occurrence(s), if any, when hazardous waste is transported to the Open Burn Unit and Open Detonation Unit in a container in noncompliance with regulatory requirements.
4. Requirements specified in the Organic Air Emissions Standards (40 C.F.R. Part 264 Subpart BB); treatment unit closures.

PERMIT ATTACHMENT 3: AIR MODELING

3.0 INTRODUCTION

The Permittee treats hazardous wastes by open burning and open detonation at the Open Burn (OB) and Open Detonation (OD) Units located at the Explosive Ordnance Disposal (EOD) Range, which is located in a remote, sparsely populated area within the Kirtland Air Force Base (KAFB) Facility boundary. The wastes treated at the Open Burn Unit and Open Detonation Unit are assigned U.S. Environmental Protection Agency (EPA) Hazardous Waste Numbers D001 (ignitability) and/or D003 (reactivity). The wastes may also carry EPA Hazard Waste Numbers D002 (corrosivity), D005, D007, D008, and D009 (toxicity characteristic metals), D018 (benzene), D030 (2,4-dinitrotoluene), D034 (hexachloroethane), and D040 (trichloroethylene) and various underlying hazardous constituents. Treatment at the Open Burn Unit and Open Detonation Unit may be facilitated by the use of safing fluids (i.e., a substance, such as hydraulic fluid or diesel fuel, with a specific gravity between a liquid and a solid used to desensitize explosives, making them safer to handle) and/or explosives.

3.1. PURPOSE

The INPUFF modeling was conducted to predict whether open burning and open detonation treatment operations adversely impact ambient air quality at and around the KAFB Facility, and to predict the pattern and extent of particulate dispersion. In addition, the results of the air modeling shall be used in conjunction with soil monitoring to evaluate impacts to human health and the environment as a result of treatment events.

INPUFF is a Gaussian Puff model, developed by the U.S. EPA in 1986 that simulates the atmospheric dispersion of neutrally buoyant or buoyant chemical releases. The model accounts for point sources and a release duration that is either finite or continuous. It is typically used in accidental release modeling scenarios, where a surface-based, high momentum vertical release of a buoyant gas occurs over a period of several minutes – similar to the open detonation scenario. The modeling scale can be from tens of meters to tens of kilometers. The U.S. Army Environmental Center evaluated over 90 air dispersion models and chose INPUFF as the most technically suitable for predicting the dispersion of emissions from diverse types of military munitions used in training, including exploding ordnance and rocket-type munitions.

3.2. PROCEDURES AND METHODS FOR DATA AQUISITION

Criteria and non-criteria pollutant emissions from the treatment events were estimated based on emission factors derived by the U.S. Army Armament, Munitions and Chemical Command, and from EPA's Compilation of Air Pollution Emission Factors (AP-42). Emissions were modeled to arrive at off-site receptor air concentrations using the INPUFF model.

Model concentrations predicted at the off-site receptors were compared to both the Bernalillo County Air Quality Standards and the New Mexico Air Quality Control Regulation (AQCR) limits to determine if the treatment activities may have a significant impact on air quality. This was done because of the possibility that airborne particulate pollutants may have potential immediate effects on human health and the environment. For the OB Unit, the constituents

modeled were taken from Table 4-1 in Permit Attachment 4 (*Lists of Authorized Wastes*). For the OD Unit, the constituents modeled were taken from Table 4-2 of Permit Attachment 4. The nearest off-site receptor was assumed to be located approximately 5,600 meters from the EOD Range.

3.3. RESULTS AND INTERPRETATION

The results of the INPUFF modeling are presented below in Tables 3-1 and 3-2 of this Attachment. These results are for a distance of 1.5 kilometers in a 24-hour period. The tabulated results of the modeling were compared to applicable national, State, and Bernalillo County Air Quality Standards. As the data indicate, for every pollutant modeled, concentrations fall below the applicable ambient air quality standards by several orders of magnitude. Over 30 constituents were modeled and compared to the New Mexico Standards (Table 3-2). The AQCR 702 (Permits) limits correspond to one thousandth of the occupational exposure levels.

3.4. CONCLUSION

Based on the comparison of the INPUFF model results with the AQCR standards, under the conditions modeled, treatment activities at the Open Burn Unit and Open Detonation Unit are not predicted to have a significant impact on air quality in Bernalillo County or at the receptor sites.

TABLE 3-1

Comparison of Modeled Open Burn/Open Detonation Results to Ambient Air Quality Standards

Pollutant	Bernalillo Ambient Air Standard	State Air Standard	Federal Air Standard (µg/m^3)[1]	Maximum Open Burn Result (µg/m^3)	Maximum Open Detonation Result (µg/m^3)
Copper and Zinc					
30-day	10 µg/m^3			--[2]	--
Beryllium					
30-day	0.01 µg/m^3	0.01 µg/m^3		NA[3]	NA
Carbon Monoxide					
1-hour	15 mg/m^3	13.1 ppm[4]	40,000	9.86E-04	1.93E-03
8-hour		8.7 ppm	10,000	1.23E-04	2.44E-04
Annual	4.6 mg/m^3			3.01E-06	7.51E-06
Non-Methane Hydrocarbons					
3-hour	100 µg/m^3	0.19 ppm		4.37E-07	2.86E-06
Hydrogen Sulfide					
1-hour	0.003 ppm	0.010 ppm		3.00E-04	7.56E-05
Sulfur Dioxide					
3-hour			1,300	9.87E-07	1.09E-05

TABLE 3-1 (cont'd)					
Pollutant	**Bernalillo Ambient Air Standard**	**State Air Standard**	**Federal Air Standard (µg/m^3)[1]**	**Maximum Open Burn Result (µg/m^3)**	**Maximum Open Detonation Result (µg/m^3)**
24-hour	92 µg/m^3	0.10 ppm	365	1.23E-07	1.39E-06
Annual	11 µg/m^3	0.02 ppm	80	9.02E-09	1.27E-07
Particulate Matter (PM_{10})					
24-hour	150 µg/m^3	150 µg/m^3	150	6.85E-06	1.92E-03
7-day		110 µg/m^3		9.79E-07	2.74E-04
30-day		90 µg/m^3		2.28E-07	6.40E-05
Annual	60 µg/m^3	60 µg/m^3	50	5.01E-07	1.75E-04
Lead					
30-day	3 µg/m^3			6.83E-09	8.17E-08
3-month			1.5	6.00E-08	3.82E-08
Nitrogen Dioxide					
24-hour	117 µg/m^3	0.10 ppm		7.19E-07	1.04E-05
Annual	100 µg/m^3	0.05 ppm	100	5.26E-08	9.47E-07

1. µg/m^3 = micrograms per cubic meter.
2. No emission factor was available.
3. NA = No beryllium is burned or detonated at the EOD Range.
4. ppm = parts per million.

TABLE 3-2

Comparison of Modeled Open Burn/Open Detonation Results

to New Mexico Air Quality Control Regulation (ACQR) 702 Limits (1/1000)

Pollutant	ACQR 702 Limit (µg/m^3)[1]	Maximum Open Burning Concentration (µg/m^3)	Maximum Open Detonation Concentration (µg/m^3)
Nitric Oxide	--	2.03E-04	5.97E-05
Methane	--	6.57E-07	9.81E-06
Benzene	--	1.03E-08	4.49E-07
Pyrene	--	ND[2]	8.99E-10
Phenol	19.0	3.62E-08	1.03E-07
Dibenzo(a)furan	--	2.30E-09	5.39E-03
Diphenylamine	10.0	ND	1.27E-09
2,4,6-Trinitrotoluene	0.5	4.12E-10	1.38E-08
1-Nitropyrene	--	1.64E-10	4.33E-09
RDX	1.5	ND	8.58E-09
Picric Acid	0.1	ND	2.04E-10
Napthalene	50.0	1.18E-08	6.13E-07
Benzo(a)anthracene	--	1.36E-10	6.54E-10
Benzo(a)pyrene	0.001	7.40E-09	1.23E-08
2,4-Dinitrotoluene	1.5	8.55E-11	3.43E-08
2,6-Dinitrotoluene	1.5	1.18E-10	2.90E-08
2-Nitronapthalene	--	4.46E-10	1.10E-09
N-Nitrosodiphenylamine	--	1.23E-08	5.03E-09
1,3,5-Trinitrobenzene	--	ND	1.12E-11
2-Nitrodiphenylamine	--	1.23E-08	2.94E-10
Biphenyl	1.5	ND	2.12E-10
Phenanthrene	--	ND	7.56E-10
4-Nitrophenol	--	5.67E-09	1.06E-08

TABLE 3-2 (cont'd)			
Pollutant	**ACQR 702 Limit (µg/m^3)[1]**	**Maximum Open Burning Concentration (µg/m^3)**	**Maximum Open Detonation Concentration (µg/m^3)**
Acetylene	--	4.33E-07	7.44E-08
Paraffins	2.00	5.74E-07	5.92E-07
Olefins	--	6.52E-07	1.24E-07
Dibenzyl[A,H]-anthracene	--	ND	7.07E-09
1&2 Methyl Napthalene	--	ND	1.23E-07
3-Trimethyl-3-Phenylindane	--	ND	2.33E-09
Nonbenzene Aromatics	--	8.05E-07	1.22E-07
Chromium	0.5	3.92E-08	1.44E-08
Nickel	1.0	1.31E-08	1.04E-08
Cadmium	0.05	ND	1.17E-08
Antimony	0.5	3.92E-08	4.33E-09
Barium	0.5	1.31E-09	3.80E-06
Ammonia	18.0	ND	2.49E-04
Hydrogen Cyanide	10.0	ND	1.60E-02
Aluminum	10.0	1.09E-06	ND
Iron	5.00	4.96E-06	ND

1. µg/m^3 = micrograms per cubic meter.

2. ND = No detection

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PERMIT ATTACHMENT 4: LISTS OF AUTHORIZED WASTES

4.0 INTRODUCTION

Tables 4-1 and 4-2 list the hazardous wastes that the Permittee is authorized to manage and treat at the Open Burn and Open Detonation Units. Wastes carrying EPA Hazardous Waste Numbers D002, D005, D007 through D009, D018, D030, D034, and D040 shall not be treated at the Open Burn Unit and Open Detonation Unit unless, at the point of generation, the wastes are also reactive and/or ignitable. Wastes that are not reactive and/or ignitable shall not be mixed with reactive or ignitable wastes for the purpose of generating a hazardous waste that is authorized for treatment at the Open Burn Unit and Open Detonation Unit.

TABLE 4-1
List of Hazardous Wastes Authorized to be Treated at the Open Burn Unit

Common and/or Chemical Name - Symbol	EPA Hazardous Waste Number(s)
Benzene	D001, D018
Black Powder (Low Explosive)	D001, D003
Heat Powder	D001, D003
Titanium Tetrachloride	D003
Hexachloroethane (HC Smoke)	D034
IMR 4064	D001
IMR 4350	D001
JPN Propellant	D001, D003
Magnesium	D001, D003
Phosphorus Red, White	D001
Smokeless Powder	D003
Thermite (TH-3)	D001, D003
Known Inert Items:	
Aluminum	D001, D003
Chromium	D007
Iron	D001
Lead	D008
Lead Alloy	D008

TABLE 4-2
List of Hazardous Wastes Authorized to be Treated at the Open Detonation Unit

Common and/or Chemical Name - Symbol	EPA Hazardous Waste Number(s)
ALSC (Linear Shaped Charge), HNS	D001, D003
ALSC (RDX)	D001, D003
Amatol (AN, TNT)	D001, D003
Ammonium Nitrate (AN)	D003
Ammonium Perchlorate (AP)	D003
Ammonium Picrate	D001, D003
ANFO	D001, D003
APEX 1220	D001, D003
APEX 1320	D001, D003
ARTEC (HMX-water)	D001, D003
ATX-M	D001, D003
ATX 25RM Slurry	D001, D003
AWH Shape Charge	D001, D003
Baratol (High Explosive [HE])	D001, D003, D005
Barium Nitrate	D001, D003, D005
Barium Peroxide	D001, D003, D005
Barium Potassium Nitrate	D001, D003, D005
Barium Soluble Compounds	D001, D003, D005
BCTK Explosives	D001, D003
Benzene	D001, D018
BKN03 Propellant	D001, D003
Black Powder (Low Explosive)	D001, D003
Blasting Agent	D001, D003
Chromium	D007
CLSC (Copper Linear Shaped Charge)	D001, D003
Composition A (HE)	D001, D003
Composition B (HE)	D001, D003
Composition B/Baratol Mixture (HE)	D001, D003, D005

TABLE 4-2 (cont'd)	
Common and/or Chemical Name - Symbol	**EPA Hazardous Waste Number(s)**
Composition C4 Class 3 (HE)	D001, D003
Cordite (Double-base gum)	D001, D003
Cyanotetrazolatopentamine Cobalt, Perchlorate	D001, D003
Cyclonite (HE, RDX)	D001, D003
Cyclotol (RDX, TNT)	D001, D003
C-1 Detasheet	D001, D003
C-3	D001, D003
C-4	D001, D003
C-6 Discs	D001, D003
DACP Powder	D001, D003
Detaflex	D003
Detasheet A	D001, D003
Detasheet A4	D001, D003
Detasheet A5	D001, D003
Detasheet C	D001, D003
Detasheet C1	D001, D003
Detasheet C2	D001, D003
Detasheet C3	D001, D003
Detasheet C4	D001, D003
Detasheet C5	D001, D003
Detasheet C6	D001, D003
Detasheet D	D001, D003
Detasheet L	D001, D003
DetCord (PETN)	D001, D003
Detonators	D001, D003, D008
Detonators EBW	D001, D003
Detonators HBW, Ensign Bickford	D001, D003
Dinitrotoluene (DNT)	D001, D003, D030
Dipicrylamide	D001, D003
DBX	D003

TABLE 4-2
(cont'd)

Common and/or Chemical Name - Symbol	EPA Hazardous Waste Number(s)
Diazodinitrophenol (DDNP)	D003
Double Base Smokeless Powder	D001, D003
DNP	D001, D003
DNPT	D003
Dynamite	D003
Ednatol	D003
EL-506A (HE, PETN)	D001, D003
EL-506D (HE, PETN)	D001, D003
Extex 3003	D001, D003
Extex 8003	D001, D003
Explosive D	D001, D003
Explosive Piston Motors	D003
Flex Linear Shaped Charge	D001, D003, D008
Gas Pressure Generator	D001, D003
Heat Powder	D001, D003
Hexachlorethane (HC Smoke)	D034
Hexanitroazobenzene	D001, D003
HMX (octagen) High Melting Explosive	D001, D003
HNAB	D001, D003
Hexanitrostilbene (HNS)	D001, D003
HNS I	D001, D003
HNS II	D001, D003
HNS Titanium Powder	D001, D003
Holex 2506	D001, D003
Improved Military Rifle (IMR) propellant 4350	D001
IMR 4064	D001
Iremite 60	D001, D003
Iremite 80	D001, D003
Iragel	D001, D003
Ireco Booster 2-C, 3-C, 4-C	D001, D003

TABLE 4-2 (cont'd)	
Common and/or Chemical Name - Symbol	**EPA Hazardous Waste Number(s)**
Iron Perchlorate	D003
Iron Potassium Perchlorate	D003
JPN Propellant	D001, D003
Kinestik Part A, B	D001, D003
Lead	D008
Lead Azide (HE)	D001, D003, D008
Lead Case Flexible Linear Shaped Charge	D001, D003, D008
Lead Mononitraresorcinate (LMNR)	D001, D003, D008
Lead Sulfocyanate	D001, D003, D008
Lead Styphanate (HE)	D001, D003, D008
LX-04	D001, D003
LX-10	D001, D003
LX-13	D001, D003
LX-14	D001, D003
LX-15	D001, D003
LX-16	D001, D003
LX-17	D001, D003
M-6 Propellant	D001, D003
M-77 Water Gel Explosives	D001, D003, D005
MDF (RDX, HNS)	D001, D003
Mercury Fulminate (HE)	D001, D003, D009
Minol	D001, D003
N-5 Sheet Propellant	D001, D003
Nitrocellulose	D001, D003
Nitroglycerin	D001, D003
Nitroguanidine	D001, D003
Nitromethane	D001, D003
NQ	D001, D003
Octol LGE Cast	D001, D003
PBX 9010	D001, D003

TABLE 4-2 (cont'd)	
Common and/or Chemical Name - Symbol	**EPA Hazardous Waste Number(s)**
PBX 9205	D001, D003
PBX 9404	D001, D003
PBX 9407	D001, D003
PBX 9504	D001, D003
PBXN-5	D001, D003
PBXN-6	D001, D003
PBXN-301	D001, D003
Pentaerythritol Tetranitrate (PETN) (HE)	D001, D003
PETN/Titanium Mix	D001, D003
PETN Zirconium	D001, D003
PETRIN	D001, D003
Pentaerythritol Tetranitrate	D001, D003
Pentolite (PETN/TNT) (HE)	D001, D003
Photo Flash Powder (simulators)	D001, D003
Picric Acid	D001, D002, D003
Picritol	D001, D003
Plain Wave Generator (PBX 9404)	D001, D003
Plasticized White Phosphorous	D001
Plasticizer	D001, D003
Polysulfide Prepolymer	D001, D003
Potassium Chlorate	D003
Potassium Nitrate	D003
Potassium Perchlorate (initiator)	D001, D003
Primacord (PETN)	D001, D003
Propellant HPC-95, HPC-60	D001, D003
Propellant M-30, M1, M6	D001, D003
Propellant MC-1951	D001, D003
Propellant (TPH1207C)	D001, D003
RDX	D001, D003
RDX #5	D001, D003

TABLE 4-2 (cont'd)	
Common and/or Chemical Name - Symbol	**EPA Hazardous Waste Number(s)**
Red Phosphorous	D001
RL-5-X Det Cord	D001, D003
Rocket Motor Double Base Propellant	D001, D003
RP-2	D001
RP-87	D001
Separation Explosives (RDX)	D001, D003
Semtex	D001, D003
Smokeless Powder	D003
Sodium Azide	D001, D003
Sodium Nitrate	D003
Strontium Nitrate	D003
Strontium Peroxide	D003
Tetryl (HE)	D001, D003
Tetrytol	D001, D003
TH-1	D001, D003
TH-3	D001, D003
Thermite Powder	D003
TH/KP	D001, D003
Titanium Tetrachloride	D003
TPH 3442 (propellant)	D003
Titanium Boron Powder	D001
Titanium Hydride	D001
Titanium Subhydride	D001
TLX	D001, D003
Trinitrotoluene (TNT)	D001, D003
Tritonal	D001, D003
TATB Pellets, Pad	D001, D003
Toluene (nitrated forms)	D001, D003
Torpex	D003
Tovex	D003

TABLE 4-2 (cont'd)	
Common and/or Chemical Name - Symbol	**EPA Hazardous Waste Number(s)**
TPH 3386 (propellant)	D003
Triaminotrinitrobenzene (TATB)	D001, D003, D018
Trichloroethylene	D040
WAK 2, TP-H12	D001, D003
XTX 8003	D001, D003
Known Inert Items Destroyed:	
Aluminum	D001, D003
Iron	D001
Lead	D008
Lead Alloy	D008

PERMIT ATTACHMENT 5: WASTE ANALYSIS PLAN

5.0 INTRODUCTION

This Waste Analysis Plan (WAP) describes the procedures that shall be used at the Kirtland Air Force Base (KAFB) Facility Open Burn (OB) and Open Detonation (OD) Units to characterize wastes that are to be treated at and treatment residues resulting from treatment at the Open Burn Unit and Open Detonation Unit. The Open Burn Unit and Open Detonation Unit are located at the Explosive Ordnance Disposal (EOD) Range. This WAP follows the EPA (1994) guidance provided in "*Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Wastes: A Guidance Manual*", and is organized to address the six major elements recommended in the guidance:

- **Section 5.1, Facility Description**, references general descriptions of the KAFB Facility and the Open Burn Unit and Open Detonation Unit, and summarizes additional information about the Open Burn Unit and Open Detonation Unit where treatment is conducted. It also summarizes the processes and activities that generate or are used to manage wastes, and describes the wastes that are treated at the Units; the treatment residues generated as a result of treatment, and the hazardous waste management units at the Facility.
- **Section 5.2, Waste Analysis Parameters**, discusses the selection of waste characterization parameters for the waste treated at the Open Burn Unit and Open Detonation Unit. It also identifies the analytical parameters for treatment residues generated at the OB Unit, and presents the rationale for the selection of these analytical parameters. In addition, this Section references Attachment 6 of this Permit concerning the analytical parameters for soil sampling at the Open Burn Unit and Open Detonation Unit.
- **Section 5.3, Waste Characterization Procedures**, describes the procedures that shall be used to characterize the wastes treated at the Open Burn Unit and Open Detonation Unit, and the procedures that shall be used to characterize treatment residues generated at the OB Unit. It also references Permit Attachment 6 for the procedures that shall be used to sample and analyze soil at the Open Burn Unit and Open Detonation Unit.
- **Section 5.4, Analytical Laboratory and Testing/Analytical Methods Selection**, presents information on the selection of the analytical laboratory and the methods that will be used to characterize hazardous waste and treatment residues.
- **Section 5.5, Waste Re-evaluation Frequencies**, discusses the criteria that shall be used to determine the frequencies by which waste characterization information shall be re-evaluated.
- **Section 5.6, Special Procedural Requirements**, identifies the special procedures that shall be followed when wastes are received from off-site generators and for ignitable,

reactive, and incompatible wastes, and the provisions for complying with land disposal restriction (LDR) requirements.

5.1. FACILITY DESCRIPTION

General descriptions of the KAFB Facility and the Open Burn Unit and Open Detonation Unit are provided in Attachment 1 of this Permit.

5.1.1. Description of Facility Processes and Activities

The Open Burn Unit and Open Detonation Unit are used to treat reactive and ignitable hazardous wastes. These wastes are typically in the form of bulk explosives; damaged, defective, expired, or unserviceable munitions; explosives from research and development activities; and explosives-contaminated waste. Wastes treated in the Open Burn Unit and Open Detonation Unit are generated at the facilities listed in Table 5-1. These wastes are often generated as a result of specific processes and activities that are well defined and well controlled. Non-hazardous wastes (e.g., contraband, firearms) are also treated at the Open Burn Unit and Open Detonation Unit as a service in support of the various agencies listed in Table 5-1. Waste is not transported to or accepted for treatment unless all preparations for treatment have been completed in advance of the waste arriving at the site.

5.1.2. Hazardous Wastes Managed at the EOD Range

The hazardous wastes treated at the Open Burn Unit and Open Detonation Unit exhibit the characteristic of reactivity (D003). Some of these wastes also exhibit the characteristics of ignitability (D001) and corrosivity (D002). These wastes may also potentially contain the following toxicity characteristic metals and organic compounds, identified by specific EPA Hazardous Waste Numbers: barium (D005), chromium (D007), lead (D008), mercury (D009), benzene (D018), 2,4-dinitrotoluene (D030), hexachloroethane (D034), and trichloroethylene (D040). The characteristics of hazardous wastes treated at the Open Burn Unit and Open Detonation Unit shall be identified using acceptable knowledge of process (KOP) or sampling and analysis, as appropriate and shall be documented in writing by the generators. Incompatible wastes are not accepted for treatment at the Open Burn Unit and Open Detonation Unit. It may be necessary to saturate the wastes with a safing fluid (e.g., water, acetone, alcohol, hydraulic fluid) before they are placed in a Unit for treatment.

Categories of hazardous waste that may be accepted for treatment include, for example, explosives, propellants, and pyrotechnics in the form of pure substances and explosives-contaminated wastes. Explosive Waste, including propellants, pyrotechnics, and munitions that may be treated in the Open Burn Unit and Open Detonation Unit shall include only the waste types authorized in Attachment 4 of this Permit.

Residue generated as a result of treatment in the OB Unit comprises primarily ash, but lead slag and metal casings may also be components of the residue. These residual wastes potentially contain toxicity characteristic metals that may become concentrated in the treatment residue. They may also contain trace amounts of toxicity characteristic organic compounds (D018, D030, D034, and D040), should any have been present in the original wastes, and benzene (D018) if

fuel is used to sustain a burn event. The original waste streams, and thus the treatment residues, may also contain underlying hazardous constituents (UHCs) such as chromium, lead, nickel, vanadium, and zinc.

Hazardous wastes treated at the Open Burn Unit and Open Detonation Unit and treatment residues are classified as a non-wastewater waste under the LDR regulations in 40 C.F.R. Part 268.

5.1.2.1. *Chemical and Physical Properties*

Knowledge of the chemical and physical properties of hazardous wastes to be treated at the Open Burn Unit and Open Detonation Unit is essential for proper waste management. The hazardous wastes to be treated consist of ignitable and reactive compounds, and may also contain toxicity characteristic metals and organic compounds, as described below. As mentioned above, they may also contain UHCs such as chromium, lead, nickel, vanadium, and zinc.

Ignitable (D001) and reactive (D003) wastes, such as those listed in Tables 4-1 and 4-2 of Attachment 4, are treated at the Open Burn Unit and Open Detonation Unit. On occasion, corrosive (D002) wastes (e.g., picric acid) that are also reactive may be treated at the Open Burn Unit and Open Detonation Unit.

Barium (D005), chromium (D007), lead (D008), and mercury (D009) are toxicity characteristic metals that may be in the wastes or in the casings surrounding the wastes to be treated. The toxicity characteristic organic compounds benzene (D018), 2,4-dinitrotoluene (D030), hexachloroethane (D034), and trichloroethylene (D040) may also be present. As a result of treatment, organic compounds (if they were present in the waste) should be mostly destroyed due to temperatures that range from 1500 to 2000° F (815° to 1093° C) in the OB Unit and temperatures that exceed 3000° F (1649° C) in the OD Unit.

The hazardous wastes to be treated at the Open Burn Unit and Open Detonation Unit are mostly in solid form. However, on occasion, wastes in liquid form (e.g., picric acid) may be treated.

Explosive Ordnance Disposal personnel shall check the Munitions Items Disposition Action System (MIDAS) and other databases/technical manuals for appropriate treatment information and Attachment 4 of this Permit to determine if the waste is authorized for treatment at the Open Burn Unit and Open Detonation Unit. The MIDAS and other databases/technical manuals also provide them with the manufacturer's name (if available), chemical composition information, Material Safety Data Sheets (if available), and reactivity data. EOD personnel shall check the MIDAS and other databases/technical manuals frequently, as the information included therein is subject to change.

5.1.3. Description of Open Burn Unit and Open Detonation Unit

A physical description of the Open Burn Unit and Open Detonation Unit, a discussion of waste types managed in each Unit, and information on the waste management operations at the Units (including containers and container handling) are also presented in Parts 1, 2, and 3, and Attachments 2, 3, 4, 7, 8, and 9 of this Permit.

Specific physical and chemical operating constraints shall be observed to ensure that the treatment process is effective. Operating acceptance limits reflect both the process and equipment design limitations. These limits determine the range of hazardous wastes that can be managed safely in the Open Burn Unit and Open Detonation Unit while meeting regulatory requirements and complying with permit conditions. Hazardous wastes that do not meet the operating acceptance limits or are not authorized by this Permit for treatment shall not be accepted by the Facility for treatment and shall be returned to the generator. The operating acceptance limits established are as follows.

OB Unit

- The maximum amount of hazardous waste treated during any single open burning event must not exceed 1,500 pounds (lbs.) of uncased explosives or 200 lbs. of cased munitions.
- The maximum total quantity of waste (hazardous and non-hazardous combined) treated during any single open burning event must not exceed 5,000 lbs.
- Waste is authorized for treatment by this Permit (Permit Attachment 4)

OD Unit

- The maximum amount of hazardous waste treated during any single open detonation event must not exceed 1,500 lbs. of uncased explosives and 200 lbs. of cased munitions.
- Waste is authorized for treatment by this Permit (Permit Attachment 4)

5.2. WASTE ANALYSIS PARAMETERS

The generator shall characterize hazardous wastes slated for treatment in the Open Burn Unit and Open Detonation Unit using KOP or sampling and analysis, as appropriate. EOD personnel shall review characterization information to ensure that the hazardous wastes proposed for treatment are properly characterized for their physical and chemical properties and can be managed safely and in accordance with the Conditions of this Permit. KOP shall only be used in lieu of sampling and analysis when the composition and physical characteristics of the waste are exactly known and well controlled, and if sampling and laboratory analysis present unnecessary hazards to personnel.

A brief discussion on the selection of waste characterization parameters for the wastes treated at and resulting from treatment at the Open Burn Unit and Open Detonation Unit is presented in Section 5.2.1.

Treatment residue and, as appropriate, any other hazardous wastes to be treated at the Open Burn Unit and Open Detonation Unit shall be characterized by sampling and analysis for LDR purposes. A discussion of the criteria and rationale for parameters selection for treatment residues as well as other wastes is presented in Section 5.2.1.

At the OD Unit, hazardous waste in its original form is destroyed. However, treatment residues will contaminate soil. In order to effectively monitor contaminated soil at the OD Unit, the Permittee shall implement the *Soil Sampling and Analysis Plan* (SSAP), which is described in

Attachment 6 of this Permit. A discussion of the analytical parameters selected for monitoring soil at the OD Unit is also presented in the SSAP.

5.2.1. Criteria and Rationale for Parameter Selection

The waste characterization information to be provided by the Permittee and off-site generators for hazardous wastes treated at the Open Burn Unit and Open Detonation Unit must include all necessary information on the presence of toxicity characteristic metals and organic compounds, as defined in 40 C.F.R. Part 261, Subpart C, and data on the presence of any UHCs listed in 40 C.F.R. § 268.48. Information on these parameters is necessary for safe, effective, and lawful management of the wastes to be treated, including making waste determinations and assessing and meeting LDR requirements.

Treatment residue in the OB Unit may contain toxicity characteristic metals and organic compounds, as well as UHCs. Treatment residues shall be sampled and analyzed for the characteristic metals and organics that are known to be present in the original wastes using the Toxicity Characteristic Leaching Procedure (TCLP). Treatment residues shall also be sampled for UHCs. UHCs may require total or TCLP analysis depending on the constituent as required at 40 C.F.R. § 268.48.

Sampling and analysis of treatment residues is required in all but one case. Sampling and analysis of treatment residues is not required where all of the following conditions are met: fuels containing hazardous constiuents are not used to conduct a burn; and all of the original wastes contain no characteristic metals or organics, no UHCs, and have not been mixed with safing fluids containing hazardous constituents. This unique case is expected to be only rarely, if ever, applicable to the treatment of hazardous wastes the Open Burn Unit and Open Detonation Unit.

5.2.2. Special Parameter Selection Requirements

There are no additional special parameter selection requirements for hazardous wastes treated at the Open Burn Unit and Open Detonation Unit.

5.3. WASTE CHARACTERIZATION PROCEDURES

The approach to characterization shall be based on the chemical and physical nature of the waste. Characterization procedures used at the KAFB Facility require all generators to provide KOP, related technical information, and/or sampling and analysis results (including information on UHCs) as appropriate. Characterization of treatment residues generated at the OB Unit shall be generally accomplished using sampling and analysis pursuant to Section 5.2.1 of this Permit Attachment. Annual characterization of soil at the Open Burn Unit and Open Detonation Unit shall be accomplished by sampling and analysis pursuant to the SSAP in Attachment 6 of this Permit. Accurate characterization is necessary for appropriate waste classification and assignment of EPA Hazardous Waste Numbers, in the preparation of LDR documentation, and ensuring proper management of waste.

5.3.1. Characterization Strategy

The characterization strategy for hazardous wastes treated at the Open Burn Unit and Open

Detonation Unit and for treatment residues are described below.

5.3.1.1. *Wastes to be Treated*

Prior to accepting waste for treatment at the Open Burn Unit and Open Detonation Unit, a detailed chemical and physical description of the waste shall be provided by the generator. Because most wastes treated are produced according to documented formulation processes or are of the original manufacturer's chemical composition, KOP may be used as appropriate for waste characterization.

A current file of pertinent MSDSs and a file of all wastes that have been treated at the Open Burn Unit and Open Detonation Unit shall be maintained at the EOD Shop. Records will include the treatment date, the wastes types and quantities treated, and the types and quantities of explosive filler(s), if any.

Ensuring that detailed and accurate waste characterization exists shall include the steps outlined below. All waste treated at the Open Burn Unit and Open Detonation Unit shall be screened and verified prior to treatment. Screening shall ensure that waste meets the operating acceptance limits criteria presented in Section 5.1.3 and that the wastes are authorized for treatment (Attachment 4) by this Permit. Verification shall be performed to ensure that documentation is consistent with a visual inspection of the waste.

5.3.1.2. *Screening*

Screening is performed by the appointed EOD Team Chief. Documentation may include, but is not limited to, a completed Ammunition Disposition Request (ADR), a hazardous waste manifest, a Manufacturers Safety Data Sheet (MSDS), a description of the process generating the waste, and sampling and analysis data. (Examples of a Uniform Hazardous Waste Manifest that may be used by off-site generators and of the ADR are provided in Appendix 5-1 for informational purposes only.) If documentation is incomplete or inadequate, EOD personnel shall contact the generator for clarification and require that the generator correct the situation. Documentation shall be provided for the contents of each container of waste. EOD personnel shall compare the information on the documentation with the requirements of this Permit. Only waste that meets these requirements of this Permit shall be transported to the Open Burn Unit and Open Detonation Unit for treatment.

5.3.1.3. *Verification*

All waste shipments to the Open Burn Unit and Open Detonation Unit shall be verified in two phases. Phase 1 will be conducted to ensure shipping documentation completeness, and Phase 2 is to ensure that the waste delivered corresponds to the documentation provided for that waste. Waste shall not be accepted for treatment until all verification is complete.

5.3.1.4. *Phase 1 Verification*

Upon receipt of a waste shipment at the Open Burn Unit and Open Detonation Unit, a determination of shipping documentation completeness shall be made by EOD personnel. Each shipping document that accompanies an off-site waste shipment shall be checked to ensure that

the following information is present and complete.

- The shipment identification number.
- The proper U.S. Department of Transportation basic description.
- The quantity (weight) of waste in the shipment.
- The number and type of containers in the shipment.
- A signed and dated certification of the shipment's content.
- The shipment labels and placards which match the shipping document.

Containers will be visually examined for deficiencies such as dents, cracks, and corrosion. Conditionally exempt small quantity generators do not need a hazardous waste manifest. If there are discrepancies, they shall be resolved by contacting the generator before EOD personnel sign the shipping document. If the discrepancies cannot be resolved, EOD personnel shall reject the shipment. Rejected waste shall be returned to the generator.

5.3.1.5. *Phase 2 Verification*

The EOD Team Chief, with assistance from other EOD personnel, shall compare the contents of waste shipments received with the description on the documentation provided by the generator to ensure that they match. The visual inspection shall include content identification and quantity estimation. If any waste fails verification, it shall be returned to the generator to resolve the discrepancy.

5.3.1.6. *OB Unit Treatment Residues*

Residue generated as a result of treatment at the OB Unit may be hazardous waste. The treatment residue comprises primarily ash; lead slag and other metals may also be present. Pieces of metal that are readily separable from ash shall be separated from the ash and managed as a different treatment residue. Treatment residue shall be removed, containerized, treated, and/or disposed of properly based on sampling and analysis data pursuant to Section 5.2.1 of this Permit Attachment.

Composite samples shall be collected from treatment residues. The samples shall be analyzed for the constituents known to be present in the original waste that was treated; this includes benzene if fuel was used to sustain a burn event. Characteristic metals and organic compounds (such as D018, D030, D034, and D040) shall be analyzed for using the TCLP method. If UHCs are present in the original wastes, they shall also be analyzed for in the laboratory using appropriate methods. The samples shall be analyzed using the applicable *SW-846* methods indicated in Table 5-2 of this Attachment. After sampling, the treatment residue shall be containerized and managed appropriately.

5.3.2. Sampling Equipment

Each sample of treatment residue or other waste requiring sampling and analysis shall be collected using appropriate sampling equipment, as recommended in *SW-846* or other

Department-approved sampling guidance.

5.3.3. Equipment Decontamination

Disposable clean equipment shall be used to eliminate the potential for cross contamination during sampling. Therefore, maintaining and decontaminating sampling equipment will not be necessary.

5.3.4. Sample Preservation and Storage

Treatment residue and other waste samples shall be collected in clean containers and preserved, as appropriate; to ensure that their integrity remains intact prior to, during, and after transport to the analytical laboratory. Container types, preservation techniques, and holding times for expected analytes of interest for treatment residues are presented in Table 5-3.

5.3.5. Quality Assurance/Quality Control

Quality assurance (QA) process shall be implemented to obtain high quality data. Quality control (QC) procedures shall be implemented to measure the degree to which this QA objective is fulfilled.

QC samples shall be collected as part of sampling activities. If samples are analyzed for VOCs, trip and field blanks shall be prepared and analyzed for VOCs. Duplicates shall also be collected and analyzed for all constituents of concern. A chain-of-custody form shall be completed and shall include the type of sample collected; the names and signatures of the sampler(s); the sample numbers, date, and time of collection; the designation as a grab or composite sample; the names, dates, times, and signatures of any persons involved in transferring samples; and the shipping number. Personnel shall be properly trained in the use of sampling equipment, sample containers, and sampling methods to ensure that sampling activities are conducted appropriately.

5.3.6. Health and Safety Protocols

To protect health and safety, sampling personnel shall be properly trained on the potential hazards associated with hazardous waste-management procedures. Proper personal protective equipment (PPE) (such as disposable gloves) shall be worn to minimize exposure of personnel to hazardous waste.

5.4. ANALYTICAL LABORATORY AND TESTING/ANALYTICAL METHODS SELECTION

Characterization of the wastes treated in the Open Burn Unit and Open Detonation Unit shall be accomplished using KOP or by sampling and analysis, as appropriate. .

5.4.1. Analytical Laboratory Selection

An EPA-certified analytical laboratory shall be selected to perform laboratory analysis of waste. The laboratory shall be required to have a comprehensive QA/QC program, technical analytical expertise, and an effective information management system.

5.4.2. Testing and Analytical Methods Selection

The selection of analytical testing methods for waste is based on the following.

- The physical state of the waste.
- The analytes of interest.
- The required detection limits (i.e., regulatory thresholds).
- Information requirements (e.g., to ensure compliance with LDR treatment standards).

Collectively, these factors contributed to the selection of typical testing/analytical procedures included in Table 5-2 of this Attachment for treatment residues.

5.5. WASTE RE-EVALUATION FREQUENCIES

A re-evaluation of waste characterization data shall be conducted as necessary but at least annually to ensure that data are accurate, in accordance with 40 C.F.R. § 264.13(a)(3). Updates of waste characterization information are required when:

- A change occurs in the process or operation generating the hazardous waste, and
- Hazardous waste received from an off-site facility does not match the waste specified on the accompanying manifest or shipping papers.

Waste characterization data for the wastes treated at the Open Burn Unit and Open Detonation Unit shall be re-evaluated at least annually. This information shall be used to determine if waste characterization data are accurate and to determine the appropriateness of current waste management practices and characterization methods, and shall be documented in the Operating Record.

5.6. SPECIAL PROCEDURAL REQUIREMENTS

Procedures for receiving wastes generated off-site and for managing ignitable, reactive, and incompatible wastes are summarized below. In addition, provisions for compliance with LDR requirements are presented in this Section.

5.6.1. Procedures for Ignitable, Reactive, and Incompatible Wastes

Wastes that exhibit the characteristics of reactivity and ignitability are treated in the Open Burn Unit and Open Detonation Unit. These characteristics are documented with information provided by the waste generators. Incompatible wastes shall not be managed at the Open Burn Unit and Open Detonation Unit.

5.6.2. Provisions for Complying with LDR Requirements

There are special waste analysis requirements under the LDR program for hazardous waste generators and treatment facilities. Generators of hazardous waste must determine if the waste must be treated before it can be land disposed. Generally, hazardous wastes must meet applicable treatment standards prior to land disposal. These treatment standards are expressed in

two ways:

- As constituent concentrations in the waste, either as an extract of the waste (as determined by TCLP), or as total waste analysis, or
- As specified treatment technologies.

Wastes that have concentration-based treatment standards must generally be analyzed in a laboratory to determine applicable hazardous constituent's concentration levels. LDR determinations can be accomplished by testing the waste, or in some cases applying KOP. The TCLP method shall be used to evaluate whether treatment standards expressed as concentrations in the waste extract have been met, and total waste analysis methods shall be used to evaluate whether treatment standards based on total waste concentrations have been met.

Characteristic hazardous wastes that have treatment standards expressed as specified technologies in 40 C.F.R. § 268.40 must also meet the Universal Treatment Standards (UTS) in 40 C.F.R. § 268.48 prior to land disposal. The generator and treatment facility requirements that must be met to ensure compliance with LDR are discussed in the following sections, and are summarized in Tables 5-6 and 5-7.

All notices and certifications required by 40. C.F.R § 268.7(a)(8) shall be maintained at the Facility for at least three years from the date the waste that is the subject of such documentation was last sent to on-site or off-site treatment, storage, or disposal.

5.6.2.1. *Generator Requirements*

Generators are required to send a one-time written notice to the facility receiving each exact type of waste stream. This includes on-site generators and off-site generators listed in Table 5-1 that send waste to the Open Burn Unit and Open Detonation Unit for treatment, and the Permittee, as the "generator" when treated wastes are sent to an off-site facility for subsequent treatment and/or disposal. A copy of the one-time notice shall be maintained at the EOD Shop. The notice shall include:

1. The applicable EPA Hazardous Waste Numbers and the manifest number of the initial shipment.
2. A statement that the waste is subject to LDRs.
3. The UHCs and their concentrations in the wastes, if any.
4. The applicable treatability group category (normally as a non-wastewater).
5. Waste code subdivisions based on waste-specific criteria, if appropriate.
6. Waste analysis data, if appropriate.

For wastes or contaminated soil that do not meet treatment standards, the one-time written notice to the treatment facility shall include the generator paperwork requirements information referenced in 40 C.F.R. § 268.7(a)(2). No further notification will be necessary unless the waste or receiving facility changes. If the latter is true, a new notification shall be sent to the receiving facility, and a copy of the new notification shall be maintained at the EOD Shop. For

contaminated soil, a certification signed by an authorized representative shall be included with the notice.

For wastes that meet treatment standards at the original point of generation, the one-time notice to the disposal facility shall include the generator paperwork regulatory requirements information and the certification statement. For contaminated soil that meets treatment standards at the original point of generation, the one-time notice to the disposal facility shall include the generator paperwork requirements and the certification statement. If the waste changes, a new notification and certification shall be sent and a copy of each shall be maintained at the EOD Shop.

All of the supporting data used to determine that a waste is restricted from land disposal, either based on knowledge of the waste or on testing the waste, shall be retained at the EOD Shop, as required in 40 C.F.R. § 268.7(a)(6). Records of all notices, certifications, and waste characterization data (e.g., KOP, waste analysis data) shall be maintained for at least three years from the date that the waste subject to such documentation was last sent to the off-site treatment, storage, or disposal facility.

The alternative LDR treatment standards for contaminated soil presented in 40 C.F.R. § 268.49 shall be applied to soil that becomes waste and is contaminated as a result of treatment at the OD Unit. Contaminated soil shall be analyzed for the same constituents of wastes that were treated. As defined in 40 C.F.R. § 268.49(d), the constituents subject to treatment shall be those listed in the UTS table in 40 C.F.R. § 268.48 that are reasonably expected to be present in any given volume of contaminated soil and that are present at concentrations greater than ten (10) times the UTS. If soil is excavated (e.g., based on a risk assessment) and if the soil contains any of these constituents at a concentration greater than 10 times the UTS, they shall be sent to an off-site facility for treatment to comply with the required regulatory standards.

For contaminated soil that becomes waste and does not meet treatment standards, a one-time written notice to the off-site treatment facility shall include the generator requirements referenced in 40 C.F.R. § 268.7(a)(2). No further notification shall be necessary unless the waste or receiving facility changes. In this case, a new notification shall be sent to the receiving facility, and a copy of the new notification shall be maintained at the EOD Shop. In addition to the notification, a certification prepared in accordance with 40 C.F.R. § 268.7(a)(2)(i) and signed by an authorized representative shall be included with the one-time notice.

For contaminated soil that becomes waste and meets treatment standards at the original point of generation, the one-time notice to the disposal facility shall include the generator paperwork requirements information and the certification. If the waste changes, a new notification and certification shall be sent to the receiving facility, and a copy of each shall be maintained at the EOD Shop.

5.6.2.2. *Treatment Facility Requirements*

For the ignitable and reactive hazardous wastes treated at the Open Burn Unit and Open Detonation Unit, the specified treatment technology in 40 C.F.R. § 268.40 is DEACT (deactivation). Deactivation shall be accomplished by treatment in the Open Burn Unit and

Open Detonation Unit, which removes the hazardous characteristics of ignitability and/or reactivity. Residue resulting from treatment by OB and OD is subject to LDR.

In accordance with 40 C.F.R. § 268.7(b)(1) and (2), OB Unit treatment residues require testing of the treatment residues to assure that the applicable treatment standards presented in 40 C.F.R. § 268.40 are met. After treatment of hazardous waste at the OB Unit to eliminate the characteristics of ignitability and reactivity, the treatment residue may exhibit the toxicity characteristic for metals and/or organics (such as D018, D030, D034, and D040). UHCs may also be present.

If an analysis indicates that a treatment residue does not fully meet the Treatment Standards for Hazardous Wastes in 40 C.F.R. § 268.40 and the Universal Treatment Standards of 40 C.F.R. § 268.48, the residue shall be sent to an off-site facility for additional treatment, including any necessary treatment of UHCs to meet the applicable treatment standards. A notification and certification signed by an authorized representative shall be submitted to the off-site treatment facility with the shipment of the treatment residue that is a restricted waste. The certification and notice shall also meet the regulatory notice and certification requirements of 40 C.F.R. § 268.7(a).

If analysis indicates that a treatment residue meets the treatment standards, it shall be sent off-site for disposal. A notification and certification signed by an authorized representative shall be submitted to the off-site disposal facility with the shipment of the treatment residue. The certification and notification shall also meet the notice and certification requirements. Copies of certifications and notifications shall be placed in the files at the EOD Shop. A new certification shall be sent to the off-site treatment, storage and disposal facility (TSDF) if the treatment residue changes or the receiving TSDF changes, and a copy of the new certification shall be placed in the EOD Shop files.

If a waste is determined to be no longer hazardous, a one-time notification and certification shall be placed in the files at the EOD Shop, and shall be submitted to the Department, as required by 40 C.F.R. § 268.9(d). The notification and certification shall be updated if the process or operation generating the waste changes and/or if the Subtitle D facility receiving the waste changes. If such changes occur, the generator shall notify the Department on an annual basis; such notification and certification shall be provided to the Department by the end of the calendar year. The notification shall include:

- The name and address of the Subtitle D facility receiving the waste shipment, and
- A description of the waste (e.g., the treatment residue) as initially generated, including EPA Hazardous Waste Number(s), treatability group(s), and UHCs.

An authorized Facility representative, as appropriate, will sign the certification.

Table 5-1 **Potential Waste Generators from whom KAFB accepts wastes for treatment at the Open Burn Unit and Open Detonation Unit**
Drug Enforcement Agency
Bureau of Alcohol, Tobacco, and Firearms
New Mexico Institute of Mining and Technology
New Mexico Engineering Research Institute
University of New Mexico Civil Engineering Research Facility
Air Force Operation Technical Evaluation Center
Federal Bureau of Investigation
Bureau of Indian Affairs
Joint Task Force 6
Edgerton, Germeshausen, and Grier, Inc. (EG&G)
Transportation Safe Guards
Defense Evaluation Services Administration
U.S. Customs
U.S. Forest Service
New Mexico State Police
Sandia National Laboratories/New Mexico
Defense Logistic Agency Phoenix
KAFB Munitions
Air Force Research Laboratory
New Mexico Air National Guard
U.S. Navy Weapons Facility, KAFB
Air Force 898th Air Vehicle Diagnostic System
U.S. Department of Defense
U.S. Department of Energy
Department of Defense Munitions Activities

TABLE 5-2

Summary of Characterization Methods for Treatment Residue Generated by Open Burning

Parameters	Method Numbers	Test Method	Rationale
Metals:	SW-846 [a]	Toxicity characteristic leaching procedure (TCLP)	Determine TCLP metals concentrations in samples of solid process residues
Barium Chromium Lead Mercury	(1311, 6010B, 7080A, 7081) (1311, 6010B, 7190, 7191) (1311, 6010B, 7420, 7421) (7470A, 7471A) or equivalent methods[c]	Inductively-Coupled Plasma atomic emission spectroscopy or Atomic Absorption or Manual Cold Vapor technique	Determine TCLP metals concentrations in samples of solid process residues
Volatile Organic Compounds (VOC)	SW-846 [a] (8260B)	Total VOC analysis by gas chromatography/mass spectrometry (GC/MS)	Determine TCLP metals concentrations in samples of solid process residues
Semivolatile Organic Compounds (SVOC)	SW-846[a] (8270C)	Total SVOC analysis by GC/MS	Determine TCLP metals concentrations in samples of solid process residues

a. U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

b. Equivalent methods, subject to NMED approval, may be substituted.

TABLE 5-3

Recommended Sample Containers, Preservation Techniques, and Holding Times[a]

Sample Type and Analyte Class	Container	Preservative	Holding Time
Volatile Organics			
Treatment Residue	4 oz glass jar with Teflon cap	Cool to 4 degrees Celsius (ºC)	14 days
Semivolatile Organics			
Treatment Residue	8 oz glass jar with Teflon cap	Cool to 4ºC	Samples extracted within 14 days and extracts analyzed within 40 days following extraction
Metals			
Metals (except hexavalent chromium and mercury)	8 oz glass jar with Teflon cap	Cool to 4ºC	180 days
Hexavalent chromium	8 oz glass jar with Teflon cap	Cool to 4ºC	One month to extraction; 4 days after extraction until analyzed
Mercury	8 oz glass jar with Teflon cap	Cool to 4ºC	28 days

a. Information primarily from U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*, EPA, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.
b. WM = Wide-mouth
c. Glass
d. Polyethylene

TABLE 5-4

Land Disposal Restrictions (LDR) Requirements for Generators

Type of Waste	General Requirement	Notification To:	Written Notice/Certification
All wastes treated at the Explosive Ordnance Disposal Range	U.S. Environmental Protection Agency Hazardous Waste Number(s) and Manifest Number of first shipment	Treatment, Storage or Disposal Facility and Place Copy in Generator File	
	Statement that waste is subject to LDRs		
	Underlying hazardous constituents		
	Applicable treatability group (i.e., non-wastewater)		
	Waste code subdivisions (if applicable)		
	Waste analysis data (if available)		
	Identification of soil to be treated to the 40 C.F.R. §268.49 standards and contaminants subject to treatment		Notices and certifications in 40 C.F.R. §268.7(a)(3)(i) and (ii).
Wastes or contaminated soil that do not meet all treatment standards		Treatment, Storage or Disposal Facility and Place Copy in Generator File	Notice referenced in 40 C.F.R. §268.7(a)(2). For contaminated soil, notice referenced in 40 C.F.R. §268.7(a)(2) and certification in 40 C.F.R. §268.7(a)(2)(i).
Wastes or contaminated soil that meet the treatment standards at the original point of generation		Treatment, Storage or Disposal Facility and Place Copy in Generator File	For wastes, notice and certification referenced in 40 C.F.R. 268.7(a)(3)(i). For contaminated soil, notice referenced in 40 C.F.R. §268.7(a)(3)(ii).
Soils that do not meet 40 C.F.R. §268.49 alternative treatment standards		Treatment, Storage or Disposal Facility and Place Copy in Generator File	Notice in 40 C.F.R. §268.7(a)(2) and certification in 40 C.F.R. §268.7(a)(2)(i).
Soils that meet 40 C.F.R. §268.49 alternative treatment standards	If sent to a Subtitle C disposal facility:	Treatment, Storage or Disposal Facility	Soil-specific certification in 40 C.F.R. §268.7(b)(4) and certification in 40 C.F.R. §268.7(a)(3)(ii).
	If sent to a Subtitle D disposal facility:	Treatment, Storage or Disposal Facility and Place Copy in Generator File & New Mexico Environment Department	Notice in 40 C.F.R. §268.9(d)(1) and soil-specific certification in 40 C.F.R. §268.7(b)(4).

TABLE 5-5 Land Disposal Restrictions (LDR) Requirements for Treatment Facilities			
Type of Waste	**General Requirement**	**Notification To:**	**Written Notice/Certification**
All treatment residues and contaminated soil	Must meet all generator requirements in Table 5-6, unless otherwise noted.	Facility	
Waste residues that do not meet all 40 C.F.R. §268.40 treatment standards		Facility & off-site treatment facility	Notice and certification in 40 C.F.R. §268.7(b) (4) (iv), notice in 40 C.F.R. §268.7(b) (3) (ii), and appropriate notice and certification in Table 5-7.
Waste residues that meet 40 C.F.R. §268.40 treatment standards	If sent to a Subtitle C disposal facility:	Facility & off-site disposal facility	Notices and certifications in 40 C.F.R. §268.7(b)(4)(v) and notice in 40 C.F.R. §268.7(b)(3)(ii).
	If sent to a Subtitle D disposal facility:	Facility & New Mexico Environment Department	Notice in 40 C.F.R. §268.9(d)(1) and certification in 40 C.F.R. §268.7(b)(4).

TABLE 5-6

Land Disposal Restrictions (LDR) Requirements for Generators

Type of Waste	General Requirement	Notification To:	One-Time Written Notice/Certification
All wastes treated at the Explosive Ordnance Disposal Range	U.S. Environmental Protection Agency Hazardous Waste Number(s) and Manifest Number of first shipment	Kirtland Air Force Base (KAFB) Treatment Facility	
	Statement that waste is subject to LDRs		
	Underlying hazardous constituents		
	Applicable treatability group (i.e., non-wastewater)		
	Waste code subdivisions (if applicable)		
	Waste analysis data (if available)		
	Identification of soil to be treated to the 40 C.F.R. §268.49 standards and contaminants subject to treatment		Notices and certifications in 40 C.F.R. § 268.7(a)(3)(ii).
Wastes or contaminated soil that do not meet all treatment standards	40 C.F.R. § 268.7(a)(2)	KAFB Treatment Facility & Off-Site Treatment Facility	Notice referenced in 40 C.F.R. § 268.7(a)(2). For contaminated soil, notice referenced in 40 C.F.R. §268.7(a)(2) and certification in 40 C.F.R. § 268.7(a)(2)(i).
Wastes or contaminated soil that meet the treatment standards at the original point of generation	Defined in 40 C.F.R. § 268.7(a)(3)	KAFB Treatment Facility &Off-Site Disposal Facility	For wastes, notice and certification referenced in 40 C.F.R. § 268.7(a)(3)(i). For contaminated soil, notice referenced in 40 C.F.R. § 268.7(a)(3)(ii).
Soils that do not meet 40 C.F.R. §268.49 alternative treatment standards		KAFB Treatment Facility & Off-Site Treatment Facility	Notice in 40 C.F.R. §268.7(a)(2) and certification in 40 C.F.R. §268.7(a)(2)(i).
Soils that meet 40 C.F.R. §268.49 alternative treatment standards	If sent to a Subtitle C disposal facility:	KAFB Treatment Facility & Off-Site Disposal Facility	Soil-specific certification in 40 C.F.R. § 268.7(b)(4) and certification in 40 C.F.R. § 268.7(a)(3)(ii).
	If sent to a Subtitle D disposal facility:	KAFB Treatment Facility & New Mexico Environment Department	TCLP requirements Notice in 40 C.F.R. § 268.9(d)(1) and soil-specific certification in 40 C.F.R. § 268.7(b)(4).

TABLE 5-7 Land Disposal Restrictions (LDR) Requirements for Treatment Facilities			
Type of Waste	**General Requirement**	**Notification To:**	**One-Time Written Notice/Certification**
All treatment residues and contaminated soil	Must meet all generator requirements in Table 5-6, unless otherwise noted.	Kirtland Air Force Base (KAFB) Treatment Facility	
Waste residues that do not meet all 40 C.F.R. §268.40 treatment standards		KAFB Treatment Facility & Off-Site Treatment Facility	Certification in 40 C.F.R. § 268.7(b) (4) (iv), notice in 40 C.F.R. § 268.7(b) (3) (ii), and appropriate notice and certification in Table 5-5.
Waste residues that meet 40 C.F.R. §268.40 treatment standards	If sent to a Subtitle C disposal facility:	KAFB Treatment Facility & & Off-Site Disposal Facility	Certifications in 40 C.F.R. § 268.7(b)(4)(v) and notice in 40 C.F.R. § 268.7(b)(3)(ii).
	If sent to a Subtitle D disposal facility:	KAFB Treatment Facility & New Mexico Environment Department	Notice in 40 C.F.R. § 268.9(d)(1) and certification in 40 C.F.R. § 268.7(b)(4).

PERMIT ATTACHMENT 6: SOIL SAMPLING AND ANALYSIS PLAN

6.0 INTRODUCTION

The purpose of this sampling and analysis plan is to ensure that accurate data are collected to determine whether a release of hazardous waste or hazardous constituents has occurred at the Open Burn (OB) and Open Detonation (OD) Units that may pose a threat to human health. Any corrective action that may be required for the Open Burn Unit and Open Detonation Unit shall be conducted in accordance with Parts 4 and 5 of this Permit.

The Kirtland Air Force Base (KAFB) Open Burn Unit and Open Detonation Unit are located at the Explosive Ordnance Disposal (EOD) Range and are permitted as RCRA Subpart X miscellaneous units. The Open Burn Unit and Open Detonation Unit are used to treat hazardous waste, including Explosive Wastes, to remove the hazardous characteristics of reactivity and ignitability. Non-hazardous wastes (contraband and firearms) are also treated at the Open Burn Unit and Open Detonation Unit as a service in support of the various agencies listed in Table 5-1 of Permit Attachment 5, *Waste Analysis Plan*. The Permittee shall perform soil monitoring at the Open Burn Unit and Open Detonation Unit to assess whether or not contaminants are being released to soil at levels that could endanger human health. During the operational life of the Open Burn Unit and Open Detonation Unit, soil sampling and analysis shall be performed on an annual basis in accordance with the procedures described in this Soil Sampling and Analysis Plan (SSAP).

6.1. SAMPLING AND ANALYSIS PROCEDURES

This Section describes procedures and methods for sampling and analyzing soil samples at the Open Burn Unit and Open Detonation Unit. Other applicable procedures or methods provided in the most current version of "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*" (*SW-846*) (U.S. Environmental Protection Agency [EPA], 1986 and approved updates) may be used if conditions or experience show the alternate method(s) to be more appropriate and if approved by the Department. All sampling procedures used will be documented in the field logbook. Sampling shall be performed in accordance with procedures given in "*Samplers and Sampling Procedures for Hazardous Waste Streams*" (EPA, 1980), or *SW-846*, and in accordance with this SSAP.

6.1.1. Sampling Schedule and Frequency

Soil samples shall be collected annually at the Open Burn Unit and Open Detonation Unit, typically during the summer months. Sampling shall occur within 24 hours following the last treatment event for the calendar year at the Open Burn Unit and Open Detonation Unit and before any backfilling, excavation, or grading is performed at the site. If no treatment events have occurred, annual sampling will not be conducted for that annual period. The Department shall be notified if this circumstance occurs.

6.1.2. Sampling Strategy and Analytical Parameters

For the OD Unit, four soil samples shall be collected from the 0- to 6-inch depth and analyzed for the total metals and high explosives constituents listed in Table 6-1. The sampling location strategy depends on the physical characteristics of the OD Unit. If only one crater (pit) is present during the sampling event, then four soil samples shall be taken from the walls of the crater at each of the four

compass directions (Figure 6-1). If more than one crater is present, a grid (with a minimum of 100 possible locations) that encompasses all of the craters shall be established, and four random sample locations within the grid will be selected for the sampling event (Figure 6-2). If no craters are present, then a 150-foot (ft) by 150-ft grid shall be established at the center of the cleared area which composes the OD Unit, and four soil sample locations shall be randomly selected from within the grid. One advantage of this sampling strategy is that a large portion of the site will be evaluated over time as sampling grids and craters (and thus sampling locations) are positioned at different locations.

For the OB Unit, four soil samples shall be collected from the 0 to 6 inch depth and analyzed for total metals, explosives, and semi-volatile organic compounds. Sample locations shall be within 25 feet of the OB Unit, along its north, south, east, and west sides.

Each sample location shall be located by reference to a surveyed grid datum, prominent site features, or from some documented reference point. Sample locations shall be recorded in the field logbook, and shall be shown on a figure depicting the Open Burn Unit and Open Detonation Unit.

6.1.3. Sample Collection

Qualified personnel shall collect soil samples in accordance with guidelines issued by the United States Environmental Agency (EPA) [EPA, 1986, 1998), and Department-approved methods and in accordance with this Permit Attachment. Prior to collecting a soil sample, sampling personnel shall scrape aside loose materials (e.g., rocks, litter) from the sampling location. Personnel shall collect soil samples using clean metal or plastic scoops, wooden or disposable plastic hand trowels, or similar equipment. Non-sparking equipment shall be used whenever required by EOD personnel for worker safety. Excess soil generated from each surface soil sampling location shall be used to backfill the sample hole. Samples shall be representative of the site. Cross-contamination of samples shall be avoided. Sample collection activities shall conform to Open Burn Unit and Open Detonation Unit operating procedures, which include:

1. Personnel shall schedule sampling activities with EOD Range Control;
2. Personnel shall obtain clearance from an EOD Technician/Specialist for the selected location of each sample;
3. Personnel shall wear clean gloves before collecting each individual sample;
4. Personnel shall use clean sampling equipment to collect soil samples. (Note: An unused, disposable sampler may be presumed clean if it is still in a factory-sealed wrapper. Reusable samplers will be scraped to remove any loose material, washed with a detergent and water solution, rinsed several times with tap water, rinsed with deionized water, drained of excess water, and air-dried or wiped dry.);
5. Personnel shall place each sample in a clean, unused container appropriate for the required analysis;
6. Personnel shall cap and seal each container, attach a label, add preservative as required, generate the record in the field logbook, complete the request-for-analysis and chain-of-custody forms, and deliver the samples to an EPA-certified laboratory for analysis;

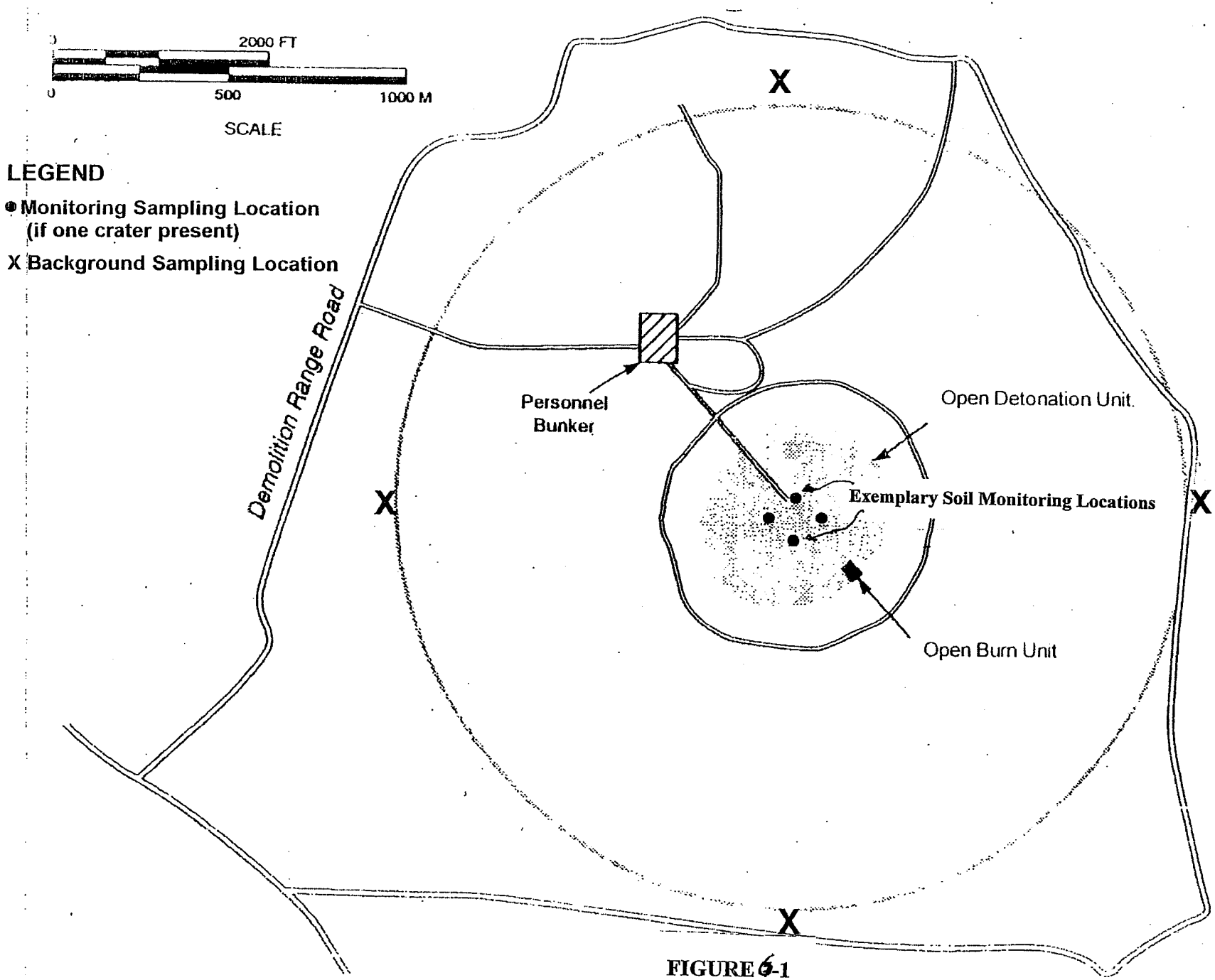

FIGURE 6-1

Monitoring and Background Sampling Locations at the Open Burn and Open Detonation Units at the Explosive Ordnance Disposal Range

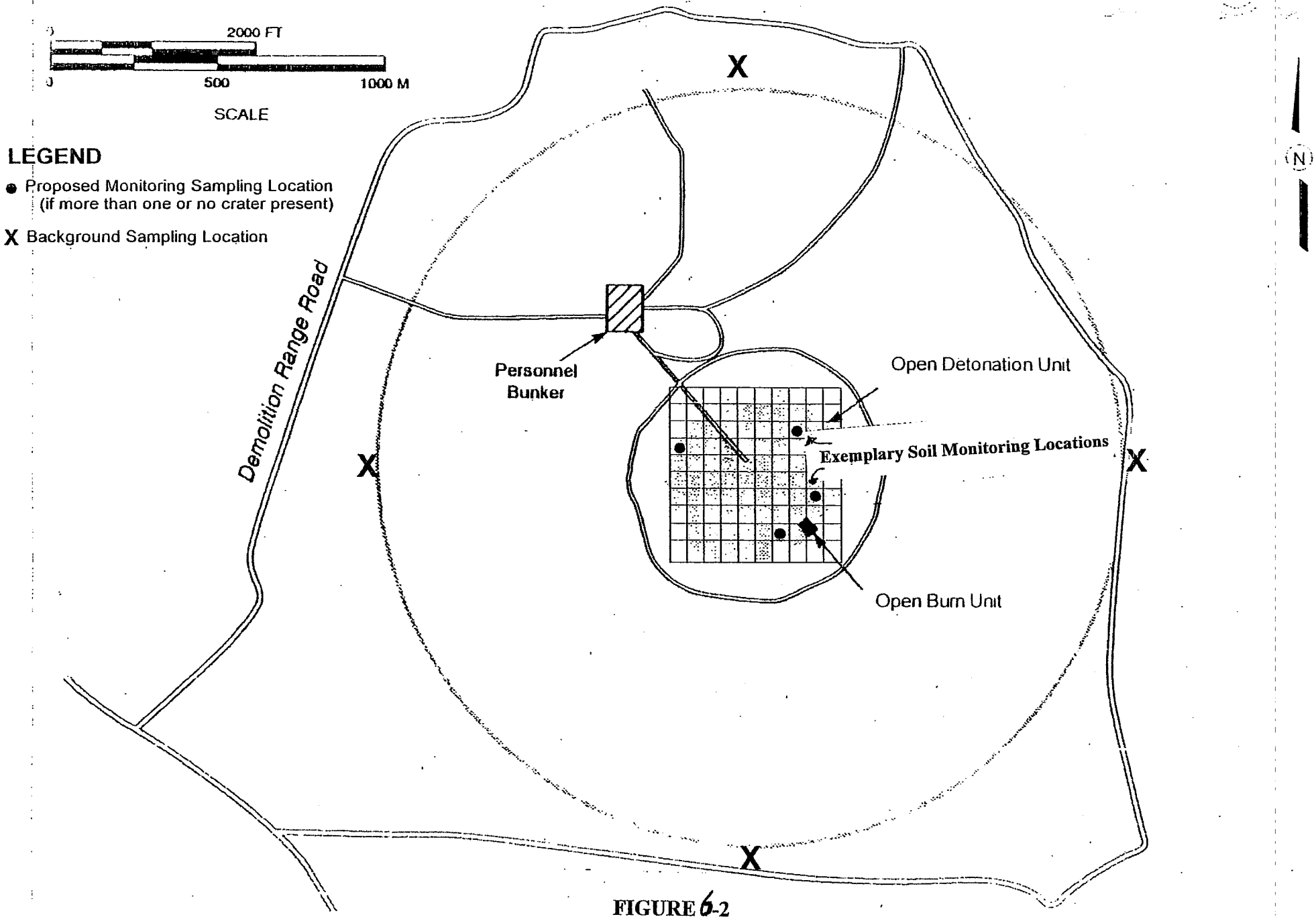

FIGURE 6-2

Monitoring Sampling Locations at the Open Burn and Open Detonation Units at the Explosive Ordnance Disposal Range

7. Personnel shall clear each sample for shipment to the analytical laboratory by an EOD Technician/Specialist; and
8. Personnel shall check out with EOD Range Control when sampling has been completed.

6.1.3.1. *Sample Containers and Preservatives*

Samples shall be placed in appropriate containers, compatible with the intended analysis. All containers shall be new, unused, and certified clean to ensure the integrity of samples collected. Samples shall be properly prepared and preserved to maintain sample integrity. Table 6-1 lists the proper container, preservative, and holding time for each chemical parameter of interest. The above requirements shall be followed for all samples collected.

6.1.3.2. *Sample Identification*

Sample identification numbers shall be assigned by alpha/numeric characters corresponding to the last two digits of the calendar year (YY), two digits of the month (MM), two digits of the day of the month (DD), a code indicating soil sample (SS), and a unique number (##) designating the sample location. Thus, a complete format of a sample identification number is: YYMMDDSS##. For example, soil sample number two collected on 3rd of June 2007 would be labeled: 070603SS02.

6.1.3.3. *Sample Handling, Documentation, and Custody Procedures*

Each sample shall be labeled, sealed, and accompanied by a chain-of-custody (CoC) and a request-for-analysis form. A CoC form shall be used to track samples from collection through analysis to ensure the integrity of analytical results. A CoC form shall include:

1. Sample number,
2. Signature of sample collector,
3. Date and time of sample collection,
4. Location at which sample was collected,
5. Type of media sampled (e.g., soil),
6. Type of preservation,
7. Analysis required,
8. Signature of persons who have samples in their possession,
9. Dates and times of possession, and
10. Signature, date and time of breaking the chain of custody seal.

An individual in custody of any sample must comply with the procedures identified in EPA (1998) Guidance, Chapter nine and those included here.

Sample labels or tags are necessary to prevent misidentification. Gummed paper labels or tags are adequate and shall include at a minimum:

1. Sample number,
2. Name or initial of collector,

3. Sample location,
4. Sample date and time,
5. Analytical method,
6. Preservation method, and
7. Other remarks.

Labels shall be affixed to sample containers before sampling, and they shall be immediately completed with the above information after the samples are collected.

The Permittee shall adhere to the following field custody procedures.

1. When collecting samples, as few people as possible should handle them.
2. Sampling personnel are responsible for the care and custody of samples until they are transferred or properly dispatched to the laboratory in accordance with the procedures described herein.
3. Sample tags or labels shall be completed for each sample using waterproof ink, or covered by transparent waterproof tape.

A CoC form shall be completed at the time of sample collection and shall remain with the samples during transfer to the analytical laboratory. The CoC form shall be signed upon receipt at the laboratory, and the original or a copy returned to the KAFB Environmental Management (EM) Branch Office for inclusion in Facility records. The CoC form shall include or be accompanied by a request-for-analysis form that lists all analyses to be performed for the samples and all special instructions related to sample management or analysis. Any potential hazards posed by the samples shall be listed on the request-for-analysis form.

The sample container shall be sealed with a gummed paper seal or tag attached to the container in such a way that the seal must be broken in order to open the container.

A field logbook shall be kept and shall contain information pertinent to field surveys and sampling. Entries in the logbook shall include:

1. Purpose of sampling;
2. Sample locations (coordinates);
3. Name and business address of person making the log entry;
4. Volume of sample;
5. Description of sampling methodology and equipment used, Date and time of sample collection;
6. Date and time of sample collection;
7. Sample destination and transporter's name (e.g., name of laboratory, United Parcel Service);
8. Map or photograph of the sampling site, if any;
9. Field observations (e.g., ambient temperature, sky conditions, past 24-hour precipitation);
10. Collector's sample identification number(s); and

11. Signature and date of person responsible for the log entry

Documentation of sample acceptance at the analytical laboratory shall be provided to the EM Branch Office. This documentation shall consist of signed copies of the CoC form. The analytical laboratory shall be required to have procedures for minimizing cross contamination of samples and securing sample custody within the laboratory.

Samples relinquished to the laboratory shall be subject to the following procedures for transfer of custody and shipment.

1. When transferring the possession of samples, the individuals relinquishing and receiving them shall sign, date, and note the time on the record. This record documents transfer of sample custody from sampling personnel to another person.
2. Shipping containers such as coolers shall be custody-sealed for shipment to the laboratory.
3. Whenever samples are split with a facility or government agency, a separate chain-of-custody record will be prepared for those samples and marked to indicate with whom the samples were being split.
4. The CoC record showing identification of the contents shall accompany all packages. The original copy shall accompany the shipment, and sampling personnel will retain a copy.

Once samples are collected and properly packaged for shipment, they shall be delivered to the laboratory where they shall be received and inspected by laboratory personnel. Laboratory personnel shall verify that the samples are correctly labeled, that documentation is correct, and shall inspect the physical condition of the containers. Any discrepancies are to be resolved between laboratory and sampling personnel at this time. The laboratory portion of the form shall be completed by the laboratory personnel and shall include at a minimum:

1. The name of the person receiving the sample,
2. Laboratory accession (identification) number,and
3. The date and time of sample receipt.

6.1.3.4. *Sample Shipping*

Samples shall be packaged and shipped to an EPA-certified commercial laboratory and shipped in accordance with U.S. Department of Transportation requirements. Samples shall be packaged in a manner to prevent breakage or puncturing of sampling containers.

6.2. INVESTIGATION-DERIVED WASTE

Investigation-derived wastes (IDW) that may be generated during soil sampling activities at the Open Burn Unit and Open Detonation Unit include decontamination water and personnel protective equipment (PPE). IDW shall be characterized by sample analyses or knowledge of process (KOP). Decontamination water and PPE generated at the time of sampling shall be managed appropriately.

Liquid waste is expected to be generated only during decontamination of sampling equipment if reusable equipment is used. Because it is essential that liquid waste be kept at a minimum volume, only the amount of water necessary to clean equipment will be used. Solvents shall not be used in order to minimize waste that cannot be disposed of in the sanitary sewer.

IDW shall be managed as follows.

1. IDW shall be stored in appropriate containers that are compatible with the wastes and that are in good condition.
2. Waste shall remain under the control of the sampling personnel generating the waste.
3. IDW shall be stored in containers that shall remain closed, except when adding or removing wastes.
4. Containers of liquid shall be provided with secondary containment.
5. Containers shall be managed in such a way as to prevent ruptures and leaks.
6. Waste containers shall be labeled as IDW pending the receipt of analytical results. Labels shall be filled out appropriately and shall be marked using a permanent marker or pen. Information on the labels shall include waste source, suspected contaminants, contents of the container, date on which accumulation and storage began, and a contact name.

IDW shall be treated and disposed of as necessary in accordance with the same procedures for treatment residues as discussed in Attachment 5 of this Permit.

6.3. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM

Because important decisions will be based on the data collected as part of this SSAP, a program to ensure that data are of high quality is essential. Data of high quality shall be ensured by collecting and analyzing QC samples, by documenting sample management so that analyses are traceable to specific areas of potential contamination, and by following a QA/QC program that mandates documentation of the precision and accuracy of laboratory analyses as well as other aspects of quality assurance.

6.3.1. Quality Control Targets

For metals, quality control targets for accuracy and precision shall be 75-125% recovered and +/-35% relative-per-cent difference, respectively. The laboratory reporting limits for metals shall be at or below the respective background level for each metal subject to analysis.

For high explosives (HE), quality control targets for accuracy and precision shall be 20-120% recovered and +-50% relative-per-cent difference, respectively. The laboratory reporting limits for HE compounds shall be at or below the appropriate human risk industrial screening level for each HE compound.

For SVOCs, quality control targets for accuracy and precision shall be 10-30% recovered and +/-50% relative-per-cent difference, respectively. The laboratory reporting limits for SVOCs shall be at or below the appropriate human risk industrial screening level for each SVOC.

6.3.2. Field Quality Control

In addition to obtaining environmental samples, field quality control (QC) samples shall be collected or prepared during each sampling event. Field QC samples shall be of the following types.

1. Equipment blanks (if using non-disposable equipment).

2. Duplicates.

Equipment blanks shall be prepared by capturing deionized water that is poured over decontaminated sampling equipment. Equipment blanks are intended to identify sources of contamination from incomplete decontamination of equipment.

Field QC activities shall include collection of QC samples in addition to field documentation requirements. Table 6-2 summarizes field QC sample requirements.

Duplicate samples shall be collected to monitor precision. Duplicate samples shall be collected at a frequency of at least one per sampling event. These duplicate samples shall be identified and treated as separate environmental samples.

6.4. LABORATORY ANALYSIS

The analytical laboratory shall operate under a QA Program Plan (QAPP) that meets the guidance of *SW-846*. QC procedures in the analytical laboratory are guided by the laboratory's QAPP. Laboratory QC samples are also required to establish the accuracy and precision of analytical data in order to determine the quality of data. Table 6-3 lists laboratory QC requirements.

6.4.1. Sample Analysis

Soil samples shall be analyzed at an EPA-certified commercial laboratory. Analytical methods are listed in Table 6-1.

All laboratory analyst notebooks, log sheets, instrument printouts, charts, and calculations relevant to analyses of these samples shall be identified and remain accessible. This information may be requested by the Department for independent review and validation. If requested, the Permittee shall provide this information to the Department.

6.4.2. Contents of Analytical Data Report

The laboratory shall be EPA certified. Analytical data reports from the laboratory shall contain at a minimum the following information.

1. A copy of the Chain of Custody.
2. Laboratory Identification (accession) number.
3. Field sample identification number.
4. Sample location.
5. Sample collection date.
6. Sample preparation and analysis date.
7. Sample preparation and analysis method.
8. Sample preparation and analysis batch.
9. Analytical parameters and results.
10. Units of measure.
11. Sample matrix.
12. Detection limit.

13. Dilution factor.
14. Matrix spike/spike duplicate results.
15. Laboratory control sample results.
16. Surrogate recovery data.
17. Nonconformance report.
18. Data qualifiers.

The analytical laboratory shall assume responsibility for the integrity and security of samples after proper custody transfer is completed. The laboratory shall implement the following steps to maintain the integrity of the samples.

1. Login personnel will receive the samples and shall provide a sample tracking number accession number) for each sample received.
2. The laboratory shall maintain a chain-of-custody for samples on the custody record. The chain-of-custody for sample extracts and digestates shall be maintained in the laboratory. The person retaining custody of these items shall sign for all samples and extracts. On completion of all analyses, these custody sheets shall be filed.
3. All samples will be held until the results have been reported and accepted by the Permittee.
4. If samples are transferred from the lab to any other destination, chain-of-custody protocols shall be followed.
5. The laboratory shall maintain documentation procedures for the preparation of reagents and supplies, which shall become an integral part of the sample record.

6.5. DATA VALIDATION

The Permittee shall evaluate the following criteria for data validation.

1. Completeness of data.
2. Collection, extraction, and analysis holding times.
3. Field and laboratory control sample results.
4. Overall data assessment and usability.
5. Requirements for data validation listed in Part 6, Section 6.3.5.2 of this Permit.

6.6. HUMAN RISK SCREENING

If a sample result for a metal exceeds the applicable background level listed in Table 6-5, the result shall be compared to the most current EPA Region 6 and Department soil screening level (SSL) for an industrial land use scenario. The industrial land use scenario shall only apply to risk screening under this SSAP, and not for purposes of closure. Analytical results for explosives and SVOCs shall be compared to the SSLs. EPA Region 6 and Department SSLs for industrial scenarios are presented in Table 6-4 for the metals, SVOCs, and HE compounds that are to be evaluated (EPA, 2004; NMED, 2004).

Sample results for arsenic shall be compared with the approved background level because the natural background concentration of arsenic in this area exceeds the EPA Region 6 human health media-specific screening level. Additionally, the screening level for thallium shall be set equal to the Department soil screening level for this constituent.

If a Department or EPA SSL does not exist for a substance, the Permittee shall calculate a screening level based on an industrial scenario and a cancer risk of 10^{-5} for carcinogens, and a HQ of 1.0 for noncarcinogens. This calculated SSL shall be subject to Department approval and shall be revised if determined by the Department not to be protective of human health.

Any exceedance of an EPA Region 6, Department, or calculated SSL if a Department or EPA SSL does not exist, shall be reported to the Department in writing within 15 calendar days. The Department will review the information and, at its discretion, may require additional site characterization to protect the health and safety of site workers. If the Department requires additional site characterization, the Permittee shall prepare a sampling and analysis plan (SAP) for Department approval. The SAP shall be prepared and submitted to the Department within 60 calendar days of the request. Upon Department approval of the SAP, the Permittee shall implement the plan within 30 days. Upon completion of the field investigation, the Permittee shall report the results of the additional site characterization effort in writing to the Department within 90 calendar days. The Department will then determine if additional sampling is required, if the site must be remediated immediately to protect workers, or if no interim corrective action is required.

6.7. REPORTING

The Permittee shall submit two copies of each annual report to the Department within 90 days of completion of each sampling event. Each annual report shall include:

1. A summary cover letter,
2. Copies of all laboratory reports associated with the sampling event, including the analytical results for each sample,
3. A summary of any constituents detected at concentrations exceeding human risk levels, including any exceeding a SSL calculated by the Permittee when a Department or EPA SSL is unavailable. The method and data used by the Permittee to calculate a SSL must also be reported,
4. A summary of field and laboratory QC sample results,
5. A summary of whether the data meet the data quality objectives listed in this Permit Attachment, and
6. A scaled, oriented map showing the location of the Open Burn Unit and Open Detonation Unit sampling grid (if any), craters (if any), and all sample locations.

Table 6-1
Analytical Parameters, Methods, Container Types, Preservation Techniques, and Holding Times for Soil Samples

Parameter	Analytical Method	Container Type and Preservative	Holding Time
Total Metals: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Mercury, Nickel, Potassium, Selenium, Silver, Thallium, Zinc	6010B or 7000 Series	500 grams (g) in wide-mouth plastic (WM-P) or glass (G) For chromium and mercury, cool to 4°C	180 days For chromium, one month to extraction, 4 days after extraction until analyzed For mercury, 28 days
High Explosives: 1,3,5-Trinitrobenzene; 1,3-Dinitrobenzene; TNT (2,4,6-Trinitrotoluene); 2,4-Dinitrotoluene; 2,6-Dinitrotoluene; 2-Amino-4,6-Dinitrotoluene; 4-Amino-2,6-Dinitrotoluene; HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine); 2-Nitrotoluene; Nitrobenzene; 3-Nitrotoluene; 4-Nitrotoluene; Tetryl; RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	8330	250 ml G, cool to 4°C	Samples extracted within 14 days and extracts analyzed within 40 days following extraction
White phosphorous	7580	100 g WM-G; cool to 4°C, store in the dark	Indefinite if preserved appropriately and container is kept tightly sealed
PETN and nitroglycerin	8321A (Modified)	Same as HEs	Same as HEs
Diesel Range Organics			
Benzene	8021B	4oz G, cool to 4°C	Extract within 14 days, analyze within 40 days following extraction
TPH	418.1 3550	4oz G, cool to 4°C	Extract within 14 days, analyze within 40 days following extraction

TABLE 6-2
Summary of Field Quality Control Samples

Quality Control Sample Type	SampleMatrix	Applicable Analyses	Frequency	Purpose
Field duplicate	Soil	Metals, HE, SVOCs	One sample per sampling event	Document precision of the sampling process
Equipment blank	Water	Metals, HE, SVOCs	One sample per day (if using non-disposable equipment)	Document if equipment is being properly decontaminated between samples

Table 6-3

Summary of Laboratory Quality Control Procedures by Analytical Method

Parameter	EPA *SW-846* Analytical Method	Quality Control Check	Frequency
Metals	**6010B, 7000 Series**	Surrogate compounds	Each sample and blank
		Instrument calibration	Daily, or each setup
		Initial/continuing calibration	After daily instrument calibration, after every 10 samples, end of analytical run
		Initial/continuing calibration blank	After daily instrument calibration, after every 10 samples, end of analytical run
		Preparation blank	Each batch of digested samples
		Interference check sample (ICS)	Each run or twice per 8-hour shift
		Matrix spike (MS)/MS Duplicate sample analysis	Once per field batch per matrix
		Initial/continuing calibration blank	Every calibration, 10% or 2 hours
		Preparation blank	Each batch of digested samples
		Interference check sample (ICS)	Each run or twice per 8-hour shift
		Matrix spike (MS)/MS Duplicate sample analysis	Once per field batch per matrix
	6010B, 7000 Series	Laboratory control sample (LCS)	Once per field batch or each digest group
		Serial dilution analysis	Once per field batch per matrix
		Instrument detection limit	Quarterly
		Inter-element corrections	Annually
		Linear range analysis	Quarterly

Table 6-3
(cont'd)

Parameter	EPA *SW-846* Analytical Method	Quality Control Check	Frequency
High Explosives and Perchlorate	**8330, 8321A (Modified)**	Initial calibration	At beginning of each 12-hour shift during which analysis is performed
		Mid-point calibration	Midpoint of the run
		Mid-level standard	Include after each group of 10 samples
		Instrument recalibration	When performance changes and acceptance criteria cannot be achieved
		Acetonitrile, methanol, and water blanks	Prior to preparation of stock solutions
		Method blanks	One for each group of up to 20 samples
		Reference samples	Once per batch
Matrix spike (MS)/laboratory control samples (LCS)	**8330, 8321A (Modified)**	Once per batch of up to 20 samples	Per method, or LCS of 70-130%
		Surrogate recoveries	After analysis of 15-20 field samples
PETN and nitroglycerin	**8321A (Modified)**	Not specified	Not specified
Sulfides	**9030B & 9034**	Reagent blank	Once per batch of up to 20 samples
		Check standards	Once per batch of up to 20 samples
		Matrix spike	Once per batch of up to 20 samples
White phosphorous	**7580**	Initial five-point calibration	Beginning of each 12-hour shift during which samples shall be analyzed
		Mid-point calibration	Following every 10th extract

Table 6-3
(cont'd)

Parameter	EPA *SW-846* Analytical Method	Quality Control Check	Frequency
Total Organic Carbon	**9060A**	Method blank	Once per batch of up to 20 samples
		MS/MS duplicate	Once per batch of up to 20 samples
		Blanks	Once per sample batch
		Check standards	Once per 15 samples
		MS duplicate	Once per 10 samples

TABLE 6-4

List of Analytical Parameters, Background Levels, and Industrial Soil Screening Levels (SSL)[a]

Constituent of Concern	EPA Region 6 SSL	NMED SSL
Metals		
Antimony	450	454
Arsenic	1.8	17.7
Barium	100,000	100,000
Beryllium	2,200	2,250
Cadmium	560	564
Chromium (Total)	500	Not established
Cobalt	2,100	20,500
Copper	42,000	45,400
Iron	100,000	100,000
Lead	800	800
Mercury	340	341
Nickel	23,000	22,700
Selenium	5,700	5,680
Silver	5,700	5,680
Thallium	79	74.9
Vanadium	390	530
Zinc	100,000	100,000

Table 6-4
(cont'd)

Constituent of Concern	EPA Region 6 SSL	NMED SSL
Diesel Fuel (Benzene + TPH)		
Benzene	0.66	6.4
TPH	Not established	520
HE		
1,3,5-Trinitrobenzene	21,000	Not established
1,3-Dinitrobenzene	68	Not established
2,4,6-Trinitrotoluene	64	342
2,4-Dinitrotoluene	1,400	1,370
2,6-Dinitrotoluene	680	Not established
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	34,000	34,200
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	17	174
m-Nitrotoluene	23,000	569
Nitrobenzene	110	147
o-Nitrotoluene	14	32.3
p-Nitrotoluene	190	437
Tetryl	Not established	Not established
White phosphorous	Not established	Not established

a. Levels in milligrams per kilogram.

TABLE 6-5 Background Concentrations of Naturally Occurring Metals at KAFB		
Metal	**Surface Soil (mg/kg)**	**Groundwater (µg/L)**
Antimony	3.9	6
Arsenic	5.6	14
Barium	130	120
Beryllium	0.65	4
Cadmium	<1	0.47
Chromium (total)	17.3	43
Cobalt	5.2	2.5
Copper	15.4	<50
Lead	21.4	10
Mercury	<0.25	2
Nickel	11.5	28
Selenium	<1	5
Silver	<1	<10
Thallium	<1.1	2
Tin	<10	50
Vanadium	20.4	13
Zinc	62	260

PERMIT ATTACHMENT 7: INSPECTION PLAN

7.0 INTRODUCTION

The information in this Attachment addresses requirements of the New Mexico Hazardous Waste Management Regulations 20.4.1 NMAC incorporating 40 C.F.R. § 264.15. The Open Burn (OB) and Open Detonation (OD) Units, which compose the Explosive Ordnance Disposal (EOD) Range, shall be inspected for malfunctions and deterioration, operator errors, and discharges that might cause or lead to a release of hazardous waste or hazardous constituents to the environment or a threat to human health. Inspections shall be conducted often enough to identify problems in time to correct them before they harm human health or the environment.

Pursuant to the miscellaneous unit requirements found in 40 C.F.R. Part 264 Subpart X, inspections of these units must meet the inspection requirements in 40 C.F.R. § 264.15 and the equipment testing and maintenance requirements in 40 C.F.R. § 264.33, as well as any additional requirements needed to protect human health and the environment.

7.1. INSPECTION SCHEDULE

In accordance with 40 C.F.R. § 264.15(b)(1), a written schedule shall be followed at the Open Burn Unit and Open Detonation Unit to routinely inspect for problems or potential problems with safety and emergency equipment, security devices, and operating and other equipment for preventing, detecting, or responding to hazards to the environment or human health. The inspection schedule is presented in Table 7-1 and shall be maintained at the EOD Range personnel bunker and at the Facility, as required by 40 C.F.R. § 264.15(b)(2).

7.2. GENERAL INSPECTION REQUIREMENTS

The Open Burn Unit and Open Detonation Unit inspection procedures for communication and fire-protection equipment shall include provisions for equipment testing and maintenance to ensure that the equipment will be operable in an emergency.

7.2.1. Scope of Inspections

At a minimum, the items listed in Table 7-1 shall be inspected.

7.2.2. Frequency of Inspections

Items listed in Table 7-1 shall be inspected monthly and before and after each treatment event as indicated in the table. Before each treatment event, inspections of specific EOD Range areas shall be conducted, such as loading and unloading areas, looking for deterioration in structures and equipment.

7.2.3. Remedial Action

If an inspection of the Open Burn Unit and Open Detonation Unit or the EOD Range reveals that a non-emergency problem has developed, remedial action, including repairs, maintenance, and replacement, shall be completed as soon as practicable to preclude further damage and to reduce the need for emergency repairs. If a hazard appears imminent or if a hazardous situation already exists,

operations at the Open Burn Unit and Open Detonation Unit shall stop, and remedial action shall be initiated immediately. These measures to implement remedial actions shall satisfy the requirements of 40 C.F.R. § 264.15(c). Any remedial action taken pursuant to an inspection shall be noted on the inspection log, in accordance with 40 C.F.R. § 264.15(d).

7.3. INSPECTION RECORDS

The Permittee shall use an inspection log based on the schedule shown in Table 7-1 to document inspection of all items listed on Table 7-1. In accordance with 40 C.F.R. § 264.15(d), the inspection records shall be maintained for at least three years. The inspection logs shall be maintained at the EOD Range personnel bunker and shall include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions taken.

TABLE 7-1
Inspection Schedule for the KAFB Open Burn and Open Detonation Units

Item Number	Inspected For	Frequency
1	Are warning signs posted on the Explosive Ordnance Disposal Range boundary (perimeter) fence at approximately 300-foot (ft) intervals?	Monthly
2	Is the EOD Range flag serviceable/posted?	Before Use
3	Are all combustibles clear of the Open Burn Unit and Open Detonation Unit to 200 ft, including vegetation?	Before Use
4	Are firebreaks clear of combustibles, including vegetation?	24 hours before use
5	Is a first-aid kit available?	Before Use
6	Are the loading and unloading areas at Open Burn Unit and Open Detonation Unit clear of explosives and are the Open Burn Unit and Open Detonation Unit clear of explosives from previous treatment activities?	Before Use
7	Are the EOD Range gates working properly?	Monthly
8	Is the Contingency Plan available at the EOD Range personnel bunker?	Before Use
9	Are all fire-protection and communication equipment operational?	Before Use
10	Is the OB Unit in serviceable condition?	Before Use
11	Is the OD Unit area in good condition?	Monthly and 24 hours before use
12	Are large metal fragments cleaned up?	Monthly
13	Is the EOD Range boundary (perimeter) fence in good condition?	Monthly
14	Are the EOD Range roads and firebreaks clear and in good condition?	Monthly
15	Is the personnel bunker berm in good condition?	Monthly
16	Is the runoff berm around the Open Burn Unit and Open Detonation Unit in good condition?	Monthly
17	Is there standing water in the OB or OD Unit?	Before Use
18	Is there kick out following OB/OD operations?	After Use
19	Is the OB steel container in good condition and free of cracks, malfunctions, and deterioration?	Before and After Use

PERMIT ATTACHMENT 8: CONTINGENCY PLAN

8.0 INTRODUCTION

This Contingency Plan has been prepared for the Open Burn (OB) and Open Detonation (OD) Units located at the Explosive Ordnance Disposal (EOD) Range at the Kirtland Air Force Base (KAFB) Facility in compliance with 40 C.F.R. Part 264, Subpart D, as applicable. This plan consists of emergency response procedures and activities specific to the Open Burn Unit and Open Detonation Unit.

8.1. PURPOSE AND IMPLEMENTATION

The purpose of this Contingency Plan is to define the responsibilities and provide for coordination of activities to minimize hazards to human health or the environment from unplanned fires, explosions, or any sudden or non-sudden release of hazardous waste or hazardous constituents. In accordance with 40 C.F.R. § 264.51(b), the provisions of this plan shall be carried out immediately whenever there is an unplanned fire, explosion, or a release of hazardous waste or hazardous constituents that could threaten human health or the environment.

EOD personnel shall activate this Contingency Plan and manage minor incidents (i.e., those which can be controlled with EOD Range resources). In the case of major incidents or emergencies, the Emergency Coordinator (EC), identified herein also as the EOD Range Safety Officer (RSO), shall immediately activate this Contingency Plan and notify the KAFB Command Post (KCP). The KCP shall assume primary responsibility for response coordination in the case of such major incidents or emergencies. Once the KCP completes its response, the RSO shall assume responsibility to ensure compliance with all the provisions of this Contingency Plan, including post-emergency inspections and reporting.

The EOD RSO shall ensure that personnel assigned to the EOD Range are trained in the location and use of eyewash solutions, fire extinguishers, and emergency protective clothing; in emergency procedures; and in evacuation procedures before starting any treatment operations.

8.1.1. Distribution

To assure proper implementation in the event of any emergency, this Contingency Plan shall be studied and understood by all personnel involved in the management of hazardous waste at the Open Burn Unit and Open Detonation Unit and by all personnel required to respond to emergency situations at the Open Burn Unit and Open Detonation Unit.

A copy of this Contingency Plan and any subsequent revisions to the plan shall be maintained at the EOD Office, the KCP, and at the personnel bunker at the EOD Range. Copies and subsequent revisions shall be distributed to the KAFB Fire Department, the Albuquerque Fire Department, and the New Mexico Environment Department in the event that they are called upon to assist with or provide emergency services.

8.1.2. Operations and Activities at the Open Burn Unit and Open Detonation Unit

The Open Burn Unit and Open Detonation Unit are used to treat reactive and ignitable hazardous

wastes by open burning or open detonation. Waste to be treated at the Open Burn Unit and Open Detonation Unit shall be transferred to the appropriate Unit by the generator on the day of the planned treatment event. Some waste may be wetted down with water to facilitate safe handling and transportation. All waste to be treated shall be placed at the appropriate treatment unit by qualified waste handlers (i.e., EOD Technicians/Specialists). Diesel fuel and wood may be added to the waste in the OB Unit to facilitate burning of the waste. The EC/RSO shall remain on site at the personnel bunker until the burn or detonation is completed. Training activities (e.g., demolition and explosives-handling methods) are also conducted at the EOD Range.

Waste shall not be stored at the Open Burn Unit and Open Detonation Unit and shall be present only during a planned treatment event.

However, if for some reason a treatment event in the OB Unit is aborted and it is unsafe to remove the waste, the OB Unit shall be covered with the retractable cover. The waste shall remain in the OB Unit until it is possible to perform the treatment or until it is possible to safely remove the waste. While awaiting treatment, the waste shall be guarded continuously by KAFB security personnel until the treatment event takes place.

If a treatment event at the OD Unit is aborted, the waste shall be sent back to the generator.

8.1.3. Characteristics of Wastes Managed at the Open Burn Unit and Open Detonation Unit

The Permittee treats reactive (D003) and ignitable (D001) hazardous wastes. These hazardous wastes include explosives, propellants, and pyrotechnics. The hazardous wastes treated at the Open Burn Unit and Open Detonation Unit are mostly in solid form; however, on occasion, wastes in liquid form (e.g., picric acid) may be treated. Metals may be present in the hazardous wastes treated or in the casings surrounding the wastes to be treated. Organic compounds (D018, D030, D034, and D040) may also be present in the original waste. EOD personnel shall review the waste characterization information (such as Knowledge of Process [KOP], sampling and analysis data, and supporting documentation) provided by the waste generators to ensure that the hazardous wastes proposed for treatment are characterized properly, can be managed safely, and are authorized for treatment pursuant to Attachment 4 of this Permit.

8.1.4. Support Agreements with Outside Facilities

The Permittee shall maintain support agreements or documentation of failed attempts to obtain such agreements with various outside facilities (e.g., medical facilities, ambulance services, Albuquerque Fire Department) for emergency response assistance in case of an emergency, pursuant to 40 C.F.R. § 264.37. These agreements shall be maintained at the KAFB Facility and are described briefly herein. A medical facilities agreement ensures that in the event of a major catastrophe or other events affecting major portions of the community population, medical care shall be available at a number of facilities and, thus, shall not exceed any one facility's capacity. An ambulance services agreement provides for coordination and coverage of such services at the KAFB Facility in the event of a disaster. An agreement with the Albuquerque Fire Department for mutual aid in fire protection ensures that assistance shall be provided, as needed.

8.2. EMERGENCY COORDINATOR

An EOD RSO shall be on site during treatment activities to coordinate emergency response measures. The EOD RSO is the functional equivalent of the EC. The EOD RSOs shall be thoroughly familiar with this Contingency Plan, the Permit, characteristics of the hazardous wastes managed at the Open Burn Unit and Open Detonation Unit, the hazardous waste management operations and activities conducted at the Open Burn Unit and Open Detonation Unit, the location of hazardous wastes managed at the Open Burn Unit and Open Detonation Unit when treatment operations are in progress, the location of waste management related records within the Facility, and the EOD Range layout. The Base Civil Engineer shall also serve as the functional equivalent of an alternate EC. If the Base Civil Engineer is needed as the EC because the primary EC (RSO) is not available, the Base Civil Engineer shall be present at the Open Burn Unit and Open Detonation Unit for the entire duration of the treatment event. The names of the current EOD RSOs shall always be available from the KCP, which may be contacted by calling 846-3777 and asking for EOD personnel with the rank of Staff Sergeant or above.

8.3. RESPONSE PROCEDURES

During treatment operations, the first person to become aware of an incident or emergency shall notify the EOD RSO. At times other than during treatment operations, the first person to become aware of an incident or emergency shall notify the KCP, who shall in turn notify the EC. When the EOD RSO is notified of an incident or emergency, he shall first assess the situation to determine the scale of the incident or emergency and decide if the incident or emergency is minor. In the case of minor incidents or emergencies, the EOD RSO shall coordinate the response. In the case of major incidents or emergencies, the EOD RSO shall relinquish control to the KCP, which may in turn relenquish control to the KAFB Fire Chief when he arrives to handle the emergency; however, the EOD RSO shall remain available on-site to provide technical guidance and information.

Personnel shall evacuate the Open Burn Unit and Open Detonation Unit during an emergency in accordance with the requirements of Section 8.3.6 of this Permit Attachment. Except to provide emergency response assistance and when coordinated by the EOD RSO, personnel shall not enter or approach the Open Burn Unit and Open Detonation Unit:

1. When waste is not present at the range,
2. Until waste has been rendered safe by complete burning or detonation after a treatment event,
3. Until waste has been stabilized by saturating it with water as required for safety.

During minor incidents or emergencies, or until the KAFB Fire Chief arrives in the case of emergencies, the EOD RSO has three primary responsibilities. They are:

1. To assess the situation. By observing the scene, interviewing personnel, and/or reviewing records, the EOD RSO shall gather information relevant to the response, such as the type of event, quantity and type of released material, and actual or potential hazards to human health or the environment.
2. Protect personnel. The EOD RSO shall take reasonable measures to ensure the safety of

personnel, such as accounting for EOD Range personnel, attending to injuries, or coordinating the evacuation of EOD Range personnel, if necessary. If evacuation is indicated for other personnel, the KCP shall be informed.

3. Contain or mitigate the hazards. The EOD RSO shall take reasonable measures to ensure that unplanned fires, explosions, or releases do not occur, recur, or spread. For example, released explosive material shall be kept saturated and contained to prevent the spread of the release.

In the event that the EOD RSO determines an incident or an emergency to be minor, a person shall be assigned to stand by at a safely located telephone. At the first indication of an escalation in the degree of the incident or emergency, the standby person shall be instructed to notify the KCP at 846-3777.

If the EOD RSO determines that a major incident or emergency situation exists, he shall immediately notify the KCP at 846-3777. The KCP shall then assume primary responsibility for emergency response coordination. The EM Branch Chief of Compliance shall notify the National Response Center (1-800-424-8802) and the Department with the details of the incident or emergency.

After any incident or emergency, the EOD RSO shall ensure that the Open Burn Unit and Open Detonation Unit and emergency equipment are cleaned, waste is properly managed and disposed of, and the Open Burn Unit and Open Detonation Unit are safe to resume operation. Before operations are resumed, the EOD RSO shall contact the EM Branch Chief of Compliance, who shall inform the appropriate agencies, if necessary. The EOD RSO shall also ensure that the emergency recovery inspections and activities described in Section 8.5 of this plan are conducted. The EOD RSO shall also be responsible for preparing post-emergency reports, as presented below in Section 8.5.2.

8.3.1. Spills

The first priority in dealing with any spill is protection of personnel. If any hazardous waste is spilled during transfer to a treatment unit, transfer of the waste shall be discontinued immediately. The Range Supervisor shall notify the EOD RSO, proper personal protective equipment (PPE) shall be donned, and the spilled material and potentially contaminated media (e.g., soil) shall be contained, removed, and transferred to the appropriate unit for treatment. Wastes not authorized for treatment in the Open Burn Unit and Open Detonation Unit shall be removed and treated or disposed of at an off-site facility, as appropriate. Extreme caution shall be exercised in handling waste. If appropriate, the material shall be saturated (e.g., with water) as a precautionary measure. The incident, including details of the spill and cleanup, shall be noted in the operations log.

8.3.2. Personnel Exposure

In the event of chemical exposure to the eye or skin, the steps outlined below shall be followed as appropriate.

1. The Range Supervisor shall notify the EOD RSO.
2. Wash the eye(s) or skin with eyewash solution until the supply is exhausted. Hold the eyelids open during washing.

3. If possible, the EOD RSO (with the assistance of the Range Supervisor and any other personnel that may be present) shall ascertain what chemical was involved in the exposure and give the information to the medical facility.
4. Quickly transport the affected person to a medical facility for evaluation.

In the event of irritation of the eyes, breathing passages, or skin; difficulty in breathing; and/or nausea, light-headedness, vertigo, or blurred vision, personnel shall immediately take the following measures.

1. Notify the EOD RSO immediately.
2. The EOD RSO shall attempt to ascertain what, if any, chemical exposure occurred and what corrective measures are appropriate.
3. Transport the affected person to a medical facility for evaluation.
4. Evacuate and barricade the area to prevent unauthorized entry.

8.3.3. Power Failure

No equipment at the Open Burn Unit and Open Detonation Unit would be affected by a power failure. Equipment shall be self-powered or operated manually.

8.3.4. Unplanned Fire Involving Ordnance and/or Unplanned Explosion

EOD personnel have developed and shall implement operating practices designed to minimize the risk of unplanned fires and explosions. In the unlikely event that an unplanned fire or explosion occurs, the EOD RSO shall immediately notify the KCP at 846-3777. This Contingency Plan and KAFB response resources shall be activated.

8.3.5. Natural Disasters

After any natural disaster in the vicinity of the Open Burn Unit and Open Detonation Unit (e.g., earthquake, floods, lightning strike), the EOD RSO shall inspect the Open Burn Unit and Open Detonation Unit for any signs of damage, leakage, and land movement and initiate any necessary corrective measures to rectify potential or real problems. Inspection findings and corrective measures shall be logged.

8.3.6. Evacuation

Personnel shall evacuate the EOD Range upon voice command or by notification over two-way radios.

8.3.6.1. *Evacuation Procedure*

The following procedure shall be implemented for evacuation:

1. When an evacuation is announced, stop work.
2. Do not remain in the affected area except to assist injured personnel.

3. Proceed through the entrance gate of the fence immediately surrounding the Open Burn Unit and Open Detonation Unit to approximately 300 ft beyond the fence.
4. Report to the designated assembly area outside the EOD Range personnel bunker for roll call to be taken by the EOD RSO or his designee.
5. Be continually cognizant of wind directions (stay upwind) and emergency equipment.
6. Do not reenter the affected area until the EOD RSO or KAFB Fire Chief authorizes reentry.

8.3.6.2. *Evacuation Route*

The EOD RSO shall be responsible for ensuring that all EOD personnel and site visitors are familiar with evacuation procedures and routes. A map showing the evacuation route is provided as Figure 8-1. The map shall be posted at the EOD Range personnel bunker and the EOD office and carried by the EC on all operations.

8.4. EMERGENCY EQUIPMENT

Emergency equipment shall be available for use at the Open Burn Unit and Open Detonation Unit, as described below. The emergency equipment listed in Tables 8-2 and 8-3 shall be repaired, replaced, and/or upgraded with functionally equivalent components and equipment, as necessary.

8.4.1. Emergency Equipment

Emergency equipment to be used at the Open Burn Unit and Open Detonation Unit shall be maintained at the EOD Range personnel bunker and/or in the vehicles used for EOD Range access, and shall be present during OB/OD Unit operations. Emergency equipment that shall be available at the personnel bunker and/or in the vehicles for use at the EOD Range is presented in Table 8-2.

8.4.2. Other KAFB Facility Emergency Equipment

Other KAFB Facility emergency equipment is presented in Table 8-3. None of the equipment listed in Table 8-3 requires access to external supplies of water or water pressure for operation. There are no water lines or fire hydrants at the EOD Range. The fire trucks listed in Table 8-3 shall be maintained and tested for adequate water volume and pressure according to a regular schedule by the KAFB Fire Department.

8.5. EMERGENCY RECOVERY PROCEDURES

The recovery procedures that shall be followed after an incident or emergency at the Open Burn Unit and Open Detonation Unit are described below.

8.5.1. Post-Emergency Inspections and Activities

The following post-emergency inspections and activities shall be conducted:

1. The EOD RSO will assure that the time, date, and details of any incident or emergency are noted in the Operating Record in accordance with 40 C.F.R. § 264.56(j).
2. The EOD RSO shall inspect the premises for leaks or ruptures of equipment, and shall

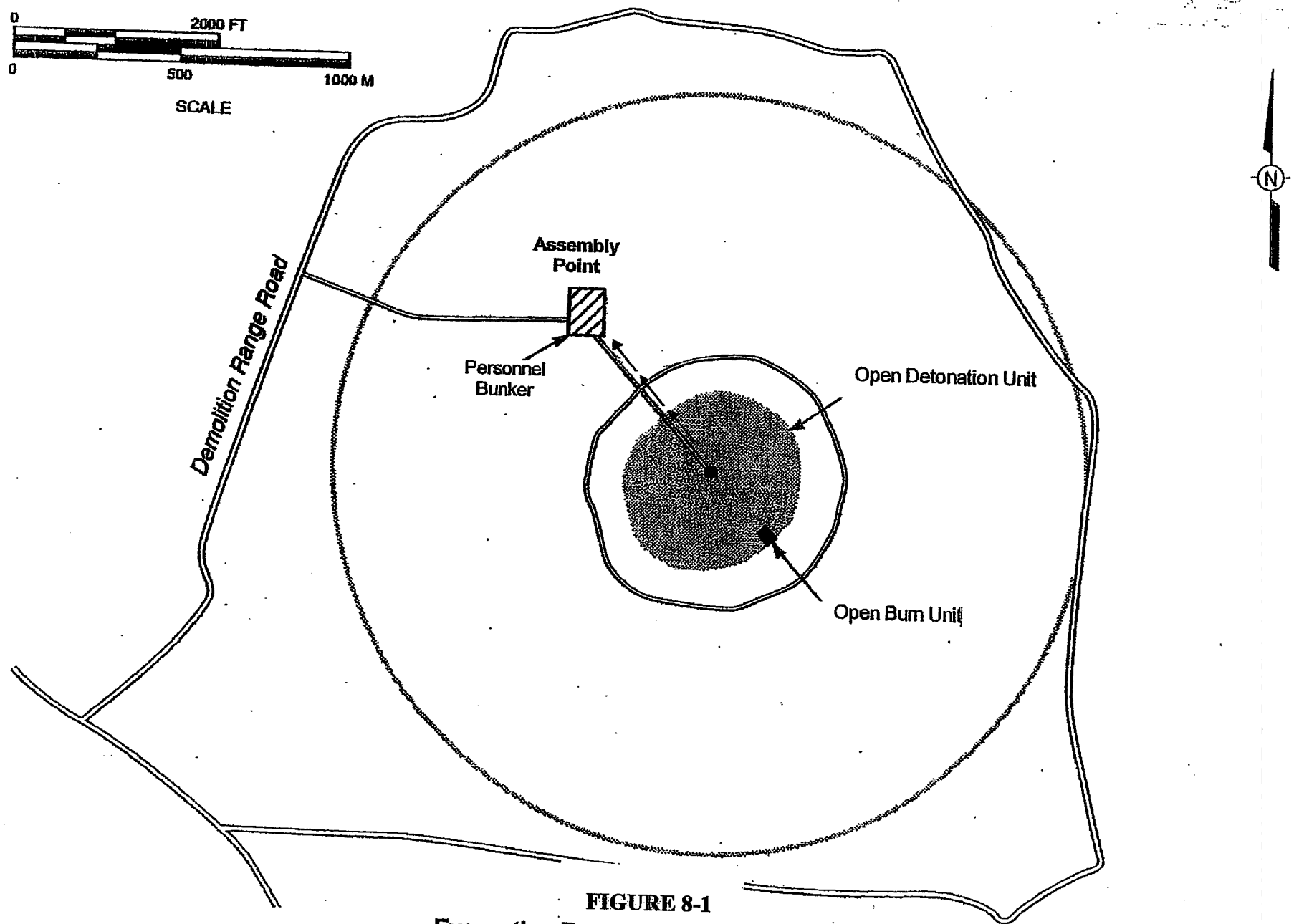

FIGURE 8-1
Evacuation Route and Assembly Point

ensure that all recovered material and waste is managed properly. The results of the inspection shall be recorded on the operations log. Only containers made of or lined with materials that will not react with and are otherwise compatible with the waste resulting from cleanup procedures shall be used.

3. Emergency response equipment shall be carefully inspected and the equipment decontaminated, replaced, or refurbished, if needed. Fire extinguishers shall be checked for adequate charge. PPE shall be checked for contamination. Remedial equipment shall be inspected for contamination and proper operation. The supply of eyewash solution and other expendable items used for first aid or cleanup shall be checked and replaced, as necessary.
4. Within 24 hours of an emergency, fire extinguishers shall be replaced and PPE decontaminated, repaired, or replaced as necessary.
5. Within three days of an emergency, other equipment and structures shall be decontaminated by cleaning with materials appropriate for the contamination. The used cleaning materials shall be collected and managed appropriately. Appropriate PPE shall be worn during decontamination procedures.
6. Within 30 days of an emergency, other equipment shall be repaired or replaced as necessary.

8.5.2. Post-Emergency Reports

The following post-emergency reports shall be made:

1. A verbal report of any incident or emergency shall be reported promptly to the EM Branch Chief of Compliance if he was not informed during its occurrence.
2. A written emergency or incident report shall be prepared jointly by the EOD RSO and the EM Branch Chief of Compliance and forwarded to the Department within 15 working days, as required by 40 C.F.R. § 264.56(j). The written report shall include, at a minimum, the following.
    a. Name, address, and telephone number of the Commander of KAFB, the EOD RSO, and the EM Branch Chief of Compliance;
    b. Name, address, and telephone number of the responsible official;
    c. Date, time, and the type of emergency;
    d. Name and quantity of material and waste involved;
    e. Extent of injuries, if any;
    f. Assessment of actual or potential hazards to human health or the environment; and
    g. Estimated quantity and disposition of recovered material and waste.
3. Before operations are resumed at the Open Burn Unit and Open Detonation Unit, the Department shall be notified that the Open Burn Unit and Open Detonation Unit is in compliance with 40 C.F.R. §§ 264.56(h) and 264.56(i) and the conditions of this Permit. The

notification shall address the fact that no new waste shall be treated that may be incompatible with released material and waste until cleanup procedures are completed and that all emergency equipment is cleaned and fit for its intended use.

8.5.3. Emergency Response Evaluation

The EM Branch Chief of Compliance shall be responsible for annual evaluations of the KAFB Facility emergency response plans and for evaluation of the response to any incident or emergency. If these evaluations reveal that changes to the emergency response plans are necessary, they shall be amended by the EM Branch Chief of Compliance and distributed to the appropriate organizations.

This Contingency Plan shall be reviewed and, if necessary, amended by the Permittee whenever:

1. The Permit, or applicable regulations, is revised.
2. The plan fails in an incident or emergency.
3. The design, construction, operation, and/or maintenance of the Open Burn Unit and Open Detonation Unit or other circumstances change in a way that materially increases the potential for unplanned fires, explosions, or releases of hazardous waste or hazardous constituents, or changes the response necessary in an incident or emergency.
4. The list of emergency equipment changes.

Whenever any of the EC contact information in Table 8-1 changes, a revised table shall be provided to the Department and distributed to all Contingency Plan holders. A copy of the revised table shall also be maintained at the EOD Range personnel bunker. A revision of Table 8-1 constitutes an amendment to this Contingency Plan. The Permittee shall request a modification to this Permit should it become necessary to amend this Contingency Plan for any reason.

TABLE 8-1 Emergency Coordinator (Range Safety Officer) Contact Information for the Explosive Ordnance Disposal Range At Kirtland Air Force Base Facility			
Contact or Name	**Address**	**Office Phone**	**Home Phone**
D. Brent Wilson, Base Civil Engineer	Building 20684 KAFB, NM 87117	846-7911 or 846-0411	281-5857

TABLE 8-2 Emergency Equipment Available at the EOD Range Personnel Bunker and/or in the Vehicles Used at the Open Burn Unit and Open Detonation Unit
Two-way radio capable of reaching EOD personnel conducting treatment operations
Shovels
Hand tools
Fire extinguishers -- ABC
Demolition kit
First-aid kit
Spill containment kit
Eye wash kit
Brooms

TABLE 8-3

Kirtland Air Force Base Facility Emergency Equipment Available for Use at the OB and OD Units

Emergency Item or Equipment	Description	Location	Contact
Emergency Vehicles	Emergency Response Vehicle: Mobile Command Post equipped with communications equipment.	KAFB CE Readiness	846-9196
	Ambulances	KAFB Fire Department	911 or 846-8069
	Security Vehicles: Vans and trucks equipped with communications equipment and utilized for transportation of personnel and equipment.	KAFB Security Police	846-7926
	Fire Trucks: Fire-fighting vehicles outfitted with equipment for fighting fires and with self-contained breathing apparatuses (SCBAs).	KAFB Fire Department	911 or 846-8069
	Helicopter: Rotary-wing aircraft for transportation of personnel to or from site.	KAFB Command Post	846-3777
Medical Supplies	Stretchers/Stokes Litter: Equipment for movement of injured personnel. Stokes litter shall immobilize personnel so they may be moved vertically.	KAFB Fire Department	846-8069
	Blankets: Normal blankets.		
	Medical Kits: Emergency first-aid supplies.		
	Oxygen: Medical grade oxygen in compressed cylinders equipped for personnel use.		
Safety Supplies	Air Packs: SCBAs equipped with positive pressure mode for use by personnel entering hazardous atmospheres. Cylinders contain sufficient air for 60 minutes of use. No fewer than 6 air packs.	KAFB Fire Department	846-8069
	Monitoring Instruments		
Transportation	Tractor-trailer combinations, 18-wheelers, 40-foot trailers, 40,000 pound capacity	KAFB Logistics Readiness Squadron	853-7843
	1-ton and 2-ton flat-bed trucks with sideboards		
	1.5-ton enclosed panel vans		
	Passenger vehicles, including sedans and vans		
	Passenger buses		

PERMIT ATTACHMENT 9: PERSONNEL TRAINING PLAN

9.0 INTRODUCTION

The primary objective of the Explosives Ordnance Disposal (EOD) training program is to prepare personnel to conduct operations at the Open Burn (OB) and Open Detonation (OD) Units in a safe and environmentally sound manner in compliance with this Permit and New Mexico Hazardous Waste Management Regulations (HWMR). To achieve this objective, the program provides all EOD personnel with training relevant to their positions.

All EOD personnel shall complete initial training within six months of assignment to EOD Range duty. Personnel shall not work at the Open Burn Unit and Open Detonation Unit until they have completed training on the Contingency Plan (Attachment 8 of this Permit) EOD personnel shall be given, at a minimum, a basic understanding of the regulatory requirements of hazardous waste management and emergency response procedures. EOD personnel shall receive additional classroom and on-the-job training designed specifically to teach them how to perform their duties safely and in conformance with regulatory requirements and this Permit. All EOD personnel shall receive the required training prior to being allowed to work unsupervised.

9.1. TRAINING PROGRAM

Training for EOD personnel is the overall responsibility of the EOD Flight Chief and the Range Safety Officer (RSO). All training shall be conducted by qualified EOD Technicians and includes formal classroom sessions, on-the-job training, and review of written procedures and plans. A summary of the training program for EOD personnel is shown in Table 9-1.

9.1.1. Job Title/Job Description

As required by 40 C.F.R. § 264.16(d)(1) and (2), records of each job title related to hazardous waste management at the Open Burn Unit and Open Detonation Unit, a list of employees for each job title, and job descriptions for each job title shall be maintained at the EOD Shop. Job descriptions shall include hazardous waste management duties, and required skills, experience, and education.

9.1.2. Training Content, Frequency, and Techniques

The EOD training program shall include a comprehensive combination of internal training courses and on-the-job training. Each training course shall be developed carefully to ensure relevancy of the course objectives and support the goal of safe and environmentally sound operations at the Open Burn Unit and Open Detonation Unit in compliance with this Permit and the HWMR. Course outlines shall be maintained in the Training Section at the EOD Shop. The general training content and frequency of training are presented in Table 9-1.

9.2. TRAINING DIRECTOR

The Training Director (EOD Flight Chief) shall direct the training program and shall be responsible for establishing training requirements for EOD personnel. The EOD Flight Chief shall be required to be knowledgeable of the applicable hazardous waste management regulations and specific processes employed at the Open Burn Unit and Open Detonation Unit, pursuant to the HWMR and this Permit.

9.2.1. Relevance of Training to Job Position

The EOD training program shall provide employees with training relevant to their positions and to respond effectively to emergencies at the EOD Range. The EOD Flight Chief shall receive hazardous waste management training relevant to his position. EOD personnel shall receive relevant training on the requirements of this Permit (including Contingency Plan implementation), EOD operations (including emergency procedures, equipment, and systems), and in management of hazardous wastes.

9.3. IMPLEMENTATION OF TRAINING PROGRAM

The EOD training program shall be implemented to ensure that all EOD personnel who work at the Open Burn Unit and Open Detonation Unit receive the training indicated in Table 9-1. Personnel shall be trained on the Contingency Plan in Attachment 8 of this Permit before working at the Open Burn Unit and Open Detonation Unit. EOD personnel shall receive the rest of the indicated training within six months of their date of assignment to the Open Burn Unit and Open Detonation Unit. Personnel shall not work in unsupervised positions until they have successfully completed all training requirements. All EOD Range personnel shall participate annually in a training refresher. Visitors shall be provided instruction commensurate with the nature of their visit.

Records relating to the EOD training program shall be maintained at the EOD Shop. These records include the job titles for all hazardous waste management positions and a roster of employees in those positions. The records shall also include a list of courses required for each position, course descriptions, documentation that each employee has received and completed appropriate training, and information regarding qualifications. Training records on former employees must be kept for at least three years from the date the employee last worked at the Facility (40 C.F.R. § 264.16(e)).

TABLE 9-1 Summary of EOD Training Program for Open Burn Unit and Open Detonation Unit		
Course	**Content**	**Frequency**
Basic EOD Course	Covers all aspects of positions and duties associated with EOD operations	Initial
Explosive Safety	General Safety Requirements, Motor Vehicle Transportation, Disposal Range Requirements, Disposal Range Procedures, Range Safety, Standard Safety Guidelines, Site Entry, Site Control, Personal Protective Equipment, Contingency Plan, Implementation, Procedures for Using Emergency Equipment, Procedures for Shutdown of Operations, Responses(s) to Emergencies, Emergency Coordinator(s), Evacuation Route and Procedures, Post-emergency Procedures	Initial/Annual
Relevant In-House Training	General Overview of Procedures to Perform Operations at the EOD Range; Waste Analysis Plan; Identification of Waste to be Managed; Waste Screening and Verification; Range Operation; Safety Practices; Security; Range Inspections; Preventive Procedures, Structures, and Equipment; Prevention of Reaction of Reactive Waste, Ignitable and Incompatible Waste; Authorized Wastes	Initial/Annual
Resource Conservation and Recovery Act Training	Hazardous Waste Management and Regulations – Overview, Hazardous Substances and Properties, General Facility Standards, Preparedness and Prevention, Contingency Plan and Emergency Procedures, Record Keeping and Reporting	Initial/Annual

PERMIT ATTACHMENT 10: CLOSURE PLAN

10.0 INTRODUCTION

This Closure Plan describes the activities necessary to close the Open Burn (OB) and Open Detonation (OD) Units at the Explosive Ordnance Disposal (EOD) Range, Kirtland Air Force Base (KAFB). Until final closure of both Units is complete and has been certified and approved by the New Mexico Environment Department (Department) in accordance with the New Mexico Hazardous Waste Management Regulations, a copy of the approved Closure Plan and all approved revisions shall be maintained at KAFB (the Facility). This Closure Plan and any revisions thereof shall be made available, upon request, to the Department.

If the Open Burn Unit and Open Detonation Unit can not be cleaned closed, the Permittee shall amend this plan and implement the new plan upon obtaining approval from the Department, and shall implement the contingency post-closure care plan required by Part 2, Section 2.9 of this Permit.

10.1. GENERAL CLOSURE INFORMATION

This Closure Plan has been prepared in accordance with the requirements of 40 C.F.R. § 270.14(b)(13), and 40 C.F.R. Part 264, Subparts G and X.

10.1.1. Closure Performance Standard

The Open Burn Unit and Open Detonation Unit shall be closed to meet the following performance standards:

- Minimize the need for further maintenance;
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to ground or surface waters or to the atmosphere; and
- Comply with the requirements of 40 C.F.R Subpart G and 264.601.

10.1.2. Partial and Final Closure Activities

The Permittee shall notify the Department, in writing, at least 45 calendar days before the date on which final closure of the Open Burn Unit and Open Detonation Unit will commence. Both Units shall be closed simultaneously; partial closure (i.e., closure of just one Unit or part of any Unit) shall not occur unless directed otherwise by the Department.

Final closure for the Open Burn Unit and Open Detonation Unit is expected in the year 2050. Final closure shall consist of:

1. Decontaminating and decommissioning all structures and equipment used at the Open Burn Unit and Open Detonation Unit;
2. Removing soil and debris that have contaminant concentrations that pose unacceptable risk to human health or the environment; and

3. Sending for treatment and disposal any solid and hazardous waste, including treatment residues, to a permitted treatment, storage, or disposal facility (TSDF) in accordance with applicable regulatory requirements.

Final closure shall be complete when:

1. All such solid and hazardous waste have been treated and disposed of off-site as required by law;
2. All structures, equipment, and surrounding areas have been decontaminated or removed, as applicable;
3. Sampling demonstrates that no unacceptable risk to human health or the environment exists at either Unit;
4. A closure certification has been submitted to the Department; and
5. The Department has approved closure.

10.1.3. Maximum Extent of Operations and Maximum Waste Inventory

The maximum extent of hazardous waste operations shall be confined to the inner fenced area surrounding the Open Burn Unit and Open Detonation Unit. Closure activities and any corrective action that may be required shall not be limited to the inner fenced area.

No more than 18,000 lbs of hazardous wastes shall be treated per year at the OD Unit. No more than 80,000 pounds of hazardous waste shall be treated per year at the OB Unit. An estimate of the total maximum inventory of hazardous waste treated during the active life (1980 to present) of the Open Burn Unit and Open Detonation Unit is approximately 151,000 pounds net explosive waste.

10.1.4. Schedule for Closure

Closure of the Open Burn Unit and Open Detonation Unit shall comply by the schedule presented in Table 10-1.

10.1.5. Amendment of the Closure Plan

If it becomes necessary to amend this Closure Plan, the Permittee shall submit a revised plan in writing describing any circumstances which affect the plan. The request shall include a copy of the proposed amended plan for approval by the Department. The Permittee shall amend the Closure Plan if:

1. There are changes in operating plans or in the OB/OD Unit's design or other factors that affect the plan, or
2. There is a change in the expected year of closure, or
3. Unexpected events occur during closure activities that require modification of the approved closure plan.
4. The Permittee requests the Department to apply alternative closure requirements.
5. Changes in state law that affect the Closure Plan

The Permittee shall submit an amended Closure Plan at least 60 calendar days prior to the proposed change in Unit design or operation, or within 60 calendar days of the occurrence of an unexpected event that affects the plan. If the unexpected event occurs during final closure, the Closure Plan revision shall be requested within 30 days of the occurrence. If the Department requests a revision of the plan, a plan revised in accordance with the request shall be submitted within 60 calendar days of notification or within 30 calendar days if a change in unit conditions occurs during final closure activities.

10.1.6. Closure and Post-Closure Cost Estimate, Financial Assurance, and Liability Requirements

Because the KAFB Facility is a federal facility it is currently exempt from the requirement to provide closure and post-closure care cost estimates and the requirements to provide financial assurance and liability insurance for closure and post-closure activities pursuant to 40 C.F.R. Part 264 Subpart H.

10.2. CLOSURE CERTIFICATION

Within 60 calendar days after completion of closure activities for the Open Burn Unit and Open Detonation Unit, the Permittee shall submit to the Department, via certified mail, a certification that the Units have been closed in accordance with the specifications of this Closure Plan. The certification shall be signed by a responsible representative of the Permittee and by an independent, professional engineer registered in the State of New Mexico. Documentation supporting the independent, registered professional engineer's certification shall be furnished to the Department with the certification.

10.2.1. Closure Report

Upon completion of the closure activities, a closure report shall be submitted to the Department with the Closure Certification. The report shall document the closure activities conducted and contain, for example, at a minimum, the following information:

1. The certification described in Section 13.1.7.
2. A summary of closure activities.
3. Any significant variance from the approved plan and the reason for the variance.
4. A summary of all sampling data associated with the closure, including analytical results for all field and laboratory quality control samples.
5. A statement indicating whether the quality of data is adequate to support closure in accordance with the Performance Standards of this Closure Plan.
6. The location of the file of supporting documentation (e.g., memos, logbooks, laboratory sample analysis data)
7. Disposal location of all solid and hazardous waste, including any contaminated debris and soil, and hazardous and non-hazardous treatment residues.
8. A certification of the accuracy of the report.

9. Survey Plat

10.2.2. Survey Plat

A survey plat shall be submitted no later than the certification of closure to the zoning authority, or the authority with jurisdiction over local land use, and to the Department. The survey plat shall meet the requirements of 40 C.F.R. 264.116.

10.3. CLOSURE PROCEDURES

All hazardous waste present at the Open Burn Unit and Open Detonation Unit shall be treated before closure activities commence, provided such waste is authorized to be treated via the Open Burn Unit and Open Detonation Unit or, the waste shall be treated and disposed of at an offsite facility as permitted by law. Contaminated structures and equipment shall be decontaminated and removed. Any structures and equipment that cannot be decontaminated shall be dismantled, placed into containers, and managed as solid or hazardous waste, as applicable, and disposed of as permitted by law.

The first phase of closure shall consist of a hazards survey of the Units of the EOD Range conducted by qualified health physics and industrial hygiene personnel. The purpose of the survey shall be to locate and remove any “kick-out” (untreated waste, waste fragments, or unexploded ordnance) and to identify potential contamination concerns that may present hazards to workers during closure activities and to specify any control measures necessary to reduce worker risk. This survey shall provide the information necessary for health physics and industrial hygiene personnel to identify worker qualifications, personal protective equipment (PPE), safety awareness, work permits, exposure control programs, and emergency coordination that may be required to perform closure activities. All workers involved in the closure activities shall be required to have training and medical monitoring, in accordance with applicable regulations. Personnel performing closure activities shall be required to wear PPE as specified by health physics and industrial hygiene personnel.

10.3.1. Open Burn Unit

The next phase of closure shall consist of decontamination of the Open Burn Unit and Open Detonation Unit. Any remaining untreated wastes shall be treated, waste residues shall be removed from the OB Unit and associated structures shall be decontaminated.

The steel container of the OB Unit shall be washed with warm detergent and water solution and then rinsed with clean water. Portable berms or other containment structures shall be set up around the steel container to collect used wash water and rinse water. Both the wash and rinse water shall be sampled and analyzed for the parameters listed in Table 1, 40 C.F.R. 261.24, for the toxicity characteristic. If the sampling and analysis indicates that the wash or rinse waters are hazardous, the OB Unit shall be washed and rinsed again in the same manner. The wash and rinse cycles shall continue until the OB Unit’s steel container has been decontaminated. Decontamination is considered complete when the wash and rinse waters are found to be non-hazardous by sampling and analysis. The wash and rinse water, once collected, shall be immediately transferred to approved U.S. Department of Transportation containers for disposal after the wastewater has been properly

characterized.

After the OB Unit's steel container has been decontaminated, it shall be removed for recycling and the concrete base and walls shall be decontaminated following the same process as for the steel container. Wash and rinse cycles for the concrete shall continue until sampling and analysis data representing the wash and rinse water demonstrates successful decontamination. The concrete will then either be reused or sent to a solid waste landfill for disposal. If successful decontamination of the steel container or concrete cannot be achieved, the steel container or concrete shall be managed as hazardous waste. Non-hazardous wash and rinse waters may be disposed of in the City of Albuquerque's sewer treatment system. Otherwise, the wash and rinse waters shall be managed as hazardous waste.

Soil samples shall be taken from the area surrounding the OB Unit. The soil shall be characterized by sampling and analysis, and shall be removed and disposed of if necessary to protect human health and the environment. Soil samples shall be analyzed for the same constituents as those for soil samples collected at the OD Unit. Soil samples shall be collected under the footprint of the OB Unit.

If sampling and analysis of soil indicates the presence of hazardous waste or hazardous constituents above background levels, a risk assessment shall be conducted to determine whether the contaminants pose an unacceptable risk to human health or the environment. In lieu of a baseline risk assessment, the Permittee may compare the soil sampling results to the soil screening levels using the procedures listed in the Department's most current version of "*Technical Background Document for Development of Soil Screening Levels*" (as it may be updated), provided the soil screening levels are based on a residential land use scenario. If the risk assessment demonstrates that the level of contamination is unacceptable, the contaminated soil exhibiting unacceptable risk shall be subject to corrective action and shall be excavated and removed. The excavated soil shall be collected, transferred to approved DOT containers, and, if applicable, managed and disposed of as hazardous waste.

The Permittee shall conduct corrective action activities at the OB Unit using the cleanup levels in Section 4.4 of Part 4 of this Permit.

All of the PPE worn by personnel performing closure activities shall be disposable; therefore, all PPE shall be placed into containers and managed as hazardous waste. This waste shall be considered to be contaminated with all of the hazardous waste constituents contained in the wastes that have been treated at the Unit.

10.3.2. Open Detonation Unit

Surface and subsurface soil and any debris at the OD Unit shall be characterized by sampling and analysis. Soil sampling shall follow the procedures described in Section 10.3 of this Attachment. Soil shall be analyzed for the parameters listed in Tables 10-2, 10-3, and 10-4. If sampling and analysis of soil indicates the presence of hazardous waste or hazardous constituents above background levels, a risk assessment shall be conducted to determine whether the contaminants pose an unacceptable risk to human health or the environment. In lieu of a baseline risk assessment, the Permittee may compare the soil sampling results to the soil screening levels using the procedures

listed in the Department's most current version of "*Technical Background Document for Development of Soil Screening Levels*" (as it may be updated), provided the soil screening levels are based on a residential land use scenario. If the risk assessment demonstrates that the level of contamination is unacceptable, the contaminated soil exhibiting unacceptable risk shall be subject to corrective action and shall be excavated and removed. The excavated soil shall be collected, transferred to approved DOT containers, and, if applicable, managed and disposed of as hazardous waste.

The Permittee shall conduct corrective action activities at the OD Unit using the cleanup levels in Section 4.4 of Part 4 of this Permit.

Background soil concentrations for metals are those approved by the Department for the KAFB Facility, and are listed in Table 6.5 of Attachment 6 of this Permit.

10.4. SAMPLING, DECONTAMINATION PROCEDURES, AND PPE

This Section describes procedures and methods for sampling soil and liquid. Other applicable procedures or methods given in the most current version of "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846)* (EPA, 1986 and all approved updates) may be used at the time of actual closure if conditions or experience show the alternate method(s) to be more appropriate, and if approved by the Department. All analytical methods and procedures used shall be described in the closure report. Sampling of waste shall be conducted in accordance with procedures given below in this Permit Attachment and in "*Samplers and Sampling Procedures for Hazardous Waste Streams" (EPA, 1980) or SW-846*.

The tools and equipment used for decontamination of the Open Burn Unit and Open Detonation Unit shall be scraped as necessary to remove any contaminated soil, debris, or residue; cleaned with detergent and water solution; and rinsed with clean water. The wash and rinse water shall be collected, and the wash and rinse water shall be sampled and analyzed for the parameters listed in Tables 10-2, 10-3, and 10-4. Non-hazardous wash and rinse waters may be disposed of in the City of Albuquerque's sewer treatment system. Otherwise, the wash and rinse waters shall be managed as hazardous waste.

All of the PPE worn by personnel performing closure activities will be disposable; therefore, all PPE shall be placed into containers and managed as solid or hazardous waste, as applicable.

10.4.1. Soil Sampling

At the OD Unit, soil samples shall be collected on a 25-ft by 25-ft grid spacing from the surface to 15-ft below ground surface at five-foot intervals (total of four samples per location). At a minimum, the 25-ft by 25-ft grid shall encompass all portions of the OD Unit that have hosted or may have hosted a pit used for the treatment of hazardous waste. Any areas used for training shall be considered a part of the OD Unit for purposes of establishing the sampling grid.

At the OB Unit, three (3) samples on each side (north, south, east, and west) shall be collected within 25 feet of the OB Unit at a depth of 0 to 6 inches. At least three (3) soil samples shall also be collected from beneath the OB Unit.

The samples shall be analyzed for the parameters listed in Tables 10-2, 10-3, and 10-4, which

include the types of hazardous wastes managed at the Open Burn Unit and Open Detonation Unit.

Surface soil samples (zero to 6-inches depth) shall be collected with a wooden or Teflon™ trowel or scoop. To collect deeper samples, a Veihmeyer soil sampler, auger drill, direct push technology, or other appropriate method shall be used. Only discrete grab samples shall be collected; no samples shall be composited.

Clean sampling equipment shall be used to collect each sample. Unused, disposable sampling equipment may be presumed clean if still in a factory-sealed wrapper prior to use. Reusable sampling equipment shall be decontaminated after use by scraping to remove any loose material, washing with a detergent and water solution, rinsing several times with tap water, rinsing with deionized water, and drained of excess water, and air-dried or wiped dry.

10.4.2. Liquid Sampling

A Coliwasa sampler or similar device shall be used to sample liquids (for example, rinse water). As an alternative to the Coliwasa, glass tubes may be used to sample liquids. The primary advantage in using a glass tube is that the tube can be disposed of after each sample is collected, thus eliminating the potential for cross-contamination.

10.4.3. Sample Containers and Preservatives

Samples shall be placed in clean, unused containers compatible with the intended analysis and shall be properly prepared, preserved, documented, labeled, handled, and secured to maintain sample integrity (see Tables 10-5 and 10-6).

10.4.4. Sample Handling and Documentation

Each sample shall be labeled, sealed, and accompanied by a chain-of-custody and a request-for-analysis form. A chain-of-custody form shall be used to track samples from collection through analysis to ensure that the integrity of the samples is protected. The sample handling and documentation procedures shall be equivalent to those in the most current version of *SW-846*. Important aspects of the procedures are presented below.

A chain-of-custody form shall be prepared for all samples collected for laboratory analyses. The form shall include at a minimum:

1. Sample number.
2. Name and signature of sample collector.
3. Date and time of sample collection.
4. Location at which sample was collected.
5. Type of sample (e.g., soil, liquid).
6. Signatures of persons who have had the samples in their possession.
7. Dates and times of possession.

This form shall be initiated at the point of sample collection and shall remain with the sample at all

times prior to and during transfer to the analytical laboratory. The form shall be completed upon receipt at the laboratory and the original returned to the Permittee for inclusion in the Facility records. The chain-of-custody form shall include a request-for-analysis form that lists all analyses to be performed for the samples and all special instructions relating to sample management or analysis. Any potential hazards posed by the samples shall be listed on the request-for-analysis form.

Sample containers shall be sealed with gummed paper seals attached to the containers in such a way that the seals must be broken in order to open the containers. Seals and sample labels shall be completed with a waterproof pen or marker. Sample labels are necessary to prevent misidentification of samples and shall include at minimum the following information:

1. A unique sample number.
2. Name or initials of sample collector.
3. Sample collection date and time.
4. Sample location.
5. Sample type, depth, and description.

A field logbook shall be kept and shall contain information pertinent to field surveys and sampling. Sufficient information shall be recorded so that a person can reasonably reconstruct what occurred at a sampling event without relying on a collector's memory. Entries in the logbook for a given sampling event shall, at a minimum, include:

1. Purpose of sampling.
2. Sample locations.
3. Name and business address of person making log entry.
4. Numbers, types, and volumes of samples, including field QC samples.
5. Description of sampling method and equipment used.
6. Date and time of sample collection.
7. Sample destination and transporter's name (for example, name of laboratory, United Parcel Service).
8. Map or photograph of the sampling site.
9. Field observations (for example, ambient temperature, sky conditions, past 24-hour precipitation).
10. Listing of sample identification number(s).
11. Signature of person responsible for the log entry.

Documentation of sample acceptance at the analytical laboratory shall be provided to the Permittee following sample screening and completion of analysis. This documentation shall consist of signed copies of the chain-of-custody. The analytical laboratory shall have procedures for minimizing cross-contamination of samples and securing sample custody within the laboratory.

10.4.5. Sample Shipping

Samples shall be packaged and shipped to an EPA-certified commercial laboratory in accordance with DOT shipping requirements and in a manner to ensure that the integrity of the samples is protected. The sample containers shall be cushioned to protect against breakage or puncture.

10.4.6. Sample Analysis

Samples shall be analyzed at an EPA-certified commercial laboratory. Test methods for analysis of all samples shall be performed according to procedures documented in *SW-846* or other methods approved by the Department. Constituents in the hazardous wastes treated at the Open Burn Unit and Open Detonation Unit are to be included in these analyses. Analytical methods, detection limits, and instrumentation are listed in Tables 10-2 through 10-4.

Calibration, operation, QC (bias, precision, blank and matrix effects), and requirements for laboratory analyses shall be performed as listed in the individual analytical methods of *SW-846*. All laboratory analyst notebooks, log-sheets, instrument printouts, charts, and calculations relevant to analyses of these samples shall be identified and remain accessible. This information may be requested by the Permittee or the Department for independent review and validation. If requested by the Department, the information shall be provided by the Permittee to the Department.

10.4.7. Quality Assurance (QA)/Quality Control (QC)

Because decisions about closure activities shall be based, in part, on analyses of samples from media and potentially contaminated surfaces, a program to ensure data are of high quality is essential. The Permittee shall ensure the high quality of data by documenting sample collection and management. The Permittee shall accomplish this by following a QA/QC program that mandates documentation of the precision and accuracy of all laboratory analyses, as well as data completeness, representativeness, and comparability.

Sampling activities shall include the collection of QC samples and their documentation. QC samples to be collected include equipment blanks, trip blanks, field blanks, and duplicate samples. Table 10-7 of this Attachment summarizes the field QC sample requirements.

Blanks and duplicate samples shall be prepared or collected to monitor the performance of the data collection and analysis process, beginning with sampling and continuing through transportation, storage, and analysis. To document adequate decontamination of sampling equipment, equipment blanks (consisting of deionized water rinsate captured from decontaminated sampling equipment) shall be prepared and analyzed if reusable sampling equipment is employed.

In the case of samples to be analyzed for volatile organic compounds, in order to document cross-contamination attributable to shipping and handling procedures, trip blanks (consisting of deionized water) shall be prepared, taken to the sampling site, and then shipped to the laboratory along with the other samples to be analyzed for VOCs.

In the case of samples to be analyzed for volatile organic compounds, field blanks shall also be prepared to document cross-contamination attributable to field conditions. Field blanks (consisting of deionized water) shall be prepared, taken to the sampling site, their containers opened during the sampling of environmental media, and then shipped to the laboratory along with the samples to be

analyzed for volatile organic compounds.

Equipment blanks shall be collected at a frequency of one per sampling day per media type. Duplicate samples shall be collected at a frequency of at least one per every twenty environmental samples per media type. Field and trip blanks shall be collected at a frequency of at least one each per sampling day. Acceptance criteria for QA/QC sample analyses shall be consistent with those for environmental samples as specified in Permit Attachment 6, Section 6.3.

The analytical laboratory shall operate under a QA Program Plan (QAPP) that meets the requirements of *SW-846*. QC procedures in the analytical laboratory are to be guided by the laboratory's QAPP. Laboratory QC samples are required to evaluate the accuracy and precision of analytical data. Table 10-8 lists laboratory QC procedures by analytical methods. The laboratory must analyze and report to the Permittee the results of the following types of laboratory quality control samples: blanks, duplicates, spikes, matrix spikes and matrix spike duplicates.

The Permittee shall evaluate the following criteria for data validation:

1. Completeness of data,
2. Collection, extraction, and analysis holding times,
3. Field and laboratory control sample results,
4. Overall data assessment and usability, and
5. Requirements for data validation listed in Part 6, Section 6.3.5.2 of this Permit.

The Permittee shall ensure that the laboratory uses the above criteria for data validation. The Permittee shall apply the same criteria for the analysis of field QC samples. The Permittee shall also validate the data following the procedures in Section 6.3.5 of Part 6 of this Permit.

10.5. MANAGEMENT OF WASTE FROM CLOSURE ACTIVITIES

Wastes that will be generated during closure activities at the Open Burn Unit and Open Detonation Unit include excess soil from sampling, decontamination water, PPE, and possibly contaminated soil and debris. To minimize the amount of waste generated during closure activities, excess soil cuttings from borings shall be replaced in the borings when appropriate. The volume of liquid waste generated during the cleaning of structures and equipment (e.g., sampling equipment) shall be minimized by using only the amount of wash water and rinse water necessary to achieve successful decontamination. Solvents will likely not be used; this approach will help to minimize the amount of liquids that cannot be disposed of in the sanitary sewer system.

10.5.1. Waste Management

Wastes associated with closure activities at the Open Burn Unit and Open Detonation Unit shall also be managed as follows:

1. Wastes shall be stored in appropriate containers that are compatible with the wastes and that are in good condition.
2. If hazardous or potentially hazardous, the containers shall be labeled as hazardous waste or shall be labeled with the contents of the container.

3. Hazardous waste shall be managed in accordance with all applicable regulations in 40 C.F.R. 261-268.
4. Waste containers shall remain under the control of the personnel generating the waste.
5. Waste containers shall be segregated according to compatibility and chemical waste type.
6. Wastes shall be stored in containers that remain closed, except when adding or removing wastes.
7. Waste containers bearing free liquid shall be provided with secondary containment of sufficient volume to prevent spilled liquids from being released onto the ground.
8. Waste containers shall be managed in such a way as to prevent ruptures and leaks.
9. Waste containers shall be labeled appropriately, pending receipt of analytical results. Labels shall be filled out appropriately and marked using a permanent marker or pen. In addition to that required by item #2, label information shall include waste source, depth (if appropriate), the date on which accumulation began, and the name and contact information of the generator.

If analytical results indicate that a waste is hazardous, the Permittee shall implement the appropriate storage, treatment, and disposal procedures as required by law.

10.5.2. Waste Containers

Wastes from closure activities shall be containerized as follows.

- Decontamination (wash and rinse) water shall be stored in closed-top containers.
- Used PPE shall be stored in plastic trash bags of at least three-mil thickness upon completion of each day's work. Each bag shall be labeled with the date, an identification number, and a reference to the sampling location and placed in a covered container. Containers will be labeled appropriately whenever PPE bags are stored in them.
- Contaminated soil, debris, and treatment residues shall be stored in plastic or steel drums, as appropriate.
- All containers of liquid shall be stored with secondary containment.

10.5.3. Waste Characterization

Characterization of waste generated during closure activities shall be based upon the results of sampling and analysis.

10.5.4. Waste Disposal

All wastes from closure activities determined to be hazardous shall be managed in accordance with the NM Hazardous Waste Management Regulations from the time of generation. Hazardous waste shall be shipped off-site for treatment and disposal at a permitted RCRA Subtitle C facility. Wastes characterized as non-hazardous shall also be managed and disposed of in accordance with law.

10.6. GROUNDWATER MONITORING

Groundwater monitoring wells shall be properly plugged and abandoned in accordance with all regulations and Department guidance, provided groundwater contamination has not occurred. If groundwater contamination has occurred, monitoring wells shall be maintained for the purpose of implementing corrective action. If corrective action is required by the Department, the Permittee shall immediately implement corrective action pursuant to Parts 4 and 5 of this Permit.

TABLE 10-1
Closure Schedule

Activity	Time Required
Advertise for proposals.	-90 Days
Notify the Department of receiving final volume of hazardous waste.	-45 Days prior to close
Receive proposals.	-30 Days
Select contractor and award contract.	-10 Days
Begin closure activities—field investigation.	Day 0
OB/OD Unit decontamination and removal.	Day 10
Obtain analysis of wash and rinse water.	Day 45
Conduct soil sampling.	Day 50
Obtain analysis of soil samples.	Day 80
Soil excavation (if necessary) and verification sampling.	Day 100
Final decontamination activities and soil removal (if necessary).	Day 130
Submit final report to the Department.	180 days after receiving final volume of hazardous waste

Note: The schedule above indicates calendar days from the beginning by which activities shall be completed. Some activities may be conducted simultaneously or may not require the amount of time listed.

TABLE 10-2
Target Detection Limits, Analytical Methods and Instrumentation for Metals Analysis

Analyte	Target Detection Limit[a] (mg/kg or µg/L)	EPA *SW-846*[b] Analytical Method	Instrumentation[c] (Used in Analysis)
Arsenic	0.22	6010B, 7060A, 7061A	ICP-AES, GFAA[d], GHAA[e]
Antimony	0.15	6010B, 7080A, 7081	ICP-AES, FLAA[f], GFAA
Barium	0.077	6010B, 7080A, 7081	ICP-AES, FLAA[f], GFAA
Beryllium	0.026	6010B, 7090, 7091	ICP-AES, FLAA, GFAA
Cadmium	0.014	6010B, 7130, 7131A	ICP-AES, FLAA, GFAA
Chromium	0.198	6010B, 7190, 7191	ICP-AES, FLAA, GFAA
Cobalt	0.38	6010B, 7420, 7421	ICP-AES, FLAA, GFAA
Copper	0.18	6010B, 7470A, 7471A	CVAA[g]
Lead	0.12	6010B, 7420, 7421	ICP-AES, FLAA, GFAA
Mercury	0.039	7470A, 7471A	CVAA[g]
Nickel	0.49	6010B, 7520	ICP-AES, FLAA
Selenium	0.495	6010B, 7740, 7741A	ICP-AES, GFAA, GHAA
Silver	0.1	6010B, 7760A, 7761	ICP-AES, FLAA, GFAA
Thallium	0.11	6010B, 7840, 7841	ICP-AES, FLAA, GFAA
Vanadium	0.27	6010B, 7080A, 7081	ICP-AES, FLAA[f], GFAA
Thallium	0.18	6010B, 7840, 7841	ICP-AES, FLAA, GFAA

a. mg/kg = milligrams per kilogram (non-Aqueous detection limit); µg/L = micrograms per liter (aqueous detection limit)
b. U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
c. ICP-AES = Inductively coupled plasma atomic emission spectrometry
d. GFAA = Graphite-furnace atomic absorption spectrometry
e. GHAA = Gaseous hydride atomic absorption spectrometry
f. FLAA = Flame atomic absorption spectrometry
g. CVAA = Cold-vapor atomic absorption spectrometry

TABLE 10-3
Target Detection Limits, Analytical Methods, and Instrumentation for Organics Analysis

Analyte (Group)	Target Detection Limits	EPA *SW-846*[a] Analytical Method	Instrumentation
Volatile organic compounds	0.88-5.0 µg/L[b] water	8260B	GC/MS[c]
	0.47-5.0 µg/kg[b] soil		
Semivolatile organic compounds	0.77-10.0 µg/L water	8270C	GC/MS
	33.6-1,660 µg/kg soil		

a. U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.
b. µg/L = micrograms per liter; µg/kg = micrograms per kilogram.
c. GC/MS = Gas chromatography/mass spectrometry.

TABLE 10-4

Target Detection Limits, Analytical Methods, and Instrumentation for High Explosives Analysis

Analyte (Group)	Target Detection Limits[a] Soil (mg/kg)	Analytical Method EPA *SW-846*[b]	Instrumentation[c]
High Explosives:	0.25		
1,3,5-Trinitrobenzene	0.25		
1,3-Dinitrobenzene	0.25		
2,4,6-Trinitrotoluene (TNT)	0.25		
2,4-Dinitrotoluene	0.26		
2,6-Dinitrotoluene	NA		
2-Amino-4,6-Dinitrotoluene	NA		
4-Amino-2,6-Dinitrotoluene	2.2	8330	HPLC[c]
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.25		
2-Nitrotoluene	0.26		
Nitrobenzene	0.25		
3-Nitrotoluene	0.25		
4-Nitrotoluene	0.65		
Tetryl	1.0		
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.0		

a. mg/kg = milligrams per kilogram; µg/L = micrograms per liter.

b. U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

c. HPLC = High performance liquid chromatography.

TABLE 10-5
Sample Containers, Preservation Techniques,
And Holding Times for Soil Samples

Analyte Group	Container	Preservative	Holding Time[a]
Metals[b] (except mercury and hexavalent chromium)	8 oz glass jar with Teflon cap	None	180 days
Mercury	8 oz glass jar with Teflon cap	Cool to 4 degrees Celsius (°C)	28 days
Hexavalent chromium	4 oz glass jar with Teflon cap	Cool to 4°C	30 days (plus 4 days after extraction)
Volatile organic compounds[b]	4 oz glass jar with Teflon cap	Cool to 4°C	14 days
Semivolatile organic compounds[b]	4 oz glass jar with Teflon cap	Cool to 4°C	Samples extracted within 14 days and extracts analyzed within 40 days following extraction
High explosives[b]	8 oz glass jar with Teflon cap	Cool to 4°C	Samples extracted within 14 days and extracts analyzed within 40 days following extraction

a. Holding time information from U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

b. Volatile and semivolatile organic compounds, metals, and high explosives are listed by respective test method numbers in U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

TABLE 10-6
Sample Containers, Preservation Techniques and Holding Times for Liquid Samples

Analyte Group	Container	Preservative	Holding Time[a]
Metals[b] (except mercury and hexavalent chromium)	I Liter (L) Polyrthylene bottle with Polyethylene lined cap	HNO_3[e] to pH <2 and cool to 4 degrees Celsius (°C)	180 days
Mercury	400 mL Polyethylene or Glass bottle	HNO_3 to pH <2	28 days
Hexavalent chromium	125 mL Glass jar with Teflon lined cap	Cool to 4°C	24 hours
Volatile organic compounds[b]	3 x 40 mL Glass vials with Teflon-lined septum caps	HCl[f] Cool to 4°C	14 days
Semivolatile organic compounds[b]	4 x 1 liter (L) Amber Glass with Teflon-lined lid	Cool to 4°C	Samples extracted within 7 days and extracts analyzed within 40 days following extraction
High explosives[b]	4 x 1 L Amber Glass	Cool to 4°C	Samples extracted within 7 days and extracts analyzed within 40 days following extraction

a. Holding time information from U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

b. Volatile and semivolatile organic compounds, metals, and high explosives are listed by respective test method numbers in U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

c. HNO_3 = Nitric acid

d HCl = Hydrochloric acid

TABLE 10-7

Summary of Field Quality Control Samples

Quality Control Sample Type	Sample Matrix	Applicable Analyses	Frequency	Purpose
Trip blank	Water/Soil	VOCs[a]	One per day	Document any contamination attributable to shipping and field handling procedures
Field blank	Soil/Water	VOCs	One per day	Document any contamination attributable to field conditions
Field duplicate	Soil/Water	VOCs, SVOCs, metals, HE	Minimum of one per 20 environmental samples per media type	Document precision of the sampling/analysis process
Equipment blank	Soil/Water	VOCs, SVOCs, metals, HE	One sample per day per media type	Document whether decontamination of sampling equipment was adequate

[a] VOCs = volatile organic compounds.

[b] SVOCs = semivolatile organic compounds.

TABLE 10-8
Summary of Laboratory Quality Control Procedures[a] by Analytical Method

Parameter	EPA *SW-846*[b] Analytical Method	Quality Control Check	Frequency
Volatile organic compounds	8260B	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis
		Continuing calibration	Every 12 hours of analysis time
		Internal standards	All calibration standards, samples, and blanks
		Method blank	Every 12 hours of analysis time
		System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits
Semivolatile organic compounds	8270C	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis
		Continuing calibration	Every 12 hours
		Internal standards	All calibration standards, samples, and blanks
		Method blank	Each group of samples of similar matrix and concentration level (soils)
		Surrogate compounds	Each sample and blank
Metals	6010B	Surrogate compounds	Each sample and blank
		Instrument calibration	Daily, or each setup
		Initial/continuing calibration	After instrument calibration, 10% or every 2 hours
		Initial/continuing calibration blank	Every calibration, 10% or 2 hours
		Preparation blank	Each batch of digested samples
		Interference check sample (ICS)	Each run or twice per 8-hr shift
		Duplicate sample analysis	Once per field batch per matrix

		Laboratory control sample (LCS)	Once per field batch or each digest group
		Serial dilution analysis	Once per field batch per matrix
		Instrument detection limit	Quarterly
		Inter-element corrections	Annually
		Linear range analysis	Quarterly
High Explosives	8330	System performance	Every 12 hours of analysis time
		Initial calibration	Daily
		Daily calibration	At beginning of the day, singly at the midpoint of the run, and singly after last sample of day (assuming sample group of 10 or less)
		Mid-level standard	Include after each group of 10 samples
		Instrument recalibration	When performance changes and acceptance criteria cannot be achieved
		Blanks	Prior to preparation of stock solutions
		Method blanks	One for each group of up to 20 samples
		Reference samples	Once per batch
		Matrix spike (MS)/laboratory control samples (LCS)	Once per batch of up to 20 samples
		Surrogate recoveries	After analysis of 15-20 field samples

a. Source: "U.S. Environmental Protection Agency Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis" (EPA, 1990). Not all listed procedures may be applicable to *SW-846* protocols.

b. U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

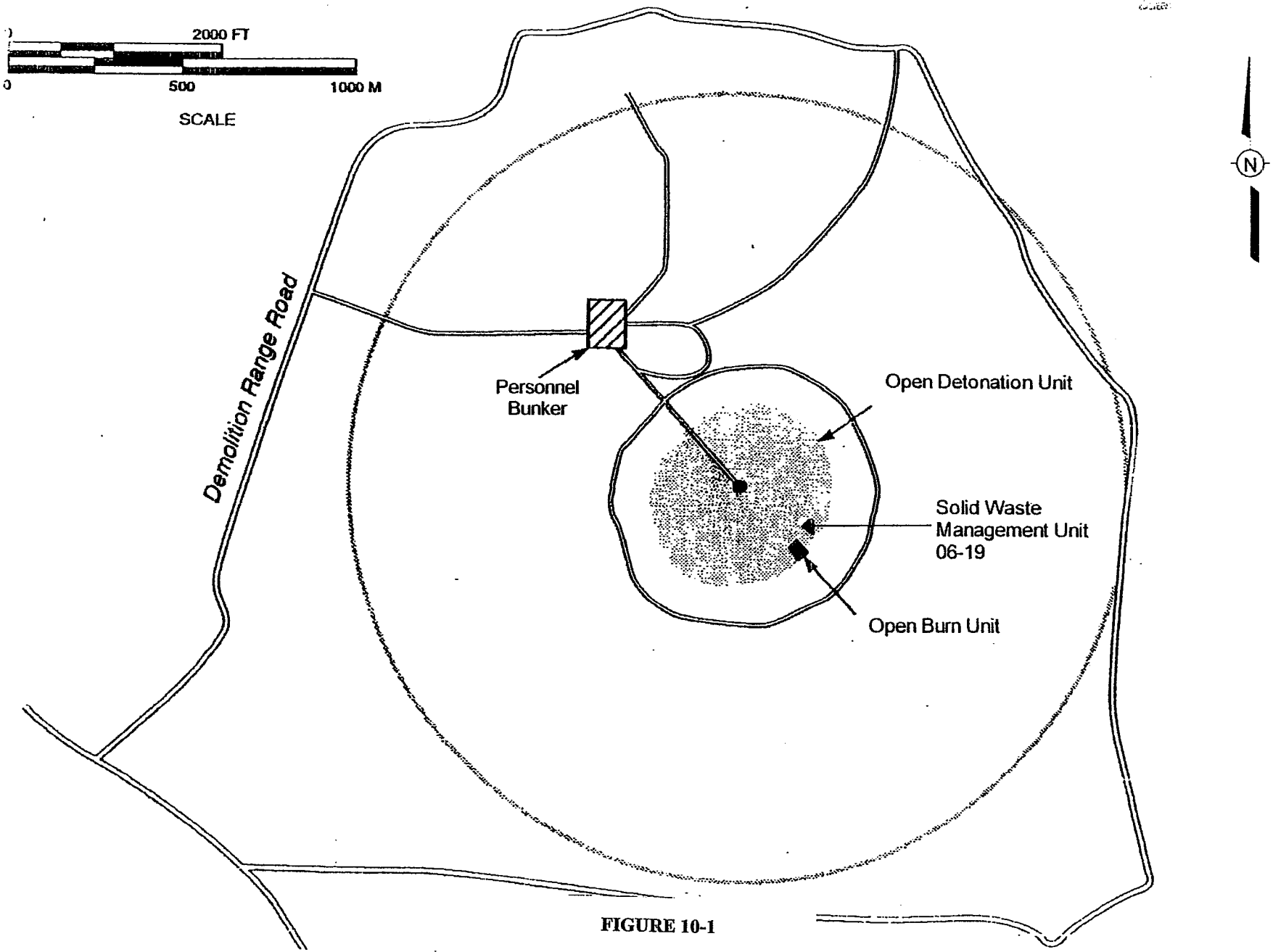

FIGURE 10-1

Location of the Open Burn and Open Detonation Units and the Solid Waste Management Unit at the Explosive Ordnance Disposal Range