B1 RCRA Part B Information for Post Closure Permit

This Permit Application is for post-closure care of the Resource Conservation and Recovery Act (RCRA) Open Burn/Open Detonation (OB/OD) Area at Fort Wingate Depot Activity (FWDA or "Facility"). Information in this attachment is provided to meet the requirements of the New Mexico Administrative Code (NMAC) 20.4.1.900, incorporating 40 Code of Federal Regulations (CFR) Part 270, and specifically the requirements of 40 CFR 270.28, Part B Information Requirements for Post-Closure Permits.

This Permit Application also includes the information required to manage and treat on-site generated waste military munitions (WMM) consisting of Munitions and Explosives of Concern (MEC) at the Corrective Action Management Unit (CAMU) in accordance with 20.4.1 NMAC, and incorporating 40 CFR 264.552 and Subpart X Miscellaneous Units.

B.1.1 Facility Description [40 CFR §270.14(b)(1)]

FWDA is an inactive U.S. Army depot whose former mission was to store, test, and demilitarize obsolete or deteriorated explosives and military munitions. In 1975, the Facility came under the administrative command of the Tooele Army Depot (TEAD), in Tooele, Utah. Command and control responsibilities were retained by TEAD until January 31, 2008, when these responsibilities were transferred to White Sands Missile Range (WSMR). The active mission of FWDA ceased and the Facility closed in January 1993, as a result of the Defense Authorization Amendments and Base Realignment and Closure Act (BRAC) of 1988.

Environmental restoration activities at FWDA began in 1989 under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) guidelines, as part of the Installation Restoration Program. The one exception was the OB/OD Area, which followed RCRA guidelines.

Since that time, the NMED has become the lead regulatory agency. In 2002, NMED determined that the remediation pathway would be solely through a RCRA permit for post-closure care of the OB/OD Area with a RCRA corrective action module to address requirements for other Solid Waste Management Units (SWMUs) and areas of concern (AOCs). The RCRA Permit was finalized in December 2005 and became effective 31 December 2005 (NMED, 2005). The RCRA permit identified the Hazardous Waste Management Unit (HWMU) within the current OB/OD unit (Parcel 3), and a total of 93 SWMUs and AOCs. In 2011 a Class 3 permit modification was approved to add a CAMU for treatment of hazardous waste. Waste permitted for treatment at the CAMU includes hazardous waste in the form of WMM that cannot be transported off-site for treatment or disposal due to inherent hazards related to transport or management of the waste.

FWDA is situated in northwestern New Mexico, in McKinley County. The Facility is located 8 miles east of Gallup, and approximately 130 miles west of Albuquerque on U.S. Route 66 (Attachment E, Figure 1).

The Facility is almost entirely surrounded by federally owned or administered lands, including both national forest and tribal lands. North and west of FWDA are Navajo tribal trust and allotted lands. East of FWDA are Federally-owned, Bureau of Indian Affairs (BIA) administered lands. Development north of FWDA includes Red Rock State Park, a Zuni railroad siding, an El Paso Natural Gas fractioning plant and housing area, the small Navajo community of Church Rock, and transportation corridors for Interstate 40, U.S. Highway 66, and the Burlington, Northern, and Santa Fe Railroad. The town of Fort Wingate, located immediately to the east of FWDA on BIA administered land, was the original Fort Wingate headquarters site. To the south and southeast is the largely undeveloped Cibola National Forest. The land to the west is mostly undeveloped and is tribal trust and allotment land administered by the BIA, Navajo Nation, and individual Native American allottees. Information for land surrounding FWDA is shown in Figure 2 (Attachment E).

FWDA currently occupies approximately 25 square miles (15,270 acres) of land with facilities formerly used to operate a reserve storage activity providing for the care, preservation, and minor maintenance of assigned commodities, primarily conventional military munitions. The Facility mission included the disassembly and demilitarization of unserviceable and obsolete military munitions. Ammunition maintenance facilities existed for the clipping, linking, and repackaging of small arms ammunition.

The Facility completed its active mission in January 1993 and is currently under caretaker status. One tenant operation is currently being maintained at FWDA. Approximately one-half of the central portion of the Facility is used by the Missile Defense Agency (MDA)/Ballistic Missile Defense Organization (BMDO). Access to the Facility is currently maintained by on-site Caretakers reporting to WSMR.

The Facility can be divided into several areas based upon location and historical land use (Attachment E, Figure 3). These major land-use areas include:

•The Administration Area - located in the northern portion of the Facility and encompasses approximately 800 acres. This area contains former offices, housing, maintenance buildings, warehouses, and utility support facilities;

•The Workshop Area - located south of the Administration Area and encompasses approximately 700 acres. This area consists of an industrial area which formerly contained ammunition maintenance and renovation buildings;

•The Magazine (Igloo) Area - covering approximately 7,400 acres in the central portion of the Facility and encompassing ten Igloo Blocks (A through H, J and K) consisting of 732 earth-covered igloos and 241 earthen revetments previously used for storage of

munitions. Eight (8) Igloos in Block B are permitted for use to store WMM awaiting treatment at the CAMU. In order to provide flexibility to the CAMU treatment schedule, FWDA is requesting four (4) additional Igloos within Block B be permitted for use to store WMM awaiting treatment. If approved, twelve (12) Igloos would be designated for storage of WMM awaiting treatment at the CAMU.

•Protection and Buffer Areas - encompassing approximately 4,050 acres consisting of buffer zones surrounding the former magazine and demolition areas. These areas are located adjacent to the eastern, northern, and western boundaries of the Facility;

•The OB/OD Area - located within the southwestern portion of the Facility. The OB/OD Area can be separated into two subareas based on period of operation, the Closed OB/OD Area and the Current OB/OD Area; and

•The CAMU - located within Parcel 3 near the Old Burning Ground and Demolition Landfill.

The closure and corrective action activities at FWDA are required under FWDA's RCRA Hazardous Waste Facility Permit No. NM 6213820974 issued by the State of New Mexico on December 1, 2005. This permit will expire on December 1, 2015 and FWDA is requesting renewal. As FWDA remediates and prepares to transfer property from U.S. Army holdings for reuse, it will identify and recover WMM and munitions debris (MD) from the various SWMUs, areas of contamination, and areas of concern situated within the Facility. FWDA plans to expedite these removal actions through field activities that involve:

- Hazard assessment and, if safe to transport, subsequent storage of WMM under the conditional exemption (CE);
- Treatment of the munitions through OB/OD in a designated CAMU; and
- Recycling of the resulting MD and scrap metal.

As part of planned property transfer to the U.S. Department of Interior (DOI), the Facility has been divided into parcels (Attachment E, Figure 3).Transfer priorities and schedules have been proposed. Parcels transferred to date include Parcel 1 (Southern Properties, approximately 4,527 acres) and Parcels 15 and 17 (portions of the Protection and Buffer Areas, approximately 907 acres). Ownership of the parcel containing the OB/OD Area (Parcel 3) will be maintained by the U.S. Department of Defense (DOD).

B1.1.1 OB/OD Operations Overview

Part of the FWDA mission was to demilitarize unserviceable, obsolete, and/or waste explosives, propellants, munitions and munitions components. Some of these demilitarization activities were accomplished by thermal treatment in the OB/OD Area. Related materials were also treated in the OB/OD Area, including objects that were

potentially contaminated with explosives during storage and handling, such as shipping containers and dunnage.

OB was used to treat energetic wastes by self-sustained combustion. Typical materials treated by OB include bulk propellants and energetic materials that were not detonable and/or could be burned without causing an explosion. Dunnage was often added to aid burning.

OD was used to destroy detonable energetic materials and munitions. Disposal charges were used to initiate detonations. OD was conducted in detonation craters on the ground surface or under earthen cover to minimize fragmentation dispersal.

As a result of the nature of OD operations, the potential exists for MEC to be present in the OB/OD Area outside the identified HWMU. MEC are any of the following: military munitions that are unexploded ordnance (UXO), abandoned or discarded (e.g., WMM); soil with a high enough concentration of explosives to present an explosive hazard; or facilities, equipment, or other materials contaminated with a high enough concentration of explosives such that it presents an explosive hazard. The term MEC has been implemented by the DOD to replace the previously used term “ordnance and explosives (OE)”. UXO is defined as military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and that has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, Facility, personnel, or material, and that remains unexploded by malfunction, design, or any other cause. Because activities within the OB/OD Area (operational and remedial) span many years, all of the terms (MEC, WMM, UXO, OE) describing types/conditions of munitions have been applied. In this Permit Application, the term MEC is generally used when discussing past characterization/ removal actions. The term WMM is used in this Permit Application when discussing future closure activities relating to the identified HWMU.

In June 2011, FWDA received a Class 3 modification to its RCRA Permit, which established a CAMU to support the identification, storage, and treatment by OB/OD of WMM. The CAMU and its operations are discussed in Section B1.1.4.

As shown in Figure 4 (Attachment E), the OB/OD Area is divided into two subareas based on period of operation. The Closed OB/OD Area was used from 1948 to 1955. Aerial photography shows burning and detonation operations were performed within the Current OB/OD Area from 1948 until Facility closure in 1993.

B1.1.2 Closed OB/OD Area

The Closed OB/OD Area includes the Old Burning Ground and Demolition Landfill Area and the Old Demolition Area (Attachment E, Figure 4). The Old Burning Ground and Demolition Landfill Area is located in Fenced-Up Horse Valley on the eastern flank of the main Hogback ridge. The Old Demolition Area is located between two sandstone ridge lines forming the Hogback and is on the western side of the main Hogback ridge. The Closed OB/OD Area was reportedly utilized between 1948 and 1955. The amount of

material treated by OB or OD in the Closed OB/OD Area are not well documented. Residues and debris from OB and OD operations were placed at various locations around the Closed OB/OD Area.

The Old Burning Ground and Demolition Landfill Area consists of approximately 26 acres, and was used to dispose of explosives contaminated materials from the Trinitrotoluene (TNT) Washout Plant and old equipment from TNT drying and flaking operations. In the mid-1950s, the area was used for OB of up to 30,000 pounds (lbs) of explosives at a time. The extent of landfilling in this area was not documented. Field investigations conducted as part of closure activities (described in the Phase IA Report, Attachment H of the 2003 Permit Application) identified three geophysical anomalies (KGA3, KGA4, and KGA5) containing buried residues and debris, three surface piles (KP2, KP3, and KP4) of residues and debris, and three small areas (KSA1, KSA2, and KSA3) where surface soil was stained with what appeared to be explosives compounds.

The Old Demolition Area consists of approximately 71 acres. The exact boundaries of this area are not well documented. However, three mounds were identified and were designated as potentially containing residue from the burning of white phosphorous rounds. Field investigations conducted as part of closure activities identified two geophysical anomalies (KGA1 and KGA2) containing buried residues and debris, and one surface pile (KP1) containing residues and debris.

The most recent NMED HWB Annual Unit Audit (AUA) identified one (1) SWMUs in the Closed OB/OD Area. SWMU 14 is the Old Burning Ground and Demolition Landfill Area, described above. SWMU 15 is the Old Demolition Area, described above, with the exception of surface pile KP1, which was identified as SWMU 33 because it is physically separated from SWMU 15. These sites are discussed further in Section B1.12.

B1.1.3 Current OB/OD Area

The Current OB/OD Area is located on the eastern side of the Hogback, south of Fenced-Up Horse Valley (Figure 4, Attachment E). This area is approximately 32 acres in size and included a number of detonation craters and the Burning Ground Area. In addition, an arroyo bisects the area, traversing (downstream) from south to north. The Current OB/OD Area was utilized as part of the FWDA mission between 1948 and January 1993.

It is believed that records of materials treated using OB and/or OD processes at FWDA were maintained during operations, but these records were lost following Facility closure in 1993. The summary information below has been compiled from various sources.

Beginning in 1980, operations in the Current OB/OD Area were permitted and regulated under RCRA Interim Status. In November 1988, FWDA submitted a RCRA Part B Permit Application (EDGe, 1988) for OB/OD activities to the U.S. Environmental Protection Agency (USEPA) Region VI and NMED. Subsequent to submission of the Part B Permit Application, FWDA was mandated for closure under BRAC. In response

to the Facility closure activities, routine OB/OD operations were ended and closure of the regulated unit initiated. A detailed discussion of the regulatory status, closure plans, and characterization efforts was included in Attachment H of the 2003 Permit Application.

The HWMU includes five detonation crater locations (CDC1 through CDC5) east of the arroyo, seven detonation crater locations (CDC6 through CDC12) west of the arroyo, and areas where residue and debris from OB/OD activities were disposed (landfilled) during the 38 years of operation. The extent of impacted soil and debris in each of these areas was characterized during the field investigation program described in the Final Open Burning/Open Detonation Area RCRA Interim Status Closure Plan Phase IA – Characterization and Assessment of Site Conditions for the Soils/Solid Matrix (USACE 1999).The boundary of the HWMU is shown in Figure 4 (Attachment E) and represents the maximum disturbed area associated with OB activities from available historical FWDA aerial photographs, and covers approximately 6 acres. The Burning Ground Area is located immediately east of the main arroyo within the Current OB/OD Area, and north of the detonation craters. The Burning Ground Area was used from 1955 until 1993 as a site to burn propellants, explosives, and pyrotechnics (PEP) and PEP-contaminated materials. Originally, OB operations were conducted on the ground surface. At some time in the 1980s, the majority of OB operations were moved to two metal burn pans and two metal troughs installed at the Burning Ground Area. However, as described in Standard Operating Procedures (SOPs) included in the 1988 Part B Permit Application, if there were munitions to be burned that had the possibility of propulsion or detonation, these munitions may have been burned in earthen cells or trenches, even after the metal pans and troughs were installed. When OB operations ceased in 1993, the metal burn pans and troughs were removed.

From 1948 until 1993, OD was performed in earthen detonation craters constructed at various locations within the Current OB/OD Area. During operation, the area was used to detonate up to 5,000 lbs of explosives at a time without earth cover, and up to 10,000 lbs of explosives with earth cover. For the period from 1976 to 1981, records identify a total of 7,640 tons of munitions were detonated in the Current OB/OD Area (Inland Pacific, 1982). At the time of Facility closure in 1993, twelve detonation craters existed. Several of the detonation craters were used in the period from 1993 to 1999 to support MEC clearance activities conducted in the OB/OD Area and other parts of the Facility. At the direction of NMED, this practice was ended in 1999, and all but one of the detonation craters were regraded and revegetated.

B1.1.4 CAMU

The CAMU is located in the southwest part of the Facility, in a valley on the east side of the Hogback. It is located within Parcel 3 (near the Old Burning Ground and Demolition Landfill Area). This area was used to destroy WMM burned on the ground surface in unlined trenches and in metal burn pans or trays. The location of the CAMU is shown in Figure 4 in Attachment E and was selected based upon the following:

- The area, according to FWDA Caretaker staff is not subject to flooding or standing surface water during weather events, and it's very gentle slope allows control of surface water run-on and run-off.

- The area is located in a remote section of the Facility that is conducive to operations requiring explosives safety quantity-distance (ESQD), which provides the required protection to personnel and property.

- The area has the added natural protective control of the hogback ridge that provides a safety barrier between FWDA property and BIA property.

- The area is near an access controlled road that provides a stable surface for transportation of items to be treated.

- The area is completely located within a fenced portion of the Facility.

Two water bearing levels were encountered at the CAMU site. The two water bearing units are alluvium and chinle groups formations. The first was encountered at approximately 30 feet below ground surface. The second water bearing level was encountered in wells at levels ranging from 58 to 96 feet below ground surface. Shallow ground water flow direction in both water bearing levels is generally to the north. According to the Natural Resources Conservation Service (NRCS) soil survey published in 2001, soils in the area of the CAMU site consist of well drained fine sandy loams at slopes of 2 to 8 percent. NRCS attribute these soils with a high runoff and no potential hazard for flooding. Restrictive features in these soils are seen at depths ranging from 20 to 60 inches. The soil supports a wide range of vegetation including but not limited to; gambels oak, big sagebrush, buckwheat, muttongrass, and bottlebrush squirriltail. Surface topography in the area generally slopes to the east-northeast. The nearest surface water body is an intermittently-flowing arroyo located approximately 500 feet east of the CAMU.

The CAMU occupies approximately 3 acres and is constructed with one primary treatment cell and no more than four contingent treatment cells for open burn and open detonation operations. The four additional contingent demolition cells can be used, one at a time, only if there is a need to treat WMM prior to normal maintenance of the primary cell or there is a functional need to change cells (e.g., a breach of a berm) for the treatment of WMM.

Each demolition cell is surrounded on three sides by a containment berm. The interior surface of the demolition cells is composed of soil. A horseshoe-shaped earthen berm surrounds each demolition cell. The berms were constructed to a width of 35 feet and a height of 8 feet. Each cell has an entrance approximately 25 feet wide for access to the interior. Schematic drawings of the cells and berms are included as Figure 5 in Attachment E.

Both OB and OD occur within the demolition cells, though not at the same time. Items to be detonated are placed directly on the earthen bottom of the cell, whereas items to be burned are placed on a burn pan in the cell (or will be treated in an alternative, safe treatment unit with equivalent treatment performance). Burn pans are constructed of steel and are approximately 4 feet wide, 8 feet long, and 1 foot deep.

B1.1.5 Conditionally Exempt Storage Igloos

Prior to treatment, the WMM may be stored in eight earth-covered magazines (ECMs or igloos) in Explosive Storage Block B of FWDA. Igloos B-1028, B-1029, and B-1038 through B-1043 have been designated for the storage of WMM in support of the CAMU. The locations of the storage ECMs are shown in Figure 6 in Attachment E. Through this permit application, FWDA is proposing to increase the number of ECMs within Block B where WMM are stored to twelve. The U.S. Army stores the WMM under the CE provision in the Munitions Rule (62 Federal Register 6621) promulgated by the EPA and adopted by the State of New Mexico. All of the qualifying conditions of the CE (e.g., the type of munitions that can be stored, how the munitions are stored, and notification and recordkeeping requirements) are met. The four additional ECMs would be selected to meet these criteria. The ECMs are not part of the CAMU.

B1.2 Security Procedures and Equipment [40 CFR §270.14(b)(4)]

This Section describes security procedures and equipment currently in use. Existing security fencing is shown in Figure 4 (Attachment E). Access routes for the OB/OD Area are shown in Figure 7 (Attachment E).

The OB/OD Area is located in a portion of the Facility that contains no other development within several thousand feet. A break room (Building 601), a control shelter and truck barricade (Building 604), and an open-sided storage shed are the only structures located within the OB/OD Area. These structures were used during operations at the OB/OD Area, and are currently unoccupied. The nearest occupied buildings on FWDA are the MDA facilities in Igloo Block J, approximately 1 mile from the OB/OD Area. The distance to the Administration Area is approximately 5.7 miles.

B1.2.1 Security [40 CFR §264.14]

FWDA does not request a waiver of the security requirements of 40 CFR 264.14. Existing procedures will be maintained to restrict and control access to the OB/OD Area. Since cessation of the active mission of the Facility, access and the required/remaining operations are maintained by on-site Caretakers who are located within the Administration Area in Building 1 (the former Headquarters). Currently, FWDA is accessed through the main entrance gate located in the Administration Area (north central portion) of the Facility. The main entrance gate is open from 6:30 A.M. to 5 P.M. during the week (Monday through Friday except for Federal Holidays) and is closed and locked at all other times. Access from the Administration Area to the remainder of FWDA (the “Limited Access Area”) is through a locked gate (Gate 109 also known as the

"51 Gate") on Navajo Boulevard (located approximately 2,800 feet from the main entrance). Access to the Limited Access Area is controlled by the Caretakers. Gate 109 is either locked or guarded 24-hours a day, 7 days a week.

The OB/OD Area is located within the Limited Access Area. Access to the OB/OD Area has been further restricted by additional security fencing installed by MDA around the lands they currently occupy. Access to the OB/OD Area "outer" gate (Gate 209) is gained via the Limited Access Area gate described above.

A secondary route, through the MDA main entrance off Route 400, requires access through a locked security gate. This gate does not have an identification number, and is locked or guarded 24-hours a day, 7 days a week. Access through this gate is controlled by on-site MDA personnel. The secondary access route to Gate 209 is used by MDA security personnel only, and does not provide access to the RCRA Interim Status Current OB/OD Area.

There are additional established controls regarding direct access to the OB/OD Area. The OB/OD Area is surrounded on all sides by security fencing. A 6-foot high chain-link fence topped with 3 strands of barbed wire (the main FWDA security fence) extends along the northern edge of the OB/OD Area, and continues along Igloo Block J to the east. In 2006, approximately 3 miles of chain link fence was installed along the western boundary of Parcel 3 to satisfy permit requirements. In 2012, approximately 3 miles of chain link fence was installed along the southern and eastern boundaries of Parcel 3 to satisfy permit requirements. A 5-strand barbed wire fence with vertical twist stays between posts restricts access to the remaining portion of the northern boundary, as shown in Figure 4 (Attachment E). This fence was constructed to prevent entry, and to minimize the possibility for the unauthorized entry of persons or livestock into the OB/OD Area. All fencing has warning signs placed a minimum of every 100 feet. The warning signs are legible from 25 feet and are printed in English, Spanish, Navajo, and Zuni, as well as pictograms. The fencing surrounding Parcel 3 connects to existing FWDA boundary fencing.

As described above, access to the "outer" portions of Parcel 3 is limited to one locked gate (Gate 209) as shown in Figure 7 (Attachment E). Access to this gate is controlled by the Caretakers and on-site MDA personnel. A second chain-link fence topped with barbed wire ("inner" security fence) and a locked-gate (Gate 209A) encloses the HWMU area. As shown in Figure 7 (Attachment E), there are additional gates (Gate 209B, Gate 209C, and two gates without identification numbers in the inner chain link fence. These gates are locked 24-hours a day, 7 days a week. Access to these gates is controlled by the Caretakers only, and may not be entered by anyone without the permission of BRAC Division.

The "outer" gate (Gate 209) to Parcel 3 will remain locked to restrict unauthorized access. Strict management protocols exist regarding control and use of access keys for the restricted areas of the Facility. Persons requiring access to Parcel 3 and/or the

HWMU Area must file a request with BRAC Division. If the access request is granted, a key is signed out from the Caretakers. The key must then be returned to the Caretakers prior to the end of the business day.

These security procedures, along with the remote location of the CAMU minimize the potential for exposure to human receptors, as required by 40 CFR 264.552(c)(2).

B1.2.2 CAMU Security Requirements [40 CFR §266.205]

In addition to the security measures described above, the WMM to be treated at the CAMU are also subject to additional access control requirements outlined below. The SOP for the Storage of WMM under the CE of the Military Munitions Rule for FWDA demonstrates compliance with 40 CFR 266.205. The security requirements outlined in the SOP include:

- High security locks placed on each ECM storing WMM.
- Access gates on the entrance road to the installation and the ECM storage areas are kept locked at all times when the caretakers are not on site.
- Caretakers check each ECM storing WMM material twice per work week.
- If materials are found to meet definitions in AR 190-11 then the above items and following will apply:

    1. CAT VII AA&E; no changes to above requirements,
    2. CAT III or IV AA&E; caretaker or contractor assigned the responsibility checks increase to every 48 hours,
    3. CAT I or II AA&E; provide armed security guards 24 hours a day, 7 days a week. Guards shall maintain constant, unobstructed observation of the MSA, prevent unauthorized entries, and make known to officials at FWDA and WSMR any unauthorized access to the ECM structures storing WMM of this category. Guards will check all CAT I ECMs hourly and CAT II ECMs every 2 hours.

B1.3 General Inspection Requirements [40 CFR §270.14(b)(5)]

Operations at the OB/OD Area during closure/post-closure will be performed by organizations contracted by the Army. Individual contractor operations will be performed in accordance with their organizational standard operating procedures, and work plans and health and safety plans developed specifically for the work to be performed at FWDA. Inspections are conducted for equipment malfunctions, MEC, metal fragments, and other releases/discharges that could threaten human health or the environment. The purpose of the inspection is to detect potential problems and correct them before

they affect human health or the environment. Records of inspections and the inspection schedule are maintained in files at the Caretakers Office in Building 1. Inspection logs will be kept on file for at least 3 years.

B1.3.1 General Inspection Schedule [40 CFR §264.15]

An inspection program meeting the requirements of 40 CFR 264.15 was developed in accordance with permit requirements issued by NMED. Elements of the inspection program are described below.

The security fencing is inspected annually with portions of any security fencing adjacent to the road inspected monthly. Any deficiencies identified are repaired within a timeframe that prevents the formation of an environmental or health hazard.

FWDA also conducts regular inspections of the facility and equipment associated with closure/post-closure of the OB/OD Area. These include checks for the mechanical condition of the equipment, equipment malfunctions, operator errors, structural deterioration, loss or theft of items, equipment supply, and releases/discharges that could adversely affect the environment. Remedial actions found to be necessary as a result of an inspection are resolved as soon as possible and on a time schedule that ensures that any deterioration or malfunction discovered does not create an environmental or human health hazard. When an inspection identifies an imminent or emerging hazard, remedial action shall be taken immediately.

The Caretakers will perform inspection of security and emergency equipment present at FWDA. Site security will be maintained through the use of fencing, gates and locks, key control for the gate locks, and warning signs. Caretaker personnel will patrol the OB/OD Area/Parcel 3 perimeter to ensure the integrity of fences used to prevent intrusion or penetration of the security system.

The inspection schedule includes items that are considered important in preventing, detecting, or responding to environmental or human health hazards associated with hazardous waste present at the OB/OD Area. The Caretakers are responsible for maintaining their communication system and emergency response equipment that is stored in Building 1007. Tests of the radio communications network are made daily when in use. A test of the transmitting system is made every 24 hours, except weekend and Federal holidays. Because the emergency communication equipment is in constant use, any defect is immediately reported and the equipment is scheduled for repair.

Emergency response equipment stored in Building 1007 that is also used by the Caretakers for routine maintenance of the FWDA facilities is inspected prior to use and at least monthly. Other emergency response equipment stored in Building 1007will be inspected monthly. Table Q-1 (Attachment Q) presents a schedule for inspecting emergency response equipment located in Building 1007 Records of these inspections are maintained in files at the Caretakers Office in Building 1.

Contractors will be responsible for inspection of necessary equipment for operational readiness prior to the beginning of closure/post-closure operations that day. If any vital equipment in the area is inoperative, has deteriorated, or is not in compliance with regulatory requirements, maintenance/replacement is initiated before operations commence, as necessary. Table Q-2 (Attachment Q) presents a schedule for inspecting safety and emergency equipment, security devices, operating equipment, and the OB/OD Area in general. The contractor's Remediation Supervisor will complete this record each day during operations.

When operations are concluded for the day, the surface area immediately surrounding the operating area shall be inspected for any possible MEC items. MEC items found will either be moved to the WMM staging area by trained UXO personnel for processing in the future, or detonated in place, if determined to be unsafe to move.

Inspections for leaks and spills are not applicable to the type of closure/post closure operations performed at FWDA.

Inspection records will be compiled and kept for 3 years. Inspection records shall show, at a minimum, the date and time of inspection, name of the inspector, notations of observations made, and the date and nature of any repairs or remedial action required.

B1.4 Waiver of Preparedness and Prevention Requirements [40 CFR §270.14(b)(6)]

FWDA does not request a waiver of the preparedness and prevention requirements of 40 CFR 264 Subpart C. Documentation of compliance with those requirements is contained in this section and in Sections B1.3 and B1.15.

The substantive requirements of 40 CFR 264.32 (Required Equipment) will be met during all closure and post-closure care activities. Personnel performing activities in the OB/OD Area will communicate with each other and the Caretakers via hand-held two-way radios or mobile phones, and the Caretakers shall have the means to summon supplemental emergency assistance, as needed. Portable fire extinguishers, fire control equipment, and decontamination equipment will be maintained at all work areas during activities in the OB/OD Area.

B1.4.1 Required Equipment (40 CFR §264.32)

The equipment specified in 40 CFR 264.32 will be maintained at the Facility and is described below.

B1.4.1.1 Internal Communications [40 CFR §264.32(a)]

Internal communication and alarm functions are achieved by voice, two-way radio, or mobile phone. During munitions recovery and treatment operations the number of people exposed to potential hazards will be kept to a minimum. Warning signs or

roadblocks will be posted to restrict the area and to ensure proper segregation of activities.

B1.4.1.2 External Communications [40 CFR §264.32(b)]

Personnel working at the Facility are required to have immediate access to a two-way radio or mobile phone capable of summoning external emergency assistance. The Caretakers will coordinate communications with off-site emergency agencies.

B1.4.1.3 Emergency Equipment [40 CFR §264.32(c)]

Fire and spill control equipment will be maintained at the Facility during operations. Portable fire extinguishers will be mounted in each transportation vehicle and on each piece of process equipment that enters the Facility to conduct closure and post closure care activities. A spill kit containing Tyvek suits, absorbent material, protective gloves, and absorbent dikes is located at the Facility, to manage liquid spills from transportation and process equipment. However, such equipment is not required for safe management of energetic items planned for treatment at the OB/OD Area, as all such items are solid material and not subject to spillage.

A portable eyewash will be present when personnel are working at the OB/OD Area. Portable showers will not be provided because the substances handled have low toxicity and are non-corrosive.

B1.4.1.4 Water for Fire Control [40 CFR §264.32(d)]

Water for fire control will be transported to the OB/OD Area in tanker trucks by off-site emergency agencies. Emergency agencies responding to fires in the OB/OD Area will ensure that the area has been evacuated and assess the fire in consultation with the Caretakers and the contractor's Remediation Supervisor. Under no circumstances will fire fighters be expected to or permitted to enter the area and attack fires involving high explosives.

B1.4.2 Testing and Maintenance of Equipment (40 CFR §264.33)

Preparedness and prevention equipment inspection schedules, for equipment maintained at the Facility, are given in Section B1.3.

B1.4.3 Access to Communications or Alarm System (40 CFR §264.34)

Personnel working with hazardous waste at the Facility will be equipped with or have access to the communications system described below.

B1.4.3.1 Hazardous Waste Handling [40 CFR §264.34(a)]

Personnel working with hazardous waste at the Facility are required to have immediate access to a two-way radio or mobile phone capable of summoning external emergency assistance.

B1.4.3.2 Personnel Working Alone [40 CFR §264.34(b)]

Personnel entering the Facility alone will have immediate access to a two-way radio or mobile phone capable of summoning external emergency assistance.

B1.4.4 Required Aisle Space (40 CFR §264.35)

The OB/OD is not a container storage facility and therefore, the aisle space requirement does not directly apply. This Facility is designed to allow ample room for vehicles to enter and leave and, in the event of an emergency, response personnel will have ample room to maneuver.

B1.4.5 Arrangements with Local Authorities (40 CFR §264.37)

Arrangements are presently in place with McKinley County for fire and emergency services.

Arrangements are also currently in place for New Mexico State Police, Gallup Police, Gallup Fire Department, and Rehoboth McKinley Christian Health Care Services.

A copy of each arrangement or request for arrangement is included as Attachment M to this Permit Application.

B1.5 FACILITY LOCATION INFORMATION [40 CFR §270.14(b)(11)]

The Facility location information is provided below.

B1.5.1 Seismic Standard [40 CFR §270.14(b)(11)(i)]

As described in Section B1.1, FWDA is situated in McKinley County. McKinley County is not listed in NMAC 20.4.1.500, incorporating Appendix VI of 40 CFR 264; and therefore, the seismic standard is not applicable.

B1.5.2 100-Year Floodplain [40 CFR §270.14(b)(11)(iii)]

Maps for the National Flood Insurance Program produced by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency are available for FWDA. As shown in Figure 8 (Attachment E), the OB/OD Area is not located in a FIA-mapped 100-year floodplain.

The 100-year flood elevation for the OB/OD Area was also calculated using the methodology provided in the New Mexico State Highway and Transportation Department (NMSHTD) Drainage Manual (NMSHTD, 1995). A narrative and spreadsheets describing the calculations are included in Attachment Q to this Permit Application. The calculated 100-year flood elevation is shown in Figures Q1 and Q2 (Attachment Q).

B1.5.3 Facilities Located Within 100-Year Floodplain [40 CFR §270.14(b)(11)(iv)]

As shown in Figure 8 (Attachment E) and presented in the trench logs from the field investigation (Appendix C in the Phase IA Report, Attachment H of the 2003 Permit Application), all identified areas containing toxicity characteristic hazardous waste are located outside the 100-year flood elevation. This meets the requirements of 40 CFR 264.18, and prevents washout of toxicity characteristic hazardous wastes by a 100-year flood event. All identified toxicity characteristic hazardous wastes have been proposed for excavation and off-site disposal.

WMM (potentially reactive characteristic hazardous wastes) may be present within the 100-year flood elevation, it is believed that no adverse effects on human health of the environment will occur if washout of WMM were to occur during a 100-year flood event, as described in the following text.

Although precise location data for WMM found and removed from the OB/OD Area in general, and the area within the 100-year flood elevation specifically, have not been kept, many environmental investigation efforts to date have focused on the arroyos and many items have been removed from those areas. Therefore, it is believed that the amount of WMM remaining on the surface in the bottom of the arroyos (and therefore potentially subject to washout during a 100-year flood) is limited. Surface water flows infrequently in the arroyos, and as described in Section 3.6.2 of the Phase IB Report (Attachment H of the 2003 Permit Application), explosives were not detected in sediment samples and no explosives were detected in the most downgradient surface water sample. For these reasons, it is believed that no adverse effects on human health or the environment will result if washout of WMM during a 100-year flood event were to occur.

B1.6 CLOSURE PLAN AND POST-CLOSURE CARE PLAN [40 CFR §270.14(b)(13)]

A Class 1 Permit Modification was approved by NMED on October 31, 2007. The modification allowed the Closure Plan (Attachment C) to be submitted in two parts. The first component of the Closure Plan entitled CLOSURE PLAN PHASE I WORK PLAN OB/OD UNIT HWMU and PARCEL 3 SWMUS and AOCs was submitted to NMED June 27, 2008 and consists of a work plan to further characterize the OB/OD SWMUs and AOCs inside Parcel 3. After the investigation phase is complete, the Facility will submit the second component of the Closure Plan that addresses cleanup of the OB/OD and associated SWMUs and AOCs. The Post Closure Care Plan is currently under development (Attachment D).

B1.7 CLOSURE NOTIFICATION DOCUMENTATION [40 CFR §270.14(b)(14)]

This requirement is not applicable, because closure has not been completed at hazardous waste disposal units in the OB/OD Area.

B1.8 CLOSURE AND POST-CLOSURE COST ESTIMATE [40 CFR §§270.14(b)(15) 270.14(b)(16)]

FWDA is a Federal facility. Under 40 CFR 264.140(c), the Federal government is exempt from the requirements of 40 CFR 264 Subpart H – Financial Requirements.

B1.9 LIABILITY REQUIREMENTS AND PROOF OF COVERAGE BY A STATE FINANCIAL MECHANISM [40 CFR §§270.14(b)(17) and 270.14(b)(18)]

FWDA is a Federal facility. Under 40 CFR 264.140(c), the Federal government is exempt from the requirements of 40 CFR 264 Subpart H – Financial Requirements.

B1.10 TOPOGRAPHIC MAP [40 CFR §270.14(b)(19)]

The information required by 40 CFR 270.14(b)(19) is included in Figures 9a, 9b-1, 9b-2, 9b-3, 9b-4, 9b-5, 9b-6, and 9c (Attachment E). A wind rose is included as Figure 10 (Attachment E).

B1.11 ADDITIONAL INFORMATION REQUIREMENTS [40 CFR §270.14(c)]

This section presents the additional information requirements for the protection of ground water. All information presented herein has been prepared in accordance with NMAC 20.4.1.900 (incorporating 40 CFR Part 270). The information provided in the following subsections include: a summary of the ground water data obtained to date; aquifer identification and expected ground water flow directions; description of the ground water plume of contamination; and the compliance ground water monitoring program.

B1.11.1 Summary of Ground Water Data [40 CFR §270.14(c)(1)]

Since the 1980s, a number of ground water investigations have been completed at the FWDA. Ground water investigation efforts have primarily focused on six areas: the TNT Leaching Beds Area (SWMU 1 located within Parcel 21); Igloo Block D, Ammo Workshop (SWMUs 12, 27, 70 and AOC 30 within Parcel 22), the Administration Area (multiple SWMUs and AOCs located in Parcels 6, 7, and 11); the Eastern Landfill Area (SWMU 13 located within Parcel 18); Buildings 542 and 600 Area (SWMUs 11 and 4 located within Parcel 6); and the OB/OD Area (located within Parcel 3). Numerous ground water monitoring wells have been installed to characterize the nature and extent of contamination that resulted from activities associated with the OB/OD units and various SWMUs and AOCs. Figure 11 shows the current monitoring well network and the reuse parcels in the northern areas which include the administrative and workshop areas. The addition or removal of monitoring wells from this network will be proposed through updates to the Ground Water Monitoring Program. Figure 11 also shows the

current monitoring well network and the reuse parcels in the southern area which includes the OB/OD units.

The initial 2008 Interim Measures Facility-Wide Ground water Monitoring Program (GMP), prepared by TerranearPMC for the U.S. Army Core of Engineers (USACE), Fort Worth District, describes the proposed ground water monitoring to be conducted as part of the Environmental Restoration Program at the FWDA. The current RCRA Permit (NMED, 2005) requires subsequent annual updates and revisions to the Interim Measures Facility-Wide GMP. Versions 3, 4, and 5 of the Interim Measures Facility-Wide GMP represent the updates for the CYs 2009, 2010, and 2011, respectively. The 2009 GMP was approved by NMED; and, subsequent approvals for the reduction of the initial analytical requirements have been formally documented in letter correspondences with the agency.

The Final 2014 Interim Measures Facility-Wide GMP Version 7, dated 13 January 2014 (Innovar Environmental, Inc., and CB&I, 2014), , provides the most recent summary of ground water data obtained during investigations completed at FWDA in accordance with 40 CFR 270.14(c)(1). A summary of the analytes detected is included in Table 1 of Attachment F. Detailed descriptions of the approach and results of the ground water characterization are presented in the Facility-Wide GMP, which also describes the proposed ground water monitoring to be conducted as part of the on-going Environmental Restoration Program at FWDA. Existing monitoring well locations are shown in Figure 11 (Attachment E). Sampling under the NMED-approved GMP, and subsequent revised monitoring plans have been ongoing since 2008. The results of the monitoring activities are documented in semiannual ground water monitoring reports submitted to NMED.

B1.11.2 Aquifer Identification [40 CFR §270.14(c)(2)]

B1.11.2.1 Geologic Summary

The FWDA is located in an erosional basin within the Navajo section of the Colorado Plateau Physiographic Province and lies on the northwest apex of the Zuni Uplift. This basin is regionally bounded by the Gallup Sag to the west, the Acoma Sag and McCarty's Syncline to the east, and the Chaco Slope to the north. The Zuni Uplift is an elongated north-northwest trending structural uplift that is primarily a result of vertical upward displacement followed by deformation resulting from horizontal compressive stress associated with the Laramide Orogeny (Cretaceous). The uplift has exposed tilted Mesozoic sedimentary strata within the south-western portion of the installation, a majority of which are Triassic mudstones and sandstones.

Specifically, the dominant topographic structural feature located on the southwest margin of the Zuni Uplift is the Nutria Monocline or "Hogback." This steep structural feature is a monoclinal belt with dips ranging from 30 to 45 degrees near the Facility. Dips commonly exceed 60 degrees in the southern extension of the monocline, south of

the Facility. The northern segment of the Nutria Monocline is exposed in the western portion of the FWDA, where westerly dipping Mesozoic strata is exposed to form a long, sharp-crested, north-to-south trending ridge. In areas of the installation east of the Hogback, the bedrock generally dips to the northwest.

B1.11.2.2 Stratigraphy

In the northern portion of the installation, the surface is covered by either remnants of the Chinle Group (Triassic) or alluvial deposits (Quaternary). The majority of the alluvial deposits are mostly prevalent in the Northern Area in lowland areas between bedrock remnants. Alluvial deposits are also present along intermittent streams draining the Hogback and Zuni Mountains, which flow downgradient through the northern portion of the installation before joining the South Fork of the Rio Puerco. The alluvium ranges in grain size from clay to gravel, typical of braided stream deposits (Malcolm Pirnie, Inc., 2000). Because the alluvium was generally deposited by braided streams and arroyos, the texture and internal structure are characterized by lateral and vertical heterogeneity. Information obtained from records of previously installed wells indicates that the alluvial deposits are thickest near major drainages, such as the South Fork of the Rio Puerco, where alluvial deposits can be up to 150 feet thick. Near Fort Wingate High School (located east of the installation), the alluvial deposits are approximately 75 feet thick, whereas in the Administration Area, deposit thickness is variable with average thickness varying from 0 to 70 feet within a relatively small spatial area.

The majority of the FWDA is underlain by the Chinle Group (Triassic), which is predominantly non-marine, red-bed siliciclastics. The Chinle Group consists of the Shinarump, Bluewater Creek, Petrified Forest, and the Owl Rock Formations. The Petrified Forest Formation directly underlies the majority of the installation, and is subdivided into three members: the Blue Mesa, the Sonsela, and the Painted Desert Members. All three members of the Petrified Forest Formation outcrop in various locations across the installation. The Blue Mesa, Sonsela, and Painted Desert lithologies are green-gray smectitic mudstone, light-gray to yellowish-brown cross-bedded sandstone, and reddish-brown and grayish-red smectitic mudstone, respectively. The Owl Rock formation is a limestone formation, outcrops on the installation, and is the upper most formation of the Chinle formations in this area. At the eastern extent of the FWDA installation, the older Bluewater Creek and Shinarump Formations outcrop intermittently between Quarternary alluvium.

The Chinle Group is underlain by the older San Andres Limestone and Glorieta Sandstone, both Permian in age. The San Andres Limestone generally consists of fossiliferous limestone that intertongues the Glorieta Sandstone (Anderson et al., 2003). These two formations do not outcrop within the boundaries of the Facility; however, the Glorieta Sandstone Formation does outcrop south of the installation where a thrust fault juxtaposes Permian strata against the Cretaceous Dakota Sandstone. The San Andres Limestone and the Glorieta Sandstone comprise the San Andres-Glorieta aquifer and is

the principal source of drinking water in the area (Malcolm Pirnie, Inc., 2000). Figure 12 depicts the geology of the FWDA.

B1.11.2.3 Hydrogeology

Ground water is present in several of the rock units underlying FWDA. Examination of these units and records of wells in the area indicates that the only formations at FWDA capable of yielding more than a few gallons per minute (gpm) are the Quatowam Alluvium (Quaternary) and the San Andres Limestone and Glorieta Sandstone (Permian). However, minor amounts of ground water are present in bedrock underlying the shallow alluvial aquifer and are composed of Triassic-age Members of the Chinle Group: the Painted Desert Mudstone/Claystone, the Sonsella Sandstone and the Shinarump Conglomerate. Water yields from the Shinarump and Sonsella Members generally yield 5 to 50 gpm, and the water quality is considered fair to poor. The Sonsela is mostly a sandstone with the ability to transmit a modest amount of ground water. While the Shinarump is mostly a clay unit within the confines of FWDA. Water-bearing formations of Jurassic and Cretaceous ages capable of yielding 100 gpm or more are present 4 to 6 miles to the west of FWDA, but not within installation boundaries. The tilted bedrock underlying the majority of the FWDA installation dips gently to the northwest, which substantially influences the movement of ground water. The ground water flow gradient in the Northern Area is primarily to the south-southwest in the alluvial system and to the west in the bedrock system. The ground water flow gradient appears to be in a northerly direction in the OB/OD area.

B1.11.2.3.1 Productive Aquifers

The Quaternary alluvial aquifer, which includes deposits in the Rio Puerco Valley along the northern edge of the installation, is composed of gravel, sand, silt, and clay derived from Triassic and Jurassic age strata that border the valley. This shallow aquifer is primarily recharged from surface runoff, although some deposits in the southern part of the installation are recharged by springs from underlying bedrock aquifers. Recharge of ground water within the alluvium occurs mainly during the wet seasons of the year, specifically with the snowmelt in the spring and during the summer monsoon season. Alluvial ground water aquifer within the boundary of the installation is not productive. Monitoring wells drilled into this aquifer have been tested and verify that ground water yield is extremely low.

The San Andres-Glorieta aquifer is the only ground water source for FWDA installation and outcrops near the installation's southern boundary, dipping to the north. Snowmelt and precipitation furnish much of the recharge water to the aquifer. The flow of ground water is in a northwesterly direction with the top of the San Andres-Glorieta aquifer approximately 1,100 feet bgs near the Administration Area. At this location, the aquifer is about 200 feet thick and under artesian pressure. Local variations in aquifer permeability can be large and unpredictable with hydraulic conductivity values ranging from 0.05 to

150 feet per day and yields that are highly variable from one location to another (USACE, 2011). In 1980, the region around Gallup, including FWDA, was declared an underground water basin by the State of New Mexico. This action prohibits any major new ground water withdrawals without the approval of the State Engineer. The recharge basin for this aquifer covers approximately 1,439 square miles and includes the communities of Gallup, Fort Wingate, Camerco, Mariano Lake, Navajo Wingate Village, and Rehoboth (USACE, 2011).

FWDA has collected data from the off-site wells identified in Permit Attachment 13 as required under Section VII.G.2.a, *Sampling of Offsite Water Supply Wells*, to ensure that the public is not using contaminated ground water released from the Facility. No contamination has been detected in these wells and FWDA is requesting elimination of the requirements to sample and analyze the off-site wells listed in Permit Attachment 13.

B1.11.2.4.1 Current OB/OD Area Hydrogeology

The general ground water flow in the OB/OD Area is from south to north, following the general topographic gradient (Herndon Solutions Group, 2011). Ground water in the OB/OD Area is mostly present in Triassic-age bedrock (Herndon Solutions Group, 2011) from the Chinle Group. Based on data presented in monitoring well logs, the majority of monitoring wells in the OB/OD Area are constructed in undifferentiated Chinle units or the Sonsela Member of the Petrified Forest Formation. Because ground water is generally not present in the alluvial deposits, they are generally dry. During precipitation events or run off from snow melt, ground water can saturate the sediments that load arroyos. Monitoring wells CMW20 and FW38 are constructed in arroyo sediment. FW38 is a dry well, and CMW20 only periodically contains sufficient ground water to sample (Herndon Solutions Group, 2011).

B1.11.2.4.2 Northern Area Hydrogeology

In the northern portion of the installation, the alluvium is thicker than in the OB/OD Area. Saturated thickness within the alluvial aquifer (Quatowam Alluvium) varies greatly and tends to increase as it nears drainage channels and arroyos. The direction of general ground water flow is from the north toward the south. However, directly beneath the Administration Area, ground water flow from the north converges with ground water flow from the southern edge of the Workshop Area. This convergence creates a local westerly ground water flow direction (Herndon Solutions Group, 2011).

In addition, ground water is also present in bedrock beneath the Workshop Area in discontinuous fine-grained, sandstone beds within the Painted Desert Member of the Petrified Forest Formation. Several monitoring wells are constructed with screens in these sandstones, and ground water elevation measurements indicate that the downgradient is in a westerly direction (Herndon Solutions Group, 2011).

B1.11.3 Topographic Map [40 CFR §270.14(c)(3)]

A topographic map meeting the requirements of 40 CFR §270.14(c)(3)] is included as Figures 12a through 12c in Attachment E of this application.

B1.11.4 Contaminant Plume Description

Sampling under the NMED-approved GMP has been ongoing since 2008. The results of the monitoring activities are documented in semiannual ground water monitoring reports submitted to NMED. The analysis includes VOCs, SVOCs, explosives, pesticides, and anions listed in Appendix IX of 40 CFR 264. A new report is submitted to NMED approximately every six months. The Appendix IX analytes detected in the groundwater are included in Table 5-1A of Attachment G. Attachment G also contains maps identifying the location of groundwater monitoring wells. The monitoring report provides detailed information regarding contaminant detections and ground water plumes.

In the most recent version of the FWDA RCRA Permit (Attachment R), Section VI, *GROUND WATER INVESTIGATION AND GROUND WATER CORRECTIVE ACTION FOR THE OB/OD UNIT,* the requirements for reporting of ground water sampling results are detailed in Section VI.B.7.b. Under current permit requirements, the results of all ground water monitoring and sampling conducted shall be submitted to NMED within ninety (90) calendar days of completion of field activities conducted during the associated periodic monitoring event. Due to the large number of analytes included in these sampling events, FWDA is requesting an increase in the time period for reporting the results of all ground water monitoring and sampling conducted under the RCRA permit to 120 calendar days.

B1.11.5 Ground Water Compliance Monitoring Plan

The Final 2014 Interim Measures Facility-Wide GMP Version 7, dated 13 January 2014 (Innovar Environmental, Inc., and CB&I, 2014), submitted to NMED, presents the proposed ground water monitoring to be conducted as part of the on-going Environmental Restoration Program at FWDA. The results of the monitoring activities are documented in semiannual ground water monitoring reports submitted to NMED. The Facility-Wide GMP meets the requirements set forth in 40 CFR 270.14(c)(5), 40 CFR 270.14(c)(7)), and NMAC 20.4.1.500 (incorporating 40 CFR 264.97 and 40 CFR 264.99).

B1.11.6 Corrective Action Program

In accordance with the Class 1 Permit modification approved on October 31, 2007 a Corrective Action Plan will be submitted in 2 phases. Phase I, the Closure Plan Phase I Work Plan OB/OD Unit HWMU and Parcel 3 SWMUS and AOCS was submitted in June 2008. The results from the current ground water monitoring program have not indicated a Corrective Action Program is needed. A corrective action program, if deemed

necessary, will be evaluated and submitted to NMED 360 days after completion of the proposed monitoring well installation and subsequent four quarters of ground water sampling described in Section 6 of the Closure Plan.

The Permittee is proposing corrective action complete with controls for all Railroad Lines at FWDA shown on Figure RR 1. The control will be that future use of the railway lines will be for its intended purpose. Railroad lines or tracks means an area containing railroad tracks and associated support ballast and underlying soil. The Permittee has investigated segments of FWDA's railroad system contained in AOCs and SWMUs under several RCRA Facility Investigations. The results indicate that some locations along the Railroad Lines exceed current residential soil screening levels. The results and locations of the exceedances have been provided to the stakeholders. FWDA will continue to provide stakeholders with investigation results for review and comment. However, the Permittee is requesting corrective action complete for the railroad lines for the following reasons: 1) the Navajo Nation and Zuni Pueblo have expressed interest in using the rail system upon property transfer 2) removal of ballast and soil containing contaminants will damage or destroy the railroad lines and the Army has no means of repairing the lines or other property improvements under BRAC Law, 3) use of the rail system for its intended purpose brings the potential of additional constituents being released due to normal rail system usage, 4) continued use of these areas for their intended purpose will eliminate non-industrial uses/development, thereby eliminating potential residential exposure. Therefore, the Permittee is requesting that all the railway lines at FWDA be identified as Corrective Action Complete in the new RCRA Permit.

B1.12 INFORMATION REQUIREMENTS FOR SOLID WASTE MANAGEMENT UNITS [40 CFR §270.14(d)]

There are no SWMUs and one AOC identified in the RCRA Current OB/OD Area. Three SWMUs (SWMUs 14, 15, and 33) have been identified in the Closed OB/OD Area. SWMU 74 may also lie within the boundary of the Closed OB/OD Area boundary. Information for these SWMUs is summarized in Table 2 (Attachment F).

The most recent version of the FWDA permit at the time that this application was completed identified 89 SWMUs and AOCs at FWDA that are not located within the OB/OD Areas. Information for these SWMUs is summarized in Table 2 (Attachment F). The SWMUs are located well outside the boundaries of the HWMU for which this Permit Application is being prepared, therefore they have not been included on the map of the HWMU provided as Figure 4 (Attachment E). Individual maps meeting the scale requirements (1 inch = 200 feet) of 40 CFR 270.14(b)(19) and showing all the SWMUs are included as Figure 13 through Figure 36 (Attachment E).

Environmental data collection efforts were initiated in 1992 to evaluate conditions and potential releases of hazardous wastes or hazardous waste constituents at these SWMUs. These environmental investigations and findings have been documented in

formal submittals to NMED, and are incorporated herein by reference. RCRA Facility Investigations (RFIs) have begun at several Parcels at FWDA. RFIs are performed by parcel and include all SWMUs and AOCs in the parcel. Documents are located at the NMED and FWDA Administrative Record.

B1.13 TRAFFIC INFORMATION [40 CFR §270.14(b)(10)]

The Current OB/OD Area is accessed from U.S. Highway 66 via approximately 8 miles of two-lane FWDA roadways. Approximately 3 miles, from U.S. Highway 66 to the West Patrol Road, are surfaced with asphaltic concrete ranging in width from 22 to 24 feet, and are generally in fair to good condition. The remaining distance, approximately 5 miles, are surfaced with low-bituminous paving or gravel ranging in width from 16 to 18 feet, and are generally in fair to good condition. No information on load bearing capacities of these roadways is available. Existing traffic controls and security gates are shown in Figure 7 (Attachment E). Access procedures are described in Section B1.2.

Currently, traffic into the OB/OD Area consists of light trucks carrying caretaker personnel on twice weekly inspections, with an occasional piece of heavy equipment brought in to perform roadway or drainage structure maintenance on an “as needed” basis. In addition, environmental sampling personnel utilize light trucks on a periodic basis to access the OB/OD Area for sampling activities. This type and frequency of traffic is anticipated during the post-closure care activities.

During closure, a different type and frequency of traffic is anticipated. The materials proposed for excavation and off-site disposal will require the use of end dump trucks and other heavy equipment. Trucks moving heavy equipment and appurtenances to perform the excavation would also be required. Additional events using heavy equipment are anticipated during corrective action and closure activities during 2015 - 2020.

B1.14 CHEMICAL AND PHYSICAL ANALYSES OF WASTE TO BE HANDLED [40 CFR §270.14(b)(2)]

Chemical data for and physical descriptions of debris and residue materials that are in-place within the HWMU were generated during a field investigation program; findings of the field investigation are described in detail in the Phase IA Report and summarized in Table 6 of Attachment G of the 2003 Permit Application. These documents provide a summary of the physical descriptions and estimated in-place volumes for materials encountered. The analytical data from the composite waste samples for these investigations were summarized in Table 5-15 of the Phase IA Report (Attachment H of the 2003 Permit Application). Table 11 in Attachment G of the 2003 Permit Application summarized analytical data from Toxicity Characteristic Leaching Procedure (TCLP) testing of grab waste samples.

B1.14.1 General Waste Analysis [40 CFR §264.13]

The substantive requirements of 40 CFR 264.13 (General Waste Analysis) will be met during all closure and post-closure care activities. Before any treatment, storage, or disposal of hazardous wastes, or nonhazardous wastes if applicable under §264.113(d), a detailed chemical and physical analysis of a representative sample of the wastes shall be obtained. At a minimum, the analysis shall contain all the information which must be known to treat, store, or dispose of the waste in accordance with parts 264 and 268 of this chapter.

B1.15 CONTINGENCY PLAN [40 CFR §270.14(B)(7)]

A copy of the contingency plan is included in Attachment N to this Permit Application.

B1.16 GENERAL HAZARD PREVENTION [40 CFR §270.14(b)(8)]

B1.16.1 Unloading Operations [40 CFR §270.14(b)(8)(i)]

When motor vehicles and heavy equipment are used for transporting WMM for treatment at the OB/OD Area treatment CAMU, or for transporting donor explosives to be used in the treatment CAMU, the following procedures will be used to prevent hazards associated with unloading operations:

- Prior to unloading, the vehicle(s) will be turned off, parking brake set, and vehicle wheels chocked. Only then will explosive packages, components, and ordnance be removed from the vehicle(s).
- During unloading operations, compatibility requirements will be maintained. Any unloading initiators, combustible materials, and fuels will be positioned a safe distance from explosives or ordnance.
- Explosives and ordnance will not be unloaded or piled immediately in back of the exhaust system of the transporting vehicle.
- All explosive and ordnance containers will be spotted and opened at least 10 feet from each other and from previously laid out material.
- Packages will be opened only when the vehicle is out of the area.
- When the vehicle is completely unloaded, it will be withdrawn from the area to a safe location, until completion of storage of the ordnance and explosives delivered.

B1.16.2 Runoff [40 CFR §270.14(b)(8)(ii)]

Hazardous waste, WMM, and other materials that have been recovered during closure/post-closure operations and staged awaiting treatment or shipment for disposal will be stored on plastic liners and bermed at the perimeter to prevent runoff.

B1.16.3 Water Supplies [40 CFR §270.14(b)(8)(iii)]

There is one shallow dug well (Well Number 19) located within 1 mile west of the OB/OD Area. Limited available information indicates that this well may be abandoned or is used very infrequently. This well is located hundreds of feet geologically up-section of the OB/OD Area, and, consequently, cannot be affected by operations during closure/post-closure or the flow of impacted ground water from the units undergoing closure.

B1.16.4 Equipment and Power Failures [40 CFR §270.14(b)(8)(iv)]

Power outages are not anticipated to be a source of problems at the OB/OD Area. Operations will not require a permanently installed outside source of electric or other power; therefore, the facility is not subject to power failures.

Failures of material handling equipment while transporting or handling WMM or other materials will require that the load being transported be transferred to another vehicle to complete the transport to the OB/OD Area CAMU destination.

Failures of WMM treatment equipment will require that the operation be stopped, and any in-process munitions be removed from the treatment equipment and relocated to a safe area, prior to initiating equipment repairs.

B1.16.5 Personnel Protection Procedures [40 CFR §270.14(b)(8)(v)]

The handling of WMM will be conducted in a manner that minimizes contact of involved personnel with the waste. Handling operations and requirements for protective clothing will be in accordance with remediation contractor safety requirements, which will also be described in site specific Health and Safety Plans prepared by the contractor for work performed at the OB/OD Area.

B1.16.6 Releases to the Atmosphere [40 CFR §270.14(b)(8)(vi)]

Prevention of releases to the atmosphere is not applicable to operations at the OB/OD Area.

B1.16.7 Additional Protective Measures for Transportation of WMM

Prior to treatment at the CAMU, the primary steps for handling WMM during remediation activities will include the following:

- Perform a hazard assessment to determine if the WMM item is safe to move. WMM will not be moved during the hazard assessment until the fuze condition can be ascertained. If the condition is questionable, the fuze will be considered armed.

- If the item is not safe to move (e.g., it is fuzed or exhibits a high explosive hazard), an UXO technician will treat the item using blow-in-place (BIP) methods by countercharging the item with an explosive donor charge (typically a 19 to 22-gram booster/perforator) and detonating the donor charge. BIP events will be carried out in accordance with 40 CFR 266.206.

- If the item is safe to move, it will be moved to a designated CE storage igloo in Explosive Storage Block B for later treatment via burning or detonation at the CAMU.

The hazard assessment and BIP events are not considered to be part of the CAMU.

B1.16.8 Additional CAMU Protective Measures

The following safety guidelines apply to the CAMU:

- Only qualified UXO technicians will be involved in conducting OB/OD operations. Non-UXO trained personnel may be used to perform OB/OD support activities (e.g., soil sampling) when supervised and escorted by a UXO-qualified individual. All personnel engaged in WMM handling, transport, or treatment operations will be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive situations.

- All personnel entering the CAMU will be briefed by the UXO Site Safety Officer on the hazards present at the site and the safety protocols in force.

- The UXO Site Safety Officer or Senior UXO Supervisor will establish a minimum separation distance between OB/OD operations and personnel in the open, known as the Minimum Separation Distance (MSD), based on the type of WMM being treated. Prior to burning or detonation, all personnel will withdraw from the MSD area. An adequate number of guards will be posted to prevent unauthorized entry into the treatment area. The guards will be posted at a distance to afford protection from blast and fragments. A means of communication will be maintained among all site personnel during the operation to ensure that unauthorized personnel do not stray into the area. Personnel will remain outside the MSD area until all smoke and fumes dissipate and the UXO Demolition Supervisor conducts a post blast investigation. Only after the Senior UXO Supervisor declares the area safe for entry will personnel be allowed to re-enter the area.

- At least two persons qualified to administer first aid and cardiopulmonary resuscitation will be present during OB/OD operations. Arrangements will be made in advance for prompt transportation of injured workers to a medical facility, in accordance with the Site Safety and Health Plan.
- A first aid kit will be present during OB/OD operations. The contents of the first aid kit will include, at a minimum, those items required to handle burns and puncture wounds.
- OB/OD operations will not be conducted between sunset and dawn.
- Parcel 3 is a designated Improved Conventional Munitions (ICM) area due to the presence of BLU-3 and BLU-4s. UXO Tech II and III are the only unescorted personnel allowed in the area. All others require escorts, including UXO Tech I.

B1.17 PRECAUTIONS TO PREVENT ACCIDENTAL IGNITION OR REACTION [40 CFR §270.14(b)(9)]

B1.17.1 Accidental Ignition Precautions [40 CFR §264.17(a)]

Safety guidelines will be established and implemented by the remediation contractor to prevent unintended reactions. As summarized below, the safety guidelines include, but are not limited to, the following:

- Unauthorized ignition sources such as flame-producing devices are prohibited in the OB/OD Area at any time;
- Sparking equipment and tools are prohibited near explosive materials unless specifically authorized by the contractor remediation supervisor;
- Hand tools and mechanical devices are inspected prior to use to ensure their safety;
- Motor vehicles used to transport WMM, or other materials are inspected prior to use to ensure their proper operation;
- OB/OD operations cease during electrical storms, rain, or snowstorms;
- Dry grass, leaves, and flammable/combustible materials are removed from the immediate area surrounding WMM staging and treatment operations;
- Initiators (e.g. blasting caps, primers) and explosives are packaged, transported, and handled separately from WMM until placement for treatment; and
- Engines of transport vehicles are turned off prior to the unloading of munitions at the OB/OD Area.

B1.17.2 Reactive Waste Precautions [40 CFR §264.17(b)]

WMM handled at the OB/OD Area are assumed to be reactive, and only reactive wastes will be treated at the site. Non-reactive wastes will not be treated at this facility. Personnel working in the OB/OD Area must take appropriate measures to prevent incidents that:

- Generate uncontrolled extreme heat or pressure, fire or explosions, or violent reactions;
- Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to pose a risk of fire or explosion;
- Produce uncontrolled inflammable fumes or gases in sufficient quantities to pose a risk of fire or explosion; or
- Through any other means, threaten human health or the environment.

B1.17.3 Compliance Documentation [40 CFR §264.17(a)]

These procedures are in use at Department of Defense OB/OD operations throughout the country. Experience has shown that when they are followed, the danger of accidental detonation or combustion is negligible. Compliance with the precautions described in Sections B1.17.1 and B1.17.2 of this application will be documented. This documentation may be based on references to published scientific or engineering literature, data from trial tests (e.g., bench scale or pilot scale tests), waste analyses (as specified in §264.13), or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions

B1.17.4 Additional Protective Measures for the CAMU

In addition to the guidelines described above, the following protective measures apply to the CAMU:

- All dry grass, leaves, and other flammable materials will be removed for a distance of at least 50 feet from the demolition cell during open burning and 200 feet during open detonation.
- WMM will be transported directly from the eight (8) CE Storage in Explosive Block B prior to treatment at the CAMU.
- Temporary storage of WMM at the CAMU will occur only in the event of a contingency and will not exceed 10 days.
- OB/OD operations will not be conducted during inclement weather or if inclement weather is forecasted to occur within four hours. OB/OD operations will not be

conducted when the wind speed exceeds 15 miles per hour (mph). OB/OD operations will not be conducted during sand, snow, or electrical storms strong enough to produce static electricity, which might cause premature detonation.

- The OB/OD area will be kept clean and orderly at all times.
- Open burning will not be repeated in the same demolition cell for 24 hours after all visible signs of burning have been exhausted. Burning pans will not be soaked with water to expedite cooling.
- Demolition cells will be composed of well-packed earth and will be free from loose stones and deep cracks in which explosives might lodge. Burning and detonation will not occur on concrete mats.
- Additional information on procedures for processing WMM for disposition as scrap metal are described below.
    - 1. The contractor will ensure that scrap metal generated from OE or Range Clearance is properly inspected in accordance with the procedures in I. above. Only personnel who are qualified UXO personnel per USACE's Contract Data Item Description (DID) OE-025 will perform these inspections. The Senior UXO Supervisor will certify and the contractors Safety Officer will verify that the scrap metal is free of explosive hazards.
    - 2. DD 1348-1A will be used as certification/verification documentation. All DD 1348-1A must clearly show the typed or printed names of the contractor's Senior UXO Supervisor and the contractors Safety Officer, organization, signature, and contractor's home office and field office phone number(s) of the persons certifying and verifying the scrap metal.
        - a. Local directives and agreements may supplement these procedures. Coordination with the local concerns will identify any desired or requested supplementation to these procedures.
        - b. In addition to the data elements required and any locally agreed to directives, the DD 1348-1A must clearly indicate the following for scrap metal:
            - (1) Basic material content (Type of metal; e.g., steel or mixed).
            - (2) Estimated weight.
            - (3) Unique identification of each of the containers and seals stated as being turned over.

- (4) Location where OE scrap was obtained.
- (5) Seal identification, if different from the unique identification of the sealed container.

- c. The following certification/verification will be entered on each DD 1348-1A for turnover of scrap and will be signed by the Senior UXO Supervisor and the contractors Safety Officer:
  - "This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, are free of explosive hazards, engine fluids, illuminating dials and other visible liquid HTRW materials.

The Contingency Plan for the FWDA CAMU prepared to meet requirements in 40 CFR 264, Subpart D, is presented in Attachment N of this Permit Application.

B1.18 TRAINING PROGRAMS [40 CFR §270.14(b)(12)]

An outline of training programs is included as Attachment M to this Permit Application.

B2.0 WASTE MUNITIONS DESCRIPTION [40 CFR §264.552(d)(1)]

A summary of MEC identified at FWDA is provided annually as Part of the Community Relations Plan. This information includes the results of UXO surveys conducted at FWDA (Attachment J). The surveys have found 24,000 lbs Net Explosive Weight (NEW) to date at FWDA.

To estimate the NEW of WMM to be treated at the CAMU, a selected number of representative munitions items were identified based on the following:

- Number of items found during previous FWDA munitions response actions, combined with current findings;
- Most conservative model of the munitions item per the USEPA's AP 42, Volume I, Fifth Edition, Chapter 15, Ordnance Detonation tables; and
- NEW per ORDATA Online and AP 42.

Table 1 lists the subset of WMM historically found at FWDA that were selected for a conservative assessment of OD operations.

Table 1: Found Munitions Items at FWDA for OD

Items/Nomenclature	Number of Items	Most Common Explosive Filler	NEW (lb) / Item
40-mm projectiles Mk2*	8,083	CS / HC / TNT / Composition A3	0.187
81-mm projectiles M821	80	TNT / RDX / white phosphorus / Composition B	0.364
105-mm projectiles M490	474	TNT / RDX/ white phosphorus / Composition B	12.080
155-mm projectiles M107	51	TNT / RDX / white phosphorus / Composition B	15.448
Smoke canisters / candles M125A1 Green Star	782	White phosphorus / red phosphorus / magnesium / sodium nitrate / flare / illumination mixtures	1.669
Mines / mine parts M2/M49A4**	114/217	RDX / TNT / tetryl / Composition B	0.457
Fuses M557	9,347	RDX / Composition B / tetryl / PBXN	0.0522

Note:
lb = pounds
mm = millimeters
CS = 2-chlorobenzalmalononitrile, a gas used by the military as a supposed non-lethal riot control agent
HC = hexachloroethane-zinc, a substance used for white smoke screen in multiple military munitions
TNT = 2,4,6-trinitrotoluene
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
PBXN = plastic-bonded explosive of different mixtures most often utilizing RDX or octahydro-1,3,5,7 tetranitro-1,3,5,7-tetrazocine (HMX) in the formula. Examples of commonly used mixtures are PBXN¬-106 (95% RDX + 5% polyurethane rubber) or PBXN-5 (95% HMX + 5% fluoroelastomer).

*The M383 is the worst-case 40-mm available in the AP 42; however, it is considered a launched grenade. The Mk2 40-mm projectile is more relevant to found items. The Mk2 has a NEW of 0.187 lb per item, while the M383 has a NEW of 0.117 lb.

**The M18A1 mine is the worst-case mine listed in the AP 42; however, according to the UXO summary table for FWDA, M2 series bounding mines were found. These items have a NEW of 5.07 lb in AP-42. Nevertheless, on the basis of USACE site knowledge, the M2 mine / mine parts was used with a NEW based on the M49A4 60-mm high explosive cartridge.

Table 2 identifies the bulk explosives and powders to be treated during OB operations.

Table 2: Bulk Explosives and Powders at FWDA for OB

Items/Nomenclature	Compound Material	NEW (lb) / Burn
Black powder	Potassium nitrate 74% Sulfur 10.4% Charcoal 15.6%	100
Smokeless powder	Nitroglycerin / trinitroglycerin 20% Barium nitrate 1.6% Nitrocellulose 78.4%	100
Bulk explosives	Bulk TNT flake and loose powder found on range	100

B2.1 TREATMENT PROCESS DESCRIPTION [40 CFR §264.552(e)(2)]

This section provides a description of the OB/OD treatment process for WMM at the CAMU. All treatment operations will be performed in strict adherence to U.S. Army standard operating procedures or work plans. OB/OD operations will be conducted during daylight hours and will not be conducted during periods of anticipated inclement weather, heavy overcast conditions, or electrical storms, or when the wind velocity exceeds 15 mph. These treatment processes have been selected specifically to minimize any potential exposure or harm to the public health or environment.

The primary method for operations to be conducted at the CAMU will be to remove all material at the end of each operating day; however as an optional method for unforeseen problems (i.e. weather storm, excessively high winds, etc.) designated temporary storage area(s) for recovered Material Potentially Presenting and Explosive Hazard (MPPEH) will be placed temporarily within the CAMU. These materials will only be stored at this area for no more than ten (10) calendar days with the completion of treatment/disposal being completed as soon as the next demolition/treatment day can be scheduled. Any materials placed in the designated temporary storage area will be properly segregated and stacked in a manner that will prevent excessive spread of contamination. This area will also be provided the required security measures, as it is within a locked and controlled double fence and the FWDA Caretakers will perform the roving checks of the area as required.

The CAMU will be operated until the remaining WMM at FWDA has been treated. All treatment processes will be performed under the direction and supervision of the Senior

UXO Supervisor. During these operations, the UXO Site Safety Officer will closely monitor these operations, strictly enforce safety and adherence to work plans, and ensure that the exclusion area is appropriately evacuated.

The CAMU is used to treat ignitable (D001) and reactive (D003) hazardous wastes, such as damaged, defective, expired, and unserviceable munitions through open burning and open detonation. Wastes treated at the CAMU may also be hazardous due to one or more of the following toxicity characteristics: barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), 17 or 2,4-dinitrotoluene (D030). Treatment may also include the wastewater treatment sludge from the manufacture or processing of explosives (K044).

Open Detonation (OD). The earthen demolition cells at the CAMU will be excavated as previously described at the start of each demolition day. A visual inspection by a UXO technician will determine if the WMM requires venting to open internal cavities and expose fillers. Items to be detonated/vented will be transported to and placed within a demolition cell. Boosters/perforators will be placed in intimate contact with each item and, if required, covered with earth. Each booster or perforator will contain 19-22 grams or 0.042-0.049 pounds NEW of Composition 4 (C-4) or other readily available donor charge. Engineering controls or protective measures will be employed where required to minimize the damage to cultural resources, if present, and contain munitions fragments resulting from the detonation, in accordance with the Programmatic Agreement.

After OD/venting, the munitions debris will be inspected by two independent UXO technicians. The Senior UXO Supervisor and the UXO Quality Control Specialist will verify and certify that the munitions debris has been “100% properly inspected and to the best of our knowledge and belief, presents no explosive hazard.” The munitions debris and scrap metal will then be certified “safe to recycle” and will be recycled at a smelter facility for its raw commodity value.

Any items or material that cannot be certified as “safe to recycle” will be left in the detonation cells for reventing and re-inspections. If it continues to “present an explosive hazard,” it will be transported as hazardous material to a USEPA-approved facility for off-site disposal. Small arms ammunition up to and including .50-caliber cartridges that cannot be vented or treated on site will also be profiled, packaged, and disposed of at an off-site USEPA-approved facility.

This procedure for MD and scrap metal certification and off-site recycling has been applied at the Former Kirtland Practice Bombing Ranges (N-1, N-2, N-3, N-4 and New Demolition Area) where NMED was the lead regulatory agency. Other New Mexico sites where similar non-explosive MD and scrap metal were recycled include the Laguna Pueblo and Isleta Pueblo projects where the EPA was the lead regulatory agency. There have not been any known or documented cases wherein MD and scrap metal that is “safe to recycle” has been characterized as hazardous waste. In addition to examining the munitions debris, the dirt in the cell will be visually cleared and all scrap and

munitions debris will be removed after each detonation, unless stormy weather or other unforeseen problems require temporary storage as noted above. At the conclusion of each day's operations, the demolition cells will be backfilled with dirt from the immediate area. The cells will then be re-created for use at the beginning of the next demolition day. The berms surrounding the cells will remain in place throughout the active life of the CAMU and will be removed when the last FWDA site / SWMU is closed. Then the CAMU site itself will be investigated and remediated, as necessary, before being restored to its pre-CAMU condition. FWDA will follow the closure requirements stipulated in the existing RCRA permit (Subpart EE of 40 CFR 264 and 265).

Open Burning (OB). Disposition of the propellants, bulk explosives, metal powders, detonators and miscellaneous munitions constituents will be determined by the on-site Senior Unexploded Ordnance Supervisor (SUXOS) and contractors Safety Officer. Disposition at the CAMU is determined to be the safest method for all items; however alternatives to OB (thermal convection, packaging and shipping to licensed/permitted incinerator, packaging and shipping to a licensed/permitted OB facility, etc.) can be used only when both the SUXOS and OESS have designated such items as being safe for both movement and off-site transportation.

Incidental solid wastes generated during the operation of the CAMU may include wooden ammunition boxes and containers, etc. The solid wastes that can be safely separated from the munition item/constituent will not be disposed by open burning at the OB. They will be separated and certified as material documented as safe (MDAS) in accordance with DoD and USACE regulations and requirements and sent off-site for proper final disposition.

When a burn is required by the SUXOS and contractors Safety Officer, a single burn pan may be placed within a demolition cell at the CAMU. The material to be treated may be placed in a bed of combustible material; fuel oil or diesel may be poured over the material to assist combustion if required. Incidental solid wastes, such as wooden ammunition boxes, containers, and pallets may also be burned during the treatment process.

A typical burn operation is expected to last for 30 to 60 minutes, with secondary hot ash and coals burning for one to three hours after all flames have diminished. After the burning has visibly exhausted itself, the UXO Demolition Supervisor will return to inspect the area for completeness of burn, heat retainment, and any other dangerous conditions. Consecutive burns at the same cell will not be conducted in a single day, and no cool down procedures (e.g., drenching with water) will be used. Burn pans will be cleaned out after each burn operation, unless stormy weather or unforeseen conditions require temporary storage of debris. The burn pans will be reused for subsequent burns. The resulting ash will be properly characterized and disposed of at an off-site USEPA-approved facility. Burn pans will not be left in the demolition cells between burns.

The treatment capacity of the CAMU is 200 lb NEW per shot for cased munitions to be treated by OD. The treatment capacity per burn is 200 lb NEW for uncased munitions items. Waste treatment in the CAMU is anticipated to at the rate of ≤ 1,000 lbs NEW per week and a maximum annual volume of ≤52,000 lbs NEW per year. Each detonation will require approximately one hour to complete, which includes placing the charge, covering the munitions with dirt (if warranted), detonating the munitions, inspecting the debris, and clearing the debris.

B2.1.1 WASTE ANALYSIS PLAN [40 CFR §270.14(b)(3)]

Wastes generated at the CAMU will include ash from OB/OD of MEC, recyclable scrap, non-MEC debris (incidental solid waste), and potentially impacted soil. Details on waste characterization and management appear in Attachment 14 of the Revised Permit (CAMU Waste Analysis Plan) dated April 2014 and included as Attachment P.

B2.2 TREATMENT EFFECTIVENESS [40 CFR §264.552(c)(1) and (c)(6)]

The open air thermal destruction of WMM is a commonly used treatment technique that has been proven to be effective, safe, and economical. The effectiveness of OB/OD treatment has been demonstrated through full-scale field tests and controlled tests conducted at the Propellant, Explosive, and Pyrotechnic Thermal Treatment Evaluation and Test Facility (commonly known as the “BangBox”) at Dugway Proving Ground’s West Desert Test Center in Utah.

The destruction and removal efficiency (DRE), a common measure of treatment effectiveness, has been shown to be greater than 99% for energetics undergoing either open burning or open detonation. A summary of DREs for various WMM based on the BangBox tests is listed below:

- Open Burning
- Ammonium perchlorate–based propellants>99.9999%
- Organic-based propellants >99.9999%
- Open Detonation
- Bulk explosives 99.725%
- Suppressed (buried) detonations >99.9999%
- Encapsulated explosives 99.9697%

Field studies (e.g., comparing the amount of waste treated to the amount of residue generated) have also been used to demonstrate the effectiveness of OB/OD treatment.

Alternatives to OB/OD that are currently available include thermal treatment (i.e., incineration) and disassembly or removal of inert portions (prior to further treatment). These alternatives are not always suitable for WMM for one or more of the following reasons:

- The composition of the WMM may be unknown, unstable, or degraded.
- The WMM cannot be disassembled safely.
- The development of a deactivation, recovery, and recycling program is not economical.

The transportation of WMM from FWDA to a facility with existing equipment for disassembly or thermal treatment (e.g., Tooele Army Depot) in itself would pose an unacceptable safety risk to the public. Therefore, the treatment of WMM through OB/OD at FWDA is considered the most effective, economical, and safe approach.

B2.3 POTENTIAL EXPOSURE PATHWAYS [40 CFR §264.552(c)(2) and (e)(3)]

This section discusses the potential for migration of and exposure to munitions constituents during activities at the CAMU. This analysis of exposure pathways can also be applied to the requirements of 40 CFR 264.552(e)(6)(iii), although the CAMU will be operated such that waste will not be left in place after closure. Exposure to munitions constituents through ground water or surface water pathways is considered unlikely for the following reasons:

- The selected treatment method has been proven to be highly effective in destroying explosives (refer to Section B2.2).
- CAMU activities will be suspended during periods of anticipated inclement weather, including rain events. Thus, contact of munitions constituents with storm water run-on during treatment is unlikely.
- The demolition cells will be visually cleared and all scrap and munitions debris will be removed after each detonation. At the conclusion of each day's operations, the demolition cells will be backfilled with dirt. Thus, no depression will be left where storm water run-on (e.g., from rain events at night) could potentially collect.

The means by which the CAMU will achieve Environmental Performance Standards contained in 40 CFR 264.601.

B2.3.1 Ground Water

Hydrogeologic investigations have occurred at FWDA, and ground water monitoring wells have been drilled in various locations throughout the Facility. Monitoring wells were installed in the Current OB/OD Area in 1996 to assess the presence and quality of shallow ground water; most of these wells are located in the southern and central portions of the Current OB/OD Area. Additional wells were drilled in the Current OB/OD Area in 1998 to delineate the northern extent of impacted shallow ground water. Five monitoring wells are situated within 1,000 feet of the CAMU. This section summarizes information obtained from these wells.

- The depth-to-ground water and stratigraphy generally were inconsistent among shallow wells in the vicinity of the proposed CAMU. Most wells showed two distinct water-bearing intervals, the Painted Desert Member and Sonsela Sandstone Member. At two of the wells (CMW21 and CMW22), ground water was first encountered at depths of 28 feet and 29.5 feet bgs, respectively. A second water-bearing interval was encountered in these same wells at depths of 58 feet and 96.5 feet bgs, respectively. However, at some wells, only one water-bearing interval was encountered. The depth-to-ground water at another nearby well (CMW24) was 223 feet bgs.

- The shallow ground water flow direction in the first and second water-bearing intervals in the surrounding wells is generally to the north.

- Ground water at the Current OB/OD Area is physically separated from the ground water located on the western side of the Hogback (i.e., from the ground water at the Closed OB/OD Area).

TerranearPMC (2006) concluded that “extensive mudstone and siltstone units underlying the Current OB/OD Area ground water system, being of inherently lower primary permeability than surrounding sandstone units, inhibit vertical movement of ground water to underlying potable aquifer units, such as the Glorieta Sandstone.” Well 69, the water supply well for FWDA, is installed in the Glorieta Sandstone at a depth of 1,350 feet bgs.

The Army has proposed installation of additional ground water monitoring wells in the vicinity of the CAMU in the Parcel 3 RFI Work Plan. These wells will further characterize ground water in this area. This report was submitted to NMED in 2009. Monitoring well installation, and additional ground water investigation, have been postponed due to munitions cleanup activities.

The potential migration of munitions constituents from OB/OD activities to underlying shallow ground water is considered unlikely because of the operational characteristics of the CAMU (e.g., suspension of activities during inclement weather and clearing of scrap and munitions debris after each detonation). Furthermore, the depth to any water-

bearing formation suitable for public drinking water supply effectively eliminates the ground water exposure pathway.

To confirm these assumptions regarding the ground water pathway, periodic sampling and analysis of surface soil will be conducted. The purpose of this sampling is to determine whether munitions constituents have been released to the soil from the CAMU. Soil sampling will occur prior to initiating OB/OD activities (to establish a baseline) and upon closure of the CAMU.

For the baseline and closure sampling events, five surface soil samples will be collected from the primary treatment cell and surrounding berm. Additional soil samples will be collected from any of the other treatment cells that have been used for OB/OD. Samples will be analyzed for volatile organic compounds, semi-volatile organic compounds, metals, explosive compounds, perchlorate, nitrate, cyanide, PCBs, dioxins, furans, and total petroleum hydrocarbons.

Samples will be collected using a stainless steel spoon or trowel, which will be decontaminated after each sample is collected. The analytical results will be compared to New Mexico Soil Screening Levels to determine whether ground water monitoring is needed. Any contaminated soils will be removed or decontaminated upon completion of all CAMU operations; soil cleanup levels are further discussed in the 2014 Facility Permit Attachment 7 included in Attachment P of this application.

Regardless of the outcome of the soil sampling at the CAMU, an interim facility-wide ground water monitoring plan has been developed under the FWDA RCRA Permit, Section V. Monitoring is currently under way and is expected to be sufficient to track contaminants that originate from the CAMU, should any reach the ground water, because the wastes to be treated at the CAMU are not different from wastes historically treated at FWDA. Furthermore, since the treatment method has been demonstrated to be highly effective and since the unit will be managed such that wastes will not remain in place upon closure, the CAMU is expected to meet the criteria of 20.4.1.500 NMAC (incorporating 40 CFR 264.552(g)) for an exemption from ground water monitoring. The monitoring plan has been suspended in Parcel 3 until cleanup is complete due to potential munitions hazards.

B2.3.2 Surface Water

The proposed CAMU is located on the eastern side of the Hogback, and the surface topography in the area generally slopes to the east-northeast. The nearest surface water body is an arroyo that is located approximately 500 feet east of the proposed CAMU. The arroyo bisects the Current OB/OD Area and is normally dry.

The average annual precipitation at FWDA varies between 8 and 20 inches based on elevation, with a Facility average of 11 inches. Most precipitation occurs as rainfall during summer thunderstorms. The driest conditions occur in spring and autumn; light

snow accumulation occurs in winter. Evaporation is extremely high at FWDA minimizing infiltration to ground water.

As previously mentioned, OB/OD activities are suspended during periods of anticipated inclement weather, such as rain events. All scrap and munitions debris will be removed from the demolition cells after each detonation, and the cells will be backfilled with dirt at the conclusion of each day's operations. Thus, the migration of munitions constituents through surface water contact is considered unlikely.

In addition to these controls, an additional protective measure will be added for control of surface water run-off. This measure will consist of a silt-fence being installed at the 200-foot vegetation clearance perimeter surrounding the entire CAMU area to ensure that potentially contaminated surface soils will not wash away outside of the 200-foot circumference.

B2.3.3 Air

Potential exposure to munitions constituents and heavy metals through air is reduced by suspending OB/OD activities when the wind velocity exceeds 15 mph and by limiting the amount of WMM detonated or burned on a daily basis. The proposed permit limit is for 200 lb NEW cased and 200 lb NEW uncased munitions per day. The average wind speed, measured at nearby Gallup Municipal Airport, is 7.3 mph. The windiest conditions occur from March through June, when the wind speed averages 9.1 mph. The prevailing wind direction is from the west-southwest.

The remote location and topographic features of the proposed CAMU were selected, in part, to minimize the impacts of airborne contaminates to human receptors. FWDA does not contain any housing facilities. The nearest residential area downwind of the proposed CAMU is the town of Fort Wingate, with a population of 1,364.13 This town is located approximately 4 miles east-northeast of the proposed CAMU. Fort Wingate has an elementary school and high school.

FWDA consulted with the NMED Air Quality Bureau (AQB) with respect to the applicability of an air quality permit for the CAMU. Based on documentation received from NMED AQB, an open burning permit is not required for the OD of manufactured explosives, as stated under 20.2.60.7 NMAC. Therefore, this regulation does not apply to the CAMU unit for manufactured explosives. Open burning of other hazardous wastes not categorized as manufactured explosives must meet the requirements of 20.2.60.113 NMAC and the requirements of hazardous waste permits and other permits issued by the NMED.

The January 8, 2010 letter from NMED AQB the emissions from OD/OB operations at the CAMU operations as described are exempt from permitting thresholds for Pre-Construction Permit. Therefore, open burning will not require a permit but must be conducted in accordance with this hazardous waste permit and other conditions outlined

in regulations. The FWDA CAMU is not subject to TAPs air permitting requirements in 20.2.72.400 NMAC because FWDA was an existing source at the time the requirement became effective.

The letter also states AQB's strong recommendation that disposal be limited to amounts that do not cause "an impact above acute toxic thresholds". FWDA will attempt to limit the daily disposal amount of Toxic Air Pollutants (TAP) emissions using the CAMU procedures described in Permit Attachment 1. Finally, NMED AQB included some qualifiers in its transmittal email when addressing these exemptions:

- only a "discrete amount" will be burned or detonated,
- the OB/OD will be conducted for a limited time period (estimating a 5-year timeframe), and
- only FWDA-waste will be treated.

Based on the consultation with NMED AQB, no additional air permits are required for the CAMU as long as the actions are in compliance with this hazardous waste permit and, by inference, represented operating assumptions are maintained.

B2.3.4 Ecological Receptors

Operation of the CAMU is not expected to have a significant impact on ecological receptors. The treatment method has been proven to be highly effective in destroying explosives, and remaining scrap metal is removed after each detonation. In addition, the proposed CAMU will be located in a disturbed area (near the Old Burning Ground and Demolition Landfill Area), which historically has been used for the treatment of similar military munitions. Compared to the Current OB/OD Area, the footprint of the CAMU is relatively small (approximately 3 acres).

The CAMU site will be closed to residential standards, which is protective of ecological receptors.