

HAZARDOUS WASTE BUREAU
New Mexico Environment Department



Position Paper

Position Paper

**Use of Low-Flow and Other Non-Traditional
Sampling Techniques for RCRA
Compliant Groundwater Monitoring¹**

1. Scope

Currently, many sites use a traditional method of well purging and sampling, which involves removal of a specific pre-calculated number of well volumes from the monitoring well prior to sample collection. Due to rising disposal costs, some Resource Conservation and Recovery Act (RCRA) permitted facilities in New Mexico are looking for ways to reduce the volume of water produced during purging and are exploring alternative sampling techniques. As a result, purging and sampling techniques for compliance groundwater monitoring have become an important issue for both facilities and the regulatory agency. The Hazardous Waste Bureau (HWB) of the New Mexico Environment Department (NMED) developed the following guidance regarding low-flow and other non-traditional sampling methods to promote clarity and consistency. This HWB position paper is intended to provide guidance to the regulated community and assist with preparation of written requests to HWB for sampling deviations based on site-specific conditions. The selection of a sampling technique depends on well and site conditions. HWB outlines the selection criteria for low-flow well purging and sampling in this document. Information is provided for the appropriate use of the low-flow technique in order to obtain RCRA compliant groundwater monitoring results that are defensible and reproducible. Other non-traditional sampling techniques are also discussed.

2. Background

¹This document is intended as guidance for employees of the Hazardous Waste Bureau (HWB) and RCRA-regulated facilities within the State of New Mexico. This guidance does not constitute rule making and may not be relied upon to create a right or benefit, substantive or procedural, enforceable at law or in equity, by any person. HWB may take action at variance to this guidance and reserves the right to modify this guidance at any time without public notice.

The objective of sampling is to obtain groundwater samples that are representative of aquifer conditions. However, many factors contribute to the water chemistry results obtained from groundwater monitoring wells. Laboratory analytical methods for most analytes and sample types are well established and carefully documented. Errors associated with the collection and handling of a sample generally exceed those associated with the analysis. The site-specific conditions must be fully evaluated during the initial stages of monitoring well network design, construction, installation, development, and during well operation and maintenance. If a well is not properly constructed and developed, zones other than the intended zone may be sampled (Puls and Barcelona, April 1996). Proper development following monitoring well installation is required prior to sampling. Selection of the development technique must be based on the aquifer properties encountered during well drilling and other site-specific factors. No sampling technique can overcome an improperly designed or developed well. Guidelines for proper well development (with the exception of open-borehole bedrock wells) can be found in ASTM D5521-94. Documentation of indicator parameters during well development is useful to aid in the establishment of purging behavior for a specific well.

With the traditional sampling technique, three to five well volumes are removed from the well prior to sample collection. Indicator parameters are collected during the purging process. Once the indicator parameters have stabilized, a groundwater sample is collected. This method has its advantages, some of which include: easy calculation and removal of a set volume of water, a variety of equipment can be employed (some of which is relatively inexpensive, e.g., disposable bailer) and it is a commonly accepted method. Disadvantages of this technique include: increased sample turbidity resulting from agitation or mixing of the well water, mobilization of colloids which may not be mobile under natural conditions², failure to ensure that stagnant³ water is removed from the well prior to sampling, generation of large volumes of purge water, especially in large diameter wells, and arbitrary removal of a specific number of well volumes because the purge volume calculation is not site-specific.

Low-flow purging and sampling techniques have been developed to eliminate some of the potential problems associated with traditional sampling methods including: reduction in the amount of purge water generated, directly resulting in a reduction in disposal costs associated with purging a well, reduction in sample turbidity eliminating the need for filtration, attainment of better quality samples, and sample collection in a manner that minimizes disruption to the monitoring well (Powell and Puls, 1997). Although low-flow purging and sampling has been used at a variety of sites, it has primarily been tested and used in two-inch diameter wells. Initially there were limited data available on its performance in wells greater than 2-inches in diameter (Van Maltby and Unwin, 1992), but more recent information indicates that sufficient results may be obtained from larger diameter wells (Shanklin, Sidle, and Ferguson, 1995). Also, it should be noted that low-flow purging and sampling

²Natural conditions refer to conditions that are assumed to exist in the aquifer under flow conditions that are not under stress due to pumping.

³Stagnant water is water that has been standing in the casing for a period of time and may be chemically different from formation water due to off-gassing or other chemical processes that may have occurred while the water remained in the casing.

results might not be indicative of water chemistry in the entire screened interval. Generally, low-flow purging and sampling water chemistry results will be indicative of the screened interval surrounding the pump intake. This can also be true when using traditional sampling techniques because the screened interval might cross variable stratigraphy, some of which yield water more readily than others. Therefore, it is best to minimize the overall length of the screened interval, if possible, and place the pump in the targeted contaminant zone that is representative of plume conditions.

HWB makes a distinction between low-flow and micropurging methods. There are major differences between low-flow and micropurging sampling techniques and the terms cannot be used interchangeably. In addition, HWB distinguishes between micropurging, the sampling method, and MicroPurge®⁴, the trade name. To avoid further confusion, HWB will avoid using the terms MicroPurge® and micropurging interchangeably.

For the purpose of this document, micropurging refers to evacuation of water from the sample collection tubing and the sample device prior to sample collection. Basically, the well is sampled at a low-flow rate, but is not purged prior to sample collection. Without purging the well before sample collection, there is no mechanism for determining whether formation or standing well water is being sampled. This method leads HWB to question the sample results and whether the sample is representative of groundwater conditions in the vicinity of the well. In some cases, this may also be a problem for the traditional method of sampling low-yield wells that are pumped dry, then allowed to recover and sampled once water has recharged the well.

3. Definitions

HWB provides the following definitions for use throughout this document. Most of these terms are not currently defined by standards organizations and may be used differently in other publications.

Discrete Sampling Device: A device or system that is installed in a monitoring well and collects a groundwater sample from targeted single interval or multiple zones.

High Flow Rate Sampling: Evacuation of water from the screened interval of a monitoring well at a rate that significantly exceeds natural flow through the screen (Barcelona, Wehrman, and Varljen, 1994) or the groundwater flow velocity for which the well was designed. High pumping rates of groundwater from the monitoring well may cause undue stress on the well screen or sand pack, shorten the usability and life span of the well, cause excessive turbidity, or may cause other damage to well construction. High flow rates coupled with long screen lengths (greater than 20 feet) can also yield false contaminant plume locations and, in some cases, incorrect contaminant concentrations (Powell and Puls, 1997). Long screens can result in the interconnection of different permeable zones that may cause misleading sample results.

⁴The use of trade names does not imply endorsement by HWB.

Low-Flow Purge and Sampling: Minimal drawdown⁵. This approach allows for indicator parameters (e.g. dissolved oxygen, pH, temperature, and specific conductance) to be monitored and allowed to stabilize during well purging. Low-flow purging and sampling rates generally range from 0.1 to 1.0 liter per minute (**L/min**) using a pump. Bailers are not acceptable for use in low-flow well purging. The actual purge rate is site-specific and may vary slightly from the range provided (Powell and Puls, 1997). Steady-state drawdown in the casing should occur if the pumping rate is sufficiently slow. Drawdown should be kept to a minimum. For wells that recharge at a rate insufficient for the use of low-flow purging and sampling, another method must be used. Employing a lower pumping rate is an attempt to approach natural flow conditions in the formation surrounding the well and produce a less turbid⁶ and more representative groundwater sample.

MicroPurge®: A low-flow sampling system developed, designed, and marketed by QED Environmental Systems, Inc. (QED). It may include the following components: flow control device, pneumatic power supply, power and flow control device, parameter stabilization system (to collect indicator parameters and determine when stabilization has occurred within the well), a drawdown meter, and a pump system. The system is designed to collect a representative and reproducible groundwater sample at a low-flow rate with minimal drawdown, using a dedicated or portable pump, with collection of indicator parameter values for the determination of stabilization prior to sample collection. Although QED equipment can be used for low-flow purging and sampling, equipment from other manufacturers is available.

Micropurging: (synonymous with **no-flow**) Evacuation of water from the sample device and tubing prior to sample collection. The sample is collected from standing water in the well; meaning an inadequate amount of water is evacuated from the well casing prior to sample collection. Indicator parameters are generally not measured; however, if measured they are representative of water present in the tubing device, not formation water. There is not a mechanism for determining whether stagnant casing or formation water is being sampled when collected from a standard completion monitoring well using this method since drawdown is not measured. In addition, water level fluctuations are not accounted for. Micropurging and no-flow assume that groundwater is constantly moving through the well screen and that the residence time of water in a well is minimal. In addition, vertical gradient and groundwater flow direction, which may vary from time to time, are not accounted for causing a high degree of variability in sample results. This method should not be confused with MicroPurge®, which is actually a low-flow sampling system.

No-Purge: Sampling groundwater from a well without any removal of water from the well prior to sampling (Newell, Lee, and Spexet, 2000).

Passive Sampling: Collection of a groundwater sample without the ongoing expenditure of external energy. Typically, a sample device is lowered into the well and allowed to equilibrate.

⁵Drawdown of 0.1 meter (0.3 feet), based on site-specific hydrogeology is recommended; however, greater drawdown may be acceptable based on site-specific conditions (USEPA, 1995).

⁶Generally less than 5 Nephelometric Turbidity Units (NTU), although this is a site-specific value and may change based on site-specific hydrogeologic conditions.

Theoretically, diffusion across a concentration or electrochemical gradient occurs causing the collection of a water sample in the screened interval.

Traditional Sampling Method: Evacuation of three to five well volumes of water from a monitoring well prior to collection of a groundwater sample. Pumps or hand bailing equipment are typically used and many times the pumps are operated at high flow rates. Indicator parameters may be collected during purging and used to determine if the well has stabilized. Often the well is purged based solely on volumetric calculations.

Vertical Profiling (of monitoring wells): The collection of formation water samples along the screened interval using a low-flow or passive method to characterize the contaminant profile of the monitoring well. Samples should be collected at approximately two-foot intervals along the screened section of the well if information regarding permeable zones is unknown (based on drilling logs or geophysical information obtained from the well). If information regarding permeable zones is known, samples should be collected from the targeted permeable zones. If the screened interval is located in only one permeable zone (and supporting documentation is available), the pump location should be set at the mid-point or slightly above the mid-point of the screened interval (USEPA, 1996). Once the contaminant profile is established, proper pump placement may be determined. Re-evaluation of pump placement should be conducted periodically to ensure proper placement over time.

4. Description of Low-Flow Technique

Low-flow is related to the amount of drawdown in a well during purging and the rate at which the well is purged. During the purging process indicator parameters are collected and allowed to stabilize prior to sample collection. Purge rates may be higher than sample rates in order to maximize purge efficiency. Prior to the collection of the groundwater sample, following stabilization of the site-specific indicator parameters, the pumping rate may be reduced. A reduced pumping rate more closely mimics natural aquifer conditions.

Once the well has met the selection criteria (*Low-Flow Well Selection Criteria*, Section 5), approval from HWB must be granted prior to changing sampling methodology for the well or at the site. This approval may require the applicant to submit new or revised standard operating procedures (SOPs) or other quality assurance documentation. The applicant should submit a revised sampling plan containing detailed information regarding the site hydrologic properties, the frequency and methodology of indicator parameter collection (as well as the indicator parameters to be measured), detailed lithologic logs, pump placement, tubing size, and contingencies to be implemented in the event indicator parameter stabilization cannot be achieved or equipment failure occurs. The applicant must submit the results of the initial vertical profile, if required, conducted to determine pump placement. HWB recommends a vertical profile be conducted if conditions change at the site (water table fluctuation, gradient changes due to pumping, or other factors). The actual frequency will be site-specific. Vertical profiling, where appropriate, will be required on a well-by-well basis as opposed to a site-wide basis. Vertical profiling will not be required if adequate geologic information is collected during drilling. Each well will be treated independently; therefore it is important to have construction and lithologic information for each well, as well as information regarding well development.

5. Low-Flow Well Selection Criteria

Once the well has been properly installed and developed, the sampling methodology for the well can be fully evaluated. Pre-approval from HWB is required to determine if the well or group of wells is appropriate for low-flow purging and sampling. In order for a well to be a potential candidate for the low-flow technique the following criteria must be met and documented to HWB for review and approval:

- Well construction details (detailed installation logs containing lithologic and well construction information or geophysical logs) are required;
- The wellhead must be constructed according to current State and EPA guidance and not allow for surface water infiltration into screened intervals. In addition to proper wellhead completion, screened intervals of the well must be properly sealed to prevent communication between saturated zones (if applicable) and/or surface infiltration;
- The screened interval of the monitoring well should be short⁷. Optimal screen length should be less than 10 feet (USEPA, March 1998). Low-flow purging and sampling may be approved for use in wells with screen lengths greater than 10 feet, provided pump intake placement is demonstrated to be appropriate. Wells with screened intervals connecting intervals of different head and/or hydraulic conductivity may act as conduits for vertical flow within the screened interval (Stone, 1997);
- Wells constructed across multiple perched or groundwater zones must be excluded unless they are constructed using devices that seal off discrete zones to eliminate communication between zones or unless they are constructed using a system designed to collect multi-level groundwater samples (discrete sampling systems);
- Drawdown must be measured and recorded during purging. The formation water must be recharging the well at a rate that is equal to the rate at which water is being removed from the well. If a well is pumped dry during purging, an alternate method⁸ must be used for sample collection; and

⁷ In guidance titled "NM Environment Department - Groundwater Section Monitor Well Construction and Abandonment Guidelines" a minimum 20-foot screened section for monitor wells (5 feet of screen above the water table to allow for seasonal water table fluctuations) is required. Note that a variance from the GWQB requirement may be requested by submitting a written request to the GWQB, if the site falls under more than one regulatory authority. HWB recommends that screened intervals be less than 10 feet unless the screened interval crosses the water table, in which case longer screen lengths are acceptable.

⁸For wells with insufficient recharge during sustained pumping where stabilization of indicator parameters cannot be achieved, samples shall be collected in the following manner (using a properly selected pump): collect indicator parameters, when the well purges dry the sampler shall note so in the log book and include the total volume of water removed, once the well is allowed to recover the sample shall be collected. Indicator parameters should be collected from the well prior to sample collection. If the well purges dry for four consecutive quarters or one year, the use of the well as a compliance monitoring point will need to be re-evaluated.

- Dedicated sampling equipment is preferred. If dedicated sampling equipment is not available, equipment must be installed prior to sample collection to allow well conditions to equilibrate prior to initiation of purging and sampling. Generally, equipment should be installed a minimum of 12 hours prior to sample collection. A shorter time period may be requested, if appropriate. If the use of bailers is planned, low-flow purge and sampling techniques cannot be employed.

6. Low-Flow Sampling Procedure

- Select the proper pump in order to avoid aeration, agitation, volatilization, or chemical interference during sampling. Selection of the proper pump is essential to obtaining valid and defensible sample results. Some pumps are not able to pump at a very low pumping rate without generating a large amount of heat, which may have a direct impact on temperature measurements (Giles and Story, November 1997). In addition, heat generation may cause the sample to off-gas possibly decreasing the concentrations of some chemicals, particularly volatile organic compounds (VOC) or semi-volatile organic compounds (SVOC).
- Select the proper tubing size and tubing material. In order to prevent air bubbles and other potential problems, a maximum tubing size of $\frac{1}{4}$ to $\frac{3}{8}$ inch inside diameter (ID) is recommended (USEPA, March 1998). The type of tubing material (e.g., Teflon®, polyurethane, silicone) may influence the sample quality due to water interaction (i.e., leaching and sorption) with the tubing material. Excess surface tubing should be minimized in an attempt to avoid heating or cooling of the water by the atmosphere before temperature measurements are collected.
- Select the water quality indicator parameter measuring device. HWB recommends the use of in-line or flow-through cell monitoring equipment, but recognizes some facilities may have more limited instrumentation. In-line or flow-through cell equipment is recommended in order to minimize sample contact with the atmosphere, which may alter sample temperatures and results through the introduction of air. HWB recommends the use of dedicated equipment, however, portable equipment may be used. By using equipment dedicated to a specific well, decontamination time and cost will be eliminated, further reducing the volume of water generated during purging. In addition, preparation time will be decreased and the amount of variability introduced by the use of different sampling equipment will be reduced.
- If well-dedicated equipment is not used, equipment should be installed in the well a minimum of 12 hours prior to the purging and sampling event to allow the equipment to equilibrate with well conditions. HWB recognizes site-specific conditions may not allow for the equipment to be installed prior to the sampling event, however, every attempt should be made to allow the equipment to equilibrate prior to purging and sampling.

- Water levels must be measured prior to purging. Water levels should be monitored at 5-minute intervals during purging to ensure that minimal drawdown is occurring in the well during the purge event. If excessive drawdown is noted during the purge event, the flow rate must be adjusted until minimal drawdown is achieved.
- Begin purging the well at a pre-determined low-flow rate based on site and well-specific characteristics. If the water-yielding ability of the well is unknown, low-flow purging can be initiated at approximately 100 ml/min (0.1 L/min) and the drawdown measured. Based on results, the purging rate may be increased incrementally up to approximately 500 ml/min (0.5 L/min), but should not exceed 1 L/min.
- Monitor indicator parameters at least every 5 minutes until stabilization is achieved. The well is considered to be stable when the indicator parameters have stabilized over three consecutive readings spaced a minimum of 5 minutes apart and when indicator parameters fall within the ranges shown in Table 1.

Table 1. Indicator Parameter Stabilization

±0.5 pH	±10% Specific conductance	±10% Temperature	±10% Dissolved oxygen (DO)	±10% turbidity (if appropriate)
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- Collect groundwater samples if minimal drawdown is achieved during purging. If the well consistently purges dry, an alternate purge method will be needed. Since each site is different and the contaminants of concern vary, analytical requirements will vary from site-to-site or well-to-well. In general, samples for VOC and SVOC analysis should be collected first.
- If well-dedicated equipment is not used, equipment must be properly decontaminated prior to use in a different well. In this case, wells should be sampled from lowest to highest contamination concentration in an attempt to minimize cross-contamination.

7. Low- Flow Sampling for Metals

RCRA and the New Mexico Water Quality Control Commission (**WQCC**) have different requirements for collection of groundwater samples for metals analyses. RCRA requires unfiltered inorganic groundwater samples in an attempt to emulate drinking water maximum contaminant levels (**MCLs**). However, the NMED Groundwater Quality Bureau (**GWQB**), which derives its regulatory authority from the WQCC regulations, requires filtered samples. It is important to identify the purpose of the metals sampling (characterization, risk assessment, or monitoring) to determine if filtered or non-filtered samples should be collected. Since NMED may use WQCC standards and/or standards based on drinking water MCLs, there are instances when HWB may require the collection and analyses of both filtered and unfiltered samples. Generally, unfiltered

groundwater samples are collected to determine total metal content, while filtered samples are collected for dissolved or suspended metal content in groundwater. Dissolved and total metals data cannot be used interchangeably.

Filtration is used in an attempt to eliminate sampling-induced turbidity. Generally, when samples are filtered in the field prior to analyses a 0.45-micron (μm) filter is used. Field filtration should not be used in an attempt to compensate for poor well construction or inadequate well development. Groundwater samples that are filtered in the field prior to chemical analyses will not provide accurate information regarding metals mobility because some metal species are mobile as colloidal-sized particulates and are likely to be removed by filtration (Puls and Barcelona, 1989). In addition, the Regional Superfund Groundwater Forum (a group of groundwater scientists) concluded that the use of a 0.45 μm filter was not useful, appropriate or reproducible, and that using a filter prior to metals analyses is not appropriate to determine "truly dissolved" constituents in groundwater samples (Puls and Barcelona, 1989). If properly conducted, low-flow purging and sampling for metals without sample filtration can provide an estimate of metals that may be mobile in groundwater, including both dissolved and naturally mobile particulates.

Since the low-flow purging and sampling technique is designed to reduce turbidity in groundwater samples (typically less than 5 NTU unless naturally mobile particulates exist in greater quantities), field filtration is not necessary. If groundwater generated during low-flow purging and sampling is in excess of 5 NTU, re-evaluation of the sample method and procedure should be conducted prior to sample collection and analysis. It may be necessary to conduct additional purging until the groundwater is below 5 NTU or further development of the well may be needed before metals sampling can be conducted.

8. Low-Flow Sampling Using Discrete Samplers

Discrete sampling systems are used to collect groundwater samples from the formation, not standing well water, without extensive purging prior to sample collection. Discrete samplers can be designed to collect groundwater samples from pre-determined targeted sample intervals or from multiple zones. Discrete samplers have many advantages, but can be expensive. Although the initial expense to purchase and install the equipment may be high, in the long term the amount of purge water generated is minimal and over the life of the well or sampling project, disposal costs can be significantly reduced. Examples of discrete sampling devices or systems include, but are not limited to: Multiport Sock Samplers (Jones, Lerner, and Baines, 1999), the WaterLoo Profiler™, and Westbay® sampling systems.

A type of discrete sampling device used for multi-layer groundwater sampling is the Multiport Sock Sampler produced and tested by the Ground Water Protection and Restoration Research Unit (**GWPRRU**). Sock samplers are constructed of inexpensive materials and can be used in open boreholes to collect discrete groundwater samples (Jones, Lerner, and Baines, 1999).

The Waterloo Profiler™ is a tool that can be used to collect depth-specific groundwater samples using a direct-push groundwater-sampling tool. This method of sample collection can be used during the investigation phase (when direct-push technology is used) to collect a vertical groundwater profile for a specific location. The Waterloo Profiler™ collects the groundwater sample

through screened ports or openings in the tip of the sample tube. The ports are connected to an internal fitting inside the tool and the water sample is brought to the surface inside the pipe using stainless steel or Teflon tubing (Precision, 1997).

Westbay® is a specific type of discrete sampling system that is designed to collect a representative groundwater sample from formation water with minimal purging. It contains a specialized sample casing that is designed and inserted into a borehole to collect discrete multi-level groundwater samples. Following installation, the system is purged to induce groundwater flow in an attempt to restore the formation to natural flow conditions, as existed prior to well installation. After proper well development and initial purging of the system, samples are collected from the Westbay® system without extensive purging because the sample is collected using valved port couplings along that casing that access the aquifer directly. Hydrostratigraphy must be determined to properly place the sampling ports. The monitoring and sampling system consists of casing components that allow a borehole to be completed at one monitor zone or many discrete monitoring zones. The inner casing contains sealed valves along its entire length to prevent groundwater from flowing in or out of the casing until the valves are opened. Casing packers seal the borehole between monitoring zones to prevent vertical flow of groundwater between zones. Electronic and mechanical probes and various sampling tools may be lowered inside the casing to measure various parameters (fluid pressure, temperature, and hydraulic parameters) and to collect groundwater samples. Monitoring zones are sampled using any number of valved port couplings that can be operated by the probe. A set volume of water is removed by sending pressure evacuated sample bottles down the well to the appropriately valved port. The bottles are filled when the sample ports are opened. Generally, sample bottles ranging from 250 to 1000 milliliters (**ml**) are used. HWB recommends discarding the first sample bottle collected. The number of bottles sent down the well is determined on a site-specific basis and depends on site analytical requirements.

Pre-approval from HWB is required prior to design, construction, installation, initial purging, and compliance sampling of a discrete sampling system.

9. Description of Micropurging, No-Flow and No-Purge Techniques

Micropurging, which is synonymous with no-flow, is often confused with low-flow (minimal drawdown) purge and sampling techniques, but the two methods are not the same and **cannot** be used interchangeably. Micropurging involves removal of water from the sample tubing and sample device prior to sample collection. Basically, micropurging and no-flow are considered to be sampling without purging. Micropurging does not have a mechanism to verify that the sample results are indicative of water quality in the formation surrounding the well. The water obtained has the potential to be stagnant, increasing the potential that off-gassing or volatilization to occur. If the sample has off-gassed or volatilization has occurred, results obtained may be biased.

Although the fact that groundwater is always moving through the system or within the aquifer is accepted within the environmental community, micropurging assumes that water is constantly flowing or being flushed through the well screen at a steady rate. The rate at which groundwater moves is not always the same. Several factors, including seasonal fluctuation, pumping, extreme drought or wet periods, and recharge rates can have an impact on the movement of groundwater causing the flow rate to vary over time. Vertical flow in the screened interval is not taken into

consideration when the micropurging technique is employed. The micropurging method assumes groundwater flow is horizontal in the screened interval and does not account for vertical flow that may be an important factor, especially in wells with long screened intervals (Stone, 1997). If a well is not purged prior to sample collection, sample results will vary over time because the residence time of well water varies, as does flow direction. If the water is recharging slowly, residence time may be increased within the well. The standing water present in the well casing may volatilize or off-gas causing the water quality results to be biased or the pH of the water to be potentially altered due to microbial action caused by exposure to the air in the well casing, which may affect metals mobilization. Based on these reasons, HWB does not approve micropurging methods.

No-purge is another alternative sampling technique. Purging is not actually performed when this method is employed; the well is simply sampled. This raises the question as to whether the sample results are valid (other than observing the presence or absence of particular constituents in groundwater). This method also assumes water is constantly moving through the screened interval, and does not account for the presence of stagnant or standing water in the well. Although this method of sample collection is extremely cost effective, not labor intensive, and requires little time (when compared to low-flow and traditional purging and sampling), samples obtained from the well are not representative of groundwater in the vicinity of the well. The American Petroleum Institute (API) (Newell, Lee, and Spexet, 2000) and the Western States Petroleum Association (WSPA) (SECOR, 1996), indicate that samples collected from monitoring wells at petroleum contaminated sites using the no-purge method "are not statistically different or provide conservative results" compared to samples collected from monitoring wells that are purged and indicator parameters stabilized. Also, these documents indicate that no-purge samples should be collected "where high-precision sampling is not needed" and "should be supplemented with conventional or low-flow techniques for key datasets." No-purge sampling may be appropriate to determine presence or absence of groundwater contamination, but is unacceptable for RCRA compliant groundwater monitoring. No-purge is not approved for use by HWB because it does not provide adequate data for RCRA compliant groundwater monitoring.

10. Other purging methods

Passive sampling can also be utilized to collect a groundwater sample. Passive sampling generates no purge water because the sample is obtained by diffusion or natural flow of groundwater. A sampling device is lowered into a well and allowed to equilibrate within the well water for a specific period of time. The device is then removed from the well and a sample is sent to the laboratory for analysis of target analytes. For a sampling program at a site use of a passive method has obvious advantages, including the fact that no purge water is generated when this method is employed. By eliminating purge water, waste disposal costs for a well or group of wells are reduced. It should be noted that air sensitive field parameters (Eh and DO) cannot be considered accurate when using these systems because no flow-through cell is used and these parameters must be measured in open air.

Two examples of passive sample devices are a passive diffusion membrane sampler and a diffusion multi-layer sampler (DMLS™). DMLS™ is an example of a multi-layer sample device for the collection of groundwater samples from targeted intervals within a 2-inch or 4-inch inside diameter monitoring well. Rods and sampling cells, which are filled with distilled water and covered with a

membrane, are lowered into the well. When equilibrium is reached the sampler is removed for laboratory analysis. Based on product literature, groundwater samples obtained using the DMLS™ can be analyzed for major ions, trace metals, organic contaminants, gases and various contaminants. Theoretically, the DMLS can be used to collect vertical chemical distribution data, sample in low permeability zones, and in highly turbid environments (USF/Johnson, 5120). Other passive diffusion membrane samplers are designed to collect groundwater samples utilizing a deionized water-filled, low-density polyethylene diffusion membrane sampling device that is inserted into the well, allowed to equilibrate over time, then removed for analysis (Rennie and Chapman, 1999).

The use of passive sample devices requires prior approval from HWB. These technologies are new and currently evolving and may not be applicable to many site conditions.

11. Summary

The terms micropurging and low-flow have been used synonymously, when in fact they mean very different things. MicroPurge® is a trade name, while micropurging refers to a sampling method of water removal from the sample device and tubing prior to sample collection. When using the micropurging method, water may not be flowing into the well, recharging the water around the sample point. A determination as to whether stagnant well water or formation water is actually being sampled cannot be made. Micropurging is not approved by HWB.

The low-flow method is related to the pumping rate and amount of drawdown measured in the well during purging. Indicator parameters are collected and allowed to stabilize before sample collection. Also prior to sample collection, the pumping rate may be reduced in an attempt to reduce sample turbidity and entrained air in the sample and to mimic natural conditions in the aquifer.

In order to consider low-flow purging and sampling, the well must meet the *Well Selection Criteria* in Section 5. If the well meets the selection criteria and a low-flow purging and sampling approach is selected, indicator parameters are chosen based on site-specific conditions and low-flow sampling equipment may be installed in the well. The use of well-dedicated equipment is suggested, but not required. If non-dedicated equipment is used, it must be allowed to equilibrate. The procedure for low-flow purging and sampling is outlined in detail in Section 6, *Low-Flow Sampling Procedure*. Written requests that specify the proposed use of low-flow purging and sampling, summarize the well selection criteria and follow the correct sampling procedures must be submitted to HWB for prior approval. Variations from the described low-flow purge and sampling technique described herein must also be submitted in writing to HWB for approval prior to implementation.

Finally, when conducting low-flow purging and sampling for metals, filtration of the sample prior to analysis is typically not required by HWB. However, WQCC regulations dictate groundwater standards for filtered metals samples. Since there may be instances where metals samples are being collected to satisfy both RCRA and WQCC, it is important to check with the regulatory agency to determine if both unfiltered and filtered samples need to be collected or if a variance should be requested to collect only unfiltered samples using the low-flow method.

The monitoring well purging and sampling method selected for a specific well or group of wells depends on many site-specific variables. Initial planning, the proper selection of well locations and

well construction materials, proper installation techniques and well completion and development are very important. If these factors are not considered, the well may not be properly installed or may even be installed in the improper location and data obtained from the monitoring well may be suspect. Once it has been determined that the well has been properly constructed, installed, and developed, the correct monitoring well purging and sampling technique may be selected.

Regardless of the method of purging and sampling selected at a site, it is important to properly train sampling personnel to use the equipment. It is also important to follow the same purging and sampling procedure each time to obtain data that are reproducible and comparable. The goal of any purging and sampling program should be to collect the most representative, highest quality data possible.

Regulatory agency approval is important for appropriate monitoring well design, construction, and development. When considering a low-flow purge and sampling program for a well, the regulatory agency should be notified and, if possible, involved in the initial planning. The same is true for any non-traditional sampling system being considered for a site.

REFERENCES

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU

New Mexico Environment Department



Position Paper

Position Paper

GENERAL REPORTING REQUIREMENTS FOR ROUTINE GROUNDWATER MONITORING AT RCRA SITES

The purpose of this document is to provide guidance for the reporting of periodic or routine groundwater and remediation system monitoring at RCRA facilities. This document provides a general outline for groundwater monitoring reports and also lists the minimum requirements for reporting within each subsection when preparing routine groundwater monitoring reports for RCRA regulated sites. All data, collected during each groundwater monitoring and sampling event in the reporting period, must be included in the reports. The general report outline is provided below.

TITLE PAGE

The title page should include the identity of the owner/operator, facility name, site or unit name, address, U.S. Environmental Protection Agency (EPA) or New Mexico Environmental Department (NMED) facility identification number and the submittal date.

EXECUTIVE SUMMARY

This section should provide a brief summary of the purpose, scope and results of groundwater monitoring conducted at the subject site during the reporting period. The site facility name, address and U.S. Environmental Protection Agency (EPA) or New Mexico Environmental Department (NMED) facility identification number(s) should be included in the executive summary. In addition, this section should include a brief summary of conclusions based on the monitoring results and recommendations for future monitoring, remedial action or site closure.

TABLE OF CONTENTS

The table of contents should list all text sections and subsections, tables, figures and appendices or attachments included in the report. The corresponding page numbers for the titles of each unit of the report should be included in the table of contents.

INTRODUCTION

This section should include the facility name, facility address, facility status (e.g.

compliance, corrective action, post-closure care, etc), EPA and/or NMED facility identification number(s), the name of the owner/operator of the facility and the purpose and type of groundwater monitoring being conducted (e.g. quarterly, semi-annual, annual, closure, etc.). Pertinent background information should be provided in this section.

SCOPE OF SERVICES

This section should provide a summary of all activities actually performed during the groundwater monitoring event including field data collection, chemical testing, remediation system monitoring, if applicable, and purge/decontamination water storage and/or disposal.

REGULATORY CRITERIA

This section should provide information regarding applicable groundwater cleanup standards, risk-based screening levels and/or risk-based cleanup goals for the subject facility. The appropriate cleanup levels for each unit within the subject facility should be included if site-specific levels have been established at separate facility locations. A table summarizing the applicable cleanup standards or inclusion of applicable cleanup standards in the data tables can be substituted for this section. Risk-based evaluation procedures, if used to calculate cleanup levels, must either be included or referenced.

GROUNDWATER MONITORING RESULTS

This section should provide a summary of the results of groundwater monitoring conducted at the site including, but not limited to, the dates that groundwater monitoring was conducted, the measured depths to groundwater, direction(s) of groundwater flow, field water quality measurements and a comparison to previous groundwater monitoring results. Field observations or conditions that may influence the results of groundwater monitoring should be reported in this section. Tables summarizing groundwater elevation/depth to groundwater measurements and field water quality measurements can be substituted for this section.

GROUNDWATER CHEMICAL ANALYTICAL DATA

This section should summarize the dates of groundwater sampling, groundwater chemical analytical methods and analytical results, and provide a comparison of the data to the cleanup standards or established cleanup levels for the site. The rationale or purpose for altering or modifying the groundwater sampling program should be provided in this section. A table summarizing the groundwater and QA/QC chemical analytical data, applicable cleanup levels and modifications to the groundwater sampling program can be substituted for this section.

REMEDIATION SYSTEM MONITORING

This section should summarize remediation system capabilities, performance, monitoring data, treatment system discharge sampling requirements and system influent and effluent sampling chemical analytical results. The dates of operation, system failures and modifications made to the remediation system during the reporting period should be

included in this section. A summary table may be substituted for this section.

SUMMARY

This section should provide a discussion and conclusions with regard to the results of groundwater monitoring conducted at the site. In addition, this section should provide a comparison of the results to applicable cleanup levels and relevant historical groundwater monitoring and chemical analytical data. An explanation should be provided with regard to data gaps. A discussion of remediation system performance, monitoring results, modifications, if applicable, and compliance with discharge requirements should be provided in this section. Recommendations and explanations regarding future monitoring, remedial action or site closure also should be included in this section.

LIST OF TABLES

The following summary tables should be included in each groundwater monitoring report. Data presented in the tables should include the current data plus data from the three previous monitoring events or, if data from less than three monitoring events is available, all data acquired during previous subsurface investigations and groundwater and/or remediation system monitoring. Summary tables can be substituted for portions of the text.

- Summary of regulatory criteria (a Regulatory Criteria text section can be substituted for this table or the applicable cleanup levels can be included in the analytical data tables).
- Summary of groundwater elevation and depth to groundwater data. The table should include the monitoring well depths and the screened intervals in each well.
- Summary of field measurements of water quality data (must include historical water quality data as described above).
- Summary of groundwater chemical analytical data (must include historical groundwater chemical analytical data as described above).
- Summary of remediation system monitoring data, if applicable (must include historical remediation system monitoring data as described above).

LIST OF FIGURES

The following figures should be included with each groundwater monitoring report. All figures must include a scale and north arrow. An explanation should be provided on each figure for all abbreviations, symbols, acronyms and qualifiers.

- Vicinity map showing topography and the general location of the subject site relative to surrounding features or properties.
- Facility site plan that presents pertinent site features and structures, well locations and remediation system location(s) and features. Off-site well locations and pertinent features should be included on the site plan if practical. Additional site plans may be required to present the locations of off-site well locations, structures and features.
- Figure presenting groundwater elevation data and indicating groundwater flow direction(s).
- Figure(s) presenting groundwater chemical analytical data for the current monitoring event. The chemical analytical data corresponding to each sampling location can be

presented in tabular form on the figure or as an isoconcentration map.

APPENDICES

Groundwater monitoring reports should include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

FIELD METHODS

The methods used to acquire field measurements of groundwater elevations, water quality data and groundwater samples should be included in this section. Methods include, but are not limited to, the methods and types of instruments used to measure depths to water, air or headspace parameters, and water quality parameters. In addition, decontamination, well purging and well sampling techniques and sample handling procedures should be provided in this appendix. Methods of measuring and sampling remediation systems should be reported in this section, if applicable. Purge and decontamination water storage and disposal methods also should be presented in this appendix. Copies of purge and decontamination water disposal documentation should be provided in a separate appendix.

CHEMICAL ANALYTICAL PROGRAM

Chemical analytical methods, a summary of data quality objectives and data quality review procedures should be reported in this appendix. A summary of data quality exceptions and their effect on the acceptability of the chemical analytical data with regard to the monitoring event and the site status should be included in this appendix along with references to case narratives provided in the laboratory reports.

CHEMICAL ANALYTICAL REPORTS

This section should include all laboratory chemical analytical data generated for the reporting period. The reports must include all chain-of-custody records and QA/QC results provided by the laboratory.



FORT WINGATE DEPOT ACTIVITY

RCRA PERMIT

DECEMBER 1, 2005

(REVISED FEBRUARY 2015)

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I GENERAL PERMIT CONDITIONS

I.A PERMITTEE

The Secretary (Secretary) of the New Mexico Environment Department (NMED) issues this Permit to the United States, Department of the Army, (Permittee), the owner and operator of Fort Wingate Depot Activity (FWDA) (the Facility) (EPA ID No. NM6213820974) located in McKinley County, New Mexico.

I.B PERMITTED ACTIVITY

This Permit requires the Permittee to close the Open Burn/Open Detonation (OB/OD) Unit, perform post-closure care for the OB/OD Unit, if necessary, conduct corrective action activities, and conduct tasks in accordance with a schedule of compliance. This Permit establishes the general and specific standards for these activities, as required pursuant to the New Mexico Hazardous Waste Act (HWA), as amended, NMSA 1978, §§ 74-4-1 et seq., and the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC.

This Permit also authorizes the Permittee 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 Code of Federal Regulations (CFR) 264.552. The CAMU is located at Solid Waste Management Unit (SWMU) 14 near the Old Burning Ground and Demolition Landfill within Parcel 3.

Except for those permitted activities specified in Section IX (Corrective Action Management Unit) and Section II.A.2 of this Permit, the Permittee is not authorized to store, treat, or dispose of any hazardous waste at the Facility under this Permit.

I.C EFFECT OF PERMIT

Compliance with this Permit during its term constitutes compliance, for purposes of enforcement, with 20.4.1.500, 700 and 800 NMAC (incorporating 40 CFR parts 266 and 268), except for those requirements not included in this permit under 40 CFR 270.4(a), only for those management practices specifically authorized by this Permit.

The Permittee must also comply with all applicable self-implementing provisions imposed by statute or rule, including 20.4.1.100, 200, 300, 400, 700, and 800 NMAC (incorporating 40 CFR parts 260, 261, 262, 263, 266, and 268). Compliance with this Permit shall not constitute a defense to any order issued or any action brought under Sections 74-4-10, 74-4-10.1 or 74-4-13 of the HWA; Sections 3008(a), 3008(h), 3013, 7002(a)(1)(b) or 7003 of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. 6901 to 6922k; Sections 104, 106(a), and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601 et seq.; or any other law providing for protection of public health or the environment. This Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local

laws or regulation. Compliance with this Permit does not relieve the Permittee from the responsibility of complying with all applicable state or federal laws and regulations.

[20.4.1.900 NMAC (incorporating 40 CFR 270.4, 270.30(g) and 270.32(b)(1));
20.4.1.901.A(11); and 1100 NMAC]

I.D EFFECT OF INACCURACIES IN PERMIT APPLICATION

This Permit is based on the assumption that the information submitted in the Part B Permit application dated June 12, 2003 (the Application), is true and correct. Any inaccuracies found in the Application may be grounds for the termination, suspension, revocation and reissuance, or modification of this Permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR 270.41, 270.42, 270.43) and for enforcement action. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(1)(11)) and 270.43(a)(2)]

I.E PERMIT COMPONENTS

This Permit consists of the regulations incorporated by reference into this Permit and the Permit Conditions in Permit Sections I through IX and Permit Attachments 1 through 15.

I.F PERMIT ACTIONS

I.F.1 Duration of Permit

This Permit shall be effective for a fixed period of ten (10) years from the effective date. The effective date of this Permit shall be thirty (30) calendar days after notice of the Secretary's decision has been served on the Permittee, or such later time as the Secretary may specify. [20.4.1.900 NMAC, (incorporating 40 CFR 270.50(a)) and 20.4.1.901.A(10) NMAC]

I.F.2 Permit Modification, Suspension, Revocation, or Termination

This Permit may be modified, suspended, revoked and reissued, or terminated for cause as specified in Section 74-4-4.2 NMSA 1978, 20.4.1.900 NMAC (incorporating 40 CFR 270.41 through 270.43), and 20.4.1.901.B NMAC. The filing of a request by the Permittee for a permit modification, or the notification of planned changes or anticipated noncompliance, shall not stay any permit condition. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(f))]

I.F.3 Unclassified Permit Modifications

Unless a permit modification is explicitly listed in Appendix I of 40 C.F.R. 270.42 as a Class 1 or Class 2 permit modification, the Permittee shall not submit the proposed permit modification as a Class 1 or Class 2 permit modification. The Permittee shall only make such permit modifications as Class 3 modifications, or may request a determination from the Secretary that the proposed permit modification is a Class 1 or 2 modification pursuant to the requirements of 20.4.1.901 and 900 NMAC (incorporating 40 CFR 270.42(d)).

I.F.4 Transfer of Land Ownership

The Permittee shall submit a permit modification request, in compliance with all requirements of 20.4.1.901 and 900 NMAC (incorporating 40 CFR 270.42), at least one

hundred eighty (180) calendar days prior to the proposed effective date of transfer of ownership of any land which is part of the Facility. The permit modification request may be submitted as a Class 3 permit modification, or the Permittee may request a determination that the modification is a Class 1 or 2 pursuant to the requirements of 20.4.1.901 and 900 NMAC (incorporating 40 CFR 270.42(d)). In addition to the requirements of 20.4.1.901 and 900 NMAC (incorporating 40 CFR 270.42), a permit modification request for transfer of land that is part of the Facility shall:

1. Identify the boundaries of the land proposed for transfer;
2. Identify the new owner;
3. Describe the location and identity of any existing or prior SWMU, AOC or hazardous waste management unit on the land proposed for transfer;
4. Describe any known or suspected presence of hazardous waste or hazardous constituents in soil or ground water at any depth within the boundaries of the land proposed for transfer;
5. Describe the status of any past, present, or planned investigations or remediation of any release of hazardous waste or hazardous constituents within the boundaries of the land proposed for transfer;
6. Include a revised map of the Facility (e.g., a revised Permit Attachment 2); and
7. Propose and describe all provisions necessary to ensure that the Permittee can meet the corrective action obligations of RCRA, the HWA, and the HWMR (e.g., covenants, deed restrictions, proposed replacement of monitoring wells or enforceable agreements for access to monitoring wells on transferred land).

[20.4.1.500 (incorporating 40 CFR 264.101); 20.4.1.900 NMAC (incorporating 270.30(1)(1), 270.32(b) and 270.42); and 20.4.1.901 NMAC]

I.F.5 Permit Reapplications

The Permittee shall submit an application for a new permit at least one hundred eighty (180) calendar days before the expiration date of this Permit, unless permission for a later date has been granted by the Secretary, pursuant to 20.4.1.900 NMAC (incorporating 40 CFR 270.10(h)). In reviewing any application for a permit renewal, the Secretary shall consider improvements in the state of control and measurement technology and changes in applicable regulations. [20.4.1.900 NMAC (incorporating 40 CFR 270.10(h) and 270.30(b)); 42 U.S.C. 6925(c)(3)]

I.F.6 Continuation of Expiring Permit

The conditions in this Permit shall continue in force and effect until the effective date of a new permit if:

1. The Permittee has submitted a timely application under 20.4.1.900 NMAC (incorporating 40 CFR 270.14), and the applicable sections in 20.4.1.900 NMAC (incorporating 40 CFR 270.15 through 270.29), which is a complete application (under 20.4.1.900 (incorporating 40 CFR 270.10(c))) for a new permit; and
2. NMED, through no fault of the Permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit.

While this Permit is continued under this condition, it remains fully effective and enforceable. [20.4.1.900 NMAC (incorporating 40 CFR 270.51(b))]

I.G PERMIT CONSTRUCTION

I.G.1 Citations

Whenever a provision of this Permit or of 20.4.1 NMAC is cited, the citation includes all subordinate provisions of the cited provision. All citations to a provision of 20.4.1 NMAC shall be considered an inclusion by reference of the cited provision of 20.4.1 NMAC and any federal regulation which it incorporates by reference. [20.4.1.900 NMAC (incorporating 40 CFR 270.30)]

I.G.2 Severability

The provisions of this Permit are severable, and if any provision of this Permit, or any application of any provision of this Permit due to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

I.G.3 Conflict in Language

If there is a conflict between the language of a Permit Condition and the language of a Permit Attachment, the language of the Permit Condition shall control over the language in the Permit Attachment. Any language in an Attachment that states or implies discretion to not comply with the minimum requirements of this Permit or 20.4.1.500, 700, and 800 NMAC is not effective and the requirements of this Permit and 20.4.1.500, 700, and 800 NMAC, shall control. [20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(1))]

I.H DEFINITIONS

For the purposes of this Permit, terms used herein shall have the same meanings as those in HWA, RCRA, and their implementing regulations, unless this Permit specifically provides otherwise. Where a term is not defined in HWA, RCRA, implementing regulations, or this Permit, the meaning of the term shall be determined by a standard dictionary reference, EPA guidelines or publications, or the generally accepted scientific or industrial meaning of the term.

Area of Concern (AOC) means any area having a known or suspected release of hazardous waste or hazardous constituents that is not from a solid waste management unit and that NMED has determined may pose a current or potential threat to human health or the

environment, pursuant to 20.4.1.500 NMAC (incorporating 40 CFR 270.32(b)(2)). An area of concern may include buildings, and structures at which releases of hazardous waste or constituents were not remediated, including one time and accidental events.

Corrective Action Management Unit (CAMU) means an area within a facility that is used only for managing CAMU-eligible wastes as part of implementing corrective action at the facility. The CAMU is located in Parcel 3 at SWMU-14 and near the Old Burning Ground and Demolition Landfill Area. [20.4.1.500 NMAC (incorporating 40 CFR 264.552)].

CAMU-eligible waste means solid and hazardous wastes consisting of munitions and explosives of concern or propellants that cannot be transported off site for treatment or disposal due to its ignitable or reactive characteristics that render such waste unsafe for transport on public roads.

Facility means Fort Wingate Depot Activity (FWDA), EPA ID Number NM 6213820974, owned by the United States Department of the Army and located approximately 8 miles east of Gallup on approximately 15,843 acres in McKinley County, in western New Mexico, including all contiguous land, and structures, other appurtenances, and improvements on the land, used for treatment, storage, or disposal of hazardous waste as designated on Permit Attachment 2. For the purpose of implementing corrective action, “Facility” means all contiguous property under the control of the owner or operator as designated on Permit Attachment 2.

Hazardous waste, for the purposes of corrective action for solid waste management units and areas of concern conducted pursuant to 20.4.1.500 NMAC (incorporating 40 CFR 264, subpart F) or 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(2)), means a hazardous waste as defined in 42 U.S.C. 6903(5), Section 74-4-3 of HWA. Hazardous waste, for the purposes of corrective action, includes any of the following, which are also a solid waste; any ground water contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.2.3103 NMAC, any toxic pollutant listed in 20.6.2.7 NMAC, any contaminant for which the EPA has promulgated a maximum contaminant level (MCL) at 40 CFR Parts 141 and 143, perchlorate, methyl tertiary butyl ether, polychlorinated biphenyls (PCBs), dioxins, furans, waste military munitions, and munitions constituents as defined at 10 U.S.C. 2710(e)(3).

Hazardous waste, for all other purposes of this Permit, means a hazardous waste as defined in 20.4.1.200 NMAC (incorporating 40 CFR 261.3).

Hazardous Constituent means any constituent identified in 20.4.1.200 NMAC (incorporating 40 C.F.R. Part 261, Appendix VIII) and any constituent identified in 20.4.1.500 NMAC (incorporating 40 C.F.R. Part 264, Appendix IX).

Kickout Area means the combined area of land adjacent to the OB/OD Unit, SWMU 16 (Demolition Landfill and Old Burning Ground), SWMU 17 (Old Demolition Area) and SWMU 35 (“Waste Pile” KPI) to which waste military munitions were released during the operation of the OB/OD Unit and to which solid wastes were released during the operation of SWMU 16 (Demolition Landfill and Old Burning Ground), SWMU 17 (Old Demolition

Area) and SWMU 35 (“Waste Pile” KPI). The Kickout Area is described in Permit Attachment 1.

Munitions and Explosives of Concern (MEC) means specific categories of military munitions that may pose unique explosives safety risks specifically:

- (A) Unexploded ordnance (UXO), as defined in 10 U.S.C.101(e)(5)(A) through (C);
- (B) Discarded military munitions (DMM), as defined in 10 U.S.C. 2710(e)(2); or
- (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

NMED means New Mexico Environment Department.

OB/OD Unit means the contiguous area of land on or in which hazardous waste was treated by the Permittee using open burning or open detonation. The OB/OD Unit includes: the area known as the Burning Ground Area, twelve Current Detonation Craters (CDC) known as CDC-1 through CDC-12, and ten (10) Current Residue Piles (CRP) known as CRP-1 through CRP-10. The estimated extent of the OB/OD Unit is depicted in Permit Attachment 12.

Open Burning means treatment that meets the definition listed in 40 CFR 260.10.

Open Detonation means the destruction of detonable explosives and munitions by the propagation of a high frequency energetic wave from a disposal charge to explosive or otherwise reactive wastes.

Release means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of any hazardous waste or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous waste or constituents).

Secretary means the Secretary of the New Mexico Environment Department or his or her designee or authorized representative.

Senior Unexploded Ordnance Supervisor (SUXOS) (as the position designation may be updated) means a person in charge of all MEC operations during the execution of the contract. The SUXOS is qualified as defined in Department of Defense Explosives Safety Board, Technical Paper 18 “Minimum Qualifications for UXO Technicians and Personnel”.

Solid Waste Management Unit (SWMU) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a Facility at which solid wastes have been routinely and systematically released.

Unexploded Ordnance (UXO) means military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installation, properties

(FUDS sites), personnel, or material and remain unexploded either by malfunction, design, or any other cause (10 U.S.C. 101(e)(5)(A) through (C)).

UXO Quality Control Safety Specialist (as the position designation may be updated) means a person in charge of ensuring that the SUXOS and all personnel are performing operations in compliance with the Federal, State, and Local Regulations. The UXO Quality Control Safety Specialist is qualified as defined in Department of Defense Explosives Safety Board, Technical Paper 18 “Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel”.

Waste Military Munitions (WMM) includes military munitions as defined in 20.4.1.100 NMAC (incorporating 40 CFR 260.10), which are solid waste as described in 20.4.1.700 NMAC (incorporating 40 CFR 266.202).

Watercourse shall have the meaning defined in 20.6.2.7 NMAC.

I.I DUTIES AND REQUIREMENTS

I.I.1 Duty to Comply

The Permittee shall comply with all conditions in this Permit, except to the extent and for the duration such noncompliance is authorized in an Emergency Permit, pursuant to 20.4.1.900 NMAC (incorporating 40 CFR 270.61). Any permit noncompliance, except under the terms of an Emergency Permit, constitutes a violation of the HWA and RCRA and may subject the Permittee, its successors and assigns, officers, directors, employees, parents, or subsidiaries, to an administrative or civil enforcement action, including civil penalties and injunctive relief, pursuant to Sections 74-4-10 or 74-10.1 of HWA or Section 3008(a) and (g), § 3013, § 7002, or § 7003 of RCRA; to permit modification, suspension, termination, revocation, denial of a permit application or modification request under Section 74-4-4.2 of the HWA; citizen suit under § 7002(a) of RCRA; criminal penalties under § 74-4-11 of the HWA or sections 3008(d)(e), or (f) of RCRA; or a combination of the foregoing. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(a))]

I.I.2 Transfer of Permit

The Permittee shall not transfer this permit to any person except after prior written approval of the NMED.

This Permit may be transferred by the Permittee to a new owner or operator only if the Permit has been modified or revoked and reissued, under 20.4.1.900 NMAC (incorporating 40 CFR 270.40(b) or 270.41(b)(2)), to identify the new Permittee and incorporate such other requirements as may be necessary under HWA and RCRA. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(1)(3) and 270.40(a))]

The Permittee may make changes in ownership or operational control of the Facility as a Class 1 modification after obtaining prior written approval of the Secretary in accordance with 20.4.1.900 NMAC (incorporating 40 CFR 270.42). The new owner or operator must submit a revised permit application no later than ninety (90) calendar days prior to the

scheduled change including a written agreement containing a specific date for transfer of permit responsibility between the current and new Permittee.

The new owner or operator shall demonstrate that he or she is complying with 20.4.1.500 NMAC (incorporating 40 CFR 264, subpart H (Financial Requirements)) within six (6) months of the date of the change of ownership or operational control of the Facility. [20.4.1.900 NMAC (incorporating 40 CFR 270.40(b))]

Before transferring ownership or operation of the Facility, the Permittee shall notify the new owner or operator in writing of the requirements of 20.4.1.500 NMAC (incorporating 40 CFR part 264) and 20.4.1.900 NMAC (incorporating 40 CFR part 270), and the HWA and shall provide NMED with a copy of this notice. [20.4.1.500 NMAC (incorporating 40 CFR 264.12(c))]

I.I.3 Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(c))]

I.I.4 Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(d))]

I.I.5 Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with this Permit. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(e))]

The Permittee shall at all times properly operate and maintain the CAMU to facilitate the implementation of reliable, effective, protective, and cost effective remedies. [20.4.1.500 NMAC (incorporating 40 CFR 264.552(c)(1))] Operational procedures for the CAMU are located in Attachment 1 of the Revised Permit.

I.I.6 Duty to Provide Information

The Permittee shall furnish to NMED, within a reasonable time, as specified by the NMED, any relevant information which NMED may request to determine whether cause exists for modifying, suspending, or revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit.

The Permittee shall also furnish to NMED, upon request, copies of records required to be kept by this Permit.

Information and records requested by NMED pursuant to this condition shall be provided in paper form or in an electronic format acceptable to NMED or both as NMED may specify.

This Permit Condition shall not be construed to limit in any manner NMED's authority under § 74-4-4.3 of HWA, § 3007(a) of RCRA, or other applicable law. [20.4.1.500 NMAC (incorporating 40 CFR 264.74(a)) and 20.4.1.900 NMAC (incorporating 40 CFR 270.30(h))]

I.I.7 Inspection and Entry

The Permittee shall allow the Secretary, or authorized representatives, upon the presentation of credentials and other documents as may be required by law, to:

1. Entrance to premises

Enter at reasonable times into the Permittee's premises where the regulated Facility or activity is located or conducted, or where records must be kept in accordance with this Permit;

2. Access to records

Have access to and copy, at reasonable times, any records that must be kept in accordance with this Permit;

3. Inspection

Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

4. Sampling

Sample, monitor or measure at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by RCRA and the HWA, any substances or parameters at any location. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(i))]

I.I.8 Monitoring and Records

I.I.8.a Representative sampling

Samples and measurements taken for the purposes of monitoring shall be representative of the monitored activity. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(j)(1))]

I.I.8.b Record retention

The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original electronic and hard copy recordings for continuous monitoring instrumentation, copies of all reports and records required pursuant to this Permit, and records of all data used to complete the Permit application until the end of closure,

corrective action, and any post-closure care period. This period may be extended by NMED at any time and is automatically extended during the course of any unresolved enforcement action regarding this Facility. The Permittee shall maintain records from all ground water monitoring wells and associated ground-water surface elevations, until the end of closure, corrective action, and any post-closure care period. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(j)(2))]

I.I.8.c Monitoring records contents

Records of monitoring information shall include:

1. The dates, exact place, and times of sampling or measurements;
2. The names and qualifications of the individuals who performed the sampling or measurements;
3. The dates analyses were performed;
4. The names and qualifications of the individuals who performed the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

[20.4.1.900 NMAC (incorporating 40 CFR 270.30(j)(3))]

I.I.9 Reporting Requirements

I.I.9.a Reporting planned changes

The Permittee shall give notice to NMED of any planned physical alterations or additions to the permitted Facility [20.4.1.900 NMAC (incorporating 40 CFR 270.30(l)(1))] no later than sixty (60) calendar days prior to making the planned changes.

I.I.9.b Reporting anticipated noncompliance

The Permittee shall give a minimum of sixty (60) calendar days advance notice to NMED of any planned changes to the Facility or any activity that may result in noncompliance with Permit requirements. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(l)(2))]

I.I.9.c Twenty-four hour and subsequent reporting

I.I.9.c.i Oral report

The Permittee shall orally report to NMED any noncompliance that may endanger human health or the environment within 24 hours from the time that the Permittee becomes aware of the circumstances. The report shall include the following:

1. Information concerning any release of any hazardous waste that may cause an endangerment to public drinking water supplies; and

2. Any information of a release or discharge of hazardous waste, or of a fire or explosion from the Facility, that could threaten the environment or human health outside the Facility.

The description of the occurrence and its cause shall include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of incident;
4. Name and quantity of materials involved;
5. The extent of injuries, if any;
6. An assessment of actual or potential hazards to the environment and human health outside the Facility, where this is applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

[20.4.1.900 NMAC, incorporating 40 CFR 270.30(1)(6)(i)]

I.I.9.c.ii Written report

The Permittee shall provide a written submission to NMED within five (5) calendar days from the time the Permittee becomes aware of the circumstances. The written submission shall contain the following:

1. A description of the noncompliance and its cause;
2. The period of noncompliance including exact date and time, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
3. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

NMED may waive the five-day written notice requirement in favor of a written report within fifteen (15) calendar days.

[20.4.1.900 NMAC (incorporating 40 CFR 270.30(1)(6)(iii))]

I.I.9.d Biennial report

The Permittee shall submit a biennial report to NMED covering Facility activities during odd numbered calendar years. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(1)(9)) and 20.4.1.500 NMAC (incorporating 40 CFR 264.75)]

I.I.9.e Other noncompliance

The Permittee shall report to NMED all instances of noncompliance not otherwise required to be reported under Permit Sections I.I.9.b and I.I.9.c at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Section I.I.9.c. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(l)(10))]

I.I.9.f Other information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit Application, or submitted incorrect information in the Permit Application or in any report submitted to NMED or the Regional Administrator, the Permittee shall promptly submit such facts or information in writing to the NMED. [20.4.1.900 NMAC (incorporating 40 CFR 270.30(l)(11))]

I.I.9.g Signatory requirement

The Permittee shall sign and certify all applications, reports, work plans, notifications, or information submitted to NMED in compliance with the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.11). [20.4.1.900 NMAC (incorporating 40 CFR 270.30(k))]

I.I.9.h Submissions to the New Mexico Environment Department

All documents must be submitted as both paper copies and also in an electronic format acceptable to NMED unless specified otherwise in this permit. The Permittee shall submit all applications, reports, work plans, notifications, or other submissions that are required to be sent to NMED by this Permit to:

Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone Number: 505-428-2500
Facsimile Number: 505-428-2567

The Permittee shall deliver all submissions by certified mail or hand delivery.

I.I.9.i Confidential information

The Permittee may claim confidentiality for any information required pursuant to this Permit, pursuant to the provisions of Section 74-4-4.3.D and F of the HWA, 20.4.1.100 NMAC (incorporating 40 CFR 260.2), and 20.4.1.900 NMAC (incorporating 40 CFR 270.12).

I.J COMPLIANCE SCHEDULES

This Permit specifies Schedules of Compliance that lead to compliance with the HWA and 20.4.1 NMAC. These Schedules of Compliance are specified in Section III (Closure Requirements), Section IV (Alternative Requirements for the Kickout Area), Section V (Facility-wide Ground Water Monitoring), Section VI (Ground Water Corrective Action Program For The OB/OD Unit), Section VII (Corrective Action for SWMUs and AOCs), and

Section VIII (Schedule of Compliance). [20.4.1.900 NMAC (incorporating 40 CFR 270.33(a))]

I.K INFORMATION REPOSITORY

The Permittee shall maintain an information repository until the end of closure, corrective action, and any post-closure care period [20.4.1.900 NMAC incorporating 40 CFR 270.30(m)]. The Permittee also shall maintain the Map Room located in the Administrative Area at the Facility.

I.K.1 Contents of the Information Repository

The Permittee's Information Repository shall contain:

1. Complete, legible hard copies (and electronic copies, if available) of all documents relating to the Permittee's previous activities which resulted or may have resulted in the generation, management, or actual or potential release of solid waste, hazardous waste, or hazardous constituents. These documents shall include, among other things, correspondence, reports, data, glossy photographic imprints, aerial photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices;
2. Complete, legible hard copies (and electronic copies, if available) of all documents relating to the Permittee's Part A and Part B Permit Applications, this Permit, and interim status closure plans and post-closure plans including, but not limited to, any correspondence, glossy photographic imprints, aerial photographs, maps, figures, drawings, tables, attachments, enclosures, and appendices;
3. Complete, legible hard copies (and electronic copies, if available) of all documents relating to any sampling, monitoring, investigation, clean up, and corrective action of solid waste, hazardous waste, or hazardous constituents, conducted at FWDA including, but not limited to, work plans, evaluations, historical reports, data aerial photographs, engineering drawings, glossy photographic imprints, maps, figures, drawings, tables, attachments, enclosures, and appendices; and
4. A searchable database that contains an index of all documents stored in the repository.

The Permittee shall add new documents, reports, data, and information to the information repository within thirty (30) calendar days after the new documents, reports, data, and information are submitted to NMED or placed in the operating record.

[20.4.1.900 NMAC (incorporating 40 CFR 270.30(m))]

I.K.2 Notice of Information Repository

The Permittee shall inform the public of its Information Repository by:

1. Including in the public notice for any Permittee initiated permit modification, a statement discussing the existence of the Information Repository, the location and hours of availability, and any access requirements; and
2. Providing written and verbal notice to the public during implementation of the Community Relations Plan required under Permit Section I.L.
3. If changing the location of the Information Repository, by informing all persons on the Facility mailing list of the new location of the Information Repository and publishing a public notice in at least two newspapers of general circulation in the Gallup, New Mexico area.

I.K.3 Location and Hours of Information Repository

The Permittee shall maintain the Information Repository at an approved location in Gallup, New Mexico or at the Facility and shall make it open to the public between 8:00 a.m. and 5:00 p.m. on each business day [20.4.1.900 NMAC (incorporating 40 CFR 270.30(m))]. The Permittee shall allow access to the Map Room located at the Facility during normal business hours on any business day, by appointment, no more than five business days after notification by an interested party requesting access to the Map Room.

I.L COMMUNITY RELATIONS PLAN

Within one hundred eighty (180) calendar days of the effective date of this Permit, the Permittee shall establish and implement a Community Relations Plan to inform the public of investigation and cleanup activities conducted under this Permit, and to inform the public of safety issues concerning waste military munitions released at the Facility and beyond the Facility boundary. The Permittee shall take best efforts in good faith to consult with the Pueblo of Zuni and the Navajo Nation when developing the Community Relations Plan, in an effort to ensure the program is responsive to the needs of the neighboring communities. The Permittee shall document this consultation, and any disagreements between the Permittee and the Navajo Nation or Pueblo of Zuni regarding the Community Relations Plan, in the operating record. The Permittee shall maintain and implement the Community Relations Plan until the later of completion of corrective action or any post-closure care period at the Facility. [20.4.1.500 NMAC (incorporating 40 CFR 264.101) and 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(2))]

I.L.1 Public Safety Program

As part of the Community Relations Plan, the Permittee shall establish and implement a Public Safety Program to prevent the unknowing or unauthorized entry of persons or livestock onto portions of the Facility where waste military munitions are known or suspected to be present and to inform the public of the presence of any waste military munitions beyond the Facility boundary. As part of the Public Safety Program, the Permittee shall make the Military Munitions Map and Table required by Permit Section I.L.2, available to the public. [20.4.1.500 NMAC (incorporating 40 CFR 264.101) and 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(2))]

I.L.2 Military Munitions Map and Table

The Permittee shall create and maintain a military munitions map and table. The military munitions map and table shall depict and list, respectively, all waste military munitions known to have been managed or identified as discarded at the Facility and also any known munitions or munitions constituents released beyond the Facility boundary. The military munitions map and table shall identify the specific types (e.g., sub-munitions, improved conventional munitions, 105 mm howitzer round, fuse), locations, and depths where each waste military munition was managed or found and its status (live or inert). The map shall also depict relevant features, including, but not limited to, locations of the OB/OD Unit, Kickout Area, SWMUs, AOCs, topographic contours, watercourses, Facility and parcel boundaries, fence type and location, gates, roads, and land owner information. The military munitions map and table shall include specific references for the sources of information to allow easy verification of the information. The map and table shall be updated annually and copies of the updated map and tables shall be submitted to NMED by March 31 of each year after the effective date of this Permit [20.4.1.500 NMAC (incorporating 40 CFR 264.101) and 20.4.1.900 (incorporating 40 CFR 270.32(b)(2))].

I.M PROVISIONS GOVERNING EXTENSIONS OF TIME

The Permittee may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for extension of time and proposed revised schedule to the NMED. The request shall state the length of the requested extension and describe the basis for the request. NMED will respond in writing to any request for extension following receipt of the request. If the NMED denies the request for extension, it will state the reasons for the denial. Permittee shall also submit copies of all requests for extensions of time to perform permit requirements to the Pueblo of Zuni and the Navajo Nation at the same time the request is sent to NMED. NMED will provide the Navajo Nation and the Pueblo of Zuni with copies of its responses on time extensions to the Permittee.

II GENERAL FACILITY CONDITIONS

II.A NOTICE OF GENERATOR REQUIREMENTS

II.A.1 Waste Generated During Closure

By removing any hazardous wastes or hazardous constituents during closure, the Permittee may become a generator of hazardous waste and must handle that waste in accordance with all applicable requirements of 20.4.1.300 NMAC, incorporating 40 CFR Part 262. [20.4.1.500 NMAC (incorporating 40 CFR 264.114)] Waste generated by treatment activities at the CAMU must be characterized in accordance with the requirements of 20.4.1.300 NMAC (incorporating 40 CFR 262.11), 20.4.1.700 NMAC (incorporating 40 CFR 266.200) and the Waste Analysis Plan (Permit Attachment 14).

II.A.2 Waste Generated By an Explosives or Munitions Emergency Response

If solid waste is generated as a result of an explosives or munitions emergency response at the Facility, or beyond the Facility boundary in response to a waste military munition released from the Facility, the Permittee must comply with the requirements of 20.4.1.300 (incorporating 40 CFR 262.11).

II.A.3 Waste Shipped to an Off-Site Facility

Whenever a shipment of hazardous waste is initiated from the Facility, the Permittee must comply with the requirements of 20.4.1.300 NMAC (incorporating 40 C.F.R. Part 262). [20.4.1.500 NMAC (incorporating 40 CFR 264.71(c))]

II.B LAND DISPOSAL PROHIBITIONS

II.B.1 Impermissible Dilution

The Permittee shall not dilute a restricted waste or the residue from treatment of a restricted waste, as a substitute for treatment. Dilution to avoid an applicable treatment standard includes, but is not limited to, the addition of solid waste to reduce a hazardous constituent's concentration, and an ineffective treatment method that does not destroy, remove, or permanently immobilize hazardous constituents. Aggregating or mixing wastes as part of a legitimate treatment process are considered permissible dilution. [20.4.1.800 NMAC (incorporating 40 CFR 268.3)]

II.B.2 Dust Suppression

The Permittee shall not use waste or used oil or any other material, which is contaminated with dioxin, PCB, or any other hazardous waste, other than a waste identified solely on the basis of ignitability, for dust suppression or road treatment. [20.4.1.700 NMAC (incorporating 40 CFR 266.23(b))]

II.C SECURITY

II.C.1 General Security Requirement

To prevent the unknowing entry and to minimize the possibility of unauthorized entry of persons or livestock onto the active portion of the Facility, the Permittee shall comply with

the security provisions and procedures specified in 20.4.1.500 NMAC (incorporating 40 CFR 264.14(b) and (c)).[20.4.1.500 NMAC (incorporating 40 CFR 264.14)].

II.C.2 Security Fence

The Permittee shall install and maintain in good repair a 6-foot high chain link security fence topped with 3 strands of angled barbed wire along the western boundary of Parcel 3 (as depicted in Permit Attachments 2 and 12) and shall install and maintain in good repair a five strand barbed wire fence along any unfenced portion of the northern boundary of Parcel 3. The Permittee shall maintain in good repair the existing five-strand barbed wire fence along the southern and eastern boundaries of Parcel 3 depicted in Permit Attachment 12. The Permittee shall maintain all other existing fencing in Parcel 3. The Permittee shall install the Security Fence within one hundred eighty (180) calendar days of the effective date of this Permit. The Permittee shall submit a Certification of Fence Completion within ninety (90) calendar days after completing the installation of the Security Fence. The Certification must include, at a minimum, a topographic map depicting pertinent geographic and Facility features (e.g., roads, buildings, surrounding property owners), the location of the fence and all access gates.

The Permittee shall confirm the full extent of the Kickout Area pursuant to Permit Section IV. The Permittee shall upgrade the existing barbed wire fence along the southern and eastern boundaries of the Kickout Area, or Parcel 3, to a 6-foot high chain link security fence topped with 3 strands of angled barbed wire no later than 180 days after confirmation of the extent of the Kickout Area pursuant to Section IV. NMED may require the Permittee to expand the security fence if evidence indicates that the Kickout Area extends beyond the security fence. [20.4.1.500 NMAC (incorporating 40 CFR 264.14(b)) and 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(2))]

II.C.3 Warning signs

The Permittee shall post warning signs on all security fences required by this Permit. The warning signs shall be posted at each gate or entrance through the security fences. The warning signs shall be posted in sufficient numbers along each security fence to be visible at all angles from any approach to the fenced area and legible from a distance of no less than 25 feet. The Permittee shall post all required warning signs at intervals not to exceed 100 feet. The warning signs shall be in English, Spanish, Navajo, and Zuni. The warning signs shall have the following legend in the required four languages: "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT". The warning signs shall also have graphic symbols or pictograms that indicate: "WARNING: EXPLOSIVE DANGER". [20.4.1.500 NMAC (incorporating 40 CFR 264.14(c)) and 20.4.1.900 NMAC (incorporating 40 CFR 270.32(b)(1))]

II.C.4 CAMU SECURITY PROCEDURES

The CAMU is subject to the security requirements in Section II.C.1. In addition, the temporary storage at the CAMU described in Section IX.G shall be enclosed by temporary fencing and access shall be restricted to authorized personnel. During periods of time when waste is stored at the temporary storage area, the area shall be secured and inspected daily to prevent unauthorized access. A log of inspections conducted at the CAMU shall be

maintained in an inspection log located at the information repository at Building 1 and shall be made available for inspection by NMED upon request. The Permittee shall maintain documentation of the waste temporarily stored at the CAMU as part of the inspection log prior to treatment and shall notify NMED of any discrepancies in accordance with 20.4.1.700 NMAC incorporating 40 CFR 266.205(v). The documentation shall be maintained in the facility operation record and in the Information Repository required by Permit Section I.K.

II.D GENERAL INSPECTION REQUIREMENTS

The Permittee shall comply with the inspection requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.15 and 264.602).

The Permittee shall inspect each security fence annually and shall inspect any portion of a security fence adjacent to a road on a monthly basis. [20.4.1.500 NMAC (incorporating 40 CFR 264.15)]

The Permittee shall remedy any deterioration or malfunction discovered by an inspection on a schedule that ensures that the problem does not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, the Permittee shall take remedial action immediately. [20.4.1.500 NMAC (incorporating 40 CFR 264.15(c))]

The Permittee shall record inspections in an inspection log or summary and keep these records for at least three years from the date of inspection, except that the Permittee shall keep records relating to CAMU operations and waste military munitions for the life of the Permit. At a minimum, the records shall include the date and time of inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions. [20.4.1.500 NMAC (incorporating 40 CFR 264.15(d))]

All inspection records shall be maintained at the Facility information repository in Building 1 and shall be made available for inspection during normal business hours.

II.E PERSONNEL TRAINING

The Permittee shall comply with personnel training requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.16). The Permittee shall maintain training documents and records for at least three (3) years from the date that the employee last worked at the Facility in accordance with 20.4.1.500 NMAC and 40 CFR 264.16(d) and (e), which is incorporated herein by reference.

The Permittee shall maintain the following documentation at the Facility: a job title for each position and the name of each employee filling each position; a written description for each position including the requisite skill, education, or other qualifications, and duties; and a written description of introductory and continuing training for each person filling each position.

All personnel engaged in WMM handling, transport, or treatment operations shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive

situations. Only trained qualified technician shall conduct treatment operations. Non-UXO trained personnel may be used to perform OB/OD support activities (e.g., soil sampling) when supervised and escorted by a trained-qualified individual.

The training records for the SUXOS and the UXO Quality Control Specialist shall be kept on file in the information repository or otherwise be made available to NMED upon request. In addition the applicable portions of the Department of Defense Explosives Safety Board, Technical Paper 18 shall be available to NMED upon request.

II.F LOCATION STANDARDS

The Facility must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood. [20.4.1.500 NMAC (incorporating 40 CFR 264.18(b))]

II.G IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements for handling ignitable, reactive, and incompatible wastes of 20.4.1.500 NMAC (incorporating 40 CFR 264.17).

WMM shall be transported directly from the eight (8) CE Storage (ECM or igloos) in Explosive Block B prior to treatment at the CAMU. The wastes shall be treated promptly upon transport to and acceptance at the CAMU. [20.4.1.500 NMAC (incorporating 40 CFR 264.552 (e)(4)(iv))] WMM shall be transported directly from the eight (8) CE Storage ECM or igloos in Explosive Block B prior to treatment at the CAMU. Temporary waste storage at the CAMU shall be allowed for no more than ten (10) days of completion of the treatment only in the event of a contingency such as excessive winds or stormy weather as described in Attachment 1 of this Permit.

The Permittee is prohibited against placing liquids in the CAMU, except where placement of such wastes facilitates the treatment for the waste. [20.4.1.500 NMAC (incorporating 40 CFR 264.552 (a)(3))]

II.H PREPAREDNESS AND PREVENTION

II.H.1 Design and Operation of Facility

The Permittee shall design, construct, maintain and operate the Facility and the CAMU to minimize the possibility of a fire, explosion, or any unplanned, sudden or non-sudden release of hazardous waste or constituents to air, soil, ground water, or surface water that could threaten human health or the environment. [20.4.1.500 NMAC (incorporating 40 CFR 264.31)]

The UXO Quality Control Specialist and the SUXOS shall make all determinations with regard to the treatment, storage, transport and classification of UXO discovered at the Facility. The Permittee shall take all necessary precautions with regard to the management of UXO encountered at the Facility and its final disposition to ensure the safety of workers and the public. The Permittee shall ensure that the names, addresses and phone numbers of

the UXO Quality Control Specialist and the SUXOS are maintained at the Facility. The Permittee shall furnish upon request the contact information for the UXO Quality Control Specialist and the SUXOS to NMED.

II.H.2 Required Equipment

At a minimum, the Permittee shall maintain at the Facility the equipment specified in 20.4.1.500 NMAC (incorporating 40 CFR 264.32). Such equipment must include communication and fire suppression equipment in accordance with the requirements of 20.4.1.500 NMAC (incorporating 264.32(a)(b) and (c)).

II.H.3 Testing and Maintenance of Equipment

The Permittee shall test and maintain as necessary the Facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment to assure its proper operation in time of emergency in compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.33).

II.H.4 Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system in compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.34). Personnel shall be equipped with a communication device or have access to a communication device that is integrated with the Emergency Coordinator's communication network.

II.H.5 Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local emergency response organizations in compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.37). The Emergency Response contact list is included in Appendix A of Attachment 15.

The Permittee shall maintain copies and descriptions of the Emergency Coordination Arrangements in the Facility operating record in compliance with Permit Section II.I.1 (Operating Record). [20.4.1.500 NMAC (incorporating 40 CFR 264.37(a))]

Where State or local authorities decline to enter into emergency arrangements, the Permittee shall document the refusal in the operating record in compliance with Permit Section II.I.1 (Operating Record).[20.4.1.500 NMAC (incorporating 40 CFR 264.37(b))]

II.H.6 Emergency Coordinator

An Emergency Coordinator shall be available at all times on the Facility premises or on call and available to respond to an emergency by reaching the Facility within a short period of time in case of an emergency. The Emergency Coordinator shall be thoroughly familiar with all operations and activities at the Facility, the location and characteristics of waste handled, the location of all records within the Facility, and the Facility layout, and shall have the authority to commit the resources needed to respond to an emergency. [20.4.1.500 NMAC (incorporating 40 CFR 264.55)]

II.H.7 Emergency Procedures

In the event of an imminent or actual emergency, the Emergency Coordinator shall immediately activate the internal emergency alarms or communication systems to notify all Facility personnel and notify the appropriate State or local agencies with designated response roles if their help is needed. Whenever there is a release, fire, or explosion, the Emergency Coordinator shall follow the requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.56). During an emergency, the Emergency Coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other portions of the Facility. These measures must include, where applicable, stopping processes and operations, collecting and containing release waste, and removing or isolating containers. Immediately after an emergency, the Emergency Coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the Facility. [20.4.1.500 NMAC (incorporating 40 CFR 264.56)]

II.I RECORD KEEPING AND REPORTING

The Permittee shall maintain in paper form and in an electronic form acceptable to NMED all information and records required to be maintained by this Permit.

II.I.1 Operating Record

The Permittee shall maintain a written Operating Record at the Facility in compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.73). The Permittee shall keep the Operating Record until closure, corrective action and any post-closure care of the Facility has been approved as complete by NMED.

II.I.2 Additional Documents to be Maintained at the Facility

The Permittee shall maintain at the Facility, until the later of completion of final closure, corrective action or any post-closure care, the following documents and all amendments, revisions, and modifications to the following documents:

1. This Permit, including all Attachments, and all approved plans, documents, and other submittals required by this Permit;
2. Personnel training documents and records required by 20.4.1.500 NMAC (incorporating 40 CFR 264.16(d));
3. The names, addresses, and phone numbers of the Emergency Coordinator and all persons designated as Alternate Emergency Coordinator; and a copy of all coordination arrangements required by Permit Section II.H.5 (Arrangements with Local Authorities)

II.I.3 Availability, Retention, and Disposition of Records

The Permittee shall furnish upon request and make available at all reasonable times for inspection by NMED or his designee, the Operating Record and all other records required to be maintained by this Permit. [20.4.1.500 NMAC (incorporating 40 CFR 264.74(a))]

Information and records requested by NMED pursuant to this condition shall be made available for inspection in paper form or in an electronic format or both as NMED may specify.

II.I.4 Biennial Report

The Permittee shall comply with the biennial reporting requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.75).

II.I.5 Personnel and Telephone Number Changes

The Permittee shall inform NMED in writing of changes in its management personnel and telephone numbers within fifteen (15) calendar days of the changes.

III CLOSURE REQUIREMENTS

III.A CLOSURE PLAN FOR THE OB/OD UNIT AND CAMU

The Permittee shall close the OB/OD Unit and CAMU in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.111), and for the CAMU, 40 CFR 264.552(b)(2) and (e)(6), and the NMED-approved OB/OD Unit Closure Plan.

III.A.1 Disposal or Decontamination of Equipment and Structures

The Permittee shall decontaminate or remove and properly dispose of all contaminated equipment and structures at the OB/OD Unit and CAMU. [20.4.1.500 NMAC (incorporating 40 CFR 264.114 264.552(e)(6)(ii), and 264.601)]

III.A.2 Closure Performance Standard

The Permittee shall remove and properly dispose of all hazardous wastes and hazardous waste residues from the OB/OD Unit and CAMU, including but not limited to debris, hazardous waste military munitions, and combustion residues. [20.4.1.500 NMAC (incorporating 40 CFR 264.113, 264.114 and 264.601)]

III.A.3 Removal or Decontamination of Contaminated Soils From the OB/OD Unit

The Permittee shall remove or decontaminate all contaminated soils from the OB/OD Unit and CAMU to meet cleanup levels in accordance with Permit Attachment 7. The Permittee may seek a determination from NMED that removal or decontamination of soils is not practicable using the procedures in Permit Attachment 7, Section 7.7.2. [20.4.1.500 NMAC (incorporating 40 CFR 264.114 and 264.601)]

III.A.4 Soil Characterization and Confirmation Sampling

Following removal of hazardous wastes and hazardous waste residues and removal or decontamination of contaminated soils from the OB/OD Unit and CAMU, the Permittee shall collect characterization and confirmation samples from the limits of the remedial excavations. The Permittee shall submit the soil samples to an analytical laboratory for chemical analysis of volatile organic compounds, semi-volatile organic compounds, metals, explosive compounds, perchlorate, nitrate, cyanide, PCBs, dioxins, furans, and any other hazardous constituents specified by NMED.

The Permittee shall, based upon the results of soil sampling, effect removal or decontamination of any remaining contaminated soils discovered at the OB/OD Unit to meet cleanup levels in accordance with Permit Attachment 7. The Permittee may seek a determination from NMED that removal or decontamination of soils is not practicable using the procedures in Permit Attachment 7, Section 7.7.2. Following removal or decontamination of such soils, the Permittee shall conduct further soil confirmation sampling of the limits of the new remedial excavations. [20.4.1.500 NMAC (incorporating 40 CFR 264.601 and 602)]

III.A.5 Characterization of Areas Not Subject to Initial Removal Actions

The Permittee shall conduct geophysical investigations encompassing the entire OB/OD Unit after the initial removal actions have been completed pursuant to Permit Sections III.A.1, III.A.2, III.A.3, and III.A.4 to evaluate for the presence of any additional treatment or disposal areas or waste military munitions not identified during previous investigation or closure activities. The Permittee shall investigate such areas where evidence of historical activities is detected and remove all remaining hazardous waste and hazardous waste residues. The Permittee shall also make all reasonable efforts to remove or decontaminate all contaminated soils to meet cleanup levels in accordance with Permit Attachment 7. The Permittee shall remove all hazardous waste and hazardous waste residues and, where practicable, remove or decontaminate all contaminated soils determined to have migrated from the OB/OD Unit. The Permittee may seek a determination from NMED that removal or decontamination of soils is not practicable using the procedures in Permit Attachment 7, Section 7.7.2. Following removal and decontamination actions, the Permittee shall verify whether cleanup levels determined in accordance with Permit Attachment 7 have been achieved by collecting soil confirmation samples at intervals approved by NMED. [20.4.1.500 NMAC (incorporating 40 CFR 264.114, 264.601 and 264.602)]

III.A.6 OB/OD Unit Closure Report

Within one hundred eighty (180) calendar days of the completion of removal and decontamination actions under Permit Sections III.A.1, III.A.2, III.A.3, III.A.4, and III.A.5, the Permittee shall submit to NMED a report summarizing the results of removal and decontamination actions and soil sampling conducted at the OB/OD Unit. If soil sampling results indicate that no contaminated soils remain at the OB/OD Unit, the report shall notify NMED of the Permittee's intention to certify closure under Permit Section III.C.3. [20.4.1.500 NMAC (incorporating 40 CFR 264.601 and 602)]

III.B INVESTIGATION AND REMEDY SELECTION

III.B.1 Investigation Work Plan

If soil sampling results indicate that contaminated soils remain at, or have migrated from, the OB/OD unit after removal and decontamination actions conducted under Permit Sections III.A.1, III.A.2, III.A.3, III.A.4, and III.A.5, the Permittee shall submit an investigation work plan to determine the nature and extent of remaining contamination to NMED for review and approval under the procedures in Section VII.L.3. The work plan shall include a schedule for implementation of specific actions and submittal of an investigation report. The work plan shall also include the proposed methods and procedures and rationale for surface and subsurface investigation including, but not limited to, non-intrusive investigation methods (e.g., geophysical surveys), drilling and well installation methods, sample collection methods, field screening procedures, chemical analytical methods, quality assurance/quality control (QA/QC) sampling, management of investigation-derived waste and any other methods and procedures proposed for use during the investigation. The work plan may include consideration of releases from co-located solid waste management units and areas of concern. [20.4.1.500 NMAC (incorporating 40 CFR 264.101, 264.601 and 264.602)]

III.B.2 Investigation Report

The Permittee shall submit an investigation report summarizing the results of the investigation to NMED for review and approval under the procedures in Permit Section VII.L.3. The Report shall include, but not be limited to, background information, a summary of the actual activities conducted, descriptions of the methods and procedures used to conduct the investigation, summaries of the results of all field measurements and laboratory analyses, maps depicting relevant features including investigation locations and the locations of detected contaminants, summary tables of the results of field measurements and chemical analyses, logs and well construction diagrams, summaries of QA/QC data, data quality exceptions, final contract laboratory reports, recommendations for further action and any other information specified by NMED. [20.4.1.500 NMAC (incorporating 40 CFR 264.101, 264.601 and 264.602)]

III.B.3 Remedy Selection Work Plan

Within one hundred eighty (180) calendar days of written notification by NMED, the Permittee shall submit a Remedy Selection Work Plan to NMED for review and approval. The Remedy Selection Work Plan shall include an evaluation of remedial alternatives, including an analysis of whether the remedial alternatives will meet the applicable requirements of 20.4.1.500 NMAC, incorporating 40 CFR 264.601, 264.603, and 264.101, and shall contain adequate information to support a recommended remedy. The Permittee shall initiate a permit modification under 20.4.1.900 NMAC, incorporating 40 CFR 270.42, and 20.4.1.901 NMAC for approval of any selected remedy. [20.4.1.500 NMAC (incorporating 40 CFR 264.603 and 264.101)]

III.B.4 Remedy Completion Report

Within one hundred eighty (180) calendar days of the completion of the remedy selected under Section III.B.3, the Permittee shall submit to NMED a report summarizing the results of the plan implementation. The report shall notify NMED of the Permittee's intention to certify closure under Permit Section III.C.3. [20.4.1.500 NMAC (incorporating 40 CFR 264.601, 264.602, and 264.101)]

III.B.5 Post-Closure Plan

If required by NMED, the Permittee shall submit to NMED, in conjunction with the Remedy Selection Work Plan, a post-closure care plan that meets all of the requirements of 20.4.1.500 NMAC, incorporating 40 CFR 264.114, 264.117, 264.118, 264.119, 264.120, and 264.603. The Post-closure Plan submittal will be considered a Class 3 permit modification.

III.C GENERAL REQUIREMENTS

III.C.1 Time Allowed for Closure Activities

The Permittee shall conduct final closure activities at the OB/OD Unit in accordance with the schedules specified in the NMED-approved Closure Plan or, if necessary, the remedy selected under Permit Section III.B.3.

III.C.2 Amendment to Closure Plans

The Permittee shall amend the NMED-approved Closure Plans required by this Section (III) as required by 20.4.1.500 NMAC (incorporating 40 CFR 264.112(c)), whenever necessary.

III.C.3 Certification of Closure

Within sixty (60) calendar days of the completion of closure of the OB/OD Unit, the Permittee shall submit to NMED a written closure certification, signed by an independent professional engineer registered in New Mexico that the Permittee closed the OB/OD Unit in accordance with the NMED-approved Closure Plans or, if necessary, the remedy selected under Permit Section III.B.3. [20.4.1.500 NMAC (incorporating 40 CFR 264.115)]

III.D CORRECTIVE ACTION MANAGEMENT UNIT CLOSURE

III.D.1 CAMU Closure Plan

The Closure Plan for the CAMU is included in Attachment 9. The CAMU must undergo closure in conjunction with corrective action conducted for SWMU 14. The Permittee shall submit an updated closure plan for the CAMU no less than 180 days, or other time specified by NMED, prior to the completion of corrective action activities at the Facility. The closure plan shall include all proposed activities, methods and procedures necessary to complete closure of the CAMU in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.111, 114 and 552(e)(6)(i) and (ii) and (f)) and Permit Attachment 7. The closure plan shall include a proposed schedule to complete closure of the CAMU and shall comply with the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.42(c)) and this Permit Part (III).

III.D.2 CAMU Closure Report

The Permittee shall submit a CAMU closure report within 180 days, or other time specified by NMED, that summarizes all activities conducted to complete closure of the CAMU and demonstrates compliance with the cleanup requirements of Permit Attachment 7. The Permittee shall submit a certification of closure and survey plat in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.115 and 116) within 90 days of NMED approval of the closure report.

IV ALTERNATIVE REQUIREMENTS FOR THE KICKOUT AREA

IV.A CONFIRMATION OF KICKOUT AREA

The Permittee shall confirm the outer boundary of the Kickout Area by conducting an initial geophysical investigation using GPS-based, best-available technology that is selected based on a site-specific geophysical prove out. The Permittee shall establish the estimated outer boundary by adding at least 275 feet along a radial transect from the furthest detected waste military munitions or waste military munitions scrap. The Permittee shall conduct the delineation of the Kickout Area in accordance with an NMED approved work plan and implementation schedule reviewed and approved under the procedures in Permit Section VII.L.3. The Permittee shall submit the work plan to confirm the extent of the Kickout Area within sixty (60) calendar days of the submittal date of the Community Relations Plan. The work plan shall contain a schedule for implementation and submittal of a confirmation report of the activities conducted under the approved work plan. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

IV.B SURFACE CLEARANCE IN THE KICKOUT AREA

The Permittee shall conduct a surface clearance on the Kickout Area, using best available technology, to remove waste military munitions from the Kickout Area. Surface clearance shall be conducted on all portions of the Kickout Area that are readily accessible by foot without the need for vegetation removal or use of safety equipment on steep slopes. The Permittee shall conduct the geophysical investigations and removals in accordance with a work plan and implementation schedule reviewed and approved under the procedures in Permit Section VII.L.3. The work plan shall propose appropriate methods and technology to conduct a surface clearance of waste military munitions in the Kickout Area. The Permittee shall submit the work plan and implementation schedule for review and approval within ninety (90) calendar days of the submittal date of the Kickout Area Confirmation Report required in Permit Section IV.A. When preparing the Work Plan for clearance, the Permittee shall consult with the Pueblo of Zuni and Navajo Nation according to the provisions of Permit Section VIII.B.1. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

IV.C CLEARANCE OF DESIGNATED AREAS

The Permittee shall conduct a geophysical survey, using best available technology, for waste military munitions in designated access areas for archaeological sites and cultural resources in the Kickout Area. The Permittee shall develop a list of the designated areas in consultation with the Navajo Nation and the Pueblo of Zuni according to the consultation procedures in Permit Section VIII.B.1. The Permittee shall excavate 100% of the detected anomalies and remove all waste military munitions in the designated areas. The Permittee shall conduct the geophysical investigations and removals in accordance with a work plan and implementation schedule reviewed and approved under the procedures in Permit Section VII.L.3. The work plan shall propose appropriate methods and technology to investigate and remove any waste military munitions in the designated areas. The Permittee shall submit the work plan and implementation schedule for review and approval within ninety (90) calendar

days of the submittal date of the Kickout Area Confirmation Report required in Permit Section IV.A. When preparing the Work Plan the Permittee shall consult with the Pueblo of Zuni and the Navajo Nation according to the provisions of Permit Section VIII.B.1. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

IV.D KICKOUT AREA REPORT

Within one hundred eighty (180) calendar days of the completion of the Kickout Area clearance under Permit Sections IV.B and C, the Permittee shall submit to NMED a report summarizing the results of the clearance actions conducted in the Kickout Area. The report shall include a discussion of the adequacy of existing fencing in relation to the extent of the Kickout Area and propose fencing changes or additional clearance as appropriate to ensure protection of public health and safety. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

IV.E ANNUAL INSPECTIONS AND REMOVAL

After initial removal of waste military munitions from the Kickout Area under Permit Sections IV.B and IV.C, the Permittee shall conduct annual inspections of the Kickout Area and remove all observed waste military munitions. The annual inspections shall be conducted on all portions of the Kickout Area, which are readily accessible by foot without the need for significant vegetation removal or use of safety equipment on steep slopes. The Permittee shall conduct these inspections and removals in accordance with an NMED-approved work plan and implementation schedule reviewed and approved under the procedures in Permit Section VII.L.3. The work plan shall propose appropriate methods for inspection and removal that are adequate to discover and remove any waste military munitions visible on the ground surface of the Kickout Area. The Permittee shall submit the work plan and implementation schedule to NMED for review and approval within ninety (90) calendar days of completion of the initial Kickout Area clearance under Permit Section IV.B. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

IV.F TRANSFER OF LANDS WITHIN THE KICKOUT AREA

If the Permittee transfers lands within the Kickout Area to another owner, the Permittee shall conduct additional clearance of the land proposed for transfer. The Permittee shall conduct a geophysical survey, using best available technology, for waste military munitions in the area designated for transfer. The Permittee shall excavate 100% of the detected anomalies and remove all waste military munitions in the designated areas. The Permittee shall conduct the geophysical investigations and removals in accordance with a work plan and implementation schedule reviewed and approved under the procedures in Permit Section VII.L.3. The work plan shall propose appropriate methods and technology to investigate and remove any waste military munitions in the designated area. The Permittee shall submit the work plan and implementation schedule for review and approval at least one hundred eighty (180) days prior to the proposed date of transfer. When preparing the work plan the Permittee shall consult with the Navajo Nation and the Pueblo of Zuni according to the provisions of Permit Section VIII.B.1. The Permittee is not required to conduct additional clearance on portions

of the land that were already cleared as designated areas under Permit Section IV.C.
[20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.110(c))]

V FACILITY-WIDE GROUND WATER MONITORING

V.A INTERIM PLAN

The Permittee shall implement an NMED-approved Interim Facility-Wide Ground Water Monitoring Plan (Interim Plan). The Interim Plan shall provide for interim ground water monitoring for the entire Facility, and off site, if necessary, prior to implementation of long-term monitoring pursuant to Section V.B. All ground water monitoring and sampling implemented pursuant to this Permit shall begin after the Interim Plan that has been approved by NMED. When preparing the Interim Plan, the Permittee shall consult with the Pueblo of Zuni and the Navajo Nation according to the provisions of Permit Section VIII.B.1. [20.4.1.500 NMAC (incorporating 40 CFR 264.101)]

V.A.1 Ground Water Monitoring and Sampling

The Interim Plan shall, at a minimum, propose the following: locations and frequency of monitoring and sampling of existing wells, the start date for the initial monitoring and sampling event, the methods for collecting field measurements, the parameters and methods for field water quality and laboratory chemical analyses, sample collection methods, quality assurance/quality control sampling, methods for management of investigation derived waste and any other ground water monitoring or sampling method or procedure required by NMED. The Permittee shall use valid data from previous ground water monitoring and sampling at the Facility to develop the Interim Plan. [20.4.1.500 NMAC (incorporating 40 CFR 264.101 and 264.552)]]

The CAMU will not be subject to groundwater monitoring requirements in 20.4.1.500 NMAC (incorporating 40 CFR 552(e)(5)) if all wastes placed into the CAMU have constituent levels at or below remedial levels or goals applicable to the CAMU, in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.552(g)).

V.A.2 Monitoring Reports

The format for periodic monitoring reports shall follow the format included in NMED's General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites. The submittal date for of the initial periodic monitoring report and the frequency of submittal of subsequent periodic monitoring reports shall be proposed in the plan. [20.4.1.500 NMAC (incorporating 40 CFR 264.101)]

V.A.3 Initial Submission of the Interim Plan

The Permittee shall submit an Interim Plan that meets all requirements of this Section to NMED within ninety (90) calendar days of the submittal date of the Community Relations Plan. NMED shall review and approve the Interim Plan under the procedures in Permit Section VII.L.3. [20.4.1.500 NMAC (incorporating 40 CFR 264.101)]

V.A.4 Annual Revision to the Interim Plan

The Permittee shall revise and update the Interim Plan annually to propose changes to the monitoring plan (e.g., to include monitoring wells installed pursuant to Sections VI and VII; to remove wells not providing valid data; to evaluate new off-site wells that have the

potential to be impacted; to make any other appropriate changes). Within ninety (90) calendar days after each anniversary of the effective date of this Permit (with the exception of the first anniversary), the Permittee shall submit a revised and updated Interim Plan to NMED for review and approval. NMED will review the revised Interim Plan under the procedures in Permit Section VII.L.3 [20.4.1.500 NMAC (incorporating 40 CFR 264.101)]. When reviewing and revising the Interim Plan, the Permittee shall consult with the Navajo Nation and Pueblo of Zuni in accordance with the provisions of Permit Section VIII.B.1.

V.B LONG-TERM PLAN

Within one hundred eighty (180) calendar days after completing the installation of all additional monitoring wells pursuant to Permit Sections VI and VII the Permittee shall submit to NMED for review and approval a long-term Facility-wide ground water monitoring plan (Long-term Plan). The Long-term Plan shall meet all requirements for the Interim Plan and shall provide for ground water monitoring for the entire Facility until the end of ground water monitoring pursuant to Section VII or ground water monitoring pursuant to Section VI. The Long-term Plan shall be submitted and reviewed as a Class 3 permit modification. Upon NMED approval, the Long-term Plan shall supersede the requirements of the Interim Plan. [20.4.1.500 NMAC (incorporating 40 CFR 264.101)]

VI GROUND WATER INVESTIGATION AND GROUND WATER CORRECTIVE ACTION FOR THE OB/OD UNIT

VI.A GROUND WATER INVESTIGATION

VI.A.1 Ground Water Investigation Work Plan

Within ninety (90) calendar days of completion of removal and decontamination actions under Permit Section III.A., the Permittee shall submit a Ground Water Investigation Work Plan to NMED to characterize releases of hazardous wastes and hazardous constituents from the OB/OD Unit to ground water and surface water. The Work Plan shall include, at a minimum, descriptions of: non-intrusive investigation methods (e.g., geophysical surveys), drilling and well installation methods, sample collection methods, field screening procedures, chemical analytical methods, QA/QC procedures, schedules, management of investigation derived waste and any other methods and procedures proposed for use during the investigation. The work plan may include consideration of releases from co-located solid waste management units and areas of concern. NMED will review and approve the Work Plan under the procedures in Permit Section VII.L.3. [20.4.1.900 NMAC (incorporating 40 CFR 270.14(c)(2), 270.14(c)(4), and 270.28) and 20.4.1.500 NMAC (incorporating 40 CFR 264.602)]

VI.A.1.a Monitoring Wells

The Permittee shall install monitoring wells to characterize any hazardous waste or hazardous constituents released into the ground water from the OB/OD Unit, including concentrations and any other necessary information. The monitoring wells shall meet the requirements of 20.4.1.500 NMAC, incorporating 40 CFR 264.97, and shall be located and designed to immediately detect releases of hazardous constituents from the OB/OD Unit. [20.4.1.900 NMAC (incorporating 40 CFR 270.14(c)(2), 270.14(c)(4), and 270.28) and 20.4.1.500 NMAC (incorporating 40 CFR 264.602)]

VI.A.1.b Characterization of Releases

The Permittee shall characterize the nature, rate, and extent of all releases of hazardous waste and hazardous constituents into the ground water and surface water from the OB/OD Unit. [20.4.1.900 NMAC (incorporating 40 CFR 270.14(c)(2), 270.14(c)(4), and 270.28) and 20.4.1.500 NMAC (incorporating 40 CFR 264.602)]

VI.A.1.c Characterization of Hydrogeology

The Permittee shall characterize site hydrogeology, aquifer properties and the properties of associated confining hydrostratigraphic units. [20.4.1.900 NMAC (incorporating 40 CFR 270.14(c)(2), 270.14(c)(4), and 270.28) and 20.4.1.500 NMAC (incorporating 40 CFR 264.602)]

VI.A.2 Ground Water Investigation Report

Within one hundred eighty (180) calendar days after completion of the ground water investigation field activities, the Permittee shall submit to NMED a ground water investigation report summarizing the results of the investigation. The Report shall include,

but not be limited to, background information, a summary of the actual activities conducted, descriptions of the methods and procedures used to conduct the investigation, summaries of the results of all field measurements and laboratory analyses, maps depicting relevant features, investigation locations and locations of detected contaminants, summary tables of the results of field measurements and chemical analyses, boring logs and well construction diagrams, QA/QC data, summaries of data quality exceptions, final contract laboratory reports, proposed corrective actions, and any other information specified by the NMED. NMED shall review and approve the report under the procedures in Permit Section VII.L.3. [20.4.1.500 NMAC (incorporating 40 CFR 264.101, 264.601 and 264.602)]

VI.B GROUND WATER CORRECTIVE ACTION PROGRAM

Within ninety (90) calendar days of NMED approval of the Ground Water Investigation Report, the Permittee shall submit to NMED a Ground Water Corrective Action Program Plan. The Ground Water Corrective Action Program shall include, at a minimum, methods for remediation of releases of hazardous waste and hazardous constituents to ground water, methods to control releases and migration of hazardous constituents in ground water, additional well installation and remediation system methods, sample collection methods, field screening procedures, chemical analytical methods, schedules, management of investigation derived waste, QA/QC procedures, aquifer and remediation system pilot testing methods, the locations and frequency of ground water monitoring and any other methods and procedures proposed for use during the corrective action program. The Permittee shall initiate a Class 3 permit modification under 20.4.1.900 NMAC (incorporating 40 CFR 270.42) and 20.4.1.901 NMAC for approval of the Ground Water Corrective Action Program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100)]

VI.B.1 Well locations, installation, and construction

The Permittee shall install and maintain a ground water monitoring system associated with the OB/OD Unit. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(d))]

VI.B.1.a Well Locations

The Permittee shall install and maintain ground water monitoring wells at the locations specified in the NMED-approved Ground Water Corrective Action Program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(a)(3) and (d))]

VI.B.1.b Construction and Maintenance of Wells

The Permittee shall construct and maintain all monitoring wells in accordance with plans and specifications presented in the NMED-approved Ground Water Corrective Action Program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(d))]. The plans and specifications shall meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.97 (a) through (f)).

VI.B.1.c Abandoned Wells

The Permittee shall plug and abandon all wells removed from the monitoring program using methods approved, in writing, by NMED.

VI.B.2 Cleanup Levels (Ground Water Protection Standard)

VI.B.2.a Hazardous Waste and Hazardous Constituents

The Permittee shall achieve the cleanup levels in Permit Attachment 7 for the following hazardous waste and hazardous constituents: RDX; perchlorate, 2,4-dinitrotoluene; 4-amino-2,6-dinitrotoluene; 2-amino-4,6-dinitrotoluene; cadmium; chromium; selenium; lead; and any additional hazardous waste or hazardous constituent discovered under Permit Section VI.B.6.a.

VI.B.2.b Point of Compliance

The point of compliance shall be at all points in ground water. The Permittee may seek a variance or determination of impracticability of obtaining cleanup levels in ground water according to the provisions of Permit Attachment 7, Section 7.7, and modify this permit as necessary to provide for any post closure care. [20.4.1.500 NMAC (incorporating 40 CFR 264.100, 264.101, and 264.603)]

VI.B.2.c Compliance Period

The Permittee shall monitor for the hazardous waste and hazardous constituents as specified in Permit Section VI.B.2.a during the compliance period. The compliance period shall be the number of years equal to the active life of the OB/OD Unit including any waste management activity prior to permitting and the closure period. NMED shall calculate the compliance period when closure of the OB/OD Unit is certified. [20.4.1.500 NMAC (incorporating 40 CFR 264.96(a) and 40 CFR 264.100(f))]

VI.B.3 Corrective Action

VI.B.3.a Implementation of Corrective Action

The Permittee shall implement corrective action in accordance with the schedule specified in the NMED-approved Ground Water Corrective Action Program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(c))]

VI.B.3.b Prevention of Exceedances

The Permittee shall conduct corrective action to prevent hazardous waste and hazardous constituents released from the OB/OD Unit from exceeding their respective cleanup levels by removing the hazardous waste and hazardous constituents or by treating them in place. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(b))]

VI.B.3.c Remediation of Exceedances

The Permittee shall conduct corrective action to remove or treat in place any hazardous waste or hazardous constituents released from the OB/OD Unit that exceed cleanup levels, including hazardous waste or hazardous constituents beyond the Facility boundary where necessary to protect human health and the environment. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(e)(1) and (2))]

VI.B.3.d Duration of Corrective Action

The Permittee shall continue corrective action during the compliance period or longer, if necessary, to ensure that the cleanup levels are not exceeded. If a cleanup level is exceeded during the compliance period, the Permittee shall continue corrective action until the cleanup level has not been exceeded for at least three (3) consecutive years. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(f))]

VI.B.4 Sampling and Analysis Procedures

The Permittee shall collect, preserve, ship (if applicable), analyze, and track and control all samples taken from monitoring wells in accordance with NMED-approved sampling and analysis procedures.

VI.B.5 Ground Water Surface Elevation

VI.B.5.a Periodic Elevation Determinations

The Permittee shall determine the ground water potentiometric surface elevation, relative to mean sea level, at each well each time ground water is sampled to an accuracy of 0.01 foot. [20.4.1.500 NMAC (incorporating 40 CFR 264.97(f))]

VI.B.5.b Reporting of Elevation at Installation

The Permittee shall survey the elevation of the top of the well casing above mean sea level of each newly installed monitoring well to an accuracy of 0.01 foot and the horizontal location of each newly installed monitoring well to an accuracy of 0.1 foot within thirty (30) calendar days after well installation.

VI.B.6 Ground Water Monitoring and Data Evaluation

The Permittee shall establish and implement ground water monitoring to demonstrate the effectiveness of corrective action. Ground water monitoring shall meet the requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.97) and shall be effective as the program for compliance monitoring under 20.4.1.500 NMAC (incorporating 40 CFR 264.99 and 264.100 (d)).

VI.B.6.a Monitoring of Hazardous Constituents

The Permittee shall determine the concentration of hazardous waste and hazardous constituents specified in Permit Section I.H throughout the compliance period and any extensions due to corrective action implementation to demonstrate compliance with the cleanup levels. The Permittee shall determine the concentration of such hazardous waste and hazardous constituents in ground water at each monitoring well at the frequency specified in the NMED-approved ground water monitoring plan. [20.4.1.500 NMAC (incorporating 40 CFR 264.96 and 264.100(d))]

The Permittee shall analyze samples at each monitoring well for additional hazardous waste and hazardous constituents (i.e., not specified in Permit Section VI.B.2.a) at the frequency specified in the NMED-approved Ground Water Corrective Action Program to determine if additional hazardous waste or hazardous constituents are present in ground water. If the

Permittee finds that additional hazardous waste or hazardous constituents are present, their concentrations shall be reported to NMED in writing within seven (7) calendar days from receipt of the results of analysis. The Permittee shall conduct corrective action for additional hazardous waste or hazardous constituents that exceed respective cleanup levels in accordance with this Section. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(d))]

VI.B.6.b Monitoring of Ground Water Flow Rate and Direction

The Permittee shall determine the ground water flow rate and direction in the uppermost aquifer and any other aquifer being monitored during each sampling event. [20.4.1.500 NMAC (incorporating 40 CFR 264.98(e))]

VI.B.7 Recordkeeping and Reporting

VI.B.7.a Recordkeeping

The Permittee shall enter all monitoring, testing and analytical data obtained during ground water corrective action in the operating record. [20.4.1.500 NMAC (incorporating 40 CFR 264.73(b)(6))]

VI.B.7.b Reporting

The Permittee shall report to NMED in writing the results of all ground water monitoring and sampling conducted under this Section. The Permittee shall submit these reports within ninety (90) calendar days of completion of the field activities conducted during the associated periodic monitoring event, unless another time period is specified by NMED.

VI.B.8 Request for Permit Modification

If the Permittee determines that the Ground Water Corrective Action Program no longer satisfies the requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.100) the Permittee shall, within ninety (90) calendar days, submit an application for a permit modification to make any appropriate changes to the program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(h))]

If the requirements of this Section (VI) are met, the Permittee shall, within ninety (90) calendar days, submit an application for a permit modification to implement a ground water compliance monitoring program. [20.4.1.500 NMAC (incorporating 40 CFR 264.100(h))]

VII CORRECTIVE ACTION FOR SWMUS AND AOCs

VII.A APPLICABILITY

The conditions of this Section apply to all Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified in Permit Attachment 8, any newly identified SWMUs and AOCs, and any releases of hazardous waste or hazardous constituents from SWMUs and AOCs.

VII.B CONTAMINATION BEYOND THE FACILITY BOUNDARY

The Permittee shall implement corrective action beyond the Facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of NMED that, despite the Permittee's best efforts, as determined by the NMED, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to cleanup a release that has migrated beyond the Facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. [20.4.1.500 NMAC (incorporating 40 CFR 264.101(c))]

VII.C CORRECTIVE ACTION ALREADY COMPLETED

Any corrective action tasks required under this Section that Permittee has already completed may be used to meet the requirements of this Section, in whole or in part, as determined by NMED. The Permittee may submit prior work to meet these requirements for NMED's approval.

VII.D NOTIFICATION AND ASSESSMENT FOR NEWLY IDENTIFIED SWMUS AND AOCs

The Permittee shall notify NMED in writing, within fifteen (15) calendar days of discovery, of any newly discovered SWMU or AOC. The notification shall include, at a minimum, the location of the newly discovered SWMU or AOC and all available information pertaining to the site history and nature of the release (e.g., media affected, hazardous waste or hazardous constituents released, magnitude of release). NMED may require the Permittee to submit a Release Assessment Report in accordance with Permit Section VII.F.1 to determine the status of the newly discovered SWMU or AOC. Alternatively, NMED may require a RFI for the newly discovered SWMU or AOC in accordance with Permit Section VII.H without requiring a Release Assessment. If NMED determines that a RFI for a newly discovered SWMU or AOC is required, the Permittee shall modify this Permit to add the SWMU or AOC to Permit Attachment 8 in accordance with 20.4.1.900 NMAC (incorporating 40 CFR 270.42).

If the Permittee conducts an explosives or munitions emergency response at the Facility, or beyond the Facility boundary, in response to a waste military munition released from the Facility, the Permittee shall treat that response location as a newly discovered AOC, unless the response is conducted within the boundaries of an existing AOC, SWMU, the Kickout Area, or the OB/OD Unit.

VII.E NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SMWUS OR AOCs

The Permittee shall notify NMED in writing, within fifteen (15) calendar days of discovery, of any newly discovered release(s) of hazardous waste or hazardous constituents from a SWMU or AOC that explains the location and circumstances of the release.

If NMED determines that investigation of the release is needed, the Permittee shall prepare and submit a RFI Work Plan in accordance with Permit Section VII.H.

VII.F RELEASE ASSESSMENT

VII.F.1 Release Assessment Report

The Permittee shall prepare and submit to NMED a Release Assessment Report, in conjunction with the associated Parcel RFI Work Plan submittal, for each AOC listed in Permit Attachment 8. If required by NMED, the Permittee shall submit a Release Assessment Report for newly discovered SWMUs or AOCs under Permit Section VII.D. Any revisions to the Release Assessment Report required by NMED shall be submitted within thirty (30) calendar days of receipt of NMED's comments on the Release Assessment Report.

The Release Assessment Report shall, at a minimum, include the following information:

1. Location of unit(s) on a topographic map of appropriate scale such as required under 20.4.1.900 NMAC (incorporating 40 CFR 270.14(b)(19));
2. Designation of type and function of unit(s);
3. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);
4. Dates that the unit(s) was operated;
5. All available site history information;
6. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous waste or hazardous constituents in the wastes; and
7. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include ground water data, soil analyses, air, and surface water data).

VII.F.2 Requirement to Proceed

NMED will review the Release Assessment Report to determine whether any further investigative action is required. NMED shall notify the Permittee of the need for confirmatory sampling if necessary, or notify the Permittee of the need for a RFI in

accordance with the requirements in Permit Section VII.H. NMED shall notify the Permittee of any corrective action complete decision.

VII.G INTERIM MEASURES

VII.G.1 NMED-Initiated Interim measures

Upon written notification by NMED, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan in accordance with Permit Attachment 3 (Interim Measures Implementation Scope Of Work) at any SWMU or AOC where NMED determines that interim measures are necessary to minimize or prevent the migration of hazardous waste or hazardous constituents and limit actual or potential human and environmental exposure to hazardous waste or hazardous constituents while long term corrective action remedies are evaluated and implemented. The Permittee shall submit its IM Work Plan to NMED within thirty (30) calendar days of NMED's notification, unless another time period is specified by the NMED. Such interim measures may be conducted concurrently with any required corrective action.

VII.G.2 Required Interim Measures

The Permittee shall prepare and submit an IM Work Plan in accordance with Permit Attachment 3 for each of the below-listed interim measures. The Permittee shall consult with the Pueblo of Zuni and the Navajo Nation according to the provisions of Permit Section VIII.B.1 prior to submittal of IM Work Plans.

VII.G.2.a Sampling of Offsite Water Supply Wells

The Permittee shall sample offsite water supply wells as identified in Permit Attachment 13 to ensure that the public is not using contaminated ground water released from the Facility. The Permittee shall submit an Interim Measures Work Plan for off-site water supply well sampling to NMED within ninety (90) calendar days of the submittal date of the Community Relations Plan. The Permittee's Interim Measures Work Plan shall include detailed well information including the following: well identification numbers, location (provided on a map and including New Mexico State Coordinate System coordinates, owner name and phone number, any well boring logs and well construction diagrams, depths to water, dates of measurement, and type of well (e.g., domestic supply well, municipal supply well, monitoring well, irrigation well, etc.). All information in the Work Plan shall be accompanied by appropriate references identifying the specific source document and specific location of the referenced information (e.g., page numbers).

VII.G.2.b Cleanup of Kickout Beyond the Facility Boundary

If the Permittee is notified of a planned change in land use of off-facility lands that are located within the Kickout Area, the Permittee shall conduct an interim measure to remove waste military munitions from the affected lands as follows: the Permittee shall remove all waste military munitions released to the Kickout Area beyond the Facility boundary by conducting a geophysical investigation, using best available technology, to detect and remove waste military munitions at a depth consistent with the proposed land use. The Permittee shall submit a work plan, within 60 days of notification of a planned land use

change, to remove all waste military munitions released beyond the Facility boundary within the area designated by the neighboring jurisdiction. The plan shall contain provisions for identifying the extent of, and removing, waste military munitions released beyond the Facility boundary and a schedule for implementation. The Permittee shall consult with affected parties in accordance with the consultation provisions in Permit Section VIII.B.1.

VII.G.3 Permittee-initiated Interim Measures

The Permittee may initiate interim measures at a SWMU or AOC by notifying NMED, in writing, at least thirty (30) calendar days prior to beginning the Interim Measures. NMED will approve the Permittee-initiated IM, conditionally approve the IM, or require submittal of an IM work plan for NMED approval prior to implementation of the Interim Measure.

VII.G.4 Emergency Interim Measures

The Permittee may determine, during implementation of site investigation activities, that emergency interim measures are necessary to address an immediate threat of harm to human health or the environment. The Permittee shall notify the NMED within one business day of discovery of the facts giving rise to the threat, and shall propose emergency interim measures to address the threat. If the NMED approves the emergency interim measures in writing, the Permittee may implement the proposed emergency interim measures without submitting an interim measures work plan. If circumstances arise resulting in an immediate threat to human health or the environment such that initiation of emergency interim measures are necessary prior to obtaining written approval from the NMED, the Permittee shall notify the NMED within one business day of taking the emergency interim measure. The notification shall contain a description of the emergency situation, the types and quantities of contaminants involved, the emergency interim measures taken, and contact information for the emergency coordinator who handled the situation. The notification shall also include a written statement justifying the need to take the emergency action without prior written approval from the NMED. This requirement shall not be construed to conflict with 20.4.1.500 NMAC (incorporating 40 CFR 264.1(g)(8)) or 20.4.1.900 NMAC (incorporating 40 CFR 270.61).

VII.G.5 IM Work Plan Requirements

The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with, and integrated into, any final corrective measures at the Facility. The IM Work Plan shall include the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

VII.G.6 Interim Measures Implementation

VII.G.6.a Implementation and Completion of Approved IM Work Plan

The Permittee shall implement interim measures required under Permit Section VII.G. in accordance with the NMED-approved IM Work Plan. The Permittee shall complete interim measures within one hundred eighty (180) calendar days of the start of implementation of the interim measure. The Permittee may submit a written request to the NMED to extend the

period for implementation of the interim measure. The request must provide justification for the extension and a proposed schedule for completion of the interim measure. The NMED will notify the Permittee, in writing, of the approval or disapproval of the request within thirty (30) calendar days of receipt of the IM implementation extension request.

VII.G.6.b Notification of changes

The Permittee shall give notice to NMED as soon as possible of any planned changes, reductions or additions to the IM Work Plan required by NMED under Permit Section VII.G.1 or initiated by the Permittee in accordance with Permit Section VII.G.3.

VII.G.7 Interim Measures Reports

The Permittee shall submit to NMED for review and approval, within ninety (90) calendar days of completion of interim measures, an Interim Measures (IM) Report for each SWMU or AOC. The IM Report shall contain, at a minimum, the following information:

1. A description of interim measures implemented;
2. Summaries of results;
3. Summaries of all problems encountered;
4. Summaries of accomplishments and/or effectiveness of interim measures; and,
5. Copies of all relevant laboratory/monitoring data, etc.

VII.H RCRA FACILITY INVESTIGATION

VII.H.1 RFI Work Plan

VII.H.1.a RFI work plan submittal

The Permittee shall submit to NMED RCRA Facility Investigation (“RFI”) Work Plans for the SWMUs and AOCs identified in Permit Attachment 8 in accordance with the schedule set forth in Table VII.2. The Permittee shall consult with the Navajo Nation and the Pueblo of Zuni regarding RFI Work Plans pursuant to Permit Section VIII.B.1.

The Permittee shall submit RFI Work Plans for those SWMUs and AOCs requiring further investigation under Permit Section VII.F.2 within ninety (90) calendar days of notification by NMED.

VII.H.1.b RCRA Facility investigation work plan requirements

The RFI Work Plan shall meet the requirements specified in Permit Attachment 4 (RCRA Facility Investigation Scope of Work). The RFI Work Plan shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and ground water. The Permittee shall provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a

unit or a media/pathway associated with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in the RFI Work Plan. Such deletions of a unit, medium, or pathway from the RFI(s) are subject to the approval of NMED. The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements specified in Permit Attachment 4. Such omissions or deviations are subject to the approval of NMED. In addition, the RFI Work Plan shall include all investigations necessary to ensure compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.101(c)).

VII.H.2 RCRA Facility Investigation Implementation

The Permittee shall implement the RFIs in accordance with the NMED-approved RFI Work Plans. The Permittee shall notify NMED at least thirty (30) calendar days prior to any permit- or corrective action-related field activity (e.g., drilling, sampling).

VII.H.3 RCRA Facility Investigation Reports

VII.H.3.a RCRA Facility investigation report

The Permittee shall prepare and submit to NMED RFI Reports for the investigations conducted in accordance with RFI Work Plans submitted under Permit Section VII.H.1. The Permittee shall submit the RFI Reports to NMED for review and approval in accordance with the schedules in its approved RFI Work Plans.

The RFI Reports shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and extent of contamination at each SWMU and AOC investigated, including sources and migration pathways, identify all hazardous waste or constituents present in all media, and describe actual or potential receptors. The RFI Report shall also describe the extent of contamination (qualitative and quantitative) in relation to background levels of the area. If the RFI Report concludes that further work is necessary, the report shall include a schedule for submission of a work plan for the next phase of investigation.

VII.H.3.b Cleanup levels

The RFI Reports shall identify the applicable cleanup levels in accordance with Permit Attachment 7 (Cleanup Levels) for each hazardous waste or hazardous constituent found at each SWMU and AOC. The Permittee shall propose in the RFI Report appropriate cleanup levels for those hazardous wastes or hazardous constituents without established cleanup levels based upon human and ecological risk.

VII.H.3.c Requirement to proceed

Based upon NMED's review of the RFI Report, NMED will notify the Permittee of the need for further investigative action, if necessary, and inform the Permittee, if not already notified, of the need for a Corrective Measures Study. NMED will notify the Permittee if corrective action is complete. If NMED determines that further investigation is necessary, NMED will require the Permittee to submit a work plan for approval that includes a proposed schedule for additional investigation(s).

VII.I CORRECTIVE MEASURES STUDY

VII.I.1 Corrective Measures Study Work Plan

VII.I.1.a Submittal of corrective measures study work plan

The Permittee shall submit a Corrective Measures Study (CMS) Work Plan within ninety (90) calendar days of notification by the NMED that such a Work Plan is required, unless another time period is specified by the NMED. The Permittee shall consult with the Pueblo of Zuni and the Navajo Nation regarding CMS Work Plans pursuant to Permit Section VIII.B.1.

VII.I.1.b Corrective measures study work plan requirements

The CMS Work Plan shall meet the requirements of Permit Attachment 5 (Corrective Measures Study Scope of Work). The CMS Work Plan shall include schedules of implementation and completion of specific actions necessary to complete a CMS. The scope of the CMS Work Plan shall include all investigations necessary to ensure compliance with 20.4.1.500 NMAC (incorporating 40 CFR 264.101).

VII.I.2 Corrective measures study implementation

The Permittee shall implement the NMED-approved CMS in accordance with the CMS Work Plan, if a CMS Work Plan is required by NMED.

VII.I.3 Corrective Measure Study Reports

VII.I.3.a Corrective measures study report

NMED may require the Permittee to submit a CMS Report as part of remedy selection. The Permittee shall submit a CMS Report to the NMED for review and approval in accordance with the schedule specified in the approved CMS Work Plan or as otherwise required by NMED. The CMS Report shall present all information gathered under the approved CMS Work Plan. The CMS Report must contain adequate information to support the recommended remedy. The CMS Report shall summarize any bench scale or pilot tests conducted. The CMS Report shall include an evaluation of each remedial alternative. If a remedial alternative requires the use of a Corrective Action Management Unit (CAMU), the CMS report shall include all information necessary to establish and operate the CAMU.

VII.I.3.b Requirement to evaluate additional remedies

NMED may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

VII.I.3.c Remedy Selection And Permit Modification

NMED shall select a remedy based, at a minimum, upon protection of human health and the environment, specific site conditions, and existing regulations. The selected remedy may include any interim measures implemented to date. The Permittee shall initiate a permit modification after selection of a remedy in accordance with 20.4.1.900 NMAC

(incorporating 40 CFR 270.42) and 20.4.1.901 NMAC to incorporate the remedy into this Permit.

VII.J CORRECTIVE MEASURES IMPLEMENTATION (CMI)

VII.J.1 Submittal of Corrective Measures Implementation Program Documents

The Permittee shall submit a Corrective Measures Implementation Work Plan within ninety (90) calendar days after approval of the permit modification for the remedy, unless another time period is specified by the NMED. The Permittee shall consult with the Navajo Nation and the Pueblo of Zuni regarding CMI Work Plans pursuant to Permit Section VIII.B.1. The Corrective Measures Implementation Work Plan shall include the conceptual design, an operation and maintenance plan, plans and specifications, construction plans and a schedule for implementation in accordance with Permit Attachment 5 (Corrective Measures Implementation (CMI) Scope Of Work).

VII.J.2 Implementation of Corrective Measures

The Permittee shall implement corrective measures in accordance with the NMED-approved CMI Work Plan and the schedule specified therein.

VII.J.3 Corrective Measures Implementation Reports

VII.J.3.a Quarterly Progress Reports

The Permittee shall, at a minimum, submit to NMED signed quarterly progress reports during implementation of corrective measures. NMED may adjust the frequency of progress reporting to address site-specific needs. Progress reports shall, at a minimum, include the following elements:

1. A description of significant activities (e.g., sampling events, inspections, etc.) and work completed/work accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of hazardous waste or constituents in treated and/or excavated volumes, nature and volume of wastes generated, etc.) during the reporting period;
2. Summary of system effectiveness. Provide a comparison of system operation to predicted performance levels (applicable only during operation of the corrective measure);
3. Summaries of all findings (including any inspection results);
4. Summaries of all contacts with representatives of the local community, public interest groups, and State government, etc., during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken and/or planned to rectify problems;

7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and,
9. If requested by NMED, the results of any sampling tests and/or other data generated during the reporting period.

VII.J.3.b Construction Completion Report

The Permittee shall submit to NMED a Construction Completion Report that documents how the completed project is consistent with the Plans and Specifications. The Construction Completion Report shall be submitted to NMED when the construction and any operational tests have been completed. The Construction Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was constructed in accordance with the Plans and Specifications;
2. Explanation and description of any modifications to the Plans and Specifications and why these were necessary for the project;
3. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;
4. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;
5. Summary of any inspection findings (include copies of key inspection documents in appendices);
6. As built drawings and/or photographs; and
7. Schedule indicating when any treatment systems shall begin full scale operations.

VII.J.3.c Corrective Measure Completion Report

The Permittee shall submit to NMED a Corrective Measure Completion Report when the Permittee believes that the corrective measure completion criteria have been satisfied. The Corrective Measure Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;
2. Corrective Measure Completion Criteria: Describe the process and criteria for determining when corrective measures, maintenance, and monitoring may cease. Corrective measure completion criteria were specified in the Operation and Maintenance (O&M) Plan;
3. Demonstration that the completion criteria have been met. Include results of testing and/or monitoring, indicating how operation of the corrective measure compares to the completion criteria;

4. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation, total treated and/or excavated volumes, nature and volume of wastes generated, site restoration activities, etc.);
5. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed; and
6. Summary of inspection findings (include copies of key inspection documents in appendices).

VII.K WORK PLAN AMENDMENTS

If the Permittee or NMED determines at any time that any RFI Work Plan, IM Work Plan, CMS Work Plan, or CMI Work Plan no longer satisfies the requirements of 20.4.1.500 NMAC (incorporating 40 CFR 264.101) or this Permit for prior or continuing releases of hazardous waste or hazardous constituents from a SWMU or AOC, the Permittee shall submit an amended Plan to NMED within ninety (90) calendar days of such determination. The Permittee shall consult with the Pueblo of Zuni and the Navajo Nation regarding work plan amendments pursuant to Permit Section VIII.B.1.

VII.L SUBMITTALS

VII.L.1 Submittal of Work Plans and Schedules

The Permittee shall submit all work plans and schedules required under this Section to NMED for review and approval prior to implementation.

VII.L.2 Schedule for Submittal of Work Plans and Reports

The Permittee shall submit all required plans and reports to NMED for review and approval in accordance with the schedules included in this Permit. NMED may grant extensions of the due date for submittals based on the Permittee's demonstration that sufficient justification for the extension exists.

VII.L.3 Approval/Disapproval of Submittals

NMED will review work plans, reports, schedules, and other documents ("submittals") submitted by the Permittee for review and approval under this Section. Upon completing review, the Secretary will send the Permittee a written notice of approval, approval with conditions, or disapproval of the submittal. If the Secretary disapproves a submittal, the Secretary will notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal. If the Secretary approves the submittal with conditions, the Secretary will notify the Permittee in writing of the condition(s) and the reasons for the imposition of such condition(s), and specify a due date for completion of the required actions.

VII.L.4 Incorporation of Approved Work Plans and Schedules

All submittals required by this Section are, upon approval by the Secretary, incorporated into this Permit and become an enforceable part of this Permit. Failure to submit any of the

required items, the submission of inadequate or insufficient information, or failure to comply with the approved work plans or schedules may subject the Permittee to enforcement action.

VII.M DISPUTE RESOLUTION

In the event the Permittee disagrees, in whole or in part, with a condition or disapproval of any submittal, the Permittee may seek dispute resolution.

VII.M.1 Notice to NMED

To invoke dispute resolution, the Permittee shall notify NMED in writing within thirty (30) calendar days of receipt of the Secretary's approval of a submittal with conditions or disapproval of a submittal. Such notice shall set forth the specific matters in dispute, the position the Permittee asserts should be adopted, the basis for the Permittee's position, and any matters considered necessary for the Secretary's determination.

VII.M.2 Agreement or Disagreement Between the Parties

NMED and the Permittee shall have thirty (30) calendar days from NMED's receipt of notification provided under Permit Section VII.M.1 to meet or confer to resolve any disagreement.

In the event an agreement is reached, the Permittee shall comply with the terms of such agreement or, if appropriate, submit a revised submittal and implement the same in accordance with, and within the time frame specified in, such agreement.

VII.M.3 Final Decision of the Secretary

If agreement is not reached within the thirty (30) calendar day period, the Secretary will notify the Permittee in writing of its decision on the dispute, and the Permittee shall comply with the terms and conditions of the decision. Such decision shall be the final resolution of the dispute and shall be incorporated as an enforceable part of this Permit. The Permittee shall implement the decision in accordance with, and within the time frame specified in, such decision.

VII.M.4 Actions Not Affected By Dispute

With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of this Permit that NMED determines are not affected by the dispute.

TABLE VII.1 SCHEDULE FOR SUBMITTAL OF CORRECTIVE ACTION DOCUMENTS	
DOCUMENT	DUE DATE
Notification of newly identified SWMUs and AOCs.	Within fifteen (15) calendar days of discovery.
SWMU and AOC Release Assessment Report.	Within ninety (90) calendar days of notification.
RFI Work Plan for newly identified SWMUs and AOCs	Within ninety (90) calendar days after receipt of notification by NMED which SWMUs and AOCs require an RFI.
Notification for newly discovered releases at previously identified SWMUs and AOCs	Within fifteen (15) calendar days of discovery.
RFI Report	In accordance with the approved RFI Work Plan.
Interim Measures Work Plan	Within thirty (30) calendar days of notification by NMED.
Interim Measures Report	Within ninety (90) calendar days of completion.
CMS Work Plan	Within ninety (90) calendar days, or other time specified by NMED, of notification by NMED that a CMS is required.
Implementation of CMS Work Plan	Within fifteen (15) calendar days after receipt of NMED's approval of Plan
CMS Report	In accordance with the schedule in the approved CMS Work Plan
CMI Work Plan	As specified by the NMED in the CMS approval
CMI Progress Reports	As specified by the NMED in the CMI approval
CMI Corrective Measure Completion Report	As specified by the NMED in the CMI approval

TABLE VII.2 SCHEDULE FOR RFI WORK PLAN, HISTORICAL INFORMATION ASSESSMENT AND RELEASE ASSESSMENT SUBMITTALS			
PRIORITY	PARCEL NUMBER	GENERAL DESCRIPTION	DOCUMENTS SUBMITTAL DATE
1	21	Parcel 21 includes the TNT Workshop Area, TNT Leach Beds, electrical transformers, and the pre-1940s munitions storage area.	09/01/06
2	11	Parcel 11 includes a portion of the Administration Area, Sewage Treatment Plant, electrical transformers, and the pre-1940s munitions storage area.	03/01/07
3	22	Parcel 22 includes the TNT Workshop Area, Igloo Block D, electrical transformers, the pre-1940s munitions storage area, and land occupied by TPL.	11/01/07
4	6	Parcel 6 includes a portion of the Administration Area, TNT Workshop Area, Igloo Block B, Buildings 537, 542, electrical transformers, the pre-1940s munitions storage area, and land occupied by TPL.	05/01/08
5	4	Parcel 4 (west central) includes Igloo Block C and may include the pre-1940s munitions storage area). Parcel 4 may also include electrical transformers.	11/01/08
6	23	Parcel 23 (west central) includes the Central Landfill, and the pre-1940s munitions storage area. Parcel 23 may include electrical transformers.	05/01/09
7	10	Parcel 10 (northwest) includes the Suspected POL Area, Former Administration and Utilities Area, and may include electrical transformers and the pre-1940s munitions storage area.	11/01/09
8	5	Parcel 5 (west central) includes former structures or buildings and may also include the pre-1940s munitions storage area. Parcel 5 may include electrical transformers.	05/01/10
9	8	Parcel 8 (northwest).	11/01/10 (completed)
10	16	Parcel 16 (northeast corner) includes the Functional Test Range 2/3, buildings near	05/01/11

TABLE VII.2 SCHEDULE FOR RFI WORK PLAN, HISTORICAL INFORMATION ASSESSMENT AND RELEASE ASSESSMENT SUBMITTALS			
PRIORITY	PARCEL NUMBER	GENERAL DESCRIPTION	DOCUMENTS SUBMITTAL DATE
		Lake Knudson, Igloo Block K, and the pre-1940s munitions storage area. Parcel 16 may also include electrical transformers.	
11	13	Parcel 13 (north central) includes the area around Lake Knudson, electrical transformers, and the pre-1940s munitions storage area.	11/01/11
12	18	Parcel 18 (north central) includes the Eastern Landfill and the pre-1940s munitions storage area. Parcel 18 may include electrical transformers.	05/01/12
13	12	Parcel 12 (north) includes electrical transformers, and may include the pre-1940s munitions storage area.	11/01/12
14	14	Parcel 14 (north) may also include electrical transformers and the pre-1940s munitions storage area).	05/01/13
15	7	Parcel 7 (west of Administration Area) includes the Western Landfill, POL Disposal Area, Trash Burning Grounds, electrical transformers, and the pre-1940s munitions storage area.	11/01/13
16	24	Parcel 24 (northwest) includes Igloo Block A and the pre-1940s munitions storage area. Parcel 24 may include electrical transformers.	05/01/14
17	25	Parcel 25 (north) is located along Interstate 40.	11/01/14 (completed)
18	20	Parcel 20 (southeast corner) includes the Functional Test Range 1, and is being used by the Missile Defense Agency (MDA). Parcel 20 may also include electrical transformers.	05/01/15
19	2	Parcel 2 (southwest corner, directly north of the OB/OD Area) includes Igloo Blocks C, H and J, Group C Landfill, Western Rifle Range, and is being used by the Missile Defense Agency (MDA). Parcel 2 may also include electrical transformers.	11/01/15
20	19	Parcel 19 (east central) includes Igloo	05/01/16

TABLE VII.2 SCHEDULE FOR RFI WORK PLAN, HISTORICAL INFORMATION ASSESSMENT AND RELEASE ASSESSMENT SUBMITTALS			
PRIORITY	PARCEL NUMBER	GENERAL DESCRIPTION	DOCUMENTS SUBMITTAL DATE
		Blocks D, E, F, and G, Building T-422 (Normal Maintenance Bldg., Bomb and Shell Paint Bldg.), electrical transformers, and the pre-1940s munitions storage area.	
21	9	Parcel 9 includes Igloo Block A and the pre-1940s munitions storage area. Parcel 9 is being used by the Missile Defense Agency (MDA). Parcel 9 may include electrical transformers.	11/01/16
22	3	Parcel 3 includes the OB/OD Area SWMUs and AOCs.	05/01/17
23	3	CAMU Closure Plan	180 days prior to the completion of the final SWMU/AOC remedy

VIII SCHEDULE OF COMPLIANCE

VIII.A COMPLIANCE SCHEDULE REQUIREMENTS

VIII.A.1 DATA GAPS IN SITE HISTORY

VIII.A.1.a Historical Documents

The Permittee shall submit to NMED copies of all historical documents, reports, data, and information relating to the Facility within ninety (90) calendar days of the effective date of this Permit. The Permittee shall also submit to the NMED a summary of the historical information and assessment of potential contaminant releases relating to each parcel in conjunction with the parcel-specific RFI Work Plan including complete, legible copies of all associated photographic imprints, maps, figures, drawings, tables, attachments, enclosures, and appendices and other related supporting documentation. The historical information assessment shall identify each historic aerial photographic feature or anomaly in each subject parcel and make a comparison of each feature or anomaly through time.

VIII.A.1.b Interviews

The Permittee shall interview persons, familiar with current and past activities and operations at the Facility, who were not interviewed previously or who may not have provided complete information during the initial interview. The Permittee shall consult with the Navajo Nation and Pueblo of Zuni regarding the interviews. The Permittee shall submit copies of all past and newly conducted interviews to NMED within one hundred eighty (180) calendar days of the submittal date of the Community Relations Plan.

VIII.A.1.c Historic Aerial Photo Interpretation

The Permittee shall perform a historic aerial photograph time sequence analysis and submit a historic aerial photograph analysis in accordance with Permit Section VIII.A.1.a.

The historic aerial photograph analysis shall include photographs that depicts and identifies each feature or anomaly, including features such as SWMUs, AOCs and any location that has actual or potential site contamination. The historic aerial photographic analysis shall include:

1. Time sequence analyses of aerial photographs organized by date and Parcel from the earliest dated photos to the present at intervals of no more than 5-years, or other interval approved by NMED;
2. Master photomap that is based on a current digital aerial photomap that contains all prominent surface features;
3. Digital files on CD of all aerial photographs in a GIS format acceptable to NMED;
4. Historic aerial photographs shall be glossy photographic prints or electronic submittals in format acceptable to NMED (e.g., SHP, PDF format);
5. Each aerial photograph shall be oriented using the New Mexico State Plane Coordinate System or other NMED approved coordinate system; and,

6. Scale with units of measurement in feet for each photograph.

The historic aerial photograph analysis shall include written interpretations of each feature or anomaly, including each SWMU, AOC, and any location that has actual or potential site contamination. [20.4.1.500 NMAC (incorporating 40 C.F.R. 264.101) and 20.4.1.900 NMAC (incorporating 40 CFR 270.14(d))]

VIII.A.1.d Submittal of Updated SWMU and AOC List

Pursuant to the requirements of Permit Section VII.D, the Permittee shall submit a list of newly identified SWMUs and AOCs within fifteen (15) calendar days after completing the requirements of Permit Section VIII.A.1.a for each Parcel. [20.4.1.500 NMAC (incorporating 40 C.F.R. 264.101)]

VIII.A.1.e Asbestos Evaluation

The Permittee shall prepare an asbestos evaluation report for submittal to NMED in conjunction with the associated parcel RFI Work Plans. The reports shall identify sites, that are not SWMUs or AOCs, where there is the potential for asbestos contamination. The reports also shall establish action levels for cleanup or abatement of asbestos, where necessary. In preparing these reports, the Permittee shall consult with Pueblo of Zuni and Navajo Nation in accordance with the provisions of Permit Section VIII.B.1. Any required action to address asbestos contamination in soil identified under this Permit Section (VIII.A.1.e) shall be addressed pursuant to CERCLA [42 U.S.C. 9601 et seq.]. Nothing in this Section (VIII.A.1.e) shall be construed to limit or waive the rights or claims of any person as defined in NMSA 1978, Section 74-4-3(M) (HWA) and 20.4.1.100 NMAC (incorporating 40 CFR 260.10).

VIII.A.2 Closure

The Permittee shall submit the following information relating to closure of the OB/OD Unit:

1. Closure Plan for the OB/OD Unit within one hundred eighty (180) calendar days of the submittal date of the Community Relations Plan that includes all of the information required in 20.4.1.500 NMAC (incorporating 40 CFR 264.111 through 264.115, 264.601, and 264.602) and that provides for compliance with the requirements of Permit Section III.A. The Closure Plan shall be submitted and reviewed as a Class 3 permit modification. The Permittee shall consult with the Navajo Nation and Pueblo of Zuni regarding the Closure Plan according to Permit Section VIII.B.1. The Closure Plan shall also include, at a minimum:
 - a. a proposed schedule for implementation of closure activities,
 - b. methods for characterization and removal of all hazardous waste and hazardous waste residues, and characterization and removal or decontamination of all contaminated structures, equipment, and known contaminated soils,
 - c. the methods and procedures for collection of characterization and confirmation samples,

- d. the methods and procedures for sample field screening and field analysis,
 - e. laboratory chemical analytical methods,
 - f. sample handling and QA/QC procedures,
 - g. the methods for management of investigation derived waste,
 - h. the methods for conducting geophysical investigations pursuant to Permit Section III.A.5, and
 - i. the proposed format for reporting on the results of closure activities.
2. A summary report of historical information within one hundred eighty (180) calendar days of the submittal date of the Community Relations Plan, including maps and data tables, of historical documents and records relating to the OB/OD Unit, including records, maps, photographs, Department of Defense and other governmental databases, environmental site investigation and remedial action documents, construction records, treatment and disposal records, interviews, and other sources of historical information;

3. A proposal to modify this Permit to include a Corrective Action Management Unit for management of waste generated during closure activities at the OB/OD Unit within one hundred eighty (180) calendar days of the submittal date of the Community Relations Plan;

[20.4.1.900 NMAC (incorporating 40 CFR 270.14(b)(13))]

VIII.A.3 Topographic Map

The Permittee shall provide a revised Permit Attachment 2 to NMED within ninety (90) calendar days of the effective date of this Permit, including:

1. all of the information required by 20.4.1.900 NMAC (incorporating 40 CFR 270.14(b)(19));
2. identification and depiction of the OB/OD Unit and SWMUs and AOCs with known locations;
3. identification, depiction, and labeling of parcels and parcel boundaries; and
4. the known extent of the Kickout Area.

VIII.A.4 Hydrogeologic Information

The Permittee shall submit a summary of Facility hydrologic and geologic data that the Permittee has used to characterize the site hydrogeology and characterize any releases of hazardous waste or constituents to the ground water and surface water to NMED within sixty (60) calendar days of the effective date of this Permit. The summary shall include:

1. Hydrogeologic data regarding the uppermost aquifer and all aquifers hydraulically interconnected beneath the Facility, including the Quaternary alluvium, Painted Desert Member of the Chinle Formation (the nomenclature is being changed to the Painted Desert Formation of the Chinle Group), Sonsela Sandstone Member, Mancos Shale;
2. Provide copies of all Facility well logs and well construction diagrams.
3. Provide ground water flow direction and rate data and the basis for such identification, potentiometric surface summary data tables and contour maps, aquifer test data, flow zone or preferential flow path data, seasonal and spatial fluctuations in flow directions, vertical and horizontal gradients, and any other available hydrogeologic information.

[20.4.1.900 NMAC (incorporating 40 CFR 270.14(c)(2), 270.14(c)(4), and 270.28) and 20.4.1.500 NMAC (incorporating 40 CFR 264.602)]

VIII.B APPROVAL OF SUBMITTALS

All plans, schedules, maps, and other documents required by this Schedule of Compliance shall be submitted to the NMED for review and approval. All plans, schedules, maps, and other documents required by this Schedule of Compliance are, upon approval by the NMED, incorporated into this Permit and become an enforceable part of this Permit. Any noncompliance with approved plans, schedules or other approved documents constitutes noncompliance with this Permit and may subject the Permittee to enforcement action.

VIII.B.1 Prior Consultation Requirements

Prior to submittal, the Permittee shall consult with the Pueblo of Zuni and the Navajo Nation regarding plans and reports that are specifically subject to consultation requirements. The Permittee shall:

- a. Take best efforts in good faith to consult with the Navajo Nation and the Pueblo of Zuni regarding the impact of the proposed actions in the plan on archaeological sites, historic sites, and traditional uses of the land. The Permittee shall attempt to identify and negotiate agreement on mitigating measures or alternatives to minimize the impact of the proposed actions in the plan on archaeological sites, historic sites, and traditional uses of the land. This consultation may be performed in conjunction with federal requirements for consultation with affected tribes.
- b. When submitting a plan or report subject to consultation requirements, the Permittee shall include a statement summarizing the consultation process and results of the process, including any agreements or disagreements between the Permittee and the Pueblo of Zuni or Navajo Nation.
- c. When submitting a plan or report subject to consultation requirements, the Permittee shall certify the statement summarizing the consultation process in accordance with Permit Section I.I.9.g.

- d. The Permittee shall maintain documentation in the operating record of the attempts at consultation and any written agreements reached or written documentation indicating refusal to consult or enter into agreement.

IX CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)

This Permit Section authorizes the operation of a CAMU to treat eligible waste in accordance with 40 CFR Part 264.552 and Subpart X, including the requirements for the design, construction, operation, maintenance and monitoring of the unit. Waste Permitted for treatment at the CAMU includes hazardous waste in the form of WMM that cannot be transported offsite for treatment or disposal due to inherent hazards related to transport or management of the waste.

IX.A CAMU DESCRIPTION

The CAMU is located in SWMU 14 in Parcel 3 as shown in Permit Attachment 12. A physical description of the CAMU is included in Permit Attachment 1 (Section 1.1.3). Figures depicting the location and design of the CAMU are provided in Permit Attachment 12.

IX.B CAMU DESIGN

IX.B.1 General Requirements

The Permittee shall design, construct, operate, and maintain the CAMU to minimize the possibility of an accidental fire, explosion, or any sudden or non-sudden release of hazardous waste or hazardous constituents into air, soil, sediment, surface water, or groundwater which could threaten human health or the environment, in accordance 20.4.1.500 NMAC [incorporating 40 C.F.R. 264.31 and 264.601] which are incorporated herein by reference.

The Permittee shall design, construct, operate, and maintain the CAMU to minimize emissions of air pollutants, and to minimize the possibility of exposure to toxic or hazardous air pollutants, and to minimize noise.

IX.B.1.a Tribal Consultation

Prior to the construction of the CAMU the Permittee shall consult with the Navajo Nation and Pueblo of Zuni with regard to the presence of cultural sites and develop procedures to address potential damage to cultural resources in accordance with VIII.B.1.a. The Permittee shall notify NMED that such procedures are in place in accordance with Permit Section VIII.B.1.d no less than 60 days prior to the start of construction activities at the CAMU.

Section IX.B.2 Treatment Cell Design

The CAMU shall be constructed with two primary treatment cells (bermed areas), one designated for open detonation operations and the other for open burn operations, and no more than three contingent treatment cells for open detonation operations as necessary. The Permittee may use up to three additional contingent detonation cells (as well as the option to utilize the open burn cell for detonation operations), one at a time, only if there is a need to treat WMM prior to normal maintenance required by IX.G.2 or there is a functional need to change cells (e.g., a breach of a berm).

The Permittee shall ensure that the cells are surrounded by horseshoe-shaped earthen containment berms. The layout and conceptual design is shown in Attachment 12. The berms shall be constructed with soils to a width of 35 feet and a height of 8 feet with an entrance to allow access to the interior of the cell. Detonation pits shall not exceed a depth of eight feet bgs. Detonation pits shall be composed of well-packed earth and shall be free from loose stones and deep cracks in which explosives might lodge.

If the soil used for construction is brought from locations outside of the CAMU, it shall be tested to evaluate for the presence of contaminants to establish a baseline prior to construction of the berms. Soil excavated for the detonation pits shall be staged in the CAMU and then replaced at the conclusion of each day's activities.

The berms surrounding the cells shall remain in place throughout the active life of the CAMU and shall be removed when the CAMU is closed.

Section IX.B.3 Burn Pan Design

Burn pans must be constructed of steel and the dimensions shall not exceed 7 feet wide by 12 feet long by 5 feet deep and may be equipped with a door to prevent or reduce kickout. The burn pans may be placed on grade within the primary cell designated for open burn operations.

IX.C PERMITTED WASTE

The Permittee may treat in the CAMU reactive (D003) and ignitable (D001) hazardous wastes, such as MEC (including damaged, defective, expired, and unserviceable munitions) explosive-contaminated wastes, propellants, bulk explosives, metal powders, detonators, miscellaneous munitions constituents and soils containing hazardous or reactive concentrations of explosive compounds. The waste types allowed to be treated shall solely be waste generated during remediation activities conducted at the Facility.

Treatment at the CAMU shall only be conducted when the designated SUXOS and UXO Quality Control Specialist have designated the material to be treated unsafe for transport off site. Solid waste shall only be treated in the CAMU if it cannot be safely separated from hazardous waste and transported off-site for disposal.

IX.D PROHIBITED WASTE

The Permittee is prohibited from treating wastes in the CAMU that can be safely transported off-site for treatment or disposal at an alternate facility. All debris and incidental solid wastes (e.g., wooden ammunition boxes, containers) that can be safely separated from the munition item/constituent and transported off-site and certified as material documented as safe (MDAS) in accordance with Department of Defense (DoD) and United States Army Corp of Engineers (USACE) regulations and requirements is prohibited from treatment at the CAMU. The Permittee is also prohibited from treating any waste that was not specifically generated at the Facility during clearance or other corrective action operations.

The placement of bulk or non-containerized liquid hazardous waste or hazardous waste contained in free liquids (whether or not sorbents have been added) in the CAMU is

prohibited except where placement of such wastes facilitates the initiation of the treatment process. [20.4.1.500 NMAC (incorporating 40 CFR 264.552(a)(3)(i))]

IX.E WASTE DETERMINATION

The SUXOS and UXO Quality Control Specialist is responsible for determining the safe disposition of WMM and incidental solid waste and for making the determination whether the waste must be blown in place, treated in the CAMU, or transported off-site for treatment or disposal. The SUXOS and UXO Quality Control Specialist are responsible for the safe conduct of each CAMU treatment event in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.552(c)(2)). If the SUXOS and the UXO Quality Control Specialist determine any items, materials, or constituents are unsafe to transport off site for disposition, then the items may be treated in the CAMU. The Permittee must document the type and volume of any WMM that must be blown in place or treated at the CAMU. Such documentation shall be maintained in a log book located at the information repository and be made available for inspection upon request during normal business hours. All treatment operations shall be documented in the associated parcel-specific corrective measures implementation report, remedy completion report, or OB/OD closure report.

IX.F MAXIMUM QUANTITY OF WASTE

Table 1 below lists the wastes authorized for treatment at the CAMU. No more than 1,000 lbs of NEW may be treated in any seven-day period.

Table 1. CAMU General Unit and Waste Description

Treatment Unit	General Description of Hazardous Waste	Hazardous Waste No.	Maximum Quantity of Waste per Treatment Event
Open Burn	MEC-Ignitable, Reactive, and Toxic Wastes.	D001, D003, D007, D008	200 lbs for uncased explosives
Open Detonation	MEC-Ignitable, Reactive, and Toxic Wastes	D001, D003, D005, D006, D007, D008, D009, D030	200 lbs Net Explosive Weight for cased

Section IX.G CAMU TREATMENT PROCESS

The Permittee shall ensure that treatment operations at the CAMU are performed in accordance with the requirements of this Permit Section (IX). Both open burning and open detonations shall only be conducted within the treatment cells. Open burning and open detonation shall not be conducted at the same time. Items to be detonated shall be placed directly on the earthen bottom of the cell or pit, whereas items to be burned shall be placed on a burn pan, or another safe alternative technology will be employed if one becomes

available that performs suitably and complies with the Environmental Performance Standards specified in Permit Section IX.B.1.

IX.G.1 Storage Prior to Treatment

WMM generated during remediation activities may be stored temporarily prior to treatment or off site disposal.

IX.G.1.a Storage at the CAMU

The Permittee shall designate temporary storage area(s) for recovered WMM within the CAMU. These materials may be stored in the CAMU for no more than ten (10) calendar days. Completion of treatment must be conducted as soon as the next demolition/treatment day can be scheduled or within 10 days, whichever is sooner. Any materials placed in the designated temporary storage area shall be segregated and stacked in a manner that will minimize the possibility of explosion, fire or the spread of contamination. The Permittee shall provide the required security measures specified in Permit Section II.C. The secured area must be inspected daily to verify that the stored materials remain stable and have not been accessed by unauthorized personnel. The results of such inspections must be recorded and maintained in accordance with Permit Section IX.M.

IX.G.1.b Storage at Designated Igloos

The Permittee may identify a need for longer term storage of WMM prior to treatment in the CAMU. WMM may be stored in the eight (8) FWDA earth-covered magazines (ECM or igloos) in Explosive Storage Block B. A Figure (Location Map of Eight Conditional Exemption Igloos) showing the location of the eight igloos is included in Permit Attachment 12. The Permittee must demonstrate compliance with 40 CFR 266.205 annually by submitting a report documenting compliance with the requirement of 266.205(a)(1) and (2) by June 30 of each year that the storage units are in use.

IX.G.2 Open Detonation (OD)

Prior to detonation the Permittee shall ensure that the designated SUXOS and UXO Quality Control Specialist conduct a visual inspection of the OD Unit to determine if the WMM requires venting to open internal cavities and expose fillers. Items to be detonated/vented shall be transported to and placed within a treatment cell. The size of the detonation pit within the cell will be commensurate with the size of the item(s) being destroyed as determined by the SUXOS and UXO Quality Control Specialist in coordination with the USACE OESS. Boosters/perforators shall be placed in intimate contact with each item and, if required, covered with earth or other material to prevent imminent hazards to workers. The Permittee shall ensure that engineering controls or protective measures are employed to contain kickout and to minimize damage to the containment berms in accordance with the Department of Defense Explosives Safety Board, Technical Paper 16, as updated.

After OD/venting, the munitions debris shall be inspected by two independent UXO technicians. The SUXOS and UXO Quality Control Specialist shall verify and certify that the munitions debris has been 100% properly inspected and presents no explosive hazard.

Munitions debris and scrap metal shall be transported off site for either disposal or recycling. Any items or material that cannot be certified as safe to recycle by the SUXOS and UXO Quality Control Specialist and cannot be transported off site for disposal may be left in the detonation pits for reventing and re-inspection. If the item continues to present an explosive hazard, it shall be re-vented (by CAMU treatment) until it no longer poses an explosive hazard. Small arms ammunition up to and including .50-caliber cartridges that cannot be vented or treated on site shall also be profiled, packaged, and disposed of at an off-site authorized facility.

IX.G.3 Open Burning (OB)

Treatment by open burning at the CAMU may be conducted only when the designated SUXOS and UXO Quality Control Specialist have designated the material unsafe to transport off site. When a burn treatment is required by the SUXOS and UXO Quality Control Specialist, a single burn pan shall be employed within the primary cell designated for open burn operations at the CAMU. The material to be treated shall be placed with an ignition source which may consist of a bed of combustible material, such as fuel oil or diesel fuel. The Permittee shall ensure that only the minimum amount of the ignition source necessary to initiate the burn is used. Incidental solid wastes, such as wooden ammunition boxes, containers, and pallets may also be used as an ignition source during the treatment process if, in the opinion of the SUXOS and UXO Quality Control Specialist determine they cannot be safely separated from the MEC.

After burning and cooling of hot ash and coals, the SUXOS and UXO Quality Control Specialist shall inspect the area for completeness of burn, heat retainment, and any dangerous conditions. Consecutive burns shall not be conducted in a single day, and no cool down procedures (e.g., drenching with water) shall be used, except in an emergency. Burn pans shall be cleaned out after each burn operation. The resulting ash may be temporarily stored in appropriate containers in the 90-day storage area prior to disposal.

IX.G.4 Wastes Generated by Treatment at the CAMU

Wastes generated by treatment operations at the CAMU including ash from the treatment of MEC, recyclable scrap, non-MEC debris (incidental solid waste), and potentially impacted soil, shall be characterized for off-site disposal in accordance with Permit Attachment 14 (Waste Analysis Plan) and 20.4.1.800 NMAC (incorporating 40 CFR 268.7).

IX.H AIR QUALITY

CAMU treatment operations shall meet the Environmental Performance Standards in 40 CFR 264.601(c). Open burning shall be conducted in accordance with applicable requirements in 20.2.60.108 NMAC, 20.2.60.113 NMAC, and 20.2.72 NMAC.

IX.I MAINTENANCE

IX.I.1 Vegetation Control

All dry grass, leaves, and other flammable vegetation shall be removed for a distance of at least 200 feet from the treatment units. Live vegetation shall not be allowed to exceed a height of six inches within 200 feet of the treatment units during periods of operation.

IX.I.2 Run On/Run Off Control

The Permittee shall design, construct, operate, and maintain run-off control systems at CAMU to prevent precipitation run-off from leaving the Unit and migration of hazardous waste or hazardous constituents [see 40 CFR 264.601(b)].

The Permittee shall design, construct, operate, and maintain run-on control systems at the CAMU to prevent precipitation from entering the Unit (see 40 CFR 264.601(b)). The Permittee shall install and maintain a silt-fence or other NMED approved erosion control measure at the perimeter of the 200-foot vegetation clearance to ensure that potentially contaminated waste residue, soil, or storm water will not migrate outside of the CAMU boundary.

IX.I.3 Accumulated Precipitation

The Permittee shall remove any standing water in the OB burn pan or in any open detonation pit or crater within 24 hours after a precipitation event, or within 24 hours of when access roads become open for vehicle traffic, should inclement weather preclude access to the CAMU. The Permittee shall analyze any water removed from the treatment unit for the presence of hazardous constituents in accordance with the Waste Analysis Plan (Permit Attachment 14), and shall manage the water appropriately.

IX.I.4 Treatment Residue

At the conclusion of each treatment event the Permittee shall clear the CAMU by removing debris, untreated explosive materials, ash, and any visibly stained soils. As soon as safely possible after a minimum of 24 hours of each open burn operation, the Permittee shall remove any treatment residue from the treatment Unit. This removal of treatment residue shall be conducted only after it has been determined that it is safe for personnel to enter the treatment unit. The Permittee shall collect a sample of the residue pursuant to Permit Attachment 14, Section 14.2 and place any residues in an appropriate container pending results of the analysis. Based on the analysis, the Permittee shall manage residues as either hazardous or nonhazardous waste, as appropriate.

IX.I.5 Unexploded Ordnance and Other Kick-Out

The Permittee shall collect all waste ejected from the treatment unit including but not limited to fragments, metal casings, or other kick-out. Within 24 hours after each open detonation or as soon as safely possible after a minimum of 24 hours of each open burn operation, the Permittee shall collect and appropriately store untreated waste or UXO, fragments of waste (including metal casings) or other kick-out originating from the treatment operations in accordance with this Permit Section IX. All such material must be shipped off site for treatment or disposal unless the SUXOS and UXO Quality Control Specialist determines that transport is unsafe in which case the material shall be further treated in the CAMU.

IX.I.6 Open Burn Container

After a minimum of 24 hours after each open burn operation, the Permittee shall conduct an inspection of the OB burn pan to ensure that the Unit is in good condition and make any necessary repairs prior to the next treatment operation.

IX.J RESTRICTIONS ON OPERATIONS

The designated UXO Quality Control Specialist and SUXOS shall establish a minimum separation distance (MSD) between CAMU operations and personnel, based on the types of WMM being treated. Prior to burning or detonation, all personnel must withdraw from the MSD area. Unauthorized entry into the treatment area shall be prevented to a distance sufficient to afford protection from blast and fragments. A means of communication shall be maintained among all site personnel during the operation to ensure that unauthorized personnel do not stray into the area. Personnel shall remain outside the MSD area until all smoke and fumes dissipate and the SUXOS and UXO Quality Control Specialist conducts a post blast investigation. Entry of personnel shall be prevented until the SUXOS and UXO Quality Control Specialist declares the area safe for access.

IX.J.1 Weather-Related Operation Restrictions

The Permittee shall not conduct treatment operations under the following conditions to minimize any potential exposure or harm to human health or environment:

1. when heavy overcast conditions or during precipitation or inclement weather, or if storms are forecasted to occur within a three mile radius in less than four hours;
2. when electrical storms exist within three miles upwind of the CAMU;
3. when the wind velocity exceeds 15 mph.; or
4. during Very High, or Extreme Fire Danger classes as designated by the United States Forest Service .

IX.J.2 Other Restrictions

The Permittee shall only conduct treatment operations only during the hours between sunrise and sunset.

IX.K GROUNDWATER MONITORING

Groundwater monitoring at the CAMU will be conducted in accordance with the required facility wide groundwater monitoring plan.

IX.L SURFACE SOIL MONITORING

The Permittee shall collect surface soil samples prior to operation of the CAMU from soils directly beneath the treatment units and surrounding berm and at eight random locations within the 200 foot radius from the treatment units to establish baseline soil contamination levels. The samples must be analyzed for semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals, explosive compounds, perchlorate, nitrate, cyanide, PCBs, dioxins, furans, and diesel and oil range organics. The sampling shall be repeated every two years after the start of treatment operations until use of the CAMU is discontinued.

The Permittee shall submit a work plan that proposes the methods and locations for sample collection and analysis no less than 90 days prior to the start of treatment operations at the CAMU. The Work Plan shall include the frequency of sampling and proposed interim screening levels that will initiate interim measures to remove soils containing concentrations of contaminants that exceed the screening levels.

IX.M RECORDKEEPING FOR TREATMENT OPERATIONS

The Permittee shall maintain a record of all treatment and maintenance operations conducted at the CAMU. The records shall include volume and type of munitions treated, method of treatment, type and volume of any ignition source, estimated volume of incidental solid waste treated and reason the waste could not be separated from the WMM, and date and time of treatment. The records also shall include descriptions of all maintenance and repair activities conducted to prevent migration of contamination at the CAMU. Such documentation shall be maintained in a log book located at the information repository and be made available for inspection upon request during normal business hours.

IX.N CLOSURE

The CAMU must be closed in accordance with Permit Section III.D upon completion of Facility Wide remedy implementation.

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ATTACHMENT 1 GENERAL FACILITY DESCRIPTION

Fort Wingate Depot Activity (FWDA or the Facility) is a former Ammunition Depot under the command of the United States Army. The Facility is located in western New Mexico in McKinley County and is approximately 8 miles east of the city of Gallup at latitude 35 degrees, 27 minutes, and 30 seconds North and longitude 108 degrees, 34 minutes, and 30 seconds West.

The Facility is surrounded by developed land to the north and east and by relatively undeveloped land to the south and west. The Facility is almost entirely surrounded by BIA administered land, national forest land, Navajo tribal land, Zuni tribal land, and individual Native American allotments.

During its active life, the Facility's mission was to store, ship, and receive military munitions and material; conduct functional tests on military munitions; reclaim, maintain, and renovate military munitions; and, demilitarize and destroy obsolete or deteriorated military munitions. In January 1993 the active mission of the Facility ended and operations ceased as a result of the Defense Authorization Amendments and Base Realignment and Closure Act (BRAC) of 1988.

In the 1980s, when the Facility became subject to RCRA permit requirements, it occupied approximately 22,120 acres. Since that time, the Facility has transferred approximately 6,277 acres to the Department of Interior. Currently, the Facility occupies approximately 15,843 acres (25 square miles).

THE OB/OD UNIT

The OB/OD Unit is located in the southwest part of the Facility. The OB/OD Unit is an inactive open burn/open detonation (OB/OD) unit that, when active, was used to treat waste military munitions and explosive contaminated waste from 1955 to 1993. After 1980, the OB/OD Unit was classified as a RCRA interim status, thermal treatment unit (see 20.4.1.600 NMAC (incorporating 40 CFR part 265, subpart P)) The OB/OD Unit includes; the area known as the Burning Ground Area, twelve Current Detonation Craters (CDC) known as CDC-1 through CDC-12, and ten (10) Current Residue Piles (CRP) known as CRP-1 through CRP-10, and the Corrective Action Management Unit (CAMU). The CAMU is located at Solid Waste Management Unit (SWMU) 14 near the Old Burning Ground and Demolition Landfill within Parcel 3 (See Permit Attachment 2, map of Fort Wingate).

The Burning Ground Area was used to destroy waste military munitions burned on the ground surface in unlined trenches and in metal burn pans or trays. The estimated area of the Burning Ground Area is approximately 7 acres (see Figure 3, Permit Attachment 2 (Topographic Map Showing Fort Wingate Depot Activity)). The Burning Ground Area is located on the east side and extends into the bottom of a large arroyo.

CDCs 1-12 are open detonation craters that were used to destroy waste military munitions. The areal extent of CDCs 1-12 is estimated to be approximately 6.5 acres. CDCs 1-12 are adjacent to and separated by a large arroyo that floods on occasion. Prior to 1993, the Permittee conducted both covered and uncovered detonations at CDCs 1-12. The Permittee conducted detonation of

explosives of up to 5,000 pounds above ground and detonation of explosives between 5,000 to 10,000 pounds with ten feet of earthen cover.

The Permittee periodically bulldozed the wastes and waste residue from the Burning Ground Area and CDCs 1-12 toward the arroyo, resulting in the formation of ten Residue Piles (CRP 1 through CRP 10). Waste military munitions have also been released from the OB/OD Unit and deposited within the arroyo due to waste management activities and natural processes.

CAMU DESCRIPTION

The CAMU is located at SWMU 14. The CAMU is designed for the treatment by OB/OD of WMM generated during cleanup of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs) and the OB/OD area, and any munitions recovered from within the facility that cannot be transported offsite for treatment or disposal. The requirements for operation of the CAMU are described in Permit Section IX. The CAMU occupies approximately three acres and contains one open burn cell and up to four detonation cells for the disposal of waste military munitions (WMM). Each treatment cell is surrounded on three sides by a containment berm. Each detonation operation will be conducted in a pit excavated to a minimum depth of two feet below ground surface or contained through the use of sandbags.

The CAMU is located in a relatively flat area, approximately 500 feet from the closest arroyo. Run-on and run-off can be readily controlled and does not have a history of flooding. The CAMU is remote and so is conducive to operations requiring explosives safety quantity-distance (ESQD), which provides the required protection to personnel and property. The area also has a natural protective control of the nearby hogback ridge that provides an extra safety barrier between FWDA property and Bureau of Indian Affairs (BIA) and Tribal Trust property. The CAMU is located near an access-controlled road that not only provides lock and fence control to the area, but also provides a stable surface for transportation of items to be treated. The CAMU is located within a double fenced area, which provides the required security requirements needed for the treatment operations.

THE KICKOUT AREA

The Kickout Area is the land surrounding the OB/OD Unit that received releases of hazardous waste and hazardous constituents from the OB/OD operations and historic operations associated with SWMU 16 (Demolition Landfill and Old Burning Ground), SWMU 17 (Old Demolition Area) and SWMU 35 ("Waste Pile" KPI). Waste military munitions in the Kickout Area were expelled or "kicked out" during detonation activities.

HAZARDOUS WASTES

The Permittee used the OB/OD Unit to thermally treat various waste military munitions including propellants, explosives, pyrotechnics, and explosive-contaminated items to render them inert. The following EPA hazardous waste numbers are associated with the hazardous wastes which may have been treated at the OB/OD Unit: D001 (ignitability), D003 (reactivity), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury), D030 (2,4-dinitrotoluene), F003 and F005 (explosive-contaminated solvents and rags), and K044

(wastewater treatment sludges from the manufacturing and processing of explosives). The OB/OD Unit may also contain wastes with other EPA hazardous waste numbers.

The CAMU is permitted to treat (by open burning or open detonation) reactive (D003) and ignitable (D001) hazardous wastes, such as MEC (including damaged, defective, expired, and unserviceable munitions) and explosive-contaminated wastes during remediation activities.

WASTE CHARACTERISTICS

The Permittee primarily treated waste military munitions at the OB/OD Unit. However, the Permittee also treated explosive-contaminated items such as rags, gloves, wood, and equipment. The Permittee used oils, fuels, solvents, and dunnage to initiate the burns. The Permittee also burned and detonated incidental solid wastes, such as wooden ammunition boxes, containers, and pallets.

The OB/OD Unit is underlain by wastes and waste residues. The burning and detonation of waste military munitions, explosive-contaminated items, and incidental solid waste is associated with a variety of contaminants (e.g., metals, explosive and propellant constituents, perchlorate, white phosphorus, volatile organic compounds, semi-volatile organic compounds, and potentially asbestos, dioxins and furans, cyanide, PCBs, pesticides, and herbicides).

ATTACHMENT 2
FACILITY MAP

FEDERAL GOVERNMENT INDIAN TRUST LANDS



PROJECT MANAGER:	DRAWN BY:	DATE:	
RCRA PERMIT ATTACHMENT 2 SWMU AND AOC LOCATIONS FACILITY WIDE			
Parcels Pending Permit Removal December 2014			
Fort Wingate Depot Activity McKinley County, New Mexico			
FILE NO.	CHKD.	DRAWING NUMBER	REV. NO.
ENG.	APP'D.	SCALE: 1" = 1,500'	

SWMU/ACCS NOT SHOWN ON MAP
AOC 75 - 65 ELECTRICAL TRANSFORMERS
SWMU 40 (SOUTH ADMIN AREA) - BUILDING T-34, WOOD SHOPS

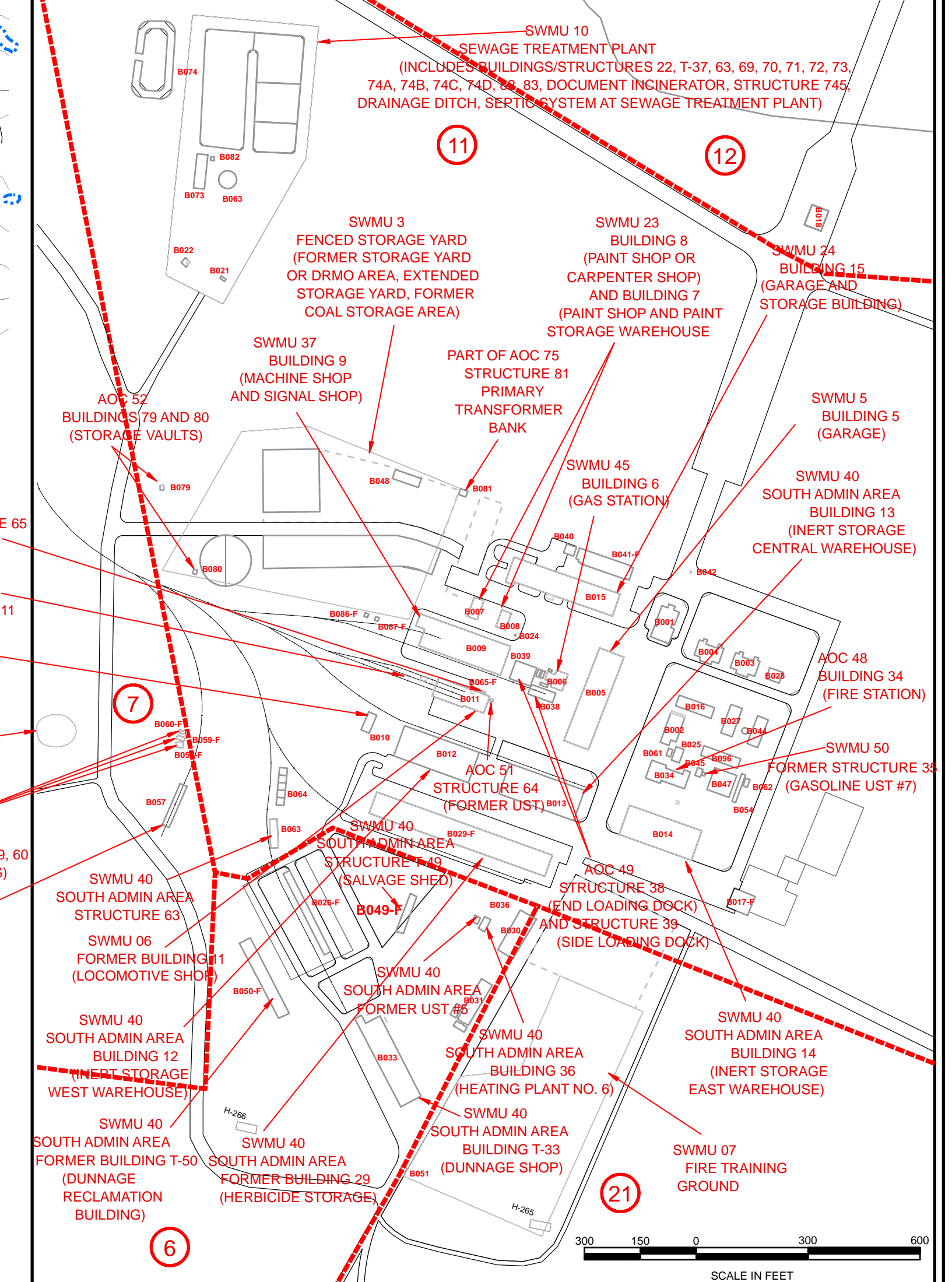
Legend

- Arroyo
- MDA FENCE
- FWDA Boundary 1993
- FWDA Boundary Pending Transfer(s)
- AOC/SWMU Corrective Action Complete
- AOC/SWMU Corrective Action Without Controls
- PARCELS
- Parcel Number
- SWMU-X AOC-X Solid Waste Management Unit or Area of Concern Requiring Corrective Action
- SWMU-X AOC-X Solid Waste Management Unit or Area of Concern Corrective Action Complete

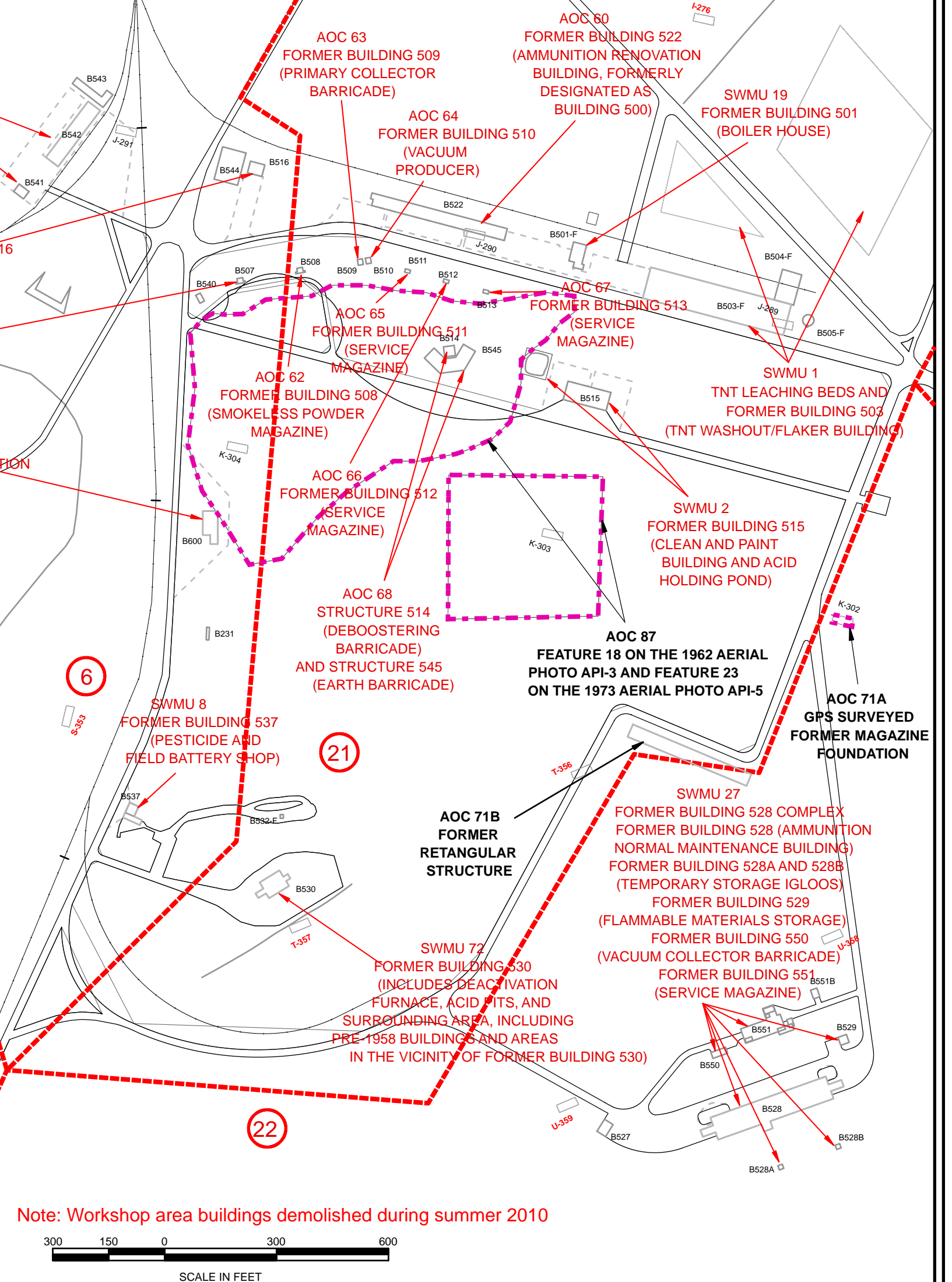
Parcel Status

- Army
- Army Retain
- Army, Leased to MDA
- Army, Pending Transfer
- BIA

ADMINISTRATION AREA



WORKSHOP AREA



Note: Workshop area buildings demolished during summer 2010

REV. NO.	DATE	DESCRIPTION	REV. BY	ENG.	CHK. BY	APP. BY
6	12 Dec 2014	Revise Facility Boundary	MGS	SWS	SWS	SWS
5	15 Mar 2014	AOC/SWMU Boundary Revisions	MGS	SWS	SWS	SWS
4	20 Jan 2011	Revise Facility Boundary	MCS	SWS	SWS	SWS
3	30 Nov 2009	Revise Facility Boundary	AML	SWS	SWS	SWS
2	31 Jul 2008	Revise Facility Boundary	MGS	SWS	SWS	SWS
1	8 Dec 2006	SWMU/AOC Locations updated	DT	EK	EK	EK

PATENTED (PRIVATE)

PATENTED (PRIVATE)

PATENTED (PRIVATE)

PATENTED (PRIVATE)

FEDERAL GOVERNMENT BLM MANAGED

FEDERAL GOVERNMENT BLM MANAGED

FEDERAL GOVERNMENT INDIAN TRUST LANDS

FEDERAL GOVERNMENT BLM MANAGED

STATE

FEDERAL GOVERNMENT BLM MANAGED

PATENTED (PRIVATE)

FEDERAL GOVERNMENT INDIAN TRUST LANDS

CIBOLA NATIONAL FOREST

FEDERAL GOVERNMENT BIA MANAGED

LEGEND

- UXO CLEARANCE AREA
- HOGBACK
- ARROYOS
- PROPERTY TRANSFER PARCEL BOUNDARIES
- BMD/MDA FENCE
- TRANSFERRED FWDA PROPERTY
- SWMUs OR AOCs THAT REQUIRE CORRECTIVE ACTION
- FWDA PROPERTY BOUNDARY, FEBRUARY 2002

ATTACHMENT 3 INTERIM MEASURES IMPLEMENTATION SCOPE OF WORK

PURPOSE

Interim measures (IM) are actions to control and/or eliminate releases or potential releases of hazardous waste and/or hazardous constituents at a facility prior to the implementation of a final corrective measure. The Permittee shall implement interim measures whenever necessary to control or abate threats to human health and the environment and to prevent or minimize the spread of hazardous waste or hazardous constituents while long-term corrective action alternatives are being evaluated. Controlling exposures or controlling the migration of a release does not necessarily mean that the site has been completely investigated or cleaned up. At some sites where interim measures are taken, additional investigations or remediation may be required.

SCOPE

The documents required for Interim Measures are, unless NMED specifies otherwise, an IM Work Plan, an Operation and Maintenance Plan, and a Proposed Schedule. If required by NMED, the IM documents may also include additional reports that evaluate the effectiveness of the interim measure and IM Plans and Specifications. The scope of work (SOW) for each document is specified below. If the Permittee can justify to the satisfaction of NMED that a plan or portions thereof are not needed in the given site specific situation, NMED may waive that requirement.

NMED may require the Permittee to conduct additional tasks or provide additional information beyond what is discussed in the SOW or specified in the approved IM documents to support the IM program. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, conducting the IM and the additional tasks.

3.1 INTERIM MEASURES WORK PLAN

The Permittee shall prepare an IM Work Plan that evaluates interim measure options and clearly describes the proposed interim measure, the key components or elements that are needed, describes the designer's vision of the interim measure in the form of conceptual drawings and schematics, and includes procedures and schedules for implementing the interim measure(s). The IM Work Plan shall, at a minimum, include the elements specified below.

3.1.1 Introduction/Purpose

The Permittee shall describe the purpose of the document and provide a summary of the project.

3.1.2 Conceptual Site Model Of Hazardous Waste or Constituent Migration

The Permittee shall present a conceptual site model (CSM) of hazardous waste or hazardous constituent migration. The conceptual site model shall consist of a working hypothesis of how the hazardous waste or hazardous constituent may move from the release source to the receptor population. The Permittee shall develop the conceptual site model considering the applicable

physical parameters (e.g., water solubility, density, Henry's Law Constant, etc.) for each hazardous waste or hazardous constituent and assessing how the hazardous waste or hazardous constituent may migrate given the existing site conditions (geologic features, depth the ground water, etc.). The Permittee shall describe the phase (water, soil, gas, non-aqueous) and location where hazardous waste or hazardous constituents are likely to be found. This analysis may have already been done as part of earlier work (e.g., Current Conditions Report). If this is the case, the IM Work Plan shall provide a summary of the conceptual site model with a reference to the earlier document.

3.1.3 Evaluation of Interim Measure alternatives

The Permittee shall list, describe, and evaluate interim measure alternatives that have the potential to stabilize the release or potential release under consideration. The Permittee shall propose interim measures for implementation and provide the rationale for the selection. The Permittee shall document the reasons for excluding any interim measure alternatives.

3.1.4 Description of Interim Measures

The Permittee shall qualitatively describe what the proposed interim measures are supposed to do and how it shall function.

3.1.5 Data Sufficiency

The Permittee shall review existing data needed to support the design effort and establish if there is sufficient accurate data available for this purpose. The Permittee shall summarize the assessment findings and specify any additional data needed to complete the interim measures design. NMED may require or the Permittee may propose that sampling and analysis plans and/or treatability study Work Plans be developed to obtain the additional data. The Permittee shall include submittal times for any new sampling and analysis plans and/or treatability study Work Plans in the project schedule.

3.1.6 Project Schedule

The Permittee shall provide a project schedule that specifies all significant steps in the process, when any key documents (e.g., Plans and Specifications, Operation and Maintenance Plan, Progress Reports) shall be submitted to NMED, and when the interim measure shall be implemented.

3.1.7 Design Basis

The Permittee shall discuss the process and methods used to design all major components of the IM. The Permittee shall discuss all assumptions made and possible sources of error. The Permittee shall provide justification for the assumptions. The Permittee shall discuss the following:

- 1) Conceptual process/Schematic diagram;
- 2) Site plan showing preliminary plant layout and/or treatment area;

- 3) Tables listing number and type of major components with approximate dimensions;
- 4) Tables giving preliminary mass balances; and
- 5) Site safety and security provisions (e.g., fences, fire control, etc.)

3.1.8 Waste Management Practices

The Permittee shall describe the wastes to be generated by the interim measure and shall specify how and where they shall be managed. The Permittee shall also discuss drainage and shall indicate how rainwater runoff and runoff shall be managed.

3.1.9 Required Permits

The Permittee shall list and describe any permits needed to construct the IM. The Permittee shall indicate on the project schedule when the permit applications shall be submitted to the applicable agencies and an estimate of the permit issuance date.

3.1.10 Investigation, sampling and monitoring activities

NMED may require the Permittee to gather additional data for design of the IM during construction and/or during the operation and maintenance of the IM. NMED may require the Permittee to use a variety of data gathering techniques including geophysical surveys, trenching, wipe samples, field samples, and fixed laboratory samples. NMED may require the Permittee to conduct investigation, sampling, and monitoring activities to obtain this data. If these activities are required, the IM Work Plan shall specify the investigation, sampling, and monitoring activities that the Permittee will use to gather the additional data. The IM Work Plan shall specify the following information:

- 1) Description and purpose of investigation, sampling, monitoring tasks;
- 2) List and description of what the Permittee will investigate, sample, or monitor (e.g., hazardous waste or hazardous constituents, chemicals, substances, parameters, and properties);
- 3) Data quality objectives;
- 4) Analytical test methods, method detection limits (MDLs), practical quantitation limits (PQLs), equivalent quantitation limits (EQLs), dilution factors, etc., achieved for each sample (i.e., fixed laboratory and field sample);
- 5) Laboratory quality assurance/quality control (QA/QC) sample results, results of the matrix spike duplicates, percent recovery, duplicate analysis, and the results of any screening analyses; and,
- 6) Investigation, sample collection, and monitoring procedures and equipment;
- 7) Field quality control procedures;

- 8) Criteria for data acceptance and rejection; and,
- 9) Schedule and frequency of investigation, sampling, and monitoring.

The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. NMED may require the Permittee to submit the investigation, sampling, and monitoring plan as a separate document.

3.1.11 Data Collection/Quality Assurance

To ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented, the Permittee shall prepare a Quality Assurance Project Plan (QAPP) to document all monitoring procedures, sampling, field measurements and sample analyses performed during the IM. The Permittee shall use quality assurance, quality control, and chain-of-custody procedures approved by NMED. The QAPP shall include the minimum elements of a quality assurance program for data collection activities specified in Chapter One of SW-846.

3.1.12 Data Management and Reporting

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and establish data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

3.1.12.a Data Record

The data record shall include the following, at a minimum:

- 1) Description and purpose of the investigation, sampling, and monitoring tasks;
- 2) Data quality objectives;
- 3) Analytical test methods, dilution factors, method detection limits, practical quantitation limits, and actual detection limits;
- 4) Laboratory quality control sample results;
- 5) Sample collection procedures and equipment;
- 6) Field quality control procedures;
- 7) Evaluation of data acceptance and rejection and criteria used;

- 8) Unique sample collection code for each sample (i.e., fixed laboratory and field sample) and each field measurement;
- 9) Location and depth of each sample (i.e., fixed laboratory and field sample) and field measurement;
- 10) Sample type (e.g., composite, grab, wipe) and media (e.g., ground water, soil) of each sample (i.e., fixed laboratory and field sample) and field measurement;
- 11) Raw data for each sample (i.e., fixed laboratory and field sample) and field measurement;
- 12) Laboratory analysis ID number;
- 13) Time and date of collection of each sample (i.e., fixed laboratory and field sample) and field measurement;
- 14) Hazardous waste or constituent, chemical, substance, parameter, and property measured;
- 15) Result of analysis (e.g., concentration);
- 16) Cleanup levels used for comparison;
- 17) Conditions during sampling; and,
- 18) Identity of the individuals performing the investigation, sampling, and monitoring.

3.1.12.b Tabular Displays

The following data shall be presented in tabular displays, including, but not limited to:

- 1) Unsorted (raw) data;
- 2) Results for each medium and for each hazardous waste or constituent, chemical, substance, parameter, and property investigated, sampled, and monitored;
- 3) Data reduction for statistical analysis;
- 4) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and,
- 5) Summary data.

3.1.12.c Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- 1) Sampling location and sampling grid;
- 2) Boundaries of sampling area, and areas where additional data are required;
- 3) Contamination concentrations at each sampling location;
- 4) Geographical extent of contamination;
- 5) Contamination concentrations, averages, and maxima;
- 6) Changes in concentration in relation to distance from the source, time, depth or other parameters;
- 7) Features affecting intramedia transport; and,
- 8) Potential receptors.

3.1.13 Appendices

The Permittee shall submit an IM Work Plan that includes the following appendices:

- 1) Design data - Tabulations of data used in the design effort;
- 2) Equations - List and describe the source of all equations used in the design process;
- 3) Sample calculation - Present and explain one example calculation for each calculation; and,
- 4) Laboratory and field test results.

3.2 INTERIM MEASURE OPERATION AND MAINTENANCE PLAN

The Permittee shall prepare an IM Operation and Maintenance (O&M) Plan that includes a strategy and procedures for performing operations, maintenance, and monitoring of the IM. The Permittee shall submit the IM O&M Plan to NMED simultaneously with the Plans and Specifications. The O&M Plan shall, at a minimum, include the following elements:

3.2.1 Purpose/Approach

The Permittee shall describe the purpose of the document and provide a summary of the project.

3.2.2 Project Management

The Permittee shall specify the levels of authority and responsibility (include organization chart), lines of communication, and a description of the qualifications of key personnel who shall operate and maintain the interim measure(s) (including contractor personnel).

3.2.3 System Description

The Permittee shall describe the interim measure and identify significant equipment.

3.2.4 Personnel Training

The Permittee shall describe the training process for O&M personnel. The Permittee shall prepare, and include in the technical specification governing treatment systems, contractor requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

3.2.5 Start-up Procedures

The Permittee shall describe system start-up procedures including any operational testing.

3.2.6 Operation and Maintenance Procedures

The Permittee shall describe normal operation and maintenance procedures including:

- 1) Description of task for operation;
- 2) Description of tasks for maintenance;
- 3) Description of prescribed treatment or operation conditions; and,
- 4) Schedule showing frequency of each O&M task.

3.2.7 Waste Management Practices

The Permittee shall describe the wastes generated by operation of the interim measure and how and where they shall be managed. The Permittee shall also discuss drainage and indicate how rainwater run-on and runoff shall be managed.

3.2.8 Sampling and monitoring activities

If sampling and monitoring activities are necessary for effective operation and maintenance of the IM, the Permittee shall provide a complete sampling and analysis section in the IM Work Plan that specifies the methods and procedures to be used during IM implementation.

The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional constituents, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis. NMED may require the Permittee to submit the sampling and analysis section as a separate document.

3.2.9 O&M Contingency Procedures

The Permittee shall describe the procedures used to address system breakdowns and operational problems including a list of redundant and emergency back-up equipment and procedures;

If the interim measure suffers complete failure, the Permittee shall specify alternate procedures to prevent the release and/or threatened releases of hazardous substances, pollutants, or hazardous waste or hazardous constituents which may endanger public health and the environment or exceed cleanup levels; and,

The Permittee shall specify in the O&M Plan that, in the event of a major breakdown and/or complete failure of the interim measure(s) (including emergency situations), the Permittee shall orally notify NMED within 24 hours of the event and shall notify NMED in writing within 72 hours of the event. The written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and the environment.

3.2.10 Data Management and Documentation Requirements

The Permittee shall describe how analytical data and results shall be evaluated, documented, and managed, including development of an analytical database. The Permittee shall specify the criteria that shall be used by the project team to review and to determine the quality and usability of the data.

The O&M Plan shall specify that the Permittee shall collect, maintain, and submit the following information:

- 1) Progress Report information, including work accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentrations of hazardous waste or hazardous constituents in treated and/or excavated volumes, nature and volume of wastes generated, etc.), and record of significant activities (e.g., sampling events, inspections, problems encountered, action taken to rectify problems, etc.).
- 2) Monitoring and laboratory data;
- 3) Records of operating costs; and,
- 4) Personnel, maintenance, and inspection records.

NMED may require the Permittee to submit additional reports that evaluate the effectiveness of the interim measure in meeting the stabilization goal.

3.3 INTERIM MEASURES PLANS AND SPECIFICATIONS

NMED may require the Permittee to prepare Plans and Specifications for the interim measure that are based upon the conceptual design but includes additional detail. If required by NMED, the Plans and Specifications shall be submitted simultaneously with the O&M Plan. The design

package shall include drawings and specifications needed to construct the interim measure. Depending on the nature of the interim measure, many different types of drawings and specifications may be needed. Some of the elements that may be required include:

- 1) General site plans;
- 2) Process flow diagrams;
- 3) Mechanical drawings;
- 4) Electrical drawings;
- 5) Structural drawings;
- 6) Piping and instrumentation diagrams;
- 7) Excavation and earthwork drawings;
- 8) Equipment lists;
- 9) Site preparation and field work standards; and,
- 10) Preliminary specifications for equipment and material.

ATTACHMENT 4 RCRA FACILITY INVESTIGATION SCOPE OF WORK

PURPOSE

The purpose of the RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from solid waste management units (SWMUs), areas of concern (AOCs), and other source areas at a facility and to gather all necessary data to support a Corrective Measures Study.

SCOPE

The RFI is one step in the corrective action program. The RFI includes the following phases: pre-investigation tasks in support of the RFI; preparation and submittal of a RFI work plan (RFI WP), the implementation of the approved RFI WP, the preparation and submittal of a RFI Report; the Preliminary Evaluation of Corrective Measure Technologies; and quarterly progress reports.

NMED may require the Permittee to conduct additional tasks or provide additional information beyond what is discussed in the SOW or specified in the approved RFI documents in order to support the RFI program. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, conducting the RFI and the additional tasks.

4.1 PRE-INVESTIGATION TASKS

Pre-investigation tasks shall include the preparation and submittal of the following documents: a Current Conditions Report; a Health and Safety Plan; and, a Proposed Schedule.

4.1.1 Current Conditions Report

The Permittee shall submit for NMED's review and approval a Current Conditions Report that provides information on site conditions, historical site use, contamination, and interim measures for the SWMUs and AOCs under investigation. The Permittee shall identify all data gaps in the Current Conditions Report (i.e., identify the information that is not available). The Current Conditions Report shall present the information and data gathered during previous investigations and studies.

4.1.1.a Facility Background

The Current Conditions Report shall summarize the regional location, pertinent boundary features, general physiography, hydrogeology, and historical uses of the area in the vicinity of and including the SWMUs and AOCs under investigation for the treatment, storage, and/or disposal of solid and hazardous waste or hazardous constituents. The Current Conditions Report shall include the items specified below.

4.1.1.a.i Maps and aerial photographs

The Current Conditions Report shall include maps that are consistent with 20.4.1.900 NMAC (incorporating 40 CFR 270.14) and shall be of sufficient detail and accuracy to locate and report all previous, current, and future studies or work performed at the SWMUs and AOCs under investigation. The Current Conditions Report shall also include aerial photographs of the subject, SWMUs, AOCs, and source areas superimposed on them.

All maps shall also depict the following:

- 1) General geographic location;
- 2) Property lines, with the owners of all adjacent property clearly indicated;
- 3) Topography and surface drainage depicting all waterways, wetlands, flood plains, water features, drainage patterns, and surface-water containment areas;
- 4) All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
- 5) Surrounding land uses (residential, commercial, industrial, agricultural, recreational);
- 6) The location of all production and ground water monitoring wells at and in the vicinity of the SWMUs and AOCs under investigation and within a quarter-mile radius of the facility boundary. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment);
- 7) Wind rose and meteorology; and
- 8) The location of the boundaries of all active, inactive, closed, transferred, or transferring military ranges.

Maps and aerial photographs shall also depict the location of all known or suspected contaminated sites and areas at the facility, including the following:

- 1) All known or suspected solid or hazardous waste treatment, storage, management, handling, or disposal areas that were active before or after November 19, 1980;
- 2) All known or suspected product storage, management, or handling areas including aboveground and underground product tanks or piping;
- 3) All former or existing buildings and structures that are known or suspected to contain lead-based paint, PCBs in paint, or asbestos containing material;
- 4) All former or existing buildings and structures that have associated floor drains, piping, septic tanks, cesspools, sumps, dry wells, piping, drain fields, or outfalls;

- 5) All former or existing indoor and outdoor electrical transformers;
- 6) All known or suspected spill areas; and
- 7) All known or suspected areas where military munitions or waste military munitions were stored, handled, maintained, managed, demilitarized, used, tested, treated, burned, detonated, destroyed, or disposed of.

4.1.1.a.ii History

The Permittee shall provide all existing site history information for the SWMUs and AOCs under investigation in the Current Conditions Report.

4.1.1.a.iii Permits and Enforcement Actions

The Current Conditions Report shall present a summary of past permits applied for and/or received, any enforcement actions and their subsequent responses, and a list of documents and studies prepared for the facility. This may include information from previous owner/operators, if available.

4.1.1.b Preliminary Assessment of Nature and Extent of Contamination

The Current Conditions Report shall include a preliminary assessment of the nature and extent of known contamination at the SWMUs and AOCs under investigation based on existing information. The Current Conditions Report shall , at a minimum, identify the following:

- 1) Location and boundaries of each unit/area;
- 2) Quantities of solid and/or hazardous wastes (managed, spilled, placed, disposed of, or released);
- 3) Type of hazardous waste or hazardous constituents (both causing or potentially causing contamination), to the extent known;
- 4) Identification of areas where additional information is necessary;
- 5) A list and brief description of all previous investigations that have occurred at the SWMUs and AOCs under investigation, who they were conducted for (i.e., which bureau, agency, etc.) and contacts; and
- 6) The results of previous investigations and studies including the RCRA Facility Assessment (RFA) and a summary of suggested further actions for all SWMUs and AOCs under investigation.

4.1.1.c Preliminary Assessment and Description of Potential Migration Pathways

The Current Conditions Report shall include a description and evaluation of the potential migration pathways based on existing information. This shall include:

- 1) All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, food webs, meteorology, and air quality;
- 2) Physical properties of hazardous waste or hazardous constituents; and,
- 3) An assessment of whether off-site migration of hazardous waste or hazardous constituents has occurred (may include a conceptual site model of hazardous waste or constituent migration).

The Current Conditions Report shall describe the potential impact(s) on human health and the environment, including demography, identification of possible sensitive subpopulations (e.g., schools, homes for the elderly, hospitals, and ecosystems), ground water, and surface water use, and present and future land use.

4.1.1.d Data Record

The data record shall include the following, at a minimum:

- 1) Description and purpose of the investigation, sampling, and monitoring tasks;
- 2) Data quality objectives;
- 3) Hazardous constituents analyzed for;
- 4) Sample collection procedures and equipment;
- 5) Field quality control procedures;
- 6) Conditions during sampling;
- 7) Identity of the individuals performing the investigation, sampling, monitoring;
- 8) Evaluation of data acceptance and rejection and criteria used;
- 9) Unique sample collection code for each sample (i.e., fixed laboratory and field sample) and each field measurement;
- 10) Location and depth of each sample (i.e., fixed laboratory and field sample) and field measurement;
- 11) Sample type (e.g., composite, grab, wipe) and media (e.g., ground water, soil) of each sample (i.e., fixed laboratory and field sample) and field measurement;

- 12) Raw data for each sample (i.e., fixed laboratory and field sample) and field measurement;
- 13) Laboratory analysis identification number;
- 14) Time and date of collection of each sample (i.e., fixed laboratory and field sample) and field measurement;
- 15) Hazardous waste or hazardous constituent, chemical, substance, parameter, and property measured;
- 16) Result of analysis (e.g., concentration);
- 17) Analytical test methods, method detection limits (MDLs), practical quantitation limits (PQLs), equivalent quantitation limits (EQLs), dilution factors, etc., achieved for each sample (i.e., fixed laboratory and field sample);
- 18) Laboratory quality assurance/quality control (QA/QC) sample results, results of the matrix spike duplicates, percent recovery, duplicate analysis, and the results of any screening analyses; and,
- 19) Cleanup levels used for comparison.

4.1.1.e Tabular Displays

The following data shall be presented in tabular displays, including, but not limited to:

- 1) Unsorted (raw) data;
- 2) Results for each medium, hazardous waste or hazardous constituent, chemical, substance, parameter, and property investigated, sampled, and monitored;
- 3) Data reduction for statistical analysis;
- 4) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and,
- 5) Summary data.

4.1.1.f Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- 1) Sampling location and sampling grid;
- 2) Boundaries of sampling area, and areas where additional data are required;
- 3) Contamination concentrations at each sampling location;

- 4) Geographical extent of contamination;
- 5) Contamination concentrations, averages, and maxima;
- 6) Changes in concentration in relation to distance from the source, time, depth or other parameters;
- 7) Features affecting intramedia transport; and,
- 8) Potential receptors.

4.1.2 Health and Safety Plan

The Permittee shall submit a Health and Safety Plan for all field activity. The Health and Safety Plan shall be developed as a stand-alone document.

4.2 RCRA FACILITY INVESTIGATION

4.2.1 Purpose/Objectives

The Permittee shall prepare and submit for NMED's review and approval a RFI Work Plan (RFI WP) to: characterize the environmental setting of the SWMUs and AOCs under investigation; determine the source; describe the source unit or area and describe the solid waste and hazardous waste that were released, placed, or disposed of; define the nature and extent of the releases of hazardous waste or hazardous constituents; and, identify actual or potential receptors.

The data generated by the Permittee during the RFI shall be of adequate technical quality to support the development and evaluation of the corrective measure alternative(s) during the Corrective Measures Study (CMS) and/or Interim Measures.

Upon receiving approval from NMED the Permittee shall implement the RFI Work Plan (RFI WP) and upon completion of the investigation the Permittee shall prepare and submit a RFI Report.

4.2.2 RFI Work Plan

The RFI WP shall specify the procedures by which the Permittee shall collect or obtain the following information or data:

- 1) Update the current conditions in accordance with Permit Attachment 4.1;
- 2) Description of the solid and/or hazardous wastes;
- 3) Waste and media characterization; and,
- 4) Potential receptor identification.

4.2.2.a Environmental Setting

The Permittee shall collect information to supplement and verify existing information on the environmental setting. NMED may request additional information not included on the following lists. The Permittee shall characterize the environmental setting as specified below.

4.2.2.a.i Hydrogeology

The Permittee shall evaluate the hydrogeologic conditions at the SWMUs and AOCs under investigation. This evaluation shall include, but not be limited to, the following:

- 1) A description of the geologic and hydrogeologic characteristics affecting ground water flow beneath the SWMUs and AOCs under investigation, including:
 - (a) stratigraphy including a description of strata including strike and dip, and identification of stratigraphic contacts;
 - (b) Structural geology including: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
 - (c) Depositional history;
 - (d) Areas and amounts of recharge and discharge;
 - (e) Regional and facility-specific ground water flow patterns; and,
 - (f) Seasonal variations in the ground water flow regime.
- 2) An analysis of any topographic features that might influence the ground water flow system.
- 3) A representative and accurate classification and description of the hydrogeologic units based on field data, tests, and cores that may be part of the migration pathways at the SWMUs and AOCs under investigation (i.e., the aquifers and any intervening saturated and unsaturated zones), including, but not limited to:
 - (a) Hydraulic conductivity, intrinsic permeability, and porosity (total and effective);
 - (b) Lithology, grain size, sorting, degree of cementation;
 - (c) An interpretation of hydraulic interconnections between saturated zones; and,
 - (d) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
- 4) Based on field studies and cores, structural geology and hydrogeologic cross-sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units that may be part of the migration pathways identifying:

- (a) Sand and gravel in unconsolidated deposits;
 - (b) Zones of fracturing or channeling in consolidated and unconsolidated deposits;
 - (c) Zones of higher permeability or low permeability that might direct and restrict the flow of hazardous waste or constituents;
 - (d) The uppermost aquifer;
 - (e) Water-bearing zones above the first confining layer that may serve as a pathway for hazardous waste or constituent migration, including perched zones of saturation; and,
 - (f) All other geologic formations, or parts thereof, yielding a significant amount of ground water.
- 5) Based upon data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential hazardous waste or constituent source, a representative description of water level or fluid pressure monitoring including:
- (a) Water level contour and/or potentiometric maps;
 - (b) Hydrologic cross-sections showing vertical flow gradients;
 - (c) The flow system, including the vertical and horizontal components of flow; and,
 - (d) Any temporal changes in hydraulic gradients, (due to seasonal influences, etc.)
 - (e) A description of man-made influences that may affect the hydrogeology of the site, identifying:
 - (i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and,
 - (ii) Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

4.2.2.a.ii Soils

The Permittee shall characterize the soil and rock units potentially affected by hazardous waste or hazardous constituent release(s). Such characterization shall include, but not be limited to, the following information:

- 1) Where remediation by removal of soils is the only corrective measure option, the Permittee shall provide map(s) and cross-sections showing the extent of contamination, depth of ground water, and the consistency and distribution of soils (using the Unified Soil Classification System (USCS, ASTM D 2487).

- 2) Where remediation by removal is the likely option, and it is necessary to determine the extent of migration (e.g., to assess the mobility of wastes from an unlined surface impoundment or landfill), the Permittee shall also provide the following in addition to the requirements immediately above:
 - (a) Depth to bedrock and the characteristics of the bedrock including discontinuities such as faults, fissures, joints, fractures, sinkholes, etc.;
 - (b) A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:
 - (c) USDA Textural Soil Classification and soil profiles showing stratifications or zones that may affect or direct the subsurface flow;
 - (d) Hydraulic conductivity and the SCS hydrologic group classification of A, B, C or D;
 - (e) Relative permeability (only if the waste may have changed the soil's hydraulic conductivity, such as concentrated organics);
 - (f) Storage capacity (if excavated soil will be stored);
 - (g) Shrink-swell potential (where extreme dry weather could lead to the formation of cracks);
 - (h) Potential for hazardous waste or hazardous constituent transport via erosion, using the Universal Soil Loss Equation;
 - (i) Soil sorptive capacity;
 - (j) Cation exchange capacity;
 - (k) Soil organic content; and,
 - (l) Soil pH.
- 3) The following hazardous waste or hazardous constituent characteristics shall be included:
 - (a) Physical state;
 - (b) Viscosity;
 - (c) pH;
 - (d) pKa;
 - (e) Density;

- (f) Water solubility;
 - (g) Henry's Law Constant;
 - (h) Kow;
 - (i) Biodegradability; and,
 - (j) Rates of hydrolysis, photolysis, and oxidation.
- 4) Where in-situ soil treatment is likely to be implemented, the above information and the following additional information shall be provided:
- (a) Bulk density;
 - (b) Porosity;
 - (c) Grain size distribution;
 - (d) Mineral content;
 - (e) Soil moisture profile;
 - (f) Unsaturated hydraulic conductivity;
 - (g) Effect of stratification on unsaturated flow; and,
 - (h) Infiltration and evapotranspiration.

4.2.2.a.iii Surface Water and Sediment

The Permittee shall characterize the surface water bodies likely to be affected by releases at or from the SWMUs and AOCs under investigation. Such characterization shall include the following activities and information:

- 1) Description of the temporal and permanent surface water bodies including:
 - (a) Lakes and ponds: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
 - (b) Impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
 - (c) Arroyos, streams, ditches, drains, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (e.g., 100-year event, arial extent, channels);
 - (d) Wetlands;

- (e) Containment measures in place (e.g., levees, concrete lining, etc.)
 - (f) Drainage patterns; and,
 - (g) Evapotranspiration rates.
- 2) Description of the chemistry of the natural surface water and sediments, including:
- (a) pH;
 - (b) Total dissolved solids;
 - (c) Total suspended solids;
 - (d) Biological oxygen demand;
 - (e) Alkalinity;
 - (f) Conductivity;
 - (g) Dissolved oxygen profiles;
 - (h) Nutrients (NH_3 , NO_3/NO_2 , PO_4^{-3});
 - (i) Chemical oxygen demand;
 - (j) Total organic carbon; and,
 - (k) Specific hazardous waste or constituent concentrations.
- 3) Description of sediment characteristics including:
- (a) Deposition area;
 - (b) Thickness profile; and,
 - (c) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.).

4.2.2.a.iv Air

The Permittee shall characterize the climate in the vicinity of the SWMUs and AOCs under investigation. Such characterization shall include the following information:

- 1) A description of the following parameters:
 - (a) Annual and monthly rainfall averages;
 - (b) Monthly temperature averages and extremes;

- (c) Wind speed and direction;
 - (d) Relative humidity/dew point;
 - (e) Atmospheric pressure;
 - (f) Evaporation data;
 - (g) Development of inversions; and,
 - (h) Climate extremes that have been known to occur in the vicinity of the SWMUs and AOCs under investigation, including frequency of occurrence.
- 2) A description of topographic and man-made features that affect air flow and emission patterns, including:
- (a) Ridges, hills, or mountain areas;
 - (b) Canyons or valleys;
 - (c) Surface water bodies (e.g., rivers, lakes, ponds, etc.);
 - (d) Wind breaks and forests; and,
 - (e) Buildings and structures.

4.2.2.b Source Characterization

The Permittee shall provide a description of the solid and/or hazardous wastes, and the areas where wastes have been treated, stored, disposed of, placed, collected, or removed including: type, quantity, physical form, disposition (containment or nature of disposal), and any facility characteristics that may affect or have affected a release (e.g., facility security, engineered barriers).

This shall include a description of the following specific characteristics at each source area:

- 1) Location, boundaries, dimensions, and depth below ground surface of the SWMU and/or AOC;
- 2) Type of SWMU and/or AOC;
- 3) Design and construction features;
- 4) Operating practices (past and present) including the history of releases;
- 5) Period of operation;
- 6) Age of SWMU and/or AOC;

- 7) General physical conditions; and,
- 8) Method used to close or remediate the SWMU and/or AOC.
- 9) Solid/Hazardous Waste Description;
- 10) Type of waste released, placed or disposed of in the SWMU and/or AOC;
 - (a) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
 - (b) Location and depth;
 - (c) Quantity and volume; and,
 - (d) Chemical composition.
- 11) Physical and chemical characteristics of waste;
 - (a) Physical form (solid, liquid, gas);
 - (b) Physical description (e.g., powder, oily sludge);
 - (c) Size and dimensions (e.g., size of military munitions);
 - (d) Temperature;
 - (e) pH;
 - (f) General chemical class (e.g., acid, base, solvent);
 - (g) Molecular weight;
 - (h) Density;
 - (i) Boiling point;
 - (j) Viscosity;
 - (k) Solubility in water;
 - (l) Cohesiveness;
 - (m) Vapor pressure;
 - (n) Flash point; and
 - (o) Waste constituents including hazardous constituents.

- 12) Migration, dispersal, and fate characteristics;
 - (a) Sorption;
 - (b) Hazardous constituents and chemical composition;
 - (c) Biodegradability, bioconcentration, biotransformation;
 - (d) Photodegradation rates;
 - (e) Combustion and detonation products;
 - (f) Hydrolysis rates;
 - (g) Chemical transformation and degradation; and,
 - (h) Physical migration due to erosion, freeze thaw, flood events, etc.

The Permittee shall document the procedures used in making the above determinations.

4.2.2.c Waste and Media Characterization

The Permittee shall collect data to characterize the waste and contaminated environmental media associated with releases at or from the SWMUs and AOCs under investigation. This data shall be sufficient to define the location, nature, extent, origin, direction, and rate of movement of hazardous waste or hazardous constituents in the ground water, soils, surface water, sediment, air, and subsurface gas. The Permittee may use a variety of data gathering techniques including geophysical surveys, trenching, wipe samples, field samples, and fixed laboratory samples, etc.

The Permittee shall provide a work plan for investigation, sampling and analysis, and monitoring. The work plan shall specify the following information, at a minimum:

- 1) Description and purpose of investigation, sampling, and monitoring tasks;
- 2) List of hazardous waste or hazardous constituents to be investigated, sampled, and monitored;
- 3) Data quality objectives;
- 4) Analytical test methods, method detection limits (MDLs), practical quantitation limits (PQLs), equivalent quantitation limits (EQLs), dilution factors, etc., achieved for each sample (i.e., fixed laboratory and field sample);
- 5) Laboratory quality assurance/quality control (QA/QC) sample results, results of the matrix spike duplicates, percent recovery, duplicate analysis, and the results of any screening analyses; and,
- 6) Cleanup levels used for comparison;

- 7) Investigation, sample collection, and monitoring procedures and equipment;
- 8) Field quality control procedures;
- 9) Criteria for data acceptance and rejection; and,
- 10) Schedule and frequency for investigation, sampling, and monitoring.

The Permittee shall provide complete work plans to characterize all wastes and media at the SWMUs and AOCs under investigation, including the following:

4.2.2.c.i Waste Characterization

The Permittee shall conduct an investigation to characterize solid waste and hazardous waste or hazardous constituents associated with releases at or from the SWMUs or AOCs under investigation. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to investigate, sample, or monitor for additional chemicals, substances, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis. The investigation shall provide the following information regarding solid waste and/or hazardous waste that was released, placed, or disposed of:

- 1) A description and delineation of the maximum concentrations of the waste;
- 2) A description and delineation of the horizontal and vertical extent of the waste;
- 3) Specific concentrations of hazardous wastes or hazardous constituents;
- 4) A description of the chemical properties of the hazardous waste or hazardous constituents. This includes hazardous waste characteristics, stability, contaminant solubility, speciation, adsorption, biodegradability, oxidation and other factors that might affect remediation, migration, transformation;
- 5) An evaluation of factors influencing waste movement; and,
- 6) An extrapolation of future waste movement over the time period specified by NMED.

The Permittee shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

4.2.2.c.ii Ground water characterization

The Permittee shall conduct an investigation to characterize any ground water plumes at or from the SWMUs and AOCs under investigation. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis.

The investigation shall provide the following information:

- 1) A description and delineation of the maximum concentrations (e.g., hot spots, source areas) of the plume(s);
- 2) A description and delineation of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating at or from the SWMUs and AOCs under investigation;
- 3) The horizontal and vertical direction of hazardous waste or hazardous constituent movement;
- 4) The velocity of hazardous waste or hazardous constituent movement;
- 5) Specific concentrations of hazardous wastes or hazardous constituents;
- 6) Background concentrations for naturally occurring constituents;
- 7) A description and delineation of the chemical properties of the hazardous waste or hazardous constituents and ground water chemistry within and throughout the plume(s). This includes contaminant solubility, speciation, adsorption, biodegradability, oxidation and other factors that might affect migration and transformation;
- 8) The horizontal and vertical concentration profiles of hazardous waste or hazardous constituents in the plume(s);
- 9) An evaluation of factors influencing the plume movement; and,
- 10) An extrapolation of future contaminant movement over the time period specified by NMED.

The Permittee shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

4.2.2.c.iii Soil characterization

The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units in the vicinity of the release from the SWMUs and AOCs under investigation. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis.

The investigation shall include the following information:

- 1) A description and delineation of the vertical and horizontal extent of hazardous wastes or hazardous constituents;

- 2) A description and delineation of the maximum concentrations (e.g., hot spots, source areas) of hazardous wastes or hazardous constituents;
- 3) A description and delineation of hazardous wastes or hazardous constituents and soil chemical properties within the source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;
- 4) Background concentrations for naturally occurring constituents;
- 5) Specific concentrations of hazardous wastes or hazardous constituents;
- 6) An extrapolation of future contaminant movement over the time period specified by NMED.

The Permittee shall document the procedures used in making the above determinations.

4.2.2.c.iv Surface Water and Sediment Characterization

The Permittee shall conduct an investigation to characterize releases to surface water bodies and sediment at or from SWMUs and AOCs under investigation. The Permittee may also be required to characterize releases from storm water runoff. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. The Permittee shall follow NMED and/or EPA guidance when conducting sampling and analysis.

The investigation shall include the following information:

- 1) A description and delineation of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating at or from SWMUs and AOCs under investigation, and the extent of contamination in sediments;
- 2) A description of the chemical and physical properties of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.
- 3) Background concentrations for naturally occurring constituents;
- 4) A description and delineation of the maximum concentrations (e.g., hot spots, source areas) of hazardous wastes or hazardous constituents;
- 5) The horizontal and vertical direction of movement of hazardous wastes or hazardous constituents;
- 6) The contaminant velocity or rate of movement;

- 7) An evaluation of the physical, biological, and chemical factors influencing contaminant movement; and
- 8) An extrapolation of future contaminant movement over the time period specified by NMED.

The Permittee shall document the procedures used in making the above determinations.

4.2.2.c.v Air Characterization

The Permittee shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere from the SWMUs and AOCs under investigation. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis. This investigation shall provide the following information:

- 1) The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.
- 2) A description of the horizontal and vertical direction and velocity of contaminant movement; and,
- 3) The rate and amount of the release.

The Permittee shall document the procedures used in making the above determinations.

4.2.2.c.vi Subsurface gas characterization

The Permittee shall conduct an investigation to characterize subsurface gases emitted from hazardous waste or hazardous constituents at the SWMUs and AOCs under investigation. The Permittee shall analyze for hazardous waste or hazardous constituents that are reasonably expected to be present. NMED may require the Permittee to sample for additional chemicals, substances, parameters, and properties. The Permittee shall follow all NMED and/or EPA guidance for sampling and analysis. This investigation shall include the following information:

- 1) A description of the horizontal and vertical extent of subsurface gas migration;
- 2) The chemical composition of the gases being emitted;
- 3) The rate, amount, and density of the gases being emitted; and,
- 4) Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Permittee shall document the procedures used in making the above determinations.

4.2.2.d Potential Receptor Identification

The Permittee shall collect data describing the human populations and environmental systems that currently or potentially are at risk of contaminant exposure at or from the SWMUs or AOCs under investigation. The chemical analysis of biological samples and may be needed. Data on observable effects in ecosystems may also be required by NMED. The Permittee shall identify the following characteristics:

4.2.2.d.i Local uses and possible future uses of ground water

The Permittee shall identify the local uses and possible future uses of ground water with respect to the following considerations:

- 1) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial);
- 2) Location of ground water users including wells and discharge areas;
- 3) Domestic and municipal (e.g., potable and lawn/gardening watering);
- 4) Recreational (e.g., swimming, fishing);
- 5) Agricultural;
- 6) Industrial; and,
- 7) Environmental (e.g., fish and wildlife propagation).

4.2.2.d.ii Authorized and unauthorized human use and access to the facility and adjacent lands

The Permittee shall identify the authorized and unauthorized human use of, and access to, the parcels on which the SWMUs and AOCs under investigation are located and adjacent lands with respect to the following considerations: recreation; hunting; residential; commercial; zoning; and, relationship between population locations and prevailing wind direction.

4.2.2.d.iii Demographic Profile

The Permittee shall submit a demographic profile of the people who use and have access (authorized and unauthorized) to the parcel on which the SWMUs and AOCs under investigation are located and adjacent lands. The Permittee shall detail the following: age; sex; sensitive subgroups; and, environmental justice concerns.

4.2.2.d.iv Ecology

The Permittee shall submit a description of the ecology of the parcel on which the SWMUs and AOCs under investigation are located and adjacent areas, including habitat and species present and expected to be present.

4.2.2.d.v Biota In Surface Water Bodies

The Permittee shall provide a description of the biota in surface water bodies on, adjacent to, or affected by the parcel on which the SWMUs or AOCs are located.

4.2.2.d.vi Tribal, State and Federal Regulations

The Permittee shall provide a description of any tribal, state and federal threatened and/or endangered species (both proposed and listed), cultural sites or other regulated areas located near the parcel on which the SWMUs or AOCs under investigation.

4.3 PRELIMINARY EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES BY LABORATORY OR BENCH-SCALE STUDIES

NMED may require the Permittee to conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to conditions at the SWMUs and AOCs under investigation.

These studies may be conducted at any time during the RFI. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study or studies, the level of effort needed, and the procedures to be used for data management and interpretation. Upon completion of the testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site specific questions identified in the test plan. The Permittee shall prepare a report summarizing the testing program and its results (if studies are performed), both positive and negative.

4.4 PROJECT SCHEDULE

The Permittee's proposed project schedule shall specify all significant steps in the RFI process and when all RFI deliverables (*e.g.*, Current Conditions Report, a Health and Safety Plan; RFI WP, *etc.*) shall be submitted to NMED.

ATTACHMENT 5 CORRECTIVE MEASURES STUDY SCOPE OF WORK

PURPOSE

The purpose of the Corrective Measures Study (CMS) is to identify and evaluate potential remedial alternatives for all releases. NMED may require the Permittee to conduct a CMS whenever hazardous waste or constituents may pose a threat to human health and the environment, whenever concentrations of hazardous waste or hazardous constituents exceed the cleanup levels specified in Permit Attachment 7 (Cleanup Levels for Environmental Media), or as otherwise required by NMED.

SCOPE

The CMS includes, unless otherwise specified by NMED, a CMS Work Plan, a CMS Report, Progress Reports, and a Proposed Schedule. The scope of work (SOW) for each document is specified below. NMED may require the Permittee to conduct additional tasks or provide additional information beyond what is discussed in the SOW or specified in the approved CMS documents in order to support the CMS program. The Permittee shall furnish all personnel, materials, and services necessary to conduct the CMS and any additional tasks.

5.1 CORRECTIVE MEASURES STUDY WORK PLAN

The CMS Work Plan shall include the following elements:

- 1) A site-specific description of the overall purpose of the Corrective Measure Study;
- 2) A description of the corrective measure objectives, including applicable cleanup levels;
- 3) A description of how a risk assessment shall be performed, if required;
- 4) A description of the specific corrective measure technologies and/or corrective measure alternatives that the Permittee shall study;
- 5) A description of the general approach to investigating and evaluating potential corrective measures;
- 6) A detailed description of any proposed pilot, laboratory and/or bench scale studies;
- 7) A proposed outline for the CMS Report including a description of how information shall be presented; and,
- 8) A description of overall project management including overall approach, levels of authority (include organization chart), lines of communication, project schedules, budget and personnel, and a description of qualifications for personnel directing or performing the work.

5.1.1 Introduction/Purpose

The Permittee shall describe the purpose of the document and provide a summary description of the project.

5.1.2 Description of Current Conditions

The Permittee shall include a brief summary/discussion of any new information that has been discovered since the RFI Current Conditions Report was finalized. This discussion shall concentrate on those issues that could significantly affect the evaluation and selection of the corrective measures alternative(s).

5.1.3 Cleanup and Screening Levels

Cleanup and screening levels shall be determined in accordance with Permit Attachment 7.

5.1.4 Corrective Measure Alternatives

5.1.4.a Identification

For sites with simple contamination and/or obvious remedies, the Permittee shall propose appropriate “presumptive remedies.” For more complex sites and/or as required by NMED, the Permittee shall list and briefly describe potentially applicable technologies for each affected media that the Permittee may use to achieve the corrective action objectives. Depending on the site-specific situation, NMED may require the Permittee to consider additional technologies.

The Permittee may wish to consider proven innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies.

Innovative technologies are defined as those technologies utilized for remediation other than incineration, solidification/stabilization, and pumping with conventional treatment for contaminated ground water. Innovative treatment technologies may require extra effort to gather information, to analyze options, and to adapt the technology to the site-specific situation. Treatability studies and on-site pilot scale studies may be necessary for evaluating innovative treatment technologies.

5.1.4.b Screening

When evaluating several corrective measures technologies, the Permittee shall also evaluate the technology limitations to show why certain corrective measures technologies may prove unfeasible to implement given existing waste and site-specific conditions. If only one corrective measure alternative is being analyzed, the Permittee shall indicate any technological limitations given waste and site-specific conditions at the facility for which it is being considered.

5.1.4.c Corrective Measure Development

As required by NMED, the Permittee shall assemble the technologies that pass the screening step into specific alternatives that have potential to meet the corrective action objectives for each

media. Options for addressing less complex sites may only require evaluation of a single or limited number of alternatives.

Each alternative may consist of an individual technology or a combination of technologies used in sequence (i.e., treatment train). Depending on the site-specific situation, different alternatives may be considered for separate SWMUs and/or AOCs. The Permittee shall list and briefly describe each corrective measure alternative.

5.1.5 Evaluation of a Final Corrective Measure Alternative

For each remedy that warrants a more detailed evaluation, including those situations when only one remedy is being proposed, the Permittee shall provide detailed documentation of how the potential remedy shall comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control, and management of wastes that are generated by remedial activities. The specific standards are provided below.

- 1) Protect human health and the environment;
- 2) Attain media cleanup standards set by NMED;
- 3) Control the source of releases so as to reduce and/or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment;
- 4) Comply with any applicable standards for management of wastes; and,
- 5) Other factors.

In evaluating the selected alternative or alternatives, the Permittee shall prepare and submit information that documents that the specific proposed remedy meets the standards listed above. The Permittee shall use the following standards in evaluating each proposed remedy.

5.1.5.a Protect human health and the environment

Proposed corrective measures shall be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be a requirement to provide alternative drinking water supplies to prevent exposures to releases from an aquifer used for drinking water purposes. Another example would be a requirement for the construction of barriers or for other controls to prevent harm arising from direct contact with waste management units. Therefore, the Permittee shall include a discussion on what types of short-term remedies are appropriate for the particular facility to meet this standard. This information shall be provided in addition to a discussion of how the other corrective measure alternatives meet this standard.

5.1.5.b Attain media cleanup standards set by NMED

Proposed remedies shall attain approved media cleanup standards. The Permittee shall also include an estimate of the time frame necessary for each alternative to meet these standards.

5.1.5.c Control the sources of releases

As part of the CMS Report, the Permittee shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at specific SWMUs and/or AOCs and the known track record of the specific technology.

5.1.5.d Comply with any applicable standards for management of wastes.

The Permittee shall include a discussion of how the specific waste management activities shall be conducted in compliance with all applicable state and federal regulations (e.g., closure requirements, land disposal restrictions).

5.1.5.e Other factors

There are five general factors that NMED will consider as appropriate in selecting/approving a remedy that meets the four standards listed above. These factors represent a combination of technical measures and management controls for addressing environmental problems. The five general decision factors include:

- 1) Long-term reliability and effectiveness;
- 2) Reduction in the toxicity, mobility, or volume of wastes;
- 3) Short-term effectiveness;
- 4) Implementability; and,
- 5) Cost.

NMED may require the Permittee to provide additional information to support the use of these factors in the evaluation of viable remedial alternatives. Examples of the types of information that may be required are provided below:

5.1.5.e.i Long-term reliability and effectiveness

The Permittee may consider whether the technology or a combination of technologies have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have an immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, earthquakes, etc.).

5.1.5.e.ii Reduction in the toxicity, mobility, or volume of wastes

As a general goal, remedies will be preferred that employ techniques, such as removal or treatment technologies that are capable of eliminating or substantially reducing the inherent potential for the hazardous waste or constituents in SWMUs, AOCs, and other source areas to cause future environmental releases or other risks to human health and the environment.

Estimates of how much the corrective measures alternatives will reduce the waste toxicity, volume, and/or mobility may be helpful in applying this factor. This may be done through a comparison of initial site conditions to expected post-corrective measure conditions.

5.1.5.e.iii Short-term effectiveness

The Permittee shall evaluate each corrective measure alternative for short-term effectiveness. Possible factors to consider include fire, explosion, exposure to hazardous substances, and potential threats associated with treatment, excavation, transportation, and redisposal or containment of waste material.

5.1.5.e.iv Implementability

The Permittee shall evaluate the implementability of each remedial option. Information to consider when assessing implementability may include:

- 1) The administrative activities needed to implement the corrective measure alternative (e.g., permits, rights of way, off-site approvals, etc.) and the length of time these activities will take;
- 2) The constructibility, time for implementation, and time for beneficial results;
- 3) The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and,
- 4) The availability of prospective technologies for each corrective measure alternative.

5.1.5.e.v Cost

The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs. The capital costs shall include, but are not limited to, costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance, etc. The operation and maintenance costs shall include, but are not limited to, labor, training, sampling and analysis, maintenance materials, utilities, waste management, equipment replacement or repair, etc. Costs shall be calculated as the net present value of the capital and operation and maintenance costs.

5.1.6 Recommendation by Permittee for a Final Corrective Measure Alternative

In the CMS Report, the Permittee shall justify and recommend in the CMS report a preferred remedial option(s) for consideration by NMED. Such a recommendation should include a description and supporting rationale for the proposed remedy consistent with the remedial standards and the decision factors discussed above.

5.2 PROJECT SCHEDULE

The Permittee's proposed project schedule shall specify all significant steps in the CMS process and when all CMS deliverables (*e.g.*, CMS Work Plan, a CMS Report, Progress Reports, *etc.*) shall be submitted to NMED.

ATTACHMENT 6 CORRECTIVE MEASURES IMPLEMENTATION SCOPE OF WORK

PURPOSE

The purpose of the Corrective Measures Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected by NMED. Corrective measures are intended to protect human health and the environment from releases at or from the facility.

6.1 SCOPE

The CMI Work Plan includes, unless otherwise specified by NMED, Conceptual Design, Operation and Maintenance Plan, Plans and Specifications, Construction Work Plan, Health and Safety Plan, and a Proposed Schedule. The scope of work (SOW) for each document is specified below. NMED may require the Permittee to conduct additional tasks or provide additional information beyond what is discussed in the SOW or specified in the approved CMI documents in order to support the CMI program. The Permittee shall furnish all personnel, materials, and services necessary to conduct the CMI and any additional tasks.

6.1.1 Conceptual Design

The Permittee shall prepare a Conceptual Design Plan that clearly describes the size, shape, form, and content of the proposed corrective measure; the key components or elements that are needed; the designer's vision of the corrective measure in the form of conceptual drawings and schematics; and, the procedures and schedules for implementing the corrective measure(s). More than one conceptual design may be needed in situations where there is a complex site with multiple technologies being employed at different locations. The Permittee shall obtain NMED approval of the Conceptual Design Plan prior to implementation. The Conceptual Design Plan shall, at a minimum, include the elements specified below.

6.1.2 Introduction/Purpose

The Permittee shall describe the purpose of the document and provide a summary description of the project.

6.1.3 Corrective Measures Objectives

The Permittee shall discuss the corrective measure objectives including applicable media cleanup levels.

6.1.4 Conceptual Site Model of Hazardous Waste or Constituent Migration

The Permittee shall present a conceptual site model of migration of hazardous waste or hazardous constituents. The conceptual site model shall consist of a working hypothesis of how the hazardous waste or hazardous constituents may move from the release source to the receptor population. The Permittee shall develop the conceptual site models by looking at the applicable

physical parameters (e.g., water solubility, density, Henry's Law Constant, etc.) for each hazardous waste or hazardous constituent and assessing how the hazardous waste or hazardous constituent may migrate given the existing site conditions (geologic features, depth to ground water, etc.). The Permittee shall describe the phase (water, soil, gas, non-aqueous) and location where hazardous waste or hazardous constituents are likely to be found.

6.1.5 Description of Corrective Measures

The Permittee's conceptual site model of hazardous waste or hazardous constituent migration shall qualitatively describe what the corrective measure is supposed to do and how it will function. The Permittee shall discuss the feasibility of the corrective measure and its ability to meet the corrective measure objectives.

6.1.6 Data Sufficiency

The Permittee shall review existing data needed to support the design effort and establish if there is sufficient accurate data available for this purpose. The Permittee shall summarize the data already collected and specify any additional data needed to complete the corrective measure design. NMED may require, or the Permittee may propose, that sampling and analysis plans and/or treatability study Work Plans be developed to obtain the additional data. NMED will determine the submittal times for any new sampling and analysis plans and/or treatability study Work Plans.

6.1.7 Project Management

The Permittee shall describe the management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who shall direct the corrective measure design and the implementation effort (including contractor personnel).

6.1.8 Project Schedule

The Permittee's project schedule shall specify all significant steps in the process and when all CMI deliverables (e.g., Operation and Maintenance Plan, Corrective Measure Construction Work Plan, etc.) shall be submitted to NMED.

6.1.9 Design Criteria

The Permittee shall specify performance requirements for the overall corrective measure and for each major component. The Permittee shall select equipment that meets the performance requirements.

6.1.10 Design Basis

The Permittee shall discuss the process and methods for designing all major components of the corrective measure and shall discuss the significant assumptions made and possible sources of error. The Permittee shall provide justification for the assumptions. The discussion of the Design Basis shall include the following:

- 1) Conceptual process/schematic diagrams;
- 2) Site plan showing preliminary corrective measures layout including treatment areas;
- 3) Tables listing number and type of major components with approximate dimensions;
- 4) Tables giving preliminary mass balances; and
- 5) Site safety and security provisions (e.g., fences, fire control, etc.).

6.1.11 Waste Management Practices

The Permittee shall describe the wastes generated during the implementation of the corrective measures and how and where they shall be managed. The Permittee shall also discuss drainage at the site and indicate how rainwater runoff and runoff shall be managed.

6.1.12 Required Permits

The Permittee shall list and describe any permits needed to construct and operate the corrective measure. The Permittee shall indicate on the project schedule when the permit applications shall be submitted to the applicable agencies and an estimate of the permit issuance date.

6.1.13 Long-Lead Procurement Considerations

The Permittee shall prepare a list of any elements or components of the corrective measure that will require custom fabrication or are considered long-lead procurement items. The list shall include the reason why the items are considered long-lead items, the length of time necessary for procurement, and the recognized sources of such procurement.

6.1.14 The Permittee shall include the following appendices:

- 1) Design data - Tabulations of significant data used in the design effort;
- 2) Equations - List and describe the source of all equations used in the design process;
- 3) Sample calculations - Present and explain one example calculation for significant or unique design calculations; and,
- 4) Laboratory or field test results.

6.2 OPERATION AND MAINTENANCE PLAN

The Permittee shall prepare an Operation and Maintenance (O&M) Plan that outlines procedures for performing operations, long term maintenance, and monitoring of the corrective measure. A CMI O&M Plan shall be submitted to NMED simultaneously with the CMI Plans and Specifications and Construction Work Plan. The O&M plan shall, at a minimum, include the elements specified below.

6.2.1 Introduction/Purpose

The Permittee shall describe the purpose of the document and provide a summary description of the project.

6.2.2 Project Management

The Permittee shall describe the management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who shall operate and maintain the corrective measures (including contractor personnel).

6.2.3 System Description

The Permittee shall describe the corrective measure and identify significant equipment.

6.2.4 Personnel Training

The Permittee shall describe the training process for O&M personnel. The Permittee shall prepare, and include in the technical specifications governing treatment systems, the contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

6.2.5 Start-Up Procedures

The Permittee shall describe system start-up procedures including any operational testing.

6.2.6 Operation and Maintenance Procedures

The Permittee shall describe normal operation and maintenance procedures including:

- 1) Description of tasks for operation;
- 2) Description of tasks for maintenance;
- 3) Description of prescribed treatment or operation conditions;
- 4) Schedule showing frequency of each O&M task; and,
- 5) Replacement schedule for equipment and installed components.

6.2.7 Waste Management Practices

The Permittee shall describe the wastes generated by operation of the corrective measure and how and where they shall be managed. The Permittee shall also discuss site drainage and indicate how rainwater runoff, and runoff shall be managed.

6.2.8 Sampling and Analysis

Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. To ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented, the Permittee shall prepare a Quality Assurance Project Plan (QAPP) to document all monitoring procedures, sampling, field measurements and sample analyses performed during these activities. The Quality Assurance Project Plan shall, at a minimum, include the elements of a quality assurance program for data collection activities as specified in Chapter One of SW-846. The Permittee shall use quality assurance, quality control, and chain-of-custody procedures approved by NMED.

6.2.9 Corrective Measure Completion Criteria

The Permittee shall describe the process and criteria (e.g., ground water cleanup level met for 3 years) for determining when corrective measures have achieved media cleanup levels. The Permittee shall also describe the process and criteria for determining when maintenance and monitoring may cease. Criteria for corrective measures such as a landfill cap shall reflect the need for long-term monitoring and maintenance. Satisfaction of the completion criteria shall trigger preparation and submittal of the Corrective Measures Completion Report.

6.2.10 O&M Contingency Procedures

The Permittee shall describe O&M Contingency Procedures including:

- 1) Procedures to address system breakdowns and operational problems including a list of redundant and emergency back-up equipment and procedures;
- 2) Alternate procedures to be implemented if the corrective measure suffers complete failure. The alternate procedures shall be able to prevent release or threatened releases of hazardous wastes or hazardous constituents which may endanger human health and the environment or exceed media cleanup levels;
- 3) Contingency that, in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), the Permittee shall orally notify NMED within 24 hours of the event and shall notify NMED in writing within 72 hours of the event. Written notification shall, at a minimum, specify what happened, what response action shall be or has been, and any potential impacts on human health and the environment; and,
- 4) Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the cleanup goals in the expected time frame. For example, in certain circumstances both a primary and secondary corrective measure may be selected for the facility. If the primary corrective measure were to fail, the secondary measure would be implemented. This section shall specify that if the primary corrective measure failed, then design plans would be developed for the secondary measure.

6.2.11 Data Management and Documentation Requirements

The O&M Plan shall specify that the Permittee shall collect and maintain the following information:

- 1) Progress Report information;
- 2) Monitoring and laboratory data;
- 3) Records of operating costs; and,
- 4) Personnel, maintenance and inspection records.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Completion Report.

6.3 PLANS AND SPECIFICATIONS

The Permittee shall prepare Plans and Specifications that are sufficient to be included in a contract document and be advertised for bid. The design package shall consist of the detailed drawings and specifications needed to construct the corrective measure. Depending on the nature of the corrective measure, many different types of drawings and specifications may be needed. Some of the elements that may be required include:

- 1) General site plans;
- 2) Process flow diagrams;
- 3) Mechanical drawings;
- 4) Electrical drawings;
- 5) Piping and instrumentation diagrams;
- 6) Structural drawings;
- 7) Excavation and earthwork drawings;
- 8) Site preparation and field work standards;
- 9) Construction drawings;
- 10) Facility drawings;
- 11) Equipment lists; and,
- 12) Detailed specifications for equipment and material.

6.4 CONSTRUCTION WORK PLAN

The Permittee shall prepare a Construction Work Plan that documents the overall management strategy, construction quality assurance procedures, and schedule for constructing the corrective measure. Upon receipt of written approval from NMED, the Permittee shall commence the construction process and implement the Construction Work Plan in accordance with the schedule and provisions contained therein. The Construction Work Plan shall, at a minimum, include the elements specified below.

6.4.1 Introduction/Purpose

The Permittee shall describe the purpose of the document and provide a summary description of the project.

6.4.2 Project Management

The Permittee shall describe the construction management approach including levels of authority and responsibility (include organization chart), lines of communication and the qualifications of key personnel who shall direct the corrective measure construction effort and provide construction quality assurance/quality control (including contractor personnel).

6.4.3 Project Schedule

The project schedule shall include timing for key elements of the bidding process, timing for initiation and completion of all major corrective measure construction tasks as specified in the Plans and Specifications, and specify when the Construction Completion Report shall be submitted to NMED.

6.4.4 Construction Quality Assurance/Quality Control Programs

The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans, and specifications. The Construction Work Plan shall include a complete Construction Quality Assurance Program to be implemented by the Permittee.

6.4.5 Waste Management Procedures

The Permittee shall describe the wastes generated during the CMI and how and where they shall be managed.

6.4.6 Sampling and Analysis

Sampling and monitoring activities may be needed for construction quality assurance/quality control and/or other construction related purposes. To ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented, the Permittee shall prepare a Quality Assurance Project Plan (QAPP) to document all monitoring procedures, sampling, field measurements and sample analysis performed during these activities.

The Permittee shall use quality assurance, quality control, and chain-of-custody procedures approved by NMED.

6.4.7 Construction Contingency Procedures

The Construction Work Plan shall include procedures to notice NMED and to address changes to the design and/or specifications caused by unforeseen problems encountered in the field.

The Construction Work Plan shall specify that, in the event of a construction emergency (e.g., fire, earthwork failure, etc.), the Permittee shall orally notify NMED within 24 hours of the event and shall notify NMED in writing within 72 hours of the event. The written notification shall, at a minimum, specify what happened, what response action shall be or has been, and any potential impacts on human health and the environment.

The Permittee shall specify procedures to be implemented if unforeseen events prevent corrective measure construction. For example, in certain circumstances both a primary and secondary corrective measure may be selected for the Facility. If the primary corrective measure could not be constructed, the secondary measure would be implemented. This section shall specify that if the primary corrective measure could not be constructed, design plans would be developed for the secondary measure.

6.4.8 Construction Safety Procedures

The Permittee shall specify construction safety procedures in a separate Health and Safety Plan.

6.4.9 Documentation Requirements

The Permittee shall describe how analytical data and results shall be evaluated, documented, and managed.

6.5 HEALTH AND SAFETY PLAN

The Permittee shall submit a Health and Safety Plan for all field activity. The Health and Safety Plan shall be developed as a stand-alone document but may be submitted with the CMI Work Plan. The Health and Safety Plan should, at a minimum, include the elements specified below.

6.5.1 Objectives

The Permittee shall describe the goals and objectives of the health and safety program (shall apply to on-site personnel and visitors). The health and safety plan shall be consistent with the Facility Contingency Plan, OSHA Regulations, NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985), all state and local regulations, and other NMED guidance, as provided.

6.5.2 Hazard Assessment

The Permittee shall list and describe the potentially hazardous substances, hazardous wastes or hazardous constituents, and conditions that could be encountered by field personnel during construction and/or operation and maintenance activities.

The Hazard Assessment section shall discuss the following:

- 1) Inhalation hazards;
- 2) Dermal exposure;
- 3) Ingestion hazards;
- 4) Physical hazards; and
- 5) Overall hazard rating

The Permittee shall include a table that, at a minimum, lists known hazardous waste or constituents, highest observed concentration, media, and symptoms/effects of acute exposure.

6.5.3 Personal Protection/Monitoring Equipment

The Health and Safety Plan shall describe the following:

- 1) Personal protection levels and identify all monitoring equipment for each operational task;
- 2) Any action levels and corresponding response actions (i.e., when will levels of safety be upgraded); and
- 3) Decontamination procedures and areas.

6.5.4 Site Organization and Emergency Contacts

The Health and Safety Plan shall list and identify all emergency contacts (include phone numbers), identify the nearest hospital and provide a regional map showing the shortest route at or from the facility to the hospital. The Health and Safety Plan shall describe site emergency procedures and any site safety organizations and shall include evacuation procedures for neighbors (where applicable). The Health and Safety Plan shall include a facility map showing emergency station locations (first aid, eye wash areas, etc.).

6.6 PROJECT SCHEDULE

The Permittee's proposed project schedule shall specify all significant steps in the CMI process and when all CMI deliverables (*e.g.*, CMS Work Plan, a CMS Report, Progress Reports, *etc.*) shall be submitted to NMED.

ATTACHMENT 7 CLEANUP LEVELS

GROUND WATER, SOIL AND SURFACE WATER CLEANUP LEVELS

The Permittee shall attain the cleanup levels specified below when implementing the closure and corrective action requirements of this Permit.

7.1 GROUND WATER CLEANUP LEVELS

The Permittee shall attain the following cleanup levels for hazardous waste and hazardous constituents in ground water:

1. For all contaminants listed in 20.6.2.7.VV and 3103 NMAC the Permittee shall attain the WQCC standards of 20.6.2.4103.A and B NMAC,
2. For all contaminants for which EPA has adopted a drinking water maximum contaminant level (MCL) under 40 CFR Parts 141 and 143, the Permittee shall attain the MCL,
3. If both a WQCC standard and an EPA MCL have been established for a contaminant, then the Permittee shall attain the lower of the two,
4. If no WQCC standard or EPA MCL has been established for a carcinogenic hazardous waste or hazardous constituent, then the Permittee shall use the most recent version of the EPA Regional Screening Levels (RSLs) for tap water and a target excess cancer risk level of 10^{-5} to develop a proposed cleanup level for NMED approval, and
5. If no WQCC standard or EPA MCL has been established for a noncarcinogenic hazardous waste or hazardous constituent, then the Permittee shall use the most recent version of the EPA RSLs for tap water and a Hazard Index (HI) of one (1.0) to develop a proposed cleanup level for NMED approval.
6. There currently is no WQCC groundwater standard or MCL for perchlorate; however, the Permittee shall determine the nature and extent of the perchlorate contamination at the Facility and, if necessary, down gradient of the Facility. If either the WQCC adopts a groundwater standard for perchlorate, or EPA or the EIB adopts an MCL for perchlorate, such standard shall be followed in accordance with this Attachment (7). If perchlorate is detected at concentrations at or greater than 6 $\mu\text{g/L}$ and no groundwater standard or MCL has been adopted by the EIB, WQCC or EPA for perchlorate, then the Permittee shall use the cleanup goal with a HI of one (1.0) to develop the proposed cleanup level for use in their site investigation or corrective measure evaluation.

7.2 SOIL CLEANUP LEVELS

The Permittee shall attain the following cleanup levels for hazardous waste and hazardous constituents in soil:

1. For all contaminants for which NMED has specified a soil screening level in NMED's *Technical Background Document for Development of Soil Screening Levels*, the cleanup level shall be the screening level specified in the most recent version of that document.
2. The Permittee shall propose a soil cleanup level for PCBs based on NMED's Position Paper Risk-based Remediation of Polychlorinated Biphenyls at RCRA Corrective Action Sites (March 2000 as updated).
3. If an NMED soil screening level has not been established for a hazardous waste or hazardous constituent the Permittee shall propose for NMED approval, a cleanup level based on the most recent version of the EPA RSLs (based on a HI of one (1.0) for compounds designated as "n" (noncarcinogen effects), "max" (maximum concentration), and "sat" (soil saturation concentration), or ten times the EPA Region VI HHMSSL for compounds designated "c" (carcinogen effects) (*i.e.* a target excess cancer risk level of 10^{-5}).

7.3 LAND USE DETERMINATION

All soil cleanup levels shall be based on a residential land use scenario unless the Secretary determines that an alternate land use is appropriate (*e.g.* subsistence farming, cultural, or industrial). The Permittee may only propose an alternate land use with higher cleanup levels (*e.g.* industrial) if NMED or EPA can legally and practicably enforce the institutional controls limiting the land use. If an alternate land use for which NMED or EPA has not established soil cleanup levels is determined to be the current and reasonably foreseeable future land use, then the Permittee may propose cleanup levels based on a risk assessment using a target excess cancer risk level of 10^{-5} for carcinogenic hazardous waste or hazardous constituent or, for noncarcinogenic hazardous waste or hazardous constituent, a HI of one (1.0).

7.4 SURFACE WATER CLEANUP LEVELS

The Permittee shall comply with the surface water quality standards specified in 20.6.2.2000-2201 NMAC and the Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

7.5 ECOLOGICAL RISK CLEANUP LEVELS

The Permittee shall derive cleanup levels for each hazardous waste and hazardous constituent for each ecological zone at the Facility using the methodology in the Department's "*Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment.*" If the ecological risk evaluation indicates that a lower cleanup level for a hazardous waste or hazardous constituent in groundwater, soil, or surface water is necessary to protect environmental receptors, NMED may establish cleanup levels based on ecological risk for hazardous waste or hazardous constituents in groundwater, soil, or surface water that are lower than levels that are solely protective of human health.

7.6 BACKGROUND CONCENTRATIONS

If the naturally occurring (background) concentration of a hazardous waste or hazardous constituent in ground water, soil, or surface water exceeds the standards specified above, then the cleanup level shall be the background concentration. To use background concentration as a cleanup level, the Permittee must obtain a written background determination from NMED.

7.7 VARIANCE FROM CLEANUP LEVELS

The Permittee may seek a variance from a cleanup level for soil or ground water as follows;

7.7.1 WQCC Standards

The Permittee may seek a variance from a WQCC standard in accordance with 20.6.2.4103.E or F NMAC.

7.7.2 Soil Standards and Non-WQCC Ground water Standards

The Permittee may seek a variance from any cleanup level for soil or for ground water (other than a WQCC standard) by submitting a written request to NMED for a determination that attainment of the cleanup level is technically infeasible or otherwise impracticable due to conflict with other environmental laws or requirements for the preservation of cultural resources. If based on technical infeasibility, the request shall include; a demonstration of technical or physical impossibility of attaining the cleanup level using potential corrective action remedies. If based on conflict with other environmental laws or requirements for the preservation of cultural resources, the request shall include documentation showing that Permittee has attempted to resolve the conflict or mitigate the impact on cultural or natural resources and shall explain why mitigating measures cannot resolve the conflict or adequately protect the cultural or natural resource (e.g. consultation and a determination of incidental taking or reasonable and prudent measures to minimize the impact under 16 U.S.C. § 1536). All requests shall include a discussion of the effectiveness of potential corrective action remedies, whether the proposed variance will allow a present or future hazard to public health or the environment, and any other information required by the Secretary. In addition, the request shall propose alternate cleanup levels for NMED approval, based on the effectiveness of potential corrective action remedies and a site-specific risk assessment based on NMED's guidance, *Technical Background Document for Development of Soil Screening Levels* (February 2004 as updated), *Assessing Human Health Risks Posed by Chemicals: Screening Level Risk Assessment* (March 2000), and *Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment* (March 2000, as updated).

**ATTACHMENT 8
HAZARDOUS WASTE MANAGEMENT UNIT, SOLID WASTE MANAGEMENT UNIT,
AND AREA OF CONCERN TABLE**

TABLE 1 SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) THAT REQUIRE CORRECTIVE ACTION		
SWMU/ AOC.	Parcel	Description
SWMU 1	21	TNT Leaching Beds & Building 503
SWMU 2	21	Building 515 (Painting and Acid Washout Building and Acid Holding Pond)
SWMU 3	11	Fenced Storage Yard (Former Storage Yard or DRMO Area, Extended Storage Yard, Former Coal Storage Area)
SWMU 4	6	Building 600 (Building 539, Ammunition Work Shop Area Change House and Laundry)
SWMU 5	11	Building 5
SWMU 6	11	Building 11 (Former Locomotive Shop)
SWMU 7	21	Fire Training Ground
SWMU 8	6	Building 537 (Pesticide and Field Battery Shop)
SWMU 9	7	POL Waste Discharge Area
SWMU 10	11	Sewage Treatment Plant (includes Buildings/ Structures 22, T-37, 63, 69, 70, 71, 72, 73, 74a, 74b, 74c, 74d, 82, 83, document incinerator, Structure 745, drainage ditch, septic system at sewage treatment plant)
SWMU 11	6	Building 542 (Ammunition Workshop) and Building 541

**TABLE 1
SOLID WASTE MANAGEMENT UNITS (SWMUS)
AND AREAS OF CONCERN (AOCS)
THAT REQUIRE CORRECTIVE ACTION**

SWMU/ AOC.	Parcel	Description
SWMU 12	22	Building 536 (Inspectors Workshop and Ammunition Renovation Depot) (includes one former PCB transformer)
SWMU 13	18	Eastern Landfill
SWMU 14	3	Old Burning Ground and Demolition Landfill Area (Includes KGA-3, KGA-4, KGA-5, KP-2, KP-3, KP-4, Arroyo in Fenced Up Horse Valley, and Dump Pile)
SWMU 15	3	Old Demolition Area (includes Inactive EOD Area, KGA-1, KGA-2, Old OB/OD & Buried White Phosphorus Rounds, and Three Mounds in Fenced-Up Horse Valley)
SWMU 16	16, may include 15	Functional Test Range 2/3
SWMU 17	2	Western Rifle Range
AOC 18	9, 24	Igloo Block A
SWMU 19	21	Building 501 (Former Boiler House and Heating Plant No. 7)
SWMU 20	7	Western Landfill, includes Features 3 and 4 on 1962 air photo API-3 (1995 Archive Search Report)
SWMU 21	23	Central Landfill
SWMU 22	2	Group C Landfill
SWMU 23	11	Building 8 (Paint Shop or Carpenter Shop) and Building 7 (Paint Shop and Paint Storage Warehouse)
SWMU 24	11	Building 15 (Garage and Storage Bldg.)
SWMU 25	7	Trash Burning Ground Property Disposal Office includes Features 1, 2 and 5 on the 1962 aerial photo API-3 (from the 1995 Archive Search Report)
SWMU 27	22	Building 528 Complex. Includes Building 528 (Ammunition Normal Maintenance Building), Building

**TABLE 1
SOLID WASTE MANAGEMENT UNITS (SWMUS)
AND AREAS OF CONCERN (AOCS)
THAT REQUIRE CORRECTIVE ACTION**

SWMU/ AOC.	Parcel	Description
		528A (temporary storage igloo), AOC 121 (Building 528B, temporary storage igloo), AOC 122 (Building 529), AOC 125 (Building 550, vacuum collector barricade), AOC126 (Building 551, service magazine)
AOC 28	6	Igloo Block B
AOC 29	2, 4, 19, 23	Igloo Block C
AOC 30	19, 22	Igloo Block D
AOC 31	19	Igloo Block E
AOC 32	19	Igloo Block F
SWMU 33	3	Waste Pile KP1
AOC 34	19	Igloo Block G
AOC 35	2	Igloo Block H
AOC 36	2	Igloo Block J (includes Missile Launch Pad used by MDA)
SWMU 37	11	Building 9 (Machine Shop and Signal Shop)
SWMU 38	20	Functional Test Range 1
SWMU 39	19	Pistol Range
SWMU 40	11	South Administration Area Formerly named the Coal Tar Storage Tanks (Structures 58, 59, and 60), SWMU 48 (Building 10), SWMU 49 (Building 12), SWMU 50 (Building 13), SWMU 51 (Building 29), SWMU 52 (Building T-33), SWMU 53 (Building 36), SWMU 54 (UST #5), AOC 55 (Structure T-49), AOC 56 (Building T-50), AOC 72 (Building 14), SWMU 77 (Building T-34), AOC 83 (Structure 63), and AOC 87

TABLE 1
SOLID WASTE MANAGEMENT UNITS (SWMUS)
AND AREAS OF CONCERN (AOCs)
THAT REQUIRE CORRECTIVE ACTION

SWMU/ AOC.	Parcel	Description
		(Structure 57)
AOC 41	16	Igloo Block K
AOC 42	6	Building 516 (Ammunition Receiving Building)
AOC 43	7	Railroad Classification Yard
SWMU 45	11	Building 6 (Gas Station)
AOC 46	11	Above Ground Tank located near Blg. 11
AOC 47	11	TPL spill of photoflash powder west of Blg. 11
AOC 48	11	Building 34 (Fire Station)
AOC 49	11	Structure 38 (End Loading Dock) and Structure 39 (Side Loading Dock)
SWMU 50	11	Structure 35 (Underground Storage Tank (UST #7) located by Building 45)
AOC 51	6 or 11	Structure 64 (Underground Storage Tank)
AOC 52	11	Building 79 and Building 80 (Storage Vaults)
AOC 53	13	Lake Knudson
AOC 54	13	Building 311 (Standard Magazine)
AOC 55	13	Structure 506 (TNT Storage Barricade)
AOC 56	13	Structure 533 (Explosive Barricade)

**TABLE 1
SOLID WASTE MANAGEMENT UNITS (SWMUS)
AND AREAS OF CONCERN (AOCS)
THAT REQUIRE CORRECTIVE ACTION**

SWMU/ AOC.	Parcel	Description
AOC 57	16	Buildings 306, 307, 308, 309, 310 (Standard Magazines near Knudson Lake)
AOC 58	19	Buildings 303 and 304 (Standard Magazines) and 320 (Field Dunnage Building along Arterial Road No. 3)
AOC 59	19	Building T-422 (former Blg. X-11, Normal Maintenance Blg., Bomb and Shell Paint Blg.)
AOC 60	21	Building 522 formerly designated as Building 500 (Ammunition Receiving Bldg.)
AOC 61	21	Building 507 (Smokeless Powder Magazine)
AOC 62	21	Building 508 (Smokeless Powder Magazine)
AOC 63	21	Building 509 (Primary Collector Barricade or Propellant Baghouse)
AOC 64	21	Building 510 (Vacuum Producer Building)
AOC 65	21	Building 511 (Service Magazine)
AOC 66	21	Building 512 (Service Magazine)
AOC 67	21	Building 513 (Service Magazine)
AOC 68	21	Structure 514 (Deboostering Barricade) and Structure 545 (Earthen Barricade)
AOC 69	22	Buildings 301, 302, and 312 (Standard Magazines), Building 316 (Field Lunch Room),
SWMU 70	22	Disassembly Plant and TPL QA Test Area (Disassembly Plant includes Building 517, Structure 518, Building 519, Structure 520, Structure 521,

**TABLE 1
SOLID WASTE MANAGEMENT UNITS (SWMUS)
AND AREAS OF CONCERN (AOCS)
THAT REQUIRE CORRECTIVE ACTION**

SWMU/ AOC.	Parcel	Description
		Structure 547) Disassembly Plant and TPL QA Test and OB/OD Area
SWMU 72	21 and may include 22	Deactivation Furnace, Deactivation Furnace Acid Pits, and surrounding area (includes pre-1958 buildings and areas in the vicinity of Blg. 530)
AOC 73	23	Former buildings or structures along Road C-3.
SWMU 74	3	Area 16 or Site 16 (Proposed Burning Ground) – to be addressed under the Kickout Area requirements unless the location is determined to be outside the Kickout Area boundary as defined Section IV.A
AOC 75	6, 7, 11, 12, 13, 19, 21, 22, and may include other parcels	Electrical Transformers (at least 65 former or existing transformers)
AOC 76	2	Feature 19 on the 1973 aerial photo (API-5) in the 1995 Archive Search Report.
AOC 77	2	Feature 20 on the 1973 aerial photo (API-5) in the 1995 Archive Search Report.
AOC 80	6	Feature 9 on 1962 aerial photo (API-3) in 1995 Archive Search Report
AOC 81	6	Feature 11 on 1962 aerial photo (API-3) in 1995 Archive Search Report
AOC 83	6	Feature 22 on 1973 aerial photo (API-5) in 1995 Archive Search Report
AOC 84	6	Feature 12 on 1962 aerial photo (API-3) in 1995 Archive Search Report
AOC 85	9	Feature 11-1 on 1962 aerial photo (API-3) in 1995 Archive Search Report and Feature 1 on 1973 aerial photo (API-5) in 1995 Archive Search Report.
AOC 86	13	Feature 15 on 1973 aerial photo (API-5) in 1995 Archive Search Report.
AOC 88	22	Former buildings or structures and disposal areas southwest, south, and southeast of Blg. 528.

**TABLE 1
 SOLID WASTE MANAGEMENT UNITS (SWMUS)
 AND AREAS OF CONCERN (AOCS)
 THAT REQUIRE CORRECTIVE ACTION**

SWMU/ AOC.	Parcel	Description
AOC 89	3	Feature 30 and Feature 34 on 1973 aerial photo (API-5) in 1995 Archive Search Report
AOC 90	3	Feature 36 on 1973 aerial photo (API-5) in 1995 Archive Search Report
AOC 91	3	Feature 41 in the 1973 aerial photo (API-5) and Feature 27 on the 1978 historic aerial photo (API-7) in the 1995 Archive Search Report.
AOC 92	3	Feature 31 on the 1973 historic aerial photo (API-5) and Feature 21 on the 1978 aerial photo (API-7) in 1995 Archive Search Report

**TABLE 2
 HAZARDOUS WASTE MANAGEMENT UNITS (HWMUS)**

HWMU	PARCEL NO.	DESCRIPTION
OB/OD Unit	3	The OB/OD Unit is an inactive open burn/open detonation (OB/OD) unit (see Permit Attachment 1) subject to the Permitting Requirements. The OB/OD Unit includes: the area known as the Burning Ground Area, twelve Current Detonation Craters (CDC) known as CDC-1 through CDC-12, ten (10) Current Residue Piles (CRP) known as CRP-1 through CRP-10.
CAMU	3	The CAMU is an active open burn/open detonation (OB/OD) treatment unit (see Permit Attachment 1) subject to the Permitting Requirements. The CAMU is located on approximately 3 acres in SWMU 14 near the Old Burning Ground and Demolition Landfill Area. The CAMU utilizes one open burn treatment cell and up to four open detonation treatment cells or safe alternative technology, when it becomes available, to treat WMM.

<p style="text-align: center;">TABLE 3 SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) CORRECTIVE ACTION COMPLETE WITH CONTROLS</p>

**TABLE 4
 SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS)
 CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS**

SWMU/AOC	Parcel	Description
AOC 71	22	Former rectangular structure near TMW-5 and north of Bldg. 528.
AOC 78	5	Feature 18 on 1973 aerial photo (API-5) in 1995 Archive Search Report.
AOC 82	6 and 5	Area adjacent to the east of Feature 18 on 1973 aerial photo (API-5) in 1995 Archive Search Report that includes drainage swale, wetland area and arroyo.
AOC 87	21	Feature 18 on 1962 aerial photo (API-3) and Feature 23 on 1973 aerial photo (API-5) in 1995 Archive Search Report.
AOC 93	12 and 14	Bivouac and Tank Training Area.
SWMU 26	10	Suspected POL Area. Large berm north of the railroad classification yard.
AOC 44	10	Former Administration and Utilities Area
AOC 79	6	Feature 2 on 1973 aerial photo (API-5) in 1995 Archive Search Report

ATTACHMENT 9
CLOSURE PLANS

1.0 INTRODUCTION

This closure plan describes the activities necessary to close the Corrective Action Management Unit at the Fort Wingate Depot Activity (Facility), hereinafter referred to as the CAMU. The information provided in this closure plan addresses the applicable closure requirements specified in the Code of Federal Regulations (CFR), Title 40, Part 264, Subparts G and 264.552 (e) and (f) for the CAMU treatment units at the Facility under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act.

Until closure is complete and has been certified in accordance with Section 8.0 of this closure plan and 40 CFR 264.115, a copy of the approved closure plan, any approved revisions, and closure activity documentation associated with the closure will be on file in the information repository in Building 1 at the Facility. Prior to closure of the unit, this closure plan may be amended in accordance with 40 CFR 265.112(c), as necessary and appropriate, to provide, at a minimum, updated sampling and analysis plans and to incorporate updated technologies. An updated closure plan shall be submitted to the New Mexico Environment Department (Department) for approval, if necessary, prior to implementing closure.

2.0 DESCRIPTION OF UNIT TO BE CLOSED

The CAMU is located in SWMU 14 in Parcel 3 as shown in Permit Attachment 12. The CAMU is designed for the treatment by open burn/open detonation (OB/OD) of waste military munitions (WMM) generated during cleanup of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs) and the OB/OD Hazardous Waste Management Unit, and any munitions recovered from within the facility that cannot be safely transported offsite for treatment or disposal. The requirements for operation of the CAMU are described in Permit Section IX. The CAMU occupies approximately three acres and contains up to five treatment cells for the disposal of WMM. Each treatment cell is surrounded on three sides by a containment berm. Each detonation operation will be conducted in a pit excavated to a minimum depth of two feet below ground surface or contained through the use of sandbags..

The CAMU is located in a relatively flat area, approximately 500 feet from the closest arroyo. Run-on and run-off can be readily controlled and evidence of flooding has not been observed at the site. The CAMU is remote and so is conducive to operations requiring explosives safety quantity-distance (ESQD), which provides the required protection to personnel and property. The area also has a natural protective control to the west by a nearby hogback ridge that provides an extra safety barrier between FWDA property and Bureau of Indian Affairs (BIA) and Tribal Trust property. The CAMU is located near an access-controlled road that not only provides lock and fence control to the area, but also provides a stable surface for transportation of items to be treated. The CAMU is located within a double fenced area, which provides the required security and restricted access requirements needed for the treatment operations.

For the purposes of closure the CAMU Treatment Area consists of the treatment cells and surrounding berms, the temporary staging area, and all access areas for loading, transporting and unloading of WMM and any ignition sources used during treatment. The burn pan will be used exclusively within the confines of one treatment cell. Figures depicting the location and design of the CAMU are provided in Permit Attachment 12.

2.1 Description of the Wastes Treated at the Unit

The Permittee treats reactive (D003) and ignitable (D001) hazardous wastes, such as munitions and explosives of concern (MEC) (including damaged, defective, expired, and unserviceable munitions), explosive-contaminated wastes, propellants, bulk explosives, metal powders, detonators, miscellaneous munitions constituents, and soils containing hazardous or reactive concentrations of explosive compounds. The waste types treated are generated during corrective action activities conducted at the Facility and include incidental solid waste that cannot be safely separated and transported off-site for disposal.

2.2 Description of the Treatment Unit

The CAMU Treatment Area consists of up to five treatment cells and a burn pan that is operated within a selected treatment cell and includes a temporary staging area and all areas used for loading, unloading and transport of WMM. The cells are each surrounded on three sides by berms constructed with soils to a width of 35 feet and a height of 8 feet with an entrance to allow access to the interior of the cell. The detonation pits are a maximum depth of eight feet bgs and are composed of well-packed earth and free from loose stones and deep cracks in which explosives might lodge. The CAMU treatment Area is surrounded by a buffer zone where vegetation is kept cropped to less than six inches in height for a radius of 200 feet.

2.3 Description of Treatments Conducted at the Unit

Detonations are initiated in the treatment cells using boosters or perforators placed in intimate contact with each item and, if required, covered with earth or other material to prevent imminent hazards to workers and to minimize kickout.

Burns are initiated in a steel burn tray using an ignition source which consists of a bed of combustible material, such as fuel oil or diesel fuel.

3.0 ESTIMATE OF MAXIMUM WASTE TREATED

A maximum of 52,000 lbs of WMM and incidental waste are treated each year in CAMU.

4.0 GENERAL CLOSURE INFORMATION

4.1 Closure Performance Standard

The unit will be closed to meet the following performance standards:

- a. Removal of all hazardous waste residues and hazardous constituents;
- b. contaminated media do not contain concentrations of contaminants greater than the clean-up levels established in Attachment 7 of the Permit. For soils the cleanup levels shall be established based on residential use.
- c. The Permittee must also demonstrate that there is no potential to contaminate groundwater.

- d. removal of hazardous waste residues, hazardous constituents, and, as applicable, contaminated media to the extent that it does not exceed a total excess cancer risk of 10⁻⁵ for carcinogenic substances and, for non-carcinogenic substances, a target Hazard Index of 1.0 for human receptors, and meet Ecological Screening Levels established in Attachment 7 of the Permit;
- e. removal of all equipment and structures and re-grading and restoration of the site to its original condition;

Closure must comply with 20.4.1.500 NMAC (incorporating 40 CFR 264.111, 114 and 264.552(e)(6)(i) and (ii) and (f))

4.2 Closure Schedule

An updated closure plan for the CAMU will be submitted no less than 180 days prior to the completion of corrective action activities at the Facility. The updated closure plan shall include all proposed activities, methods and procedures and other actions necessary to complete closure of the CAMU in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.111, 264.114, 264.552(e)(6)(i) and (ii) and 264.552(f)) and Permit Attachment 7, and include a schedule to complete closure.

Closure shall begin no later than 30 days after final corrective action activities are completed at the Facility or in accordance with an alternate schedule included in the NMED-approved updated closure plan. All closure activities shall be completed no later than 180 days after implementation of the closure plan or as specified by an alternate schedule included in the NMED-approved updated closure plan.

4.3 Closure Report

The Permittee shall submit to NMED a CAMU closure report within 180 days, or other time specified by NMED, that summarizes all activities conducted to complete closure of the CAMU and demonstrates compliance with the cleanup requirements of Permit Attachment 7 and 20.4.1.500 NMAC (incorporating 40 CFR 264.111, 264.114 and 264.552(e)(6)(i) and (ii) and 264.552(f)). The closure report shall contain the minimum requirements listed in Section 8.0 below. The Permittee shall submit a certification of closure and survey plat in accordance with 20.4.1.500 NMAC (incorporating 40 CFR 264.115 and 264.116) within 90 days of NMED approval of the closure report.

5.0 CLOSURE PROCEDURES

Closure activities at the unit shall include: a physical review of the unit and a review of the waste management and treatment records; proper management and disposal of hazardous waste residues, if applicable; removal of all equipment and structures associated with the unit; soil sampling and analysis to demonstrate that the closure performance standards and applicable cleanup levels have been achieved; and site restoration and submittal of a final closure report. The following sections provide descriptions of the closure activities.

5.1.1 Records Review

The record for CAMU operations (including, but not limited to, treatment activities, inspection and contingency plan implementation records) shall be reviewed at the time of closure and in accordance with the schedule in Section 4.2 this closure plan. The goals of the review will be to:

- a. confirm the specific hazardous waste constituents of concern listed in Table 1 of this closure plan;
- b. update Table 1 as necessary; and
- c. confirm additional sampling locations based on site records (e.g., locations of spills, kickout, damage to treatment cells).

The Permittee shall determine whether any spills or releases, damage, or hazards (e.g., damage to the treatment cells, cell berms, burn box, detonation pits or other unit materials) affecting waste containment or treatment occurred or developed during the operational life of the unit. If the records indicate any such incidents, the Permittee shall include the information in the updated closure plan required by Permit Section III.D.1. All additional sampling procedures, as applicable, shall be included in the updated closure plan.

5.2 Decontamination and Removal of Structures and Equipment

In accordance with 40 CFR 265.112(b)(4) (which is incorporated herein by reference), the unit's related equipment and materials (e.g., burn pan and fencing) shall be decontaminated, or removed, or both and managed accordingly. All such equipment must either be recycled or properly disposed at a permitted landfill.

5.2.1 Equipment Used During Decontamination Activities

Reusable tools and equipment used during decontamination activities shall be cleaned with a wash water solution. Residue, disposable equipment, and small reusable equipment that cannot be decontaminated shall be containerized and managed as waste in accordance with Section 7.0 below.

6.0 SAMPLING AND ANALYSIS PLAN

The Permittee shall submit a Sampling and Analysis Plan (SAP) that identifies the specific sampling and analysis requirements for this unit and ensures the closure requirements of 40 CFR Part 264 Subparts G and 264.552(e) and (f) are met. It also shall describe the required methods to demonstrate that the Permittee has met the closure performance standards described in Section 4.1. The Permittee shall comply with all the requirements in this closure plan as well as the applicable requirements in Section III of the Permit. The SAP shall be submitted no less than 180 days prior to the completion of corrective action activities at the Facility.

The SAP is designed to:

- 1) verify removal of equipment, structures, and materials; and

- 2) verify that all releases of hazardous constituents to any environmental media have been remediated to the levels specified in Permit Attachment 7.

The SAP must include:

- 1) Proposed soil sampling activities and groundwater sampling, as necessary,
- 2) the rationale for sampling locations,
- 3) proposed field screening and laboratory analytical methods,
- 4) the rationale for the proposed field screening and analytical methods,
- 5) the method for delineating the treatment unit kickout area,
- 6) proposed methods for 100% clearance of the treatment unit kickout area,
- 7) the methods for removal and disposition of all equipment and structures,
- 8) proposed schedule for conducting complete removal of all CAMU facilities and contaminated media, if present.

The list of hazardous constituents of concern for which soil, and potentially groundwater, samples will be analyzed are included in Table 1. The list of hazardous constituents of concern shall be utilized to select the analytical methods capable of detecting those constituents.

The Closure Plan SAP, as it is updated, shall include a site plan depicting discrete sampling locations within the CAMU Treatment Area and multi-incremental sampling (MI) decision units within the treatment kickout area to include the 200-foot radius buffer zone surrounding the CAMU Treatment Area as described in Section 2.2 of this plan.

6.1 Sampling Activities

Sampling activities shall consist of collection of discrete surface and subsurface samples within the CAMU Treatment Area, beneath the treatment units, and from the berms constructed around each detonation pit. In addition MI samples shall be collected from a minimum 200 foot radius from the CAMU Treatment Area and must include the entire treatment kickout area to demonstrate that soils within and in the vicinity of the CAMU meet the closure performance standards. Subsurface soil samples must be collected at each discrete sampling location and at locations where contamination is detected by MI sampling to minimum depths of five feet below ground surface (bgs) or to depths a minimum of three feet below the deepest detected contamination whichever is deeper. MI sample decision units shall consist of areas no greater than 10,000 ft² and no less than 50 subsamples must be collected from each decision unit. All samples will be collected and analyzed in accordance with the procedures in this closure plan.

6.2 Soil Sampling

Soil samples will be collected at the locations specified in Section 6.1 above. Soil samples will be collected using a spade, scoop, auger, trowel or other method approved by NMED. The following procedures shall be used based on the sampling method for collection of soil samples.

At a minimum, the following procedures shall be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves shall be worn when collecting samples. New disposable gloves shall be used to collect each sample;
2. All samples collected of each medium for chemical analysis shall be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in brass sleeves, shelly tubes, thin wall samplers, or in Encore™ samplers. Upon recovery of the sample collected using split barrel samplers with brass sleeves, the brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves shall be lined with Teflon tape or foil and sealed with plastic caps. The caps shall be fastened to the sleeve with tape for storage and shipment to the analytical laboratory. Samples collected in shelly tubes or thin wall samplers shall be capped in a similar fashion. The sample depth and the top of the sample shall be clearly marked. Sample container volumes and preservation methods shall be in accordance with EPA SW-846 and established industry practices for use by accredited analytical laboratories. Sufficient sample volume shall be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and
3. Sample labels and documentation shall be completed for each sample following procedures included in the site-specific work plans approved by NMED. Immediately after the samples are collected, they shall be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures shall be followed for all samples collected. All samples shall be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times. All samples shall be submitted to the laboratory within 48 hours after their collection.

Shipment procedures shall include the following:

1. Individual sample containers shall be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler shall be sealed and secured in case of sample container leakage. Temperature blanks shall be included with each shipping container;
2. Each cooler or other container shall be delivered directly to the analytical laboratory;
3. Glass bottles shall be separated in the shipping container by cushioning material to prevent breakage;

4. Plastic containers shall be protected from possible puncture during shipping using cushioning material;
5. The chain-of-custody form and sample request form shall be shipped inside the sealed storage container to be delivered to the laboratory;
6. Chain-of-custody seals shall be used to seal the sample-shipping container in conformance with EPA protocol; and
7. Signed and dated chain-of-custody seals shall be applied to each cooler prior to transport of samples from the site.

6.2.1 Cleaning of Sampling Equipment

The objective of the decontamination procedures is to minimize the potential for cross-contamination. A designated decontamination area shall be established for decontamination of drilling equipment, reusable sampling equipment and well materials. Drilling equipment or other exploration equipment that may come in contact with a borehole shall be decontaminated by steam cleaning, by hot-water pressure washing, or by other method approved by NMED prior to drilling each new boring.

Sampling or measurement equipment, including but not limited to, stainless steel sampling tools, split-barrel or core samplers, reusable field test kit equipment, well developing or purging equipment, groundwater quality measurement instruments, and water level measurement instruments, shall be decontaminated in accordance with the following procedures or other methods approved by NMED before each sampling attempt or measurement:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. Rinse with potable tap water;
3. Wash with nonphosphate detergent or other detergent approved by NMED (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
4. Rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;
5. Rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. Rinse with potable tap water; and
7. Double rinse with deionized water.

All decontamination solutions shall be managed as solid or hazardous waste based on characterization results.

6.2.1.1 Sample Logbook

Daily field activities, including observations and field procedures, shall be recorded on appropriate forms. Copies of the field forms shall be maintained at the Facility. Copies of the completed forms shall be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink shall be used to record all field activities. Photographic documentation of field activities shall be performed, as appropriate. The daily record of field activities shall include the following:

- Site or unit designation;
- Date;
- Time of arrival and departure;
- Field investigation team members including subcontractors and visitors;
- Weather conditions;
- Daily activities and times conducted;
- Observations;
- Record of samples collected with sample designations and locations specified;
- Photographic log;
- Field monitoring data, including health and safety monitoring if conditions arise that require modification of required work;
- Equipment used and calibration records, if appropriate;
- List of additional data sheets and maps completed;
- An inventory of the waste generated and the method of storage or disposal; and
- Signature of personnel completing the field record.

6.2.2 Sample Analysis Requirements

Samples shall be analyzed for all constituents listed in Table 1. Samples shall be analyzed by an independent laboratory using the methods included in Table 1 or other NMED approved methods. To the extent possible all method detection limits and reporting limits shall be less than the applicable cleanup levels included in Permit Attachment 7.

6.2.3 Analytical Laboratory Requirements

All laboratory analysis will be performed by independent analytical laboratories that maintain National Environmental Laboratory Accreditation Conference (NELAC) accreditation.

6.2.4 Quality Assurance/Quality Control

All sampling and analysis will be conducted in accordance with QA/QC procedures defined by the latest revision of “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (SW-846) (EPA, 1986) or other Department-approved procedures. Field sampling procedures and laboratory analyses will be evaluated through the use of QA/QC samples to assess the overall quality of the data produced. QC samples evaluate precision, accuracy, and the potential for sample contamination associated with the sampling and analysis process, which is described in the following sections.

6.2.4.1 Field Quality Control

The field QC samples that may be collected include field blanks, field duplicates, and equipment rinseate blanks. QC samples shall be given a unique sample identification number and submitted to the analytical laboratory as blind samples. QC samples will be identified on the applicable forms so that the results can be applied to the associated sample.

6.2.4.2 Analytical Laboratory Quality Control Samples

Soil samples collected as part of closure shall be collected at predetermined locations. Field duplicates, field blanks, equipment rinseate blanks, and reagent blanks, if necessary, shall be obtained for quality assurance during sampling activities. The samples shall be handled as described in Section 6.2 of this Closure Plan.

Field duplicate soil samples shall be obtained at a frequency of ten percent. At a minimum, one duplicate sample per sampling event shall always be obtained.

Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples with the soil samples submitted to the laboratory.

Equipment rinseate blanks shall be obtained for chemical analysis at the rate of five percent but no fewer than one rinseate blank per sampling day. Equipment rinseate blanks shall be collected at a rate of one per sampling day if disposable sampling apparatus is used. Rinseate samples shall be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinseate sample then shall be placed in the appropriate sample container and submitted with the soil samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of ten percent but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during soil sampling activities.

6.2.5 Data Reporting Requirements

The Permittee shall present summary tables of these data and Level II QA/QC results in the Closure Report. The raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory support data for samples from this

project, shall be compiled and kept on file at the contract laboratory(s) for reference. The Permittee shall make the data available to NMED upon request.

7.0 WASTE MANAGEMENT

By removing any hazardous waste or hazardous waste constituents during closure, the owner/operator may become a generator of hazardous waste. The Permittee shall control, handle, characterize, and dispose of all wastes generated during closure activities in accordance with all applicable state, federal, and local requirements (see 40 CFR 264.114).

8.0 CLOSURE REPORT

Upon completion of the closure activities at the unit, the Permittee shall submit, by registered mail, a closure report (Report) for NMED review and approval. The Report shall document that the unit has been closed in compliance with the specifications in this closure plan. The Report shall summarize all activities conducted during closure including, but not limited to:

- a) the results of all investigations;
- b) the results of all remediation of environmental media
- c) the results of all kickout clearance activities
- d) remediation waste management;
- e) removal and/or decontamination of equipment and structures;
- f) decontamination verification and soil sampling activities; and
- g) results of all chemical analyses and other characterization activities.

The Permittee shall submit the Report to NMED in accordance with Permit Section III.D. NMED may require interim reports that document the progress of closure.

The report shall document the unit's closure and contain, at a minimum, a copy of the certification pursuant to 40 CFR 264.115, any variance, and the reason for the variance, from the activities approved in this closure plan, and documentation of all activities conducted to complete closure. The certification must be signed by the Permittee and by an independent professional engineer registered in the State of New Mexico (see 40 CFR 264.115).

Table 1. List of Analytes and Laboratory Test Methods

Parameters	Method Number*	Test Method
Metals:		
Arsenic	1311, 6010B, 7060A, 7061A	Toxicity characteristic leaching procedure (TCLP) is EPA method 1311**
Barium	1311, 6010B, 7080A, 7081	
Cadmium	1311, 6010B, 7130, 7131A	Inductively-coupled plasma atomic emission spectroscopy (ICP-AES) Manual cold vapor technique
Chromium	1311, 6010B, 7190, 7191	
Lead	1311, 6010B, 7420, 7421	
Mercury	1311, 6010B, 7470A, 7471A	
Selenium	1311, 6010B, 7740, 7741A, 7742	
Silver	1311, 6010B, 7760A, 7761	
Volatile Organic Compounds	8260B	
Semi-Volatile Organic Compounds	8270C	GC/MS
Explosives Compounds: HMX, RDX, TNT, 1,3,5-TNB, 1,3-DNB, tetryl, NB, 2A-4,6-DNT, 4A-2,6-DNT, DNT-mixture 2,4/2,6, 2,6-DNT, 2,4-DNT, 2-NT (o-), 3,NT (m-), 4-NT (p-), Nitroglycerin, PETN	1311, 8330, 8332	High performance liquid chromatography (HPLC)

Parameters	Method Number*	Test Method
Perchlorate	314.0	Ion Chromatography
Nitrate	300 Series	Varies
Cyanide	9012	Automated Colorimetric, with Offline Distillation
PCBs	8082	GC
Dioxins and Furans	8280, 8290	High-Resolution Gas Chromatography/Low Resolution Mass Spectrometry (HRGC/LRMS)
TPH (Total Petroleum Hydrocarbons)	Modified 8015	GC

*All analytical methods as they may be updated or replaced.** EPA Method 1311 (TCLP) is used for waste characterization for the purpose of treatment or disposal for compounds listed in 40CFR 261.24.

ATTACHMENT 10
FACILITY-WIDE GROUND WATER MONITORING PLAN

[To be submitted and approved pursuant to Permit Part V and VII.]

ATTACHMENT 11
GROUND WATER CORRECTIVE ACTION PROGRAM

[To be submitted pursuant to Permit Part VIII.]

ATTACHMENT 12
MAP OF OB/OD UNIT

ATTACHMENT 13 OFF-SITE WELLS

The following off-site water supply wells are subject to ground water monitoring and sampling.

16T-538C

16T-538D

16T-538E

16T-538UNC

16T-602

16T-603

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ATTACHMENT 14 CAMU WASTE ANALYSIS PLAN

14.0 INTRODUCTION

This Waste Analysis Plan (WAP) describes the procedures used to characterize wastes to be treated and the residues that are generated as a result of treatment of WMM by open burn or open detonation at the Corrective Action Management Unit (CAMU) at the Fort Wingate Depot Activity (FWDA). Waste analysis requirements are specified in 40 CFR 264.13, 270.14(b) and 268.7. The WAP is organized as follows:

1. Facility Description
2. Waste Analysis Parameters
3. Waste Characterization Procedures
4. Analytical Methods
5. Frequency of Analysis
6. Special Requirements

14.1 FACILITY DESCRIPTION

The CAMU is located in SWMU 14 near the Old Burning Ground and Demolition Landfill within Parcel 3 of FWDA. The CAMU is designated to treat recovered WMM generated during corrective action activities conducted within the Facility. A description of the CAMU is described in Permit Attachment 1.

14.1.1 Description of Waste Streams to be Treated at CAMU

Historical munitions used and stored at FWDA have been documented by various surveys and investigations conducted at FWDA between 1993 and 1999. The munitions managed at FWDA range from small arms munitions to 10,000 pound bombs. The WMM munitions to be treated at the CAMU are standard military end items with well-defined physical and chemical characteristics.

Waste Permitted to be treated in the CAMU shall be limited to reactive (D003) and ignitable (D001) hazardous wastes, such as MEC (including damaged, defective, expired, and unserviceable munitions) and explosive-contaminated wastes generated during remediation activities. EPA hazardous wastes containing the codes D001 (ignitability), D003 (reactivity), D005 (barium), D006 (cadmium), D007 (chromium), D008 (lead), D009 (mercury), and D030 (2,4-dinitrotoluene) may also be treated in the CAMU. Other waste that may be treated at the CAMU include waste which may be associated with propellants, bulk explosives, metal powders, detonators, and miscellaneous munitions constituents, and soils determined by field testing (e.g., visual inspection, burn test, EnSys®) to contain 10% or greater explosives compounds. Disposition of the propellants, bulk explosives, metal powders, detonators and miscellaneous munitions constituents shall be determined by the designated and UXO Quality

Control Specialist. Items may be treated in the CAMU only if the SUXOS and UXO Quality Control Specialist determines the items are unsafe to transport off-site.

Table 1 lists the wastes authorized for treatment at the CAMU. The Permittee shall not exceed 200 lbs net explosive weight (NEW) for cased explosives or maximum of 200 lbs for uncased explosives in any treatment event. No more than 1,000 lbs of NEW may be treated in any seven day period. 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. The annual throughput of the CAMU is estimated at 52,000 lbs NEW. A minimum of 24 hours after each burn is completed is required before the debris can be inspected and cleaned.

The Permittee is prohibited from treating any wastes in the CAMU that can be safely transported off-site for treatment or disposal at an alternate facility. All debris and incidental solid wastes (e.g., wooden ammunition boxes, containers) that can be safely separated from the munition item/constituent and transported off-site and certified as material documented as safe (MDAS) in accordance with Department of Defense (DoD) and United States Army Corp of Engineers (USACE) regulations and requirements is prohibited from treatment at the CAMU. The Permittee is also prohibited from treating any waste that was not specifically generated at the Facility during clearance or other corrective action operations.

The placement of bulk or non-containerized liquid hazardous waste or free liquids contained in hazardous waste (whether or not sorbents have been added) in the CAMU is prohibited except where placement of such wastes facilitates the initiation of the treatment process. [20.4.1.500 NMAC (incorporating 40 CFR 264.552(a)(3)(i))]

Table 1: CAMU General Unit and Waste Description

Treatment Unit	Description of Treatment Unit	General Description of Hazardous Waste	Hazardous Waste No.	Maximum Quantity of Waste Allowed per Treatment Event
Open Burn	The burn pans, constructed of a fabricated steel structure that is approximately 4 ft wide, 8 ft long, and 1 ft deep.	MEC-Ignitable, Reactive, and Toxic Wastes.	D001, D003, D007, D008	200 lbs Net Explosive Weight for uncased explosives

Open Detonation	The size of each detonation pit will be commensurate with the size of the item(s) being destroyed as determined by the SUXOS and UXO Quality Control Specialist in coordination with the USACE OESS. The interior surface of the detonation pits within the treatment cells will be composed of dirt. Horseshoe-shaped earthen berms will surround each of the treatment cells. The berms will be constructed to a width of 35 feet and a height of 8 feet. The front will have an entrance approximately 25 feet wide for access to the interior of the cell.	MEC-Ignitable, Reactive, and Toxic Wastes	D001, D003, D005, D006, D007, D008, D009, D030	200 lbs Net Explosive Weight for cased explosives
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14.1.2 Description of Waste Streams Generated at CAMU

The primary waste streams to be generated at the CAMU are recyclable scrap and ash. Other materials and potentially impacted soil may also potentially be generated.

Recyclable Scrap and Material Documented as Safe (MDAS). The end waste stream from the CAMU is scrap metal and MDAS that is deemed “safe to recycle” by the SUXOS and UXO Quality Control Specialist. All scrap metal and MDAS certified in accordance with the USACE procedures of EM 1110-1-4009 will be sent to a smelter, licensed recycler or appropriate permitted facility for final disposition.

Ash. Ash will be removed after each burn/treatment. The resulting ash shall be characterized (in accordance with Section 14.3 of of this attachment) and disposed at a permitted off-site facility in accordance with all applicable local, state, and federal regulations.

Non-MEC Debris and Incidental Solid Waste. Non-MEC debris and incidental solid wastes refers to items such as wooden ammunition boxes and containers. If deemed safe to do so by the SUXOS and UXO Quality Control Specialist, these solid wastes will be segregated for off-site disposal and will not be treated with other WMM in the CAMU. If the non-MEC debris or incidental solid waste is designated as unsafe to segregate from the WMM, the Permittee may also treat such non-MEC or incidental solid waste in the CAMU. The waste stream generated will be ash.

Potentially Impacted Soil. There is a potential for releases to soils to occur as a result of CAMU treatment processes. The Permittee shall conduct soil sampling at the CAMU in accordance with Permit Section IX.L to evaluate for the presence of contaminated soils. Section 14.3 also addresses soils, although this waste analysis activity will be managed primarily as part of the Closure of the unit.

14.2 WASTE ANALYSIS PARAMETERS

Characteristics of the wastes treated at the CAMU shall be identified using generator knowledge and written documentation about the wastes being treated. As noted in Section 14.1.1, the anticipated WMM are standard military end items with well-defined physical and chemical characteristics. Military munitions are identifiable by their unique physical characteristics. The SUXOS and UXO Quality Control Specialist shall use the appropriate information sources (e.g., USEPA AP 42, Chapter 15, ORDATA online) to identify the type of munitions upon discovery. Sampling and analysis of WMM to be treated at the CAMU shall not be conducted as part of this WAP because the composition is well-known and well-controlled, and the inherent health and safety risks outweigh the potential value of the data that would be obtained by testing the WMM (i.e., sampling and subsequent laboratory analysis would present unnecessary hazards to personnel). However, post-treatment inspection must be completed to ensure that the WMM are effectively treated and rendered non-hazardous, thereby, “safe to recycle” off-site.

Sampling and analysis shall be conducted for the characterization of certain wastes generated after the completion of the CAMU treatment process, such as ash and potentially impacted soil. Generator knowledge shall be used to characterize non-MEC debris. Other wastes and incidental solid wastes generated by the treatment will undergo sampling and analysis of parameters identified in the following sections.

14.2.1 Criteria and Rationale for Parameter Selection

All waste shall be characterized for explosive related constituents prior to disposition. Table 2 provides a list of potential analytical methods for waste analysis under this WAP.

Ash. Based on knowledge of the WMM and MEC to be treated at the CAMU, the ash residue may contain the toxicity characteristic metals barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009) and organic compounds such as 2,4-dinitrotoluene (D030) present in the original wastes. The ash residue shall be sampled and analyzed for the constituents known to be in the original wastes the first time a specific waste stream is treated to establish a profile for the ash that will be generated by that waste stream, using TCLP and total analysis methods. Once a profile for the ash generated by a specific waste stream is established, additional ash sampling may not be necessary. If a specific waste stream’s characteristics change, additional ash sampling and analysis shall be conducted to establish a new profile.

Potentially Impacted Soil. Based on the generator knowledge available for WMM to be treated, soil samples shall be analyzed for metals, explosive compounds, perchlorate, and total petroleum hydrocarbons. In addition, closure and baseline samples shall be analyzed for VOCs, SVOCs, nitrate, cyanide, PCBs, dioxins, and furans. Soil from the CAMU shall be sampled and

analyzed for these parameters to comply with land disposal regulations (LDR) that may be applicable during the closure of the treatment unit (See Table 2).

Table 2: Residual Waste Testing and Analytical Methods

Parameters	Method Number*	Test Method
Metals:		
Arsenic	1311, 6010B, 7060A, 7061A	Toxicity characteristic leaching procedure (TCLP)**
Barium	1311, 6010B, 7080A, 70681	
Cadmium	1311, 6010B, 7130, 7131A	
Chromium	1311, 6010B, 7190, 7191	
Lead	1311, 6010B, 7420, 7421	
Mercury	1311, 6010B, 7470A, 7471A	
Selenium	1311, 6010B, 7740, 7741A, 7742	
Silver	1311, 6010B, 7760A, 7761	
Volatile Organic Compounds	8260B	Inductively-coupled plasma atomic emission spectroscopy (ICP-AES)
		Gas chromatography/mass spectrometry (GC/MS)
Semi-Volatile Organic Compounds	8270C	GC/MS
Explosives Compounds:	1311, 8330, 8332	High performance liquid chromatography (HPLC)
HMX, RDX, TNT, 1,3,5-TNB, 1,3-DNB, tetryl, NB,		
2A-4,6-DNT, 4A-2,6-DNT,		
DNT-mixture 2,4/2,6, 2,6-DNT,		
2,4-DNT, 2-NT (o-), 3,NT (m-),		
4-NT (p-), Nitroglycerin, PETN		
Perchlorate	314.0	Ion Chromatography
Nitrate	300 Series	Varies

Parameters	Method Number*	Test Method
Cyanide	9012	Automated Colorimetric, with Offline Distillation
PCBs	8082	GC
Dioxins and Furans	8280, 8290	High-Resolution Gas Chromatography/Low Resolution Mass Spectrometry (HRGC/LRMS)
TPH (Total Petroleum Hydrocarbons)	Modified 8015	GC

* All analytical methods as they may be updated.

** Method 1311 (TCLP) is used for waste characterization for treatment or disposal for compounds listed in 40CFR 261.24.

14.3 WASTE CHARACTERIZATION PROCEDURES

The approach to waste characterization shall be based on the chemical and physical nature of the waste stream. The characterization strategy for the hazardous wastes treated and waste streams generated at the FWDA CAMU are described below. As noted in previous sections, the WMM that may be treated by CAMU treatment operations are standard military end items with well-defined physical and chemical characteristics. The WMM deemed safe to treat at the CAMU shall be based on generator knowledge available to meet waste analysis requirements. The Permittee shall conduct post-treatment inspection to ensure that the WMM are effectively treated and rendered non-hazardous.

After treatment, the remaining munitions debris (MD) shall be inspected by the SUXOS and UXO Quality Control Specialist. The SUXOS and UXO Quality Control Specialist shall verify and certify that the munitions debris has been 100% properly inspected and does not present an explosive hazard. All scrap metal and MDAS certified in accordance with the USACE procedures of EM 1110-1-4009 shall be sent to a smelter licensed recycler or other permitted facility for final disposition.

If the MD and scrap is not deemed “safe to recycle” based on visual inspection by the SUXOS and UXO Quality Control Specialist, it shall be left in the treatment cell for re-venting (by OD) in a timely manner, followed by re-inspections. If it continues to “present an explosive hazard” it shall be re-vented (by CAMU treatment) until it no longer poses an explosive hazard. Small arms ammunition up to and including .50-caliber cartridges and medium caliber cartridges that cannot be vented or treated on site shall be profiled, packaged, and disposed of at an off-site facility in accordance with local, state, and federal regulations.

Acceptable Knowledge

Acceptable knowledge (AK) includes process knowledge, generator knowledge, additional characterization data, and facility records of analysis (EPA, 1994A).

Process knowledge (PK) includes information about the process used to generate the original munitions, material inputs to the process, and the time period during which the waste was generated. PK is described in 40 CFR 264.13(a)(2) as data developed under 40 CFR Part 261 and existing published or documented data on a specific hazardous waste or hazardous waste generated from similar processes. PK may include off-site facility waste characterization data pertaining to a specific waste and laboratory analytical data performed prior to the effective date of applicable RCRA regulations.

Additional characterization data includes data obtained after the advent of RCRA and from chemical or physical analysis that is not subject to the most recent version of SW-846 and other approved methods, or through testing of similar or surrogate waste streams. This includes previous analytical data relevant to the waste stream including results from fingerprint analyses, spot checks, or routine waste verification sampling.

Facility records of analysis consist of waste analysis and physical characterization performed prior to the effective date of RCRA regulations.

The Permittee may use AK alone or in conjunction with sampling and analysis in the following instances (EPA, 1994A):

1. hazardous wastes from specific processes that are well documented;
2. F and K-listed wastes;
3. wastes are discarded, unused, commercial chemical products, reagents, or chemicals of known physical and chemical properties (P and U-listed wastes);
4. health and safety risks to personnel would not justify sampling and analysis ; and
5. physical nature of the waste does not lend itself to taking a laboratory sample (e.g., heterogeneous waste streams).

The Permittee shall document the basis for using AK on a waste profile form. The Permittee shall maintain AK information in accordance with Permit Section II.I in a format that allows waste management personnel and subject matter experts to obtain copies or review the documentation at the Facility. The Permittee shall assign a traceable identifier (i.e., process or AK document number or alphanumeric designation) in accordance with Permit Section 2.4.10 to the waste characterization documentation so that the Permittee can obtain the information for as long as required by RCRA regulation and this Permit.

14.3.1 CAMU Treatment Residuals

CAMU treatment operations may generate solid waste in the form of ash residue as well as impact soils in the treatment cells. Prior to treatment at the CAMU and to establish a baseline for soil sample analysis, samples shall be collected in accordance with Permit Section IX.L. The

Permittee shall analyze any CAMU treatment residues remaining after treatment each time a new waste stream is treated. The Permittee shall sample the ash generated by open burn or detonation for potential contaminants of concern. Soils shall also be sampled upon completion of all CAMU operations in accordance with Permit Section IX.L.

Ash. The ash residue generated by treatment operations shall be characterized by sampling and chemical analysis the first time a specific waste stream is treated to establish a waste profile. A waste profile for ash residue shall be established for each specific waste stream treated at the CAMU. The samples shall be analyzed for the constituents known to be present in the original waste that was treated. The appropriate toxicity characteristic metals, and 2,4-DNT as necessary, (specific for the waste based on generator knowledge) shall be analyzed for by the TCLP method, and the appropriate toxicity characteristic organic compounds shall be analyzed for using the appropriate method for total analysis (See Table 2). Subsequently, ash residue resulting from treated waste in the CAMU shall be stored in appropriate containers in the 90-day storage area prior to disposal. The ash shall be characterized for disposal to determine the appropriate permitted waste disposal facility that will receive the waste. If additional sampling and analysis is required, a simple random grab or composite sample shall be collected from the ash in accordance with the methods prescribed in SW-846 or other approved methods.

Potentially Impacted Soil. The Permittee shall effectively monitor potentially contaminated soils, by collecting baseline and closure (upon completion of all operations) soil samples from the CAMU primary treatment cells and the surrounding berms. The Permittee shall analyze all soil samples for TAL metals, explosive compounds, perchlorate, white phosphorus, and total petroleum hydrocarbons, VOCs, SVOCs, nitrate, cyanide, PCBs, dioxins, and furans in the soil sample analyses.

Non-MEC Debris and Incidental Solid Waste. All non-MEC debris and incidental solid wastes (i.e. wooden ammunition boxes, containers, etc.) that can be safely separated from the munitions item/constituent shall be separated and certified as MDAS in accordance with DoD and USACE regulations and requirements and transported off-site for disposal.

Groundwater. Groundwater monitoring at the CAMU will be conducted in accordance with the required facility wide groundwater monitoring plan (see Permit Section V).

14.3.1.1 Sampling Equipment

Soil and ash samples shall be collected using a stainless steel spoon or trowel, disposable sampling equipment or other method approved by NMED. Certified, pre-cleaned sample containers obtained from the laboratory shall be used to store the samples prior to laboratory analyses. Sample volumes, container types, and preservation requirements shall be followed per specific method requirements in accordance with EPA SWA 846 or other NMED approved method.

14.3.1.2 Field Decontamination

Disposable sampling equipment (e.g., plastic spoons and disposable buckets) does not require decontamination. If non-disposable soil sampling devices are used (e.g., stainless steel spoons),

the devices shall be decontaminated prior to each use. The reusable devices shall be decontaminated by the following procedure:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. Rinse with potable tap water;
3. Wash with nonphosphate detergent or other detergent approved by NMED (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
4. Rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;
5. Rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. Rinse with potable tap water; and
7. Double rinse with deionized water.

Decontamination water and waste generated during decontamination shall be contained and transferred to a 55-gallon drum or a 1000-gallon polyethylene tank for disposal as investigation derived waste (IDW). If decontamination water has no detected contaminant levels (other than naturally occurring metals) the water may be placed in the evaporation tank behind Building 542. Alternative decontamination methods must be approved by NMED prior to use.

14.3.1.3 Sample Preservation and Storage

In the field, each sample container shall be marked with the sample identification number, sampling location, date, time of sample collection and the sampler's initials. Sample containers for chemical analysis shall be placed in ice-filled coolers immediately following collection, and stored at 4° Celsius prior to and during shipment. Sample containers shall be packaged to avoid breakage during transportation. Chain-of-Custody (CoC) shall be followed in accordance with EPA SW-846.

For each sample to be submitted to the analytical laboratory for analysis, an entry shall be made on a CoC form supplied by the laboratory. One CoC form shall be completed for each cooler for each day of sampling. The information recorded on the CoC form includes the sampling date and time, sample identification number, requested analyses and methods, and sampler's name.

CoC forms shall be placed in a sealed plastic bag and placed inside of the cooler with the samples. Upon receipt of the sample cooler, the laboratory will verify custody and condition of the samples. Non-conformances in sample receipt (e.g., broken sample containers, samples received out of temperature) shall be documented on the sample receipt form and communicated to the project team immediately.

14.3.1.4 Quality Assurance/Quality Control

To ensure that proper procedures and considerations for sample collection and preservation, QA/QC, and occupational safety and health are followed, the Permittee shall comply with the Facility-specific protocol consistent with the most recent version of EPA SW-846.

14.4 ANALYTICAL METHODS

Characterization of the wastes to be treated in the CAMU shall be accomplished using generator knowledge as presented in Section 14.2. Therefore the discussion on laboratory selection and laboratory testing/analytical methods is limited to the residual wastes, soil and ash, potentially produced by the treatment unit, and QA/QC samples. The Permittee shall comply with EPA SWA 846 analytical methods or other NMED approved methods.

14.4.1 Laboratory Selection

The Permittee shall ensure that a NELAC certified analytical laboratory be selected to perform the analysis of each specific soil and ash produced by the CAMU. The laboratory shall maintain a comprehensive QA/QC program, technical analytical expertise, and an effective information management system.

14.4.2 Testing and Analytical Method Selection

The selection of analytical testing methods for the ash and soil generated at the CAMU shall be based on the following:

1. The physical state of the waste,
2. The analytes of interest,
3. The required detection limits, and
4. Information requirements.

Collectively, these factors contributed to the selection of the testing/analytical procedures presented in Table 2.

14.5 FREQUENCY OF ANALYSIS

Waste streams treated at the CAMU consist of energetic materials that have been manufactured in accordance with military specifications and strict manufacturing requirements. As such, these waste streams of WMM will consist of materials that are known. Therefore, a re-evaluation of waste characterization data may not be necessary.

Ash generated during CAMU treatment events will be collected and transported to the CAMU temporary storage area or the less-than-90-day storage area and characterized prior to disposal. Sampling frequency will be determined by the receiving disposal facility. If the sampling results indicate the ash will be classified hazardous waste, then the containers will be removed to a permitted hazardous waste disposal facility. If the sampling results indicate the ash is not hazardous then the ash will be managed as a solid waste.

14.6 SPECIAL REQUIREMENTS

The Permittee must comply with the applicable generator requirements of 20.4.1.300 NMAC (incorporating 40 CFR 262). Procedures for managing ignitable and reactive wastes and provisions for ensuring compliance with land disposal restrictions (LDR) requirements are summarized below.

14.6.1 Compliance with General Requirements for Ignitable, Reactive, or Incompatible Wastes

Wastes exhibiting the characteristics of reactivity and ignitability shall be treated in the CAMU. The Permittee shall ensure that these characteristics are documented based on generator knowledge or field testing (e.g., burn test). The Permittee shall meet the requirements in 40 CFR 264.17 when storing the waste.

14.6.2 Provisions for Complying with LDR Requirements

The Permittee shall demonstrate and document that all waste shipped offsite for disposal meets the land disposal restrictions (LDRs) as required by 40 CFR 268.40. Testing, tracking and record keeping must comply with 40 CFR 268.7. Generally, hazardous wastes must meet applicable treatment standards prior to land disposal. These treatment standards are expressed in two ways:

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

Wastes that have concentration-based treatment standards must be evaluated to determine if applicable constituent concentration levels have been attained. This can be accomplished by testing the waste, or applying knowledge of the process or materials used to produce the waste. The treatment standards are based on leachate concentrations or total concentrations. Leachate concentrations are determined using EPA Method 1311 (toxicity characteristic leachate procedure).

Characteristic wastes that have treatment standards expressed as specified technologies in 20.4.1.800 NMAC (incorporating 40 CFR 268.40) must also meet the Universal Treatment Standards in 20.4.1.800 NMAC (incorporating 40 CFR 268.48) prior to land disposal. Special rules regarding wastes that exhibit a characteristic are also presented in 20.4.1.800 NMAC (incorporating 40 CFR 268.9). In 20.4.1.800 NMAC (incorporating 40 CFR 268.9), it states that no prohibited waste that exhibits a characteristic under 20.4.1.800 NMAC, Subpart II, Part 261, Subpart C may be land disposed unless the waste complies with the treatment standards under 20.4.1.800 NMAC, (incorporating 40 CFR 268 subpart D). In addition, for wastes that exhibit a hazardous characteristic, the generator must determine the underlying hazardous constituents, as required in 20.4.1.800 NMAC (incorporating 40 CFR 268.9(a)).

14.6.3 Treatment Facility Requirements

For the ignitable and reactive hazardous wastes treated at the CAMU, the specified treatment technology is DEACT (deactivation). Deactivation is accomplished by treatment in the CAMU unit, which removes the hazardous characteristics of ignitability and/or reactivity. Placement of CAMU-eligible waste into the CAMU does not constitute land disposal of hazardous waste. The remaining residues resulting from treatment by the CAMU are subject to the LDRs.

ATTACHMENT 15 HAZARDOUS WASTE CONTINGENCY PLAN

15.1 PURPOSE AND SCOPE

This Contingency Plan (CP) addresses the OB/OD Unit and the CAMU at FWDA and the applicable requirements of 20.4.1.500 (incorporating 40 CFR 264 subpart D).

15.1.1 Primary Hazards

FWDA is an inactive U.S. Army depot whose former mission was to receive, store, maintain, test and ship assigned materials (primarily explosives and military munitions), and to dispose of obsolete or deteriorated explosives and military munitions.

As described above, 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. Open Burn (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. Open Detonation (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 fragment dispersal.

As a result of OB/OD operations, the potential exists for MEC to be present in the OB/OD Unit, surrounding area and at other locations at the Facility. MEC are any of the following: unexploded ordnance (UXO), abandoned or discarded munitions; 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, fuze, 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, installation, personnel, or material, and that remains unexploded by malfunction, design, or any other cause.

15.1.2 Name, Address, and Telephone Number of the Owner/Operator

Names, addresses, and telephone numbers of the Owner/Operator are provided in Appendix A.

15.2 CONTINGENCY PLAN

15.2.1 General (40 CFR 264.52 (A))

The CP addresses the potential emergencies involving reactive (explosive) hazardous wastes during treatment activities at the CAMU corrective action and closure and post-closure care of the OB/OD Area. These reactive wastes include a variety of potential MEC items.

15.2.2 Arrangements Agreed to By Local Agencies (40 CFR 264.52 (C))

FWDA has entered into mutual assistance agreements with local emergency, medical and law enforcement agencies. The names and phone numbers of the local agencies are provided in Appendix A of this attachment (15).

15.2.3 Installation on Scene

The Installation on Scene Coordinator (IOSC) has been designated by the WSMR command group to be the BRAC Environmental Coordinator (BEC) at FWDA or the designated alternate. The IOSC will function as the facility emergency coordinator. The responsibilities of the IOSC include: assessing the emergency, determining the need for agency notification, requesting additional manpower and resources if required, and coordinating mitigation, cleanup, and reporting. The Advisory/Support Group (Section 15.2.4) will support the IOSC as necessary. Names, addresses, and phone numbers of the IOSC and alternates are provided in Appendix A.

During environmental restoration activities, the IOSC will be supported by an onsite remediation supervisor. Because many activities during closure/post-closure will be performed by contractors, the on-site Remediation Supervisor will change depending upon activities performed and types of contractors on-site.

15.2.4 Advisory/Support Group

Members of the Advisory/Support group are located at White Sands Missile Range (WSMR) and have the responsibility of assisting the IOSC as outlined below:

1. Environmental Office: Assists with determination of environmental threats, proper disposal and management of wastes, recordkeeping, technical guidance, and reporting to outside agencies as required by regulations.
2. Safety Office: Provides site-specific information on explosives hazards and quantity distance requirements.
3. Public Affairs Officer (PAO): The PAO may be called upon by the IOSC to interface with the news media.
4. Contracting Officer: The responsibility of the Contracting Officer is to initiate a contract for incident clean up if directed by the IOSC. Contracted clean up will be used when clean up operations exceed the capabilities of the installation
5. Directorate for Public Works and Logistics: The Facilities Support Division may provide heavy equipment support if needed and instructed by the IOSC.

15.2.5 Response During Off-Duty Hours

Duty hours for the Caretakers are 6:30 am to 5:00 pm Monday through Friday. The emergency response procedure for off-duty hours is the same as for duty hours, except for the following differences: During off-duty hours, the IOSC and Advisory/Support Group is not present; individual group members or alternates may have to be called and report to the incident site, if conditions require their presence. The primary contact for the Advisory/Support Group during off-duty hours is the BRAC Environmental Coordinator.

15.2.6 Emergency Equipment (40 CFR 264.52(E))

A list of supplies, materials, and equipment maintained at FWDA for emergency response is provided in Appendix C.

15.2.7 Evacuation Plan (40 CFR 264.52(F))

In the event that a safety or life-threatening hazard exists, the CAMU or OB/OD Area may be evacuated. The evacuation route for both areas is shown in CP Figure 4. The signals for commencement of evacuation are described below:

A steady continuous alarm with an air horn, siren, or vehicle horn will indicate that the area is being evacuated. In addition, personnel may be contacted via two-way radio or mobile phone, and instructed to evacuate the area. The Remediation Supervisor will account for the presence or absence of all personnel when assembled at a safe waiting area. Personnel working in the area of the evacuated site will assemble at the location shown on the evacuation route map (CP Figure 4) when instructed to evacuate.

15.2.8 Copies of Contingency Plan (40 CFR 264.53)

A copy of the contingency plan and all revisions to the plan will be maintained at the FWDA BEC Office in Building 1 at FWDA.

A copy of the contingency plan and all revisions to the plan will be submitted to all local police departments, fire departments, hospitals, and State and local emergency response teams that may be called upon to provide emergency services.

15.2.9 Amendment of Contingency Plan (40 CFR 264.54))

The CP will be reviewed and amended if necessary when any of the following conditions exist:

1. The facility RCRA permit is modified.
2. The CP fails in actual use during an emergency
3. The design, operation, or construction of the facility changes in such a way as to cause an increased potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.

4. The list of emergency coordinators or emergency equipment changes

15.3 EMERGENCY PROCEDURES

15.3.1 Implementation (40 CFR 264.56 (a))

The IOSC shall implement the CP if there is a fire explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment. These include uncontrolled burning or detonation, which could release hazardous constituents into the environment or endanger human health. The IOSC will act immediately to assess any such situation and determine if the CP should be implemented. The decision to implement this Plan will depend on IOSC assessment of several factors, such as:

1. The type and quantity of wastes and other materials involved;
2. The potential for the spread of fire or the initiation of an explosion; and
3. The available capability to respond to and control the situation.

If needed, the IOSC will be summoned by the on-site Remediation Supervisor. While waiting for the IOSC to arrive, on-scene personnel will try to control the incident, if safe to do so. If this is not possible, the area will be evacuated as described in Section 15.2.7.

15.3.2 Identification of Hazardous Materials Released at the OB/OD Unit (40 CFR 264.56 (B))

The IOSC, with the assistance of the Remediation Supervisor, is responsible for identifying the chemical and physical characteristics, exact source, amount, and areal extent of the release and hazards of the incident.

The IOSC shall gather available information by interviewing personnel at the CAMU or the OB/OD Unit and reviewing the schedules and records pertaining to the remedial action or closure operations. Information of any hazards presented by waste materials during an emergency would be limited to the items scheduled to be treated, that were identified during remediation activities, or were recently treated.

A summary of MEC items recovered and treated on-site during historical site characterization activities is provided in Appendix D. A summary of UXO items that may be treated at the CAMU are also provided in Appendix D. In general, similar types of MEC items are expected to be encountered during remedial actions and closure operations.

15.3.3 Assessment (40 CFR 264.56(C))

The IOSC is responsible for assessing the nature of the emergency incident. Because little or no quantitative information (for example, exposure levels) initially may be available, the criteria for assessing the hazards, risks, and vulnerabilities at the OB/OD HWMU and the CAMU are qualitative. The following criteria will be considered in making this determination:

1. The need to protect individuals present at the scene and those in the process of responding;
2. The nature and size of the incident;
3. Specific information available on the wastes and other materials involved;
4. Weather (e.g. wind speed and direction), topography, and other conditions (e.g., time of day);
5. Need to establish safety zones;
6. Factors that affect spread, ignition, or reactivity of the product;
7. The probability that the incident could spread beyond the incident scene; and
8. The need to deny access to unauthorized personnel.

To assist in the assessment of this situation, the IOSC may find it appropriate to confer with on-site personnel and/or the Advisory/Support Group, or with explosives experts from other DoD installations.

Under reasonably foreseeable conditions, the types and quantities of materials present at the CAMU and the OB/OD Unit would not result in any significant releases that could spread beyond the FWDA boundary. In the event of fires, the combination of natural firebreaks, paved roads, man-made firebreaks, and isolation distances present in the OB/OD Unit have been designed to prevent fires from spreading beyond the unit and outside the FWDA Facility.

15.3.4 Uncontrolled Fires

Uncontrolled fires, while unlikely, may occur as a result of treatment operations at the CAMU or from closure operations at the inactive OB/OD Unit. If an uncontrolled fire occurs within Parcel 3, it will not be fought unless necessary to provide assistance to injured personnel.

During uncontrolled fires, the IOSC typically performs the following functions:

1. Assess the situation using all available knowledge; the assessment determines whether or not to implement the CP;
2. Upon implementation of the CP, restricts all non-essential personnel from the area and evacuates all personnel if necessary;
3. Notifies all appropriate military authorities and emergency response units immediately;
4. Eliminates all possible sources of ignition in the immediate area. These include ignited tobacco products and unauthorized vehicle traffic;
5. Coordinates all response efforts without exposing personnel to undue risk;
6. With assistance from the WSMR Environmental Office, assumes responsibility for directing follow-up activities, if required; and
7. With assistance from the WSMR Environmental Office, prepares and submits all necessary reports on the incident.

The IOSC shall take the following actions upon implementation of the CP:

1. Stop all routine work in the affected area;
2. Stop all nonessential activities;
3. Evacuate all nonessential personnel;
4. Coordinate removal of any injured persons from the site and medical treatment of those persons;
5. Prevent access to Parcel 3 until “all-clear” notification by radio or portable telephone when all danger is over and is announced; and
6. Arrange for cleaning and inspecting all emergency equipment before resuming normal closure/post-closure operations.

15.3.5 Emergency Notifications for Off-Site Impacts (40 CFR 264.56(D))

If the IOSC determines that the facility has had an incident that could threaten human health or the environment outside of the facility, the following notification reports will be made:

- a. If the IOSC’s assessment indicates that evacuation of local areas may be advisable, they will immediately notify the appropriate local authorities and be available to assist the local authorities in making the decision of whether or not to evacuate.
- b. Immediately notify the NMED Hazardous Waste Bureau (HWB) and the Local Community Emergency Coordinator, and the National Response Center. The notification report will include:
 - Name and telephone number of the reporter
 - Name and address of the facility
 - Time and type of incident
 - Name and quantity of material(s) involved
 - Extent of any injuries
 - Possible hazards to human health, or the environment, outside the facility.

Phone numbers for reporting emergency notifications of off-site impacts are provided in Appendix A.

Fires resulting from remedial actions, closure operations and unplanned burning or detonations resulting in personnel injury are the types of emergencies requiring emergency response. Dropping energetic materials during routine handling that does not result in ignition or detonation would not constitute an emergency. Any materials dropped would either be a discrete item (such as a projectile), or solid materials, which could be recovered easily.

15.3.6 Control of Fires and Prevention of Recurrence or Spread of Fires, Explosion, or Release (40 CFR 264.56(E))

Local fire departments will respond to any reported emergency situation involving fire, with the exception noted below. These fire departments are staffed and led by trained fire fighters. Actions appropriate to controlling and preventing the spread of fires would be selected and implemented by these trained fire fighters. FWDA would rely upon their professional, on-scene judgment in selecting a course of action that is most protective of human health and the environment. Similarly, the knowledge and training of on-scene Army and remediation contractor ordnance experts shall be used in determining the most appropriate response to actual or potential releases of hazardous wastes.

As noted in the emergency response agreements (Appendix B), under no circumstances will local fire departments be expected or permitted to enter an area or fight a fire potentially involving high explosives or MEC.

Should any event occur that would require implementation of the CP, FWDA shall follow up with any actions necessary to prevent future recurrences. At a minimum, remedial actions or closure operations shall be suspended and an investigation of the incident would be conducted to determine the reasons for the occurrence. Based on the results of the investigation, any appropriate changes shall be instituted prior to resumption of closure operations.

15.3.7 Storage, Treatment, and Disposal of Released Material (40 CFR 264.56(G))

Immediately after an incident, the IOSC will arrange for the treatment, storage, or transportation and disposal of recovered waste and waste residues, contaminated soil, or other contaminated materials to eliminate any potential explosive hazards. Detonation and burning are the methods by which the items were treated at the OB/OD Unit and will be treated at the CAMU; therefore, an unintentional fire or explosion may result in partial or complete treatment of WMM. The cleanup residue will be collected by remediation personnel. Depending on the nature of the residue, the appropriate equipment will be used. The material will be collected and containerized until the arrangements for testing and disposal are made.

The IOSC shall be authorized to use all facility personnel and equipment or contractor services as necessary to complete this task. Should the services of a clean-up contractor be required, the IOSC shall request such support from the WSMR Director of Contracting. Reactive wastes or reactive waste residues recovered after an incident may be treated on-site by remediation personnel in the CAMU (if authorized).

15.3.8 Post-Emergency Equipment Maintenance (40 CFR 264.56(H)(2))

The local fire departments are responsible for maintaining emergency equipment in accordance with their organizations' established procedures. As appropriate, soiled equipment will be decontaminated with an appropriate cleaning solution and the rinsate collected in 55-gallon drums. Representative samples of the collected rinsate shall be analyzed for toxic metals (including barium, lead, and selenium) and for 2,4-dinitrotoluene and all other analyses specified

by NMED. Rinsates exhibiting hazardous toxic characteristics as defined in 40 CFR 261 shall be managed accordingly and sent off-site for appropriate treatment or disposal at a RCRA-permitted facility. Remedial activities and closure operations will resume only when all emergency equipment is determined to be clean and in-service.

Notification will be provided to the NMED HWB demonstrating that the facility is in compliance with 20.4.1.500 NMAC, incorporating 40 CFR 264.56(h), before closure operations are resumed at the OB/OD Unit or treatment operations are resumed at the CAMU.

15.3.9 Reporting Requirements (40 CFR 264.56(J))

The IOSC will notify NMED, the WSMR Environmental Office and BRAC immediately of any incident that requires implementing the CP. The WSMR Environmental Office is responsible for making the required telephone notifications to Federal, State, and Army agencies. Telephone reporting should be done promptly (not to exceed 24 hours from the time of the incident), even if the information is incomplete. Telephone numbers for immediate notifications of Contingency Plan implementation are provided in Appendix A.

A copy of the FWDA Notification of Reportable Quantity Pollution Event form (and related instructions) used to record information used to make the telephone report is included in Appendix E. A copy of this form will be completed by the WSMR Environmental Office or the IOSC and inserted into the facility copy of the CP to satisfy the requirement for entry of the incident into the Facility Operating Record.

Within 15 days after the incident, the IOSC, in conjunction with the WSMR Environmental Office, shall prepare and submit a written report to the NMED HWB.