HAZARDOUS WASTE FACILITY PERMIT

ISSUED TO: United States Department of the Army, Anniston Army Depot
United States Department of the Army, Anniston Munitions Center
United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office
Washington Government Environmental Services Company LLC
Washington Demilitarization Company, LLC

EPA ID/PERMIT NUMBER: AL3 210 020 027

LOCATION: Calhoun County, Alabama, West of the city of Anniston, Latitude 33° 39' 00" and Longitude 85° 58' 22"

UNITS PERMITTED:

1 Spent Decontamination Storage and Treatment Tank System
1 Metal Parts Furnace
1 Container Handling Building
1 Brine Storage Tank System
3 Industrial Waste Storage Buildings
1 Roll-off Storage Building
1 Waste Transfer Facility
1 Lower Munitions Corridor
1 Brine Treatment Tank System
1 Open Burning Unit
1 Static Detonation Chamber
1 Liquid Incinerator
1 Deactivation Furnace System
1 Agent Storage Tank System
3 Conventional Waste Munitions Storage Igloos
155 Chemical Agent Storage Igloos
1 Toxic Maintenance Area
1 Upper Munitions Corridor
1 Buffer Storage Area
1 Linear Projectile and Mortar Disassembly System
1 Open Detonation Unit

ISSUANCE DATE: **November 14, 2007**

Modification R1	March 24, 2008
Modification R2	September 19, 2008
Modification R3	April 20, 2009
Modification R4	June 15, 2009
Modification R5	August 3, 2009
Modification R6	September 25, 2009
Modification R7	December 17, 2009
Modification R8	February 18, 2010
Modification R9	May 5, 2010
Modification R10	June 8, 2010
Modification R11	September 23, 2010
Modification R12	November 18, 2010
Modification R13	June 8, 2011
Modification R14	September 9, 2011
Modification R15, December 20, 2011	
Modification R16, February 8, 2013	
Modification R17, April 19, 2013	
Modification R18, June 28, 2013	
Modification R19, January 10, 2014	

EXPIRATION DATE: **November 13, 2017**

This Permit is issued pursuant with the ***Code of Alabama 1975****, §§ 22-30-1-****et. seq.****, as amended, and regulations adopted thereunder and the Hazardous Wastes Management and Minimization Act and in accordance with the plans and specifications and applications filed with the Department subject to the conditions appended hereto, all of which are considered a part of this Permit. This Permit shall be subject to all applicable laws of the State of Alabama, rules and regulations and orders of the Department of Environmental Management and shall be effective from the date of issuance.*

Alabama Department of Environmental Management

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE STORAGE AND TREATMENT PERMIT

Permittee: **United States Department of the Army, Anniston Army Depot**
United States Department of the Army, Anniston Munitions Center
United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office
Washington Government Environmental Services Company LLC
Washington Demilitarization Company LLC
Permit Number: AL3210020027
EPA I.D. No.: AL3210020027
Anniston, Alabama
Modification Number: R19

Pursuant to the Hazardous Wastes Management and Minimization Act, Code of Ala. 1975, Section 22-30-1, et. seq., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), a permit is issued to the United States Department of the Army, Anniston Army Depot (Facility Owner, Facility Co-Permittee, Facility Operator); the United States Department of the Army, Anniston Munitions Center (Facility Co-Permittee, Facility Co-Operator (ANMC operations)); the United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office (Facility Co-Permittee, Facility Co-Operator (Anniston Chemical Disposal Facility (ANCDF) Site)); Washington Government Environmental Services Company LLC (Facility Co-Permittee, Facility Co-Operator (ANCDF Site)); and Washington Demilitarization Company LLC (Facility Co-Permittee, Facility Co-Operator (Static Detonation Chamber (SDC) site)) to operate a hazardous waste storage and treatment facility located in Calhoun County, Alabama, West of the city of Anniston, latitude 33° 39' 00" and longitude 85° 58' 22".

For purpose of clarification, the designations Facility Owner, Facility Co-Permittee, Facility Operator, and Facility Co-Operator hereinafter shall be referred to as Owner, Permittee, and Operator respectively. The use of referring to Co-Permittee as Permittee and Co-Operator as Operator shall not change legal obligations and/or responsibilities.

In order to ensure the proper execution of this Permit, the Permittee agrees to the following division of operation responsibility:

- The U.S. Department of the Army, Anniston Army Depot (ANAD), as Facility Owner, a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANAD Facility. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- The U.S. Department of the Army, Anniston Munitions Center (ANMC), as Permittee and Operator, acknowledges its responsibility for hazardous waste management activities under the control of ANMC as a tenant property to ANAD. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions and closure or post-closure activities. The areas under ANMC control include the energetic treatment of waste munitions by open burning and open detonation and the associated storage of waste within permitted igloos for these operations.
- The U.S. Department of the Army, ANCDF Field Office (AFO) as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANCDF Site, including responsibility for funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- Washington Government Environmental Services Company LLC as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANCDF Site for day to day management within its direct management control and authority (including waste analysis, handling and monitoring, record keeping and related hazardous waste activities) as governed by law and the decisions and direction of the Army.
- Washington Demilitarization Company LLC as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the SDC Site for day to day management within its direct

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management control and authority (including waste analysis, handling and monitoring, record keeping and related hazardous waste activities) as governed by law and the decisions and direction of the Army. The areas under control include the Building 695 Complex and the SDC used for the treatment of energetic waste munitions and the associated storage of waste within permitted service magazines for these operations.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in Chapters 335-14-1, 335-14-2, 335-14-5, 335-14-7, 335-14-8, and 335-14-9 of the ADEM Administrative Code (hereinafter referred to as the "AAC"). Applicable AACs are those which are in effect on the date of issuance of this Permit.

This Permit is based on the assumption that the information contained in the ANCDF Part B Permit Application dated December 6, 2006, as revised on January 5, 2007, August 30, 2007, November 26, 2007, January 7, 2008, February 2, 2008, February 4, 2008, February 19, 2008, June 19, 2008, August 25, 2008, August 27, 2008, November 18, 2008, December 1, 2008, December 22, 2008, February 6, 2009, March 11, 2009, March 23, 2009, May 4, 2009, May 26, 2009, June 25, 2009, July 10, 2009, August 18, 2009, September 2, 2009, October 14, 2009, January 11, 2010, February 5, 2010, April 21, 2010, May 10, 2011, June 28, 2010, August 12, 2010, September 7, 2010, October 7, 2010, December 10, 2010 January 18, 2011, May 9, 2011, August 19, 2011, October 18, 2011, January 3, 2012, January 4, 2012, February 2, 2012, March 27, 2012, July 2, 2012, April 3, 2013, and October 13, 2013 (hereby incorporated by reference and hereafter collectively referred to as the Application) is accurate.

Any inaccuracies found in this information could lead to the termination or modification of this Permit and potential enforcement action (AAC 335-14-8).

The Permittee must inform ADEM of any deviation from or changes in the information in the Application which would affect the Permittee's ability to comply with the applicable AAC or permit conditions.

This Permit is effective as of November 14, 2007, as revised March 24, 2008, September 19, 2008, April 20, 2009, June 15, 2009, August 3, 2009, September 25, 2009, December 17, 2009, February 18, 2010, May 5, 2010, June 8, 2010, September 23, 2010, November 18, 2010, June 8, 2011, September 9, 2011, December 20, 2011, February 8, 2013, April 19, 2013, June 28, 2013, and January 10, 2014 and shall remain in effect until November 13, 2017, unless revoked and reissued, or terminated (See ADEM Admin. Code rule 335-14-8-.04(4)).

Alabama Department of Environmental Management	Date Signed

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DOCUMENTS INCLUDED BY REFERENCE:

Part B Permit Application (all revisions listed below)

ANCDF 2002 Risk Assessment and Subsequent Addendums

Final Mustard Trial Burn Plan

Mustard Condition 1 and Condition 2 Trial Burn Reports

Final SDC Emission Test Plan

SDC Emissions Test Reports

Anniston Chemical Activity Chemical Munitions Storage Igloo Closure Plan

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THE RESOURCE CONSERVATION AND RECOVERY ACT HAZARDOUS WASTE PERMIT APPLICATION FOR THE U.S. DEPARTMENT OF THE ARMY, ANNISTON ARMY DEPOT, THE U.S. DEPARTMENT OF THE ARMY, ANNISTON CHEMICAL AGENT DISPOSAL FACILITY FIELD OFFICE, AND WASHINGTON GOVERNMENT ENVIRONMENTAL SERVICES, LLC DATED DECEMBER 6, 2006, AS AMENDED JANUARY 5, 2007, RESUBMITTED AUGUST 30, 2007, AS MODIFIED BY SUBSEQUENT AMENDMENTS DATED NOVEMBER 26, 2007, JANUARY 7, 2008, FEBRUARY 2, 2008, FEBRUARY 4, 2008, FEBRUARY 19, 2008, JUNE 19, 2008, AUGUST 25, 2008, AUGUST 27, 2008, NOVEMBER 18, 2008, DECEMBER 1, 2008, DECEMBER 22, 2008, FEBRUARY 6, 2009, MARCH 11, 2009, MARCH 23, 2009, MAY 4, 2009, MAY 26, 2009, JUNE 25, 2009, JULY 10, 2009, AUGUST 18, 2009, SEPTEMBER 2, 2009, OCTOBER 14, 2009, JANUARY 11, 2010, FEBRUARY 5, 2010, APRIL 21, 2010, MAY 10, 2011, JUNE 28, 2010, AUGUST 12, 2010, SEPTEMBER 7, 2010, OCTOBER 7, 2010, DECEMBER 10, 2010, JANUARY 18, 2011, MAY 9, 2011, AUGUST 19, 2011, OCTOBER 18, 2011, JANUARY 3, 2012, JANUARY 4, 2012, FEBRUARY 2, 2012, MARCH 27, 2012, JULY 2, 2012, APRIL 3, 2013, AND OCTOBER 28, 2013 (HEREAFTER COLLECTIVELY REFERRED TO AS THE APPLICATION) IS HEREBY INCORPORATED BY REFERENCE INTO THIS PERMIT AND THE PERMITTEES SHALL BE SUBJECT TO THE REQUIREMENTS THEREIN.

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LIST OF ACRONYMS

%	Percent
°F	Degrees Fahrenheit
2MRA	2 Minute Rolling Average
AAC	ADEM Administrative Code
ACAMS	Automatic Continuous Air Monitoring System
ACFM	Actual Cubic Feet per Minute
ACS	Agent Collection System
ACT	Agent Collection Tank
ADEM	Alabama Department of Environmental Management
ANMC	Anniston Munitions Center
AFO	Anniston Field Office
AHWMMA	Alabama Hazardous Wastes Management and Minimization Act
AL	Airlock
ANAD	Anniston Army Depot
ANCA	Anniston Chemical Activity
ANCDF	Anniston Chemical Demilitarization Facility
AOC	Area of Concern
AQS	Agent Quantification System
ASC	Allowable Stack Concentration
ASME	American Society of Mechanical Engineers
ATB	Agent Trial Burn
AWFCO	Automatic Waste Feed Cutoff
BD	Buried Detonation
BDAT	Best Demonstrated Available Technology
BSA	Buffer Storage Area
BTS	Brine Treatment System
BTU	British Thermal Unit
CAIRA	Chemical Accident/Incident Response and Assistance
CAMDS	Chemical Agent/Munition Disposal System
CAMU	Corrective Action Management Unit
CDC	Centers for Disease Control
CEC	Cation Exchange Capacity
CEM	Continuous Emissions Monitor
CFM	Cubic Feet Per Minute
CFR	Codified Federal Regulations
CHB	Container Handling Building
Cl_2	Chlorine
CLA	Chemical Limited Area
CMS	Corrective Measure Study
CO	Carbon Monoxide
CO_c	Corrected CO ppm
CO_m	Measured CO ppm
CON	Control Room
CS	Confirmatory Sampling
CSDP	Chemical Stockpile Disposal Program
CWA	Clean Water Act
D/P	Differential Pressure
DAAMS	Depot Area Air Monitoring System

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DAL	MPF Discharge Air Lock
DDESB	Department of Defense Explosive Safety Board
DECON	Decontamination
DFS	Deactivation Furnace
DHHS	Department of Health and Human Services
DOD	Department of Defense
DOT	Department of Transportation
DPE	Disposable Protective Ensemble
DRE	Destruction and Removal Efficiency
DSCFM	Dry Standard Cubic Feet per minute
ECR	Explosive Containment Room
ECV	Explosive Containment Room Vestibule
EONC	Enhanced On-site Container
EPA	Environmental Protection Agency
EVAP	Evaporator
EXCH	Exchanger
FD	Forced Draft
FFA	Federal Facilities Agreement
FPI	Feed Prohibitive Interlock
FT	Foot
FT^2	Squared Feet
FT^3	Cubed Feet
G	Grams
GAL	Gallons
GC	Gas Chromatograph
GFE	Government Furnished Equipment
GPL	General Population Limit
GPM	Gallons Per Minute
HCl	Hydrochloride
HDC	DFS Heated Discharge Conveyor
HEPA	High Efficiency Particulate Air
HF	Hydrofluoride
HHRA	Human Health Risk Assessment
HHS	Health and Human Services
HMMS	Hazardous Materials Management System
HPLC	High Performance Liquid Chromatography
HR	Hour
HSWA	Hazardous and Solid Waste Amendment
HTH	High Test Hypochlorite
HVAC	Heating, Ventilation, and Air Conditioning
HWMU	Hazardous Waste Management Unit
IAW	In Accordance With
I.D.	Identification
ID	Induced Draft
IDLH	Immediately Dangerous to Life and Health
IDS	Intrusion Detection System
INWC	Inches of Water Column
JACADS	Johnston Atoll Chemical Agent Disposal System
JSB	Job Safety Breakdown
LAB	Laboratory
LBs	Pounds

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LBs/2-min	Pounds Per 2-minute Average
LDR	Land Disposal Restrictions
LIC	Liquid Incinerator
LMC	Lower Munitions Corridor
LPMD	Linear Projectile/Mortar Disassembly
LSS	Life Support System
m^3	Cubed Meter
MCL	Maximum Contaminant Level
M-CR	Munition Corridor
M-CR-AL	Munitions Corridor Airlock
MDB	Munition Demilitarization Building
MEK	Methyl Ethyl Ketone
MG	Milligram
MIN	Minute
Mini-CAMS	Miniature Continuous Air Monitoring System
MMR	Military Munition Rule
MPB-AL	Munitions Processing Bay Airlock
MPF	Metal Parts Furnace
MSDS	Material, Safety and Data Sheets
ND	Non-Detect
NDE	Non-Destructive Examination
NEW	Net Explosive Weight
No	Number
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
O_2	Oxygen
O_m	Measured Percent Oxygen
OB	Open Burning
OD	Open Detonation
ONC	Onsite Storage Container
P_c	Corrected Concentration of Particulate Matter
P_m	Measured Concentration of Particulate Matter
PAS	Pollution Abatement System
PCB	Polychlorobiphenyls
PFS	Pollution Abatement System Filtration System
PIC	Products of Incomplete Combustion
PM	Particulate Matter
PMB	Personnel Maintenance Building
POHC	Principal Organic Hazardous Constituents
POL	Petroleum, Oil and Lubricants
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PPMW	Parts Per Million by Weight
PRA	Preliminary Risk Assessment
PRW	Process Water
PSIG	Pounds Per Square Inch Gauge
PUB	Process and Utility Building
QAPP	Quality Assurance Project Plans
QA/QC	Quality Assurance/ Quality Control
RA	Risk Assessment

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RAA	Risk Assessment Addendum
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFC	Request for Concurrence
RFI	RCRA Facility Investigation
RHA	Residue Handling Area
RL	Reporting Limit
ROHA	Rolling Hourly Average
RPM	Rounds Per Minute
S	Seconds
SAR	SWMU Assessment Report
SCBA	Self Contained Breathing Apparatus
SCFH	Standard Cubic Feet per Hour
SDC	Static Detonation Chamber
SDS	Spent Decontamination Solution
SGU	Specific Gravity Unit
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SOPC	Substances of Potential Concern
STB	Surrogate Trial Burn
STEL	Short-Term Exposure Level
STL	Short Term Limit
SWMU	Solid Waste Management Unit
TAP	Toxicological Agent Protective Gear
TBD	To Be Determined
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TMA	Toxic Management Area
TOX	Toxic Cubicle
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, Disposal
TSDF	Treatment, Storage, Disposal Facility
UMC	Upper Munition Corridor
UPA	Unpack Area
US	United States
WAP	Waste Analysis Plan
WCL	Waste Control Limit
WIC	Waste Incineration Container
WMM	Waste Military Munitions
WPL	Worker Protection Limit
WTF	Waste Transfer Facility
Y	Measured Oxygen Concentration in the Stack Gas

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MODULE I: STANDARD PERMIT CONDITIONS

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MODULE I: STANDARD PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

1. At the Anniston Chemical Agent Disposal Facility (ANCDF), the Permittee is allowed to store and treat hazardous waste or chemical agent in accordance with (IAW) the conditions of this Permit and IAW ADEM Administrative Code (AAC) 335 Division 14. The Permittee is allowed to store hazardous waste or chemical agent in containers, treat and store hazardous waste or chemical agent in tanks, treat hazardous waste or chemical agent in miscellaneous treatment units, and treat hazardous waste or chemical agent by incineration at the ANCDF. ANCDF is also allowed to accumulate hazardous waste onsite for less than 90 calendar days pursuant to AAC 335-14-3-.03(5).

2. Within the Anniston Army Depot (ANAD), the Permittee is allowed to thermally treat conventional waste military munitions hazardous waste by open burning and open detonation (OB/OD) IAW AAC 335-14-5-.24 in the designated OB and OD units. Any treatment, storage, or disposal (TSD) of hazardous waste or chemical agent not authorized in this Permit, by AAC 335 Division 14 or any other Resource Conservation and Recovery Act (RCRA) permit is prohibited. Within the ANAD, the Permittee is allowed to store industrially derived hazardous waste, non-regulated waste (solid and universal waste, used oil, etc.), waste conventional munitions, waste chemical agent munitions, and chemical agent derived wastes IAW the conditions of this Permit and IAW AAC 335 Division 14. The Permittee is allowed to receive shipment from off-site sources of waste conventional munitions for the purpose of reuse, recycle, recovery, or for disposal. Receipt of any other hazardous waste from off-site sources is not allowed. The Permittee is allowed to store waste chemical agent munitions and chemical agent derived wastes for a time period of greater than one year.

3. Pursuant to AAC 335-14-8-.01(4), compliance with this Permit constitutes compliance, for purposes of enforcement, with the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) and RCRA, as amended by Hazardous and Solid Waste Amendments (HSWA), except for those requirements not included in the requirements which become effective by statute, or future regulatory changes to include those requirements promulgated under AAC 335-14-9 restricting the placement of hazardous wastes in or on the land. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. Compliance with the terms of this Permit does not constitute a defense to any action brought under Code of Alabama 1975, Section 22-30-1, et. seq., as amended, or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, welfare, or the environment.

I.B. DEFINITIONS

For the purpose of this Permit, terms used herein shall have the same meaning as those in AAC 335-14-1, 335-14-2, 335-14-5, and 335-14-8, unless this Permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

"Active life" for the purposes of this Permit refers to the time period between receipt of the first batch of hazardous waste or chemical agent munition at the hazardous waste management site and certification of closure of the hazardous waste management site.

"Action levels" for the purposes of this Permit are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.

"ADEM" means the Alabama Department of Environmental Management as established by Code of Alabama 1975, § 22-22A-4.

"Area of concern" (AOC) for purposes of this Permit includes any area having a probable release of a hazardous waste, chemical agent, or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the RCRA and AAC 335-14-8-.03(3) (b)2. in order to ensure adequate protection of human health and the environment.

"Chemical agent" for purposes of this Permit, includes the nerve agents VX or GB (Sarin) and the blister agent mustard (HD/HT dependent on mixture).

"Chemical agent free" for the purposes of this Permit refers to the condition of a material that, after being analyzed for chemical agents to which the material was exposed, is determined to have chemical agent concentrations below the lowest achievable detection limits as specified by the method.

"Chemical Stockpile Disposal Program" (CSDP) means the program created by the Department of Defense to dispose of all of their stockpile of unitary chemical weapons.

"Contamination" for purposes of this Permit refers to the presence of any hazardous constituent in a concentration which exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the facility (in areas not affected by the facility).

"Conventional munitions" for the purposes of this Permit means military munitions and munition products and components produced for or used by the military for national defense and security, as defined by AAC 335-14-1-.02 as "military munitions", and are <u>not</u> chemical agent munitions.

"Corrective action" for purposes of this Permit may include all corrective measures necessary to protect human health and the environment for all releases of hazardous waste, chemical agent, or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required by AAC 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater.

"Corrective Action Management Unit" (CAMU) for purposes of this Permit, includes any area within a facility that is designated by the Department under AAC 335-14-5-.19 for the purpose of implementing corrective action requirements under AAC 335-14-5-.06(12) , 22-30-19 et seq., Code of Alabama 1975, and/or RCRA Section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

"Corrective measures" for purposes of this Permit, include all corrective action necessary to protect human health and the environment for all releases of hazardous waste, chemical agent, or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required under AAC 335-14-5-.06(12).

"DDESB" means the Department of Defense Explosive Safety Board.

"Decontamination" means the application of a solution to any waste, whether primary or secondary, equipment or facilities for the purposes of reducing agent contamination.

"Department" means the Alabama Department of Environmental Management as established by Code of Alabama 1975, § 22-22A-4.

"Extent of contamination" for the purposes of this Permit is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

"Facility" for purposes of this Permit includes ANAD and any contiguous property and structures, other appurtenances, and improvements on the property, under the control of the owner or operator seeking a permit under Subtitle C of RCRA. For the purposes of implementing corrective action under AAC 335-14-5-.06(12) a facility includes all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

"Government furnished equipment" (GFE) is hazardous waste management unit (HWMU) equipment that shall be delivered to the site as a pre-fabricated assembly.

"Hazardous constituent" for purposes of this Permit are those substances listed in AAC 335-14-2- Appendix VIII and/or Appendix IX of Chapter 335-14-5 and

include hazardous constituents released from solid waste, hazardous waste, chemical agent and hazardous waste constituents that are reaction by-products.

"Heel" refers to the amount by weight of chemical agent remaining in a munition or container after the munition or container has gone through the chemical agent draining process.

"Hourly rolling average" (ROHA) is the arithmetic mean of the 60 most recent 1-minute averages recorded.

"In process" refers to any waste - primary or secondary – loaded for charging entering through the Unpack Area (UPA)/Toxic Maintenance Area (TMA) configured with the intent of processing through the furnace.

"Interim measures" for purposes of this Permit are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long term corrective action remedies are evaluated and, if necessary, implemented.

"Land disposal" for purposes of this Permit and AAC 335-14-9 means placement in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

"Landfill" for the purposes of this Permit includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

"Normal operating" period for a unit for the purposes of this Permit shall begin when all requirements provided in Module VI for that unit have been met by the Permittee and approved by the Department, the trial burn results and the health risk assessment provided for in Condition II.N. have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Module VII have been established and last until the unit re-enters a shakedown, trial burn, or post-trial burn period or until the unit treats the last batch of waste prior to beginning closure operations.

"Operating day" refers to a 24-hour period during which operations occurred for any length of time.

"Operating record" for each site within the ANAD facility shall be in written format or electronic format and must be immediately accessible for viewing and printing a hard copy.

"Post-trial burn period" shall refer to the period of time extending from the completion of the final run of a trial burn as described in the trial burn plan for that unit until all requirements provided in Module VI for that unit have been met by the Permittee and approved by the Department, the trial burn results and health risk Assessment

provided for in Condition II.N. have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Module VII have been established.

"Primary waste" is defined as munitions, ton containers, nerve agents GB and VX and mustard agents HD and HT.

"Release" for purposes of this Permit includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, pumping, or disposing into the environment of any chemical agent, hazardous waste or hazardous constituent.

"Remediation waste" for the purposes of this Permit includes all solid and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under AAC 335-14-5-.06(12) and RCRA Section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004(v) or 3008(h) for releases beyond the facility boundary.

"Secondary waste" is defined as all waste that is not characterized as primary waste.

"Shakedown period" shall refer to the period of time required to determine operational readiness extending from systemization until the beginning of the trial burn period.

"Shutdown" for the purposes of this Permit shall be defined as the normal procedure performed to bring the furnaces from a condition of induced and forced-draft fans being operated or fuel being combusted in either chamber to a condition where no fuel is being combusted and induced and forced-draft fans are not operating.

"Site" for the purposes of this Permit includes, but is not limited to, any permitted treatment, storage or disposal activity that may be comprised of one or more HWMUs.

"Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

"Solid waste management unit" (SWMU) for the purposes of this Permit includes any unit which has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA regulated HWMUs are also solid waste

management units. SWMUs include areas that have been contaminated by routine and systematic releases of chemical agent, hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).

"Spent decontamination solution" (SDS) is a caustic, bleach or other suitable solution that has been used to neutralize agent.

"Standard operating procedure" (SOP) is a written description of the procedures by which a process, machine, etc. shall be operated. An SOP may be written by the manufacturer and/or the Permittee. Adherence to any SOP employed by the Permittee does not necessarily constitute regulatory compliance.

"Startup" for the purposes of this Permit shall be defined as the procedure and the period of time required to bring the furnaces from a state of no fuel being introduced to the combustion chambers and all induced and forced-draft fans being off to a state at which all waste feed cut-off parameters are in compliance with the permitted conditions.

"Standby" for the purpose of this Permit shall be defined as the period of time which the furnace is firing only primary or backup fuel for the purpose of maintaining furnace temperatures.

"Tank system" for the purposes of this Permit shall include the tank(s) and all primary and secondary sumps, pumps, valves, and associated piping and any other appurtenances.

"Trial burn period" shall refer to the period of time from the first run until the final run of the trial burn for that unit is completed as described in the trial burn plan for that unit.

"Unit" for the purposes of this Permit includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, miscellaneous treatment unit, or recycling unit.

I.C. PERMIT ACTIONS

This Permit may be modified, revoked and reissued, or terminated for cause as specified in AAC 335-14-8-.04 (2) through (4). The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition (AAC 335-14-8-.03(1)(f)).

I.D. SEVERABILITY

The provisions of this Permit are severable and if any provision of this Permit, or the application of any provision of this Permit 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. Invalidation of any State or Federal statutory or regulatory provision which forms the basis for any condition of this Permit does not affect the validity of any other State or federal statutory or regulatory basis for said condition.

I.E. DUTIES AND RESPONSIBILITIES

1. Duty to Comply

The Permittee must comply with all conditions of this Permit except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of Code of Alabama 1975, Section 22-30-1 et. seq., as amended, and is grounds for enforcement action, permit termination, revocation and re-issuance, modification, or denial of a permit renewal application (AAC 335-14-8-.03(1)(a)).

2. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must apply for and obtain a new permit. Notification shall be at least 180 calendar days before this Permit expires (AAC 335-14-8-.03(1)(b)).

3. Permit Expiration

a. This Permit and all conditions therein shall be effective for 10 years from the effective date of this Permit. This Permit and all conditions therein shall remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application and, through no fault of the Permittee, the Department has not made a final determination regarding reissuance of the Permit (AAC 335-14-8-.05(1) and (2)).

b. Total operating time for the Liquid Incinerator (LIC), Deactivation Furnace System (DFS), and Metal Parts Furnace (MPF) shall be no more than 22,260 operational hours (excluding standby) with no more than 6,000 operational hours for the LIC, 8,760 operational hours for the DFS, and 7,500 hours for the MPF (excluding standby) in any consecutive 12-month period.

4. Continuation of Expiring Permit

This Permit and all conditions herein shall continue in force until the effective date of a new permit, if the Permittee has submitted a timely application under AAC 335-14-8-.02(5) and the applicable paragraphs in AAC 335-14-8-.02(6) through (20) which is a complete (under AAC 335-14-8-.02(1)(c)) application for a new permit; and through no fault of the Permittee, the Department has neither issued or denied a new permit on or before the expiration date of this Permit (AAC 335-14-8-.05(2)).

5. **Obligation for Corrective Action**

Owners or operators of HWMUs must have all necessary permits during the active life (including the closure period) of the unit, and for any period necessary to comply with the corrective action requirements in Module VIII. The corrective action obligations required by this Permit shall continue regardless of whether the facility continues to operate or ceases operation and closes. The facility is obligated to complete facility-wide corrective action regardless of the operational status of the facility.

6. **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 (AAC 335-14-8-.03(1)(c)).

7. **Duty to Mitigate**

In the event of noncompliance with the permit, the Permittee shall take all reasonable steps to minimize releases to the environment resulting from the noncompliance, and shall carry out such measures as are reasonable, to prevent significant adverse impacts on human health or the environment (AAC 335-14-8-.03(1)(d)).

8. **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) which are 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 project plans (QAPP) to include following SOPs. Adherence to any SOP employed by the Permittee does not necessarily constitute regulatory compliance. This provision requires the operation of back-up or auxiliary equipment or similar systems only when necessary to achieve compliance with the conditions of this Permit (AAC 335-14-8-.03(1)(e)).

9. **Duty to Provide Information**

The Permittee shall furnish to the Department, within a reasonable time, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Department upon request, copies of records required to be kept by this Permit (AAC 335-14-8-.03(1)(h)).

10. Inspection and Entry

Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow duly designated officers and the employees of the Department or their authorized representative to (AAC 335-14-8-.03(1)(i)):

a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted; or where records must be kept under the conditions of this Permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

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

d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMA, as amended.

e. The Permittee shall provide to the Department unrestricted real-time remote access to continuously monitored and recorded ANCDF operating data and emissions monitoring data required by this Permit using a remote computer monitoring station.

11. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The methods used to obtain representative samples of the wastes to be analyzed must be the appropriate method from AAC 335-14-2 Appendix I or the methods as specified in the Waste Analysis Plan (see Sections II C-2 and III C-2 of the RCRA Permit Application). Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), or the methods as specified in the attached Waste Analysis Plan (AAC 335-14-8-.03(1)(j)).

b. The Permittee shall retain records at the facility of all monitoring information, including all calibration and maintenance records, copies of all reports and records required by this Permit, and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report or record or for periods elsewhere specified in this Permit. The Permittee shall retain, at the Facility, all monitoring records from all surface water sampling, seep sampling, soil sampling, sediment sampling, groundwater monitoring wells, and associated groundwater surface elevations until 3 years past the end of the corrective action instituted to address releases of chemical agent, hazardous waste or hazardous waste constituents from any solid

waste management unit. These periods may be extended by the request of the Department at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility (AAC 335-14-8-.03(1)(j)2. and 335-14-5-.05(5)(b)).

c. Records of monitoring information shall include (AAC 335-14-8-.03(1)(j)3.):

i. The date, exact place, and time of sampling or measurement;

ii. The individual(s) who performed the sampling for measurements;

iii. The date(s) analyses were performed;

iv. The individual(s) who performed the analyses;

v. The analytical techniques or methods used; and

vi. The results of such analyses.

d. The Permittee shall submit all monitoring results at the intervals specified elsewhere in this Permit.

12. Reporting Planned Changes

As soon as possible prior to any planned physical alteration or addition, the Permittee shall give notice to the Department of such planned physical alterations or additions to the permitted areas on the ANAD facility (AAC 335-14-8-.03(1)(l)1.).

13. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted ANAD facility or activity which may result in noncompliance with permit requirements. Advanced notice shall not constitute a defense for any noncompliance (AAC 335-14-8-.03(1)(l)2.).

14. Certification of Construction or Modification

a. The Permittee may not commence storage (except less than ninety day storage) or treatment of chemical agent or hazardous wastes in any new unit including GFE at the ANCDF until the Permittee has submitted to the Department, by certified mail or hand delivery, a certification of construction signed by the Permittee and a qualified professional engineer stating that the unit has been constructed in compliance with the permit and applicable regulations; and

i. The Department has inspected the modified or newly constructed site and finds it is in compliance with the conditions of the permit (AAC 335-14-8-.03(1)(l)2.(ii)(I)); or

ii. The Department has either waived the inspection or has not within 15 calendar days notified the Permittee of its intent to inspect (AAC 335-14-8-.03(1)(l)2.(ii)(II)).

b. The above mentioned certification of construction must include, at a minimum:

   i. As built drawings;

   ii. Descriptions and delineation of any changes to proposed drawings;

   iii. All required professional certifications;

   iv. All quality assurance/quality control documentation (QA/QC); and

   v. All required physical testing results.

c. Construction certification shall be maintained for the following ANCDF HWMUs or systems:

   i. Brine Storage Tanks System

   ii. Spent Decontamination Holding Tank System

   iii. Agent Collection Tank System

   iv. LIC and Pollution Abatement System (PAS)

   v. MPF and PAS

   vi. DFS and PAS

   vii. Container Handling Building (CHB)

   viii. Demilitarization machines by system

   ix. Heating, Ventilation, and Air Conditioning (HVAC) System (including carbon filter system)

   x. PAS Carbon Filters

   xi. Toxic Maintenance Area (TMA)

   xii. Waste Transfer Facility (WTF)

   xiii. Upper and Lower Munitions Corridors (UMC and LMC)

   xiv. Buffer Storage Area (BSA)

   xv. Brine Treatment System (BTS)

15. <u>Transfer of Permit</u>

This Permit shall be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to AAC 335-14-8-.04(1) and 335-14-8-.03(3)d. Prior to transferring ownership or operation of the permitted ANAD facility during its operating life, the Permittee shall notify the new owner or operator, in writing, of the requirements of AAC 335-14-5, 335-14-8, and this Permit (AAC 335-14-8-.03(1)(l)3).

16. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than 14 calendar days following each schedule date (AAC 335-14-8-.03(1)(l)5.).

17. 24-Hour Reporting

a. In accordance with AAC 335-14-8-.03(1)(l)6.(i), the Permittee shall verbally report to the Department any noncompliance with this Permit which may endanger human health or the environment. Any such information shall be reported as soon as possible, but not later than 24 hours from the time the Permittee becomes aware of the noncompliance.

i. Potential endangerment to human health and the environment shall include, but not be limited to, noncompliance with Condition II.A.1.

ii. Potential endangerment to human health or the environment shall include, but not be limited to, any release to the environment of any chemical agent (i.e., GB, VX, HD, and/or HT) or any chemical agent residue which results in the following:

(I) Any release to the atmosphere from the combined stack for the LIC, DFS, and MPF, MPF Cool-Down Conveyor Enclosure Ventilation, DFS Discharge Conveyor (DC) bin change out opening, or from any stack for the air filtration system if the confirmed stack emission levels exceeds the maximum Allowable Stack Concentrations (ASCs) identified for any individual chemical agent in Table 1-1.

(II) Any unprotected workers exposed to chemical agent, exceeding the Short-Term Exposure Level (STEL) specified in Table 1-1 at any chemical agent monitor (i.e., Automatic Continuous Air Monitoring System (ACAMS)/Depot Area Air Monitoring System (DAAMS)) within the ANCDF.

iii. Potential endangerment to human health or the environment shall include any non-confirmed indication that a release to the atmosphere from the combined stack for the LIC, DFS, and MPF, or from any stack for the air filtration system has occurred. The Permittee shall verbally report to the Department within 24 hours of a chemical agent monitor alarm at the maximum ASC level that indicates a potential release to the atmosphere if the stack emission levels have not been verified as a chemical agent anomaly (i.e., false positive).

b. In accordance with AAC 335-14-8-.03(1)(l)6.(i) and (ii), the immediate and 24 hour verbal report required in Condition I.E.17.a. shall include, but not be limited to, the following:

i. Information concerning the release of any hazardous waste or chemical agent which may endanger public drinking water supplies;

ii. Any information of a release or discharge of hazardous waste or chemical agent, or of a fire or explosion at the ANAD facility, which could threaten the environment or human health; and

iii. A description of the release or discharge and its cause including, at a minimum:

(I) Name, title, and telephone number of individual reporting;

(II) Name, address, and telephone number of the owner or operator;

(III) Name, address, and telephone number of the ANAD facility;

(IV) Date, time, and type of incident;

(V) Location and cause of incident;

(VI) Name and quantity of materials involved;

(VII) The extent of injuries, if any;

(VIII) An assessment of actual or potential hazard to the environment and human health, where this is applicable;

(IX) Description of any emergency action taken to minimize the threat to human health and the environment;

(X) Estimated quantity and disposition of recovered material that resulted from the incident; and

(XI) Any other information necessary to fully evaluate the situation and to develop an appropriate course of action.

c. Within 5 calendar days of the time the Permittee is required to provide verbal notification, as specified in Conditions I.E.17.a. through b., the Permittee shall provide to the Department a written submission IAW AAC 35-14-8-.03(1)(l)6.(iii).

i. The written submission shall include, but not be limited to the following:

(I) Name, address, and telephone number of the individual reporting;

(II) A description (including cause, location, extent of injuries, if any, and an assessment of actual or potential hazard to the environment and human health outside the ANAD facility, where this is applicable) of the incident (noncompliance and/or release);

(III) The period(s) in which the incident (noncompliance and/or release) occurred (including exact dates and times);

(IV) Whether the results of the incident remain a threat to human health and the environment (whether the noncompliance has been corrected and/or the release has been adequately cleaned up); and

(V) If not, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and/or the steps taken or planned to adequately clean up the release.

ii. The Permittee need not comply with the 5 calendar day written notice requirement if the Department waives the requirement and the Permittee submits a written report within 15 calendar days from the time the Permittee is required to provide verbal notification, as specified in Conditions I.E.17.a. through b.

18. Other Noncompliance

The Permittee shall report all instances of noncompliance not reported under Condition I.E.17 on a quarterly basis. The reports shall contain the information required by the AAC 335-14-8-.03(1)(1)6.

19. Other Information

If the Permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application, permit modification request, or in any report to the Department, such facts or information shall be promptly submitted by the Permittee (AAC 335-14-8-.03 (1)(l)11.). In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with the permit. The Permittee shall also promptly provide the Department all incident reports generated at any other CSDP facility.

I.F. SIGNATORY REQUIREMENT

All modifications to the RCRA Permit or Application submitted to the Department, shall be signed and certified by the ANAD Commander, ANMC Commander, ANCDF Field Office Project Manager, and WGES Project Manager, or by duly authorized representatives of those persons IAW the AAC 335-14-8-.02(2).

I.G. CONFIDENTIAL INFORMATION

The Permittee may claim information submitted as confidential if the information is protectable under Code of Alabama 1975, § 22-30-18, as amended. The term "Trade

Secret" as used in § 22-30-18 is defined in Code of Alabama 1975, § 22-30-3(12). (AAC 335-14-8-.02(3)).

I.H. REPORTS, NOTIFICATIONS, AND SUBMITTALS

1. All modifications to the RCRA Permit or Application to be sent or given to the Department should be sent by certified mail, express mail, or hand delivered to:

   Chief, Land Division
   Alabama Department of Environmental Management
   Mailing: PO Box 301463, Montgomery, AL 36130-1463
   OR
   Physical: 1400 Coliseum Blvd., Montgomery, AL 36109-2608
   Phone: (334) 271-7700
   FAX: (334) 279-3050

2. All modifications to the RCRA Permit or Application to be sent or given to the Regional Administrator should be sent by certified mail, express mail, or hand delivered to the United States (US) Environmental Protection Agency (EPA), Region 4, Waste Management Division at:

   Director, Waste Management Division
   U.S. Environmental Protection Agency, Region 4
   Atlanta Federal Center
   61 Forsyth Street SW
   Atlanta, GA 30303-3104
   Phone: (404) 562-8526

I.I. DOCUMENTS TO BE MAINTAINED AT THE ANAD FACILITY

The Permittee shall maintain at ANAD/ANCDF controlled facilities, until closure is completed and certified by a qualified professional engineer, the following documents and amendments, revisions and modifications to these documents:

1. Waste Analysis Plan (see Section C-2 of the RCRA Permit Application), as required by AAC 335-14-8-.02(5)(b)3.
2. Inspection Schedules (see Section F-2 of the RCRA Permit Application), as required by AAC 335-14-8-.02(5)(b)5.
3. Personnel training documents and records, as required by AAC 335-14-8-.02(5)(b)12.
4. Contingency Plan (Sections II G and III G of the Application), as required by AAC 335-14-8-.02(5)(b)7.
5. Operating record, as required by AAC 335-14-5-.05(4).
6. Closure Plan, as required by AAC 335-14-8-.02(5)(b)13.7. Annually adjusted closure cost estimate as required by AAC 335-14-5-.08(3)(b).
7. Copy of this Permit, Permit Attachments, current Permit Application and the current Permit Application Attachments.

8. Construction certification and as built drawings for the ANCDF HWMUs identified under Condition I.E.14.c. Construction certification and as-built drawings for any new HWMU(s) that may be constructed at ANAD or ANCD.

9. Independent tank system assessment, installation, and repair certifications; as required by AAC 335-14-8-.02(7).

10. Groundwater monitoring reports as required by AAC 335-14-5-.06.

I.J. ATTACHMENTS

1. If any of the Attachments to this Permit are found to conflict with any of the conditions in Modules I through IX, the condition shall take precedence.

2. If any section of the Application is found to be in conflict with any condition of this Permit, the condition of this Permit shall take precedence.

3. If any section of the Application is found to be in conflict with any Attachment to this Permit, the Attachment to this Permit shall take precedence.

I.K. PERMIT MODIFICATIONS AND SUBMITTALS

1. The individual trial burn plan for each different chemical agent to be treated in that incinerator shall be resubmitted by the Permittee as major permit modification(s) at least 180 calendar days prior to the proposed start date of the shakedown period for each trial burn. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed. The revised individual trial burn plans shall be approved by the Department prior to the start of the shakedown period for the respective trial burn.

2. The Permittee shall submit a revised Screening Risk Assessment Protocol at least 180 calendar days prior to the start date of the shakedown period for the initial agent trial burn which shall reflect the most current EPA guidance at the time of submittal. The revised Screening Risk Assessment Protocol shall be approved by the Department prior to the shakedown period for the initial agent trial burn.

3. The Permittee shall request a permit modification whenever changes in operating plans or facility design affect any plan (e.g. closure, groundwater monitoring, post-closure, or corrective actions) required or referenced by this permit. The Permittee must submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2) at least 60 calendar days prior to the proposed change in facility design or operation.

Table 1-1: Chemical Agent Exposure and Stack Limits

Location	Chemical Agent Concentrations (mg/m^3)		
	VX	GB	HD/HT[3]
Maximum Instantaneous ASC[1,2]	0.0003	0.0003	0.03
Maximum ROHA ASC[1,2]	0.00006	0.00006	0.006
GPL[1,3,4] (Averaging Time: 24 hours)	0.0000006	0.000001	0.00002
WPL[1,3,4] (Averaging Time: 12 Hours)	0.0000006	0.00002	0.00027
STEL [5] (Averaging Time: 15 minutes)	0.00001	0.0001	0.003
IDLH	0.003	0.1	0.7

NOTE: CDC determined that the current available data precluded acceptable exposure limits for mustard agent being precisely defined. CDC concluded that the work-place limits shall amply protect a general population 1000 meters or more from the demilitarization site or transportation route. Therefore, protection of the general public is dependent upon meeting the work-place limits within the facility.

Footnotes:

(1) Public Law 91-121/144 (USC 1512) mandates that the United States Department of Health and Human Services (DHHS) review the plans for transporting and/or disposing of lethal chemical agents and make recommendations for protecting human health and safety. DHHS delegated review and recommendation authority to the Centers for Disease Control (CDC).

(2) The Department of Army proposed the maximum ASCs indicated in Table 1-1. DHHS reviewed the concentrations and announced in the March 15, 1988 Federal Register (53 FR 8504) [corrected in 53 FR 11002, April 4, 1988] that the concentrations "met HHS criteria and appear to be more restrictive than limits set on a health base alone," and therefore made no recommendation for changes.

(3) 3 The March 15, 1988 Federal Register (53 FR 8504) [corrected in 53 FR 11002, April 4, 1988] announced that CDC concluded that the concentrations indicated in Table 1-1 shall adequately protect human health; "even long-term exposure to these concentrations would not create any adverse health effects."

(4) The October 9, 2003 Federal Register [Vol.68, No. 196, pp 58348-51] announced the final recommendations for protecting human health from potential adverse effects of exposure to agent GA, GB, and VX. The CDC conclusions in (3) above were not altered, but the human exposure values were lowered.

(5) The STEL is the 15-minute average of the ACAMS cycle concentrations. The STL is defined as the concentration determined by one ACAMS cycle.

Abbreviations:

ASC .....Allowable Stack Concentration
GPL .....General Population Limit
IDLH .....Immediately Dangerous to Live and Health
mg/m^3 .....milligrams per cubic meter
STEL .....Short-Term Exposure Level
WPL.....Worker Population Limit (time-weighted average)

MODULE II: GENERAL FACILITY CONDITIONS

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MODULE II: GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

1. The Permittee shall design, construct, maintain, and operate the permitted sites at the ANAD/ANCDF facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of chemical agent, hazardous waste, or hazardous waste constituents to air, soil, groundwater, or surface water which could threaten human health or the environment.

2. The Permittee shall construct all HWMUs IAW the approved designs and specifications that are included in the Application for new units, except for minor changes deemed necessary by the Permittee to facilitate proper construction of the HWMUs. Minor deviations from the approved designs or specifications necessary to accommodate proper construction shall be noted on the as-built drawings and the rationale for those deviations shall be provided in written narrative form to the Department. After completion of construction of each HWMU, the Permittee shall submit final as-built drawings and the narrative report to the Department as part of the construction certification documentation specified in Condition I.E.14.

3. The Permittee shall ensure that all waste shipped from the facility for offsite treatment has been appropriately characterized in accordance with Section III C of the permit application. Decontamination of items identified for offsite shipment is allowed.

II.B. RECEIPT OF OFF-SITE WASTE

The Permittee is not authorized and therefore, shall not receive hazardous waste from outside the State of Alabama at the ANCDF site. The Permittee shall only treat chemical agent and/or chemical agent munitions stored onsite at the time of issuance of this Permit. The Permittee may receive hazardous waste conventional munitions from off-site Department of Defense facilities at the ANAD site (from both within and outside the State of Alabama) for the purpose of reuse, recycle, recovery and/or disposal.

II.C. GENERAL WASTE ANALYSIS

1. The Permittee shall comply with all requirements set forth under AAC 335-14-5-.02(4) and shall follow the procedures described in the Waste Analysis Plan (see Application Sections II C-2 and III C-2).

2. The Permittee may not accept an unidentified waste for storage or treatment until it has been completely characterized and this Permit has been modified.

3. The Permittee shall utilize the methods of the Waste Analysis Plan (see Application Sections II C-2 and III C-2), for the analysis of any of the wastes listed in the Part A Application (see Section I of the Application).

Modification of the Waste Analysis Plan shall require a major permit modification except as provided in AAC 335-14-8-.04(2).

4. The Permittee has verified, through testing at the Chemical Agent Munitions Disposal System (CAMDS) in Utah, that metal scrap generated from the operation of the DFS or MPF (i.e., subjected to 1,000°F for at least 15 minutes in either unit) is thermally decontaminated. Scrap metal (bulk containers, projectiles, mortar rounds, etc.) that is thermally decontaminated will be further cleaned to remove any remaining loose residue that has been determined to be a hazardous waste (e.g. vacuumed to remove any remaining loose residue in the interior and on the exterior of the part(s)). When the interior is not vacuumed these munitions will remain in closed containers until being fed into the smelting process. That hazardous waste residue shall be disposed of IAW AAC 335-14-5, -7, & -9. Thermally decontaminated scrap metal from the MPF will be recycled by using it exclusively as feedstock for the steel-making process. ANCDF must maintain records to specifically document that thermally decontaminated scrap metal has been managed and recycled in this manner. Such records must be maintained on site and presented to the Department on request.

II.D. SECURITY PROCEDURES

The Permittee shall comply with the Security Procedures set forth under AAC 335-14-5-.02(5) and as described in Sections II F-1and III F-1 of the Application. The map of the ANCDF site depicting the location of fencing and gates for the ANCDF is located in Section III B, Figure III B-4 and the entire ANAD facility is located in Sections II B, Figures II B-2 and II B-4 of the Application.

II.E. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall comply with all requirements under AAC 335-14-5-.02(6), 335-14-5-.10(6), 335-14-5-.09(5), and 335-14-5-.15(8)(b) and the Inspection Schedules (see Sections II F-2 and III F-2 of the RCRA Permit Application).

2. The Permittee shall remedy any deterioration or malfunction (of equipment or structures) discovered during any inspection as required by AAC 335-14-5-.02(6)(c).

3. The Permittee shall record all inspection reports in the operating record for each permitted hazardous waste management site as required by AAC 335-14-5-.02(6)(d).

4. The Permittee shall maintain a copy of the Inspection Schedules (see Sections II F-2 and III F-2 of the RCRA Permit Application) for each permitted HWMU at the ANAD facility until the ANAD facility is certified closed.

II.F. TRAINING PLAN

1. The Permittee shall ensure that all personnel who handle hazardous waste or chemical agent are trained in hazardous waste management, safety procedures and emergency procedures, as applicable to their job description, IAW AAC 335-14-5-.02(7) and by following the outlines and procedures in Sections II H and III H of the Application.

2. The Permittee shall maintain a copy of the training documents and records as required by AAC 335-14-5-.02(7)(d) and (e).

II.G. PREPAREDNESS AND PREVENTION

1. The Permittee shall follow the preparedness and prevention procedures in Sections II F-3 and III F-3 of the Application.

2. The Permittee shall operate and perform preventative maintenance, inspections and repair of the equipment listed in Table 2-1, at a minimum, IAW the equipment manufacturer's specifications. The Permittee shall maintain records of these preventative maintenance and repair activities on this equipment with schedules (reflecting minimum and planned frequency for the performance of these preventative maintenance activities) in the operating record of each permitted HWMU IAW Condition I.E.11.

3. The Permittee shall maintain arrangements with state and local authorities as required by AAC 335-14-5-.03(8). If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

II.H. CONTINGENCY PLAN

1. The Permittee shall follow the procedures and schedules outlined in the Contingency Plan in Sections II G and III G of the Application. The Contingency Plan for all hazardous waste activities within the boundaries of the ANAD shall be maintained in Sections II G and III G of the Application.

2. In case of a fire*[1] or unplanned release of hazardous waste of hazardous constituents to the environment from the ANCDF site, the Permittee shall, in addition to implementing the Integrated Contingency Plan, Attachment II in the Application, perform a staged shutdown of all affected process operations at the ANCDF site, with the exception of container storage operations and storage and treatment operations in tanks, IAW the procedures specified in Sections III D-5 through D-7 of the Application.

3. The Permittee shall not restart affected process operations after shutdown under either Condition II.H.2. or shutdown as a result of a major

* [1] With the exception of munition processing fires in the ECR, unless the sprinkler system is activated.

explosion, as designated in Section III G of the Application, unless the following has occurred:

a. The Permittee has submitted a request to resume operations to the Department accompanied by the following information:

   i. Detailed description of the accident/incident;

   ii. The cause of the accident as determined by the results of investigation of the accident;

   iii. The corrective action(s) taken; and

   iv. A copy of the notification received by the Permittee from the Anniston Chemical Agent Disposal Facility Field Office (AFO) that affected process operations are authorized to resume.

b. The Permittee has ensured that all contingency equipment and resources required for plan implementation are in place.

c. The Department has provided the Permittee a written approval to resume affected process operations.

II.I. RECORDKEEPING AND REPORTING

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, the Permittee shall comply with the following:

1. The Permittee shall maintain a written or electronic operating record at the facility, IAW with AAC 335-14-5-.05(4) for all records identified in AAC 335-14-5-.05(4).

2. The Permittee shall, by March 31 of each year, submit to the Department a certification pursuant to AAC 335-14-5-.05(4), signed IAW AAC 335-14-8-.02(2), that the Permittee has a program in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable; and the proposed method of treatment, storage, or disposal is the most practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment.

3. The Permittee shall submit a biennial report covering the activities of each of the permitted HWMUs at the ANAD facility to the Department IAW AAC 335-14-5-.05(6) and 335-14-8-.03(1)(l)9.

4. The Permittee shall submit to the Department any additional reports specified in AAC 335-14-5-.05(8).

5. All reports, notifications, applications, or other materials required to be submitted to the Department shall be submitted at the address provided in Condition I.H.1.

6. All reports, notifications, applications, or other materials required to be submitted to the Regional Administrator shall be submitted at the EPA Regional address provided in Condition I.H.2.

7. From the beginning of chemical agent disposal until the closure of the ANCDF, the Permittee shall submit a monthly report within 2 weeks after the close of the calendar month. This report shall state the number of munitions and amount of chemical agents disposed of during the previous calendar month. This report shall also report the total number of munitions and amount of chemical agents disposed of since the beginning of agent operations. This report shall also report the number of munitions and amount of chemical agents remaining to be disposed.

II.J. CLOSURE

1. The Permittee shall amend the Closure Plan, included in Sections II I and III I of the Application, IAW AAC 335-14-5-.07(3)(c) and submit it to the Department for review and approval at least 180 calendar days prior to the date scheduled for commencing closure of the ANAD and/or ANCDF.

2. The Permittee shall amend the Closure Plan, included in Section II I of the Part B Application, IAW AAC 335-14-5-.07(3)(c) and submit it to the Department for review and approval at least 180 calendar days prior to the date scheduled for commencing closure of the ANAD chemical agent storage units.

3. The Permittee shall close the ANCDF and all ANAD chemical agent storage units according to the approved Closure Plan following completion of treatment of all onsite chemical agent and/or chemical agent munitions and associated waste.

4. The Permittee shall close the ANAD Industrial/Process Hazardous Waste Storage Buildings and the ANAD Hazardous Waste Conventional Munitions Components storage igloos according to the approved ANAD Closure Plan.

5. The Permittee shall not commence closure of any HWMU without first receiving approval of a Closure Plan for that unit from the Department.

6. Within 90 calendar days of the Permittee's receipt of the written approval from the Department for any HWMU's Closure Plan, modified closure plan and the post-closure plan, IAW AAC 335-14-5-.07(4)(a), the Permittee shall complete closure of the HWMU IAW the approved plans unless otherwise approved by ADEM.

7. The Permittee shall decontaminate or dispose of all ANCDF equipment as specified in the Waste Analysis Plan included as Application Section III C-2, or the Closure Plan included in Section III I of the Application.

8. The Permittee shall meet the general closure performance standard as specified in AAC 335-14-5-.07 during closure of all HWMUs at the

ANAD facility. Compliance with AAC 335-14-5-.07 shall require closure IAW Condition II.J. and the Closure Plan, included in Sections II I and III I of the Application for HWMUs.

9. The Permittee shall provide certification statements upon completion of closure for each HWMU when that HWMU at the ANAD facility has been closed IAW the applicable specifications in the Closure Plan as required by AAC 335-14-5-.07.

10. For all HWMUs, minor deviations from the permitted closure procedures necessary to accommodate proper closure shall be described in a narrative form with the closure certification statements. The Permittee shall describe the rationale for implementing minor changes as part of this narrative report. Within 60 calendar days after completion of closure of each HWMU, the Permittee shall submit the certification statements and narrative report to the Department.

11. In the event that any hazardous waste, hazardous waste constituents, contaminated subsoil, or any contaminated groundwater as specified in the Closure Plan for any HWMU cannot be clean closed by complete removal of chemical agent to below the limits specified in the ANCDF Waste Analysis Plan, the Permittee shall submit the modified closure and post-closure plans for that HWMU to the Department, as a permit modification request IAW AAC 335-14-8-.04(2) or (3), within 30 calendar days of the date that the Department notifies the Permittee in writing that the unit shall be closed in place as a landfill, IAW AAC 335-14-5-.07.

II.K. FINANCIAL ASSURANCE FOR FACILITY CLOSURE

The Permittee is exempt from the closure financial assurance requirements, IAW AAC 335-14-5-.08(1)(c).

II.L. COST ESTIMATE FOR FACILITY CLOSURE

1. The Permittee must adjust the closure cost estimate(s) annually for inflation and submit the closure cost estimate(s) to the Department no later than June 1st of each calendar year.

2. The Permittee must revise the closure cost estimate whenever there is a change in any permitted HWMU's Closure Plan as required by AAC 335-14-5-.08(3)(c).

3. The Permittee must keep in the operating record for each permitted HWMU at the ANAD facility and submit to the Department the latest closure cost estimate as required by AAC 335-14-5-.08(3)(d).

II.M. LIABILITY REQUIREMENTS

At least 180 calendar days prior to the proposed date of the shakedown period for the surrogate trial burn, Washington Government Environmental Services Company LLC shall demonstrate continuous compliance with the requirements of

AAC 335-14-5-.08(8)(a), including the requirements to have and maintain liability coverage for sudden and accidental occurrences from the ANCDF in the amount of at least $1 million per occurrence with an annual aggregate of at least $2 million, exclusive of legal defense costs.

II.N. RISK ASSESSMENT REQUIREMENTS

1. After each trial burn at the ANCDF, as provided for in Module VI, the Permittee shall submit to the Department a risk assessment addendum (RAA) following the revised protocol provided for in Condition I.K.2.,which shall compare the results of each trial burn or performance test to the data used in the preliminary risk assessment (PRA) with respect to emission estimates, stack parameters, and toxicity values.

2. The Permittee shall submit to the Department a post-trial burn risk assessment (RA) following the revised protocol provided for in Condition I.K.2. for the ANCDF under any of the following scenarios:

   a. The emission estimates from the trial burn have changed from the preliminary risk assessment to the degree that an unacceptable risk would result. The post-trial burn RA shall include those substances of potential concern (SOPCs) originally evaluated in the preliminary RA, all new compounds, and the mass of the unidentified emissions;

   b. The stack parameters from the trial burn have changed from the preliminary RA to the degree that an unacceptable risk would result; or,

   c. The toxicity values for the SOPCs originally evaluated in the preliminary RA have changed to the degree that an unacceptable risk would result.

II.O. CARBON FILTER OPERATION

This section applies only to the Munitions Demilitarization Building (MDB) and Laboratory (LAB) carbon filter system. Any reference to the term "LAB" refers to both the ANCDF and ANAD Laboratories (associated with chemical agent) unless specified otherwise.

1. The MDB and LAB filter systems shall be operational during chemical agent operations.

2. The MDB filter systems shall be monitored as follows:

   a. For the current agent campaign, semi-continuous chemical agent monitoring and data recording utilizing the ACAMS and the DAAMS shall be performed between carbon banks 1 and 2, 2 and 3, 3 and 4, 4 and 5, and in the filter stack . The ACAMS monitoring between carbon banks 1 and 2, 2 and 3, 3 and 4, and 4 and 5 shall be conducted by a single ACAMS connected to a

manifold that samples each location between carbon banks sequentially. If chemical agent is detected between carbon banks 1 and 2, a confirmation DAAMS sample is analyzed. If agent is confirmed, ACAMS and DAAMS sampling at this location will be suspended until the carbon in bank 1 is replaced, as described in Application Section III D-2.

b. The MDB filter stack shall have a dedicated ACAMS for the current agent campaign and additional ACAMS standardized for all previous agent campaigns.

c. At completion of the VX campaign, a VX ACAMS must be installed and connected to a manifold that samples between carbon banks 2 and 3 sequentially across each of the 7 of 9 filter bank systems in operation. Each filter bank system shall also have a dedicated VX DAAMS between banks 2 and 3 for confirmation of the VX rotating ACAMS should it be required. Each filter bank shall also have a dedicated GB DAAMS located between banks 2 and 3 of each filter that will be analyzed to monitor for chemical agent GB.

d. ACAMS and DAAMS monitoring as described in II.O.2.b and II.O.2.c. for a previous agent campaign shall continue until:

i. all secondary waste related to the previous agent has been processed, and

ii. carbon banks 1 and 2 of each of the 9 HVAC filter systems has been changed out with new carbon.

e. Continuous pressure drop monitoring and data recording shall be performed across each pre-filter and high efficiency particulate air (HEPA) filter element.

3. The LAB filter systems shall be monitored as follows:

a. Semi-continuous chemical agent monitoring and data recording utilizing the ACAMS and the DAAMS shall be performed between carbon banks 1 and 2, and in the filter stack. The LAB filter stack shall have a dedicated ACAMS.

b. Continuous pressure drop monitoring and data recording shall be performed across each pre-filter and HEPA filter element.

4. The MDB filter system shall be maintained IAW Table 2-2.

5. The LAB filter systems shall be maintained IAW Table 2-3.

6. If chemical agent is detected above the STL after the second carbon bank of an MDB or ANCDF LAB filter unit, the first and second carbon bank of that filter unit shall be changed out IAW Section III D-1h of the Application.

7. Pre- and HEPA filters in the MDB and LAB filter systems shall be changed when the pressure drop across the filter element exceeds 10 inwc.

8. The MDB and LAB filter systems shall be leak checked at the following minimum frequencies IAW Army SOPs:

   a. Initial set-up of filter unit leak check frequency:

      i. Carbon trays shall be leak checked prior to installation.

      ii. Carbon banks shall be leak checked once carbon trays are in place in the unit.

   b. Operation after initial set-up of filter unit leak check frequency:

      i. Carbon banks and filter elements shall be leak checked whenever an element of the bank is installed, modified or replaced.

      ii. Carbon banks and filter elements shall be leak checked IAW with Section III F Table III F-1 of the Permit Application.

      iii. Carbon banks and filter elements shall be leak checked (or equivalent procedure that proves filter has not been compromised) within 30 days following significant painting or a fire in the ventilation area.

9. MDB Closure Monitoring

   a. Monitoring within the MDB during the closure process shall be performed as described in Section III.I of the ANCDF Part B Application. This monitoring will include ventilated and unventilated monitoring.

   b. Once unventilated monitoring status is believed to be achieved by the facility, the facility must notify the Department in writing and receive written approval prior to releasing the MDB for demolition. The HVAC system must remain functional until ADEM approval to dismantle the MDB is obtained.

II.P. AIR EMISSION STANDARDS

1. General Introduction

Phase I Organic Air Emission Standards consist of AAC 335-14-5-.27 and .28 and/or 335-14-6-.27 and .28, for hazardous waste TSD facilities. AAC 335-14-5-.27 and 335-14-6-.27 contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste or chemical agent with an annual average total organic concentration of at least 10 parts per million (ppm) by weight. AAC 335-

14-5-.28 and 335-14-6-.28 contains emission standards that address leaks from specific equipment (i.e., pumps, valves, compressors, etc.) that contains or contacts hazardous waste or chemical agent that has a total organic concentration of at least ten percent by weight.

Phase II Organic Air Emission Standards consist of AAC 335-14-5-.29 for hazardous waste TSD facilities, including certain hazardous waste generators accumulating waste on-site in RCRA permit-exempt (90-day) tanks and containers. In general, under these standards air emission controls must be used for tanks, surface impoundments, containers, and miscellaneous units which contact hazardous waste containing an average organic concentration greater than 500 ppm by weight (ppmw) at the point of origination determined by the procedure outlined in AAC 335-14-5-.29(4), except as specifically exempted under AAC 335-14-5-.29(1) and (3).

2. <u>Standards</u>

a. Prior to constructing any additional equipment not covered under this Permit with process vents subject to the requirements of AAC 335-14-5-.27, the Permittee shall supply the specific Part B information required pursuant to AAC 335-14-8-.02(15), and shall obtain a permit modification IAW the provisions of AAC 335-14-8-.04.

b. Prior to constructing any additional equipment not covered under this Permit subject to the requirements of AAC 335-14-5-.28, the Permittee shall supply the specific Part B information required pursuant to AAC 335-14-8-.02(16), and shall obtain a permit modification IAW the provisions of AAC 335-14-8-.04.

c. The Permittee shall comply with the organic air emission standards for equipment leaks in AAC 335-14-5-.28 as applicable and as specifically set forth in Section III F-2 of the RCRA Permit Application.

3. <u>Organic Air Emissions</u>

a. The Permittee shall comply with the applicable requirements of 40 CFR 264, Subpart CC, as amended November 25, 1996, effective December 6, 1996.

b. The Permittee shall immediately comply with the applicable requirements under 40 Code of Federal Regulations (CFR) 265 Subpart CC for each tank, surface impoundment, container/container storage area, and/or miscellaneous unit listed in Table 2-4.

c. The following information shall be submitted to the Department as part of the construction certification documentation specified in Condition I.E.14.:

i. For every unit listed on Table 2-4, provide "Subpart CC Status/Control Option" information regarding the applicability and chosen control option. Regulatory citations shall be noted for each exemption and/or control option. Also specify the "Operational Status" for units where Subpart CC controls are or will be implemented.

ii. For each unit listed on Table 2-4, that is exempt from Subpart CC under 40 CFR 264.1080(b)(5) through § 264.1080(b)(8), or under 40 CFR 264.1082(c), provide documentation, certifications, analytical data, and/or calculations which support each exemption.

iii. For each unit listed on Table 2-4, for which a control option has been specified, provide applicable Part B information and/or certifications required under 40 CFR 270.27.

d. The permit will be modified IAW AAC 335-14-8-.04(3) to incorporate information provided pursuant to Condition II.P.3.c.i., and the Permittee shall subsequently be evaluated for compliance based on the regulatory provisions cited under "Subpart CC Status/Option."

II.Q WASTE MINIMIZATION

1. Certification Requirements

Pursuant to AAC 335-14-5-.05(4), and Section 3005(h) of RCRA, 42 U.S.C. 6925(h), the Permittee must certify, no less often than annually, that:

a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and

b. The proposed method of TSD is the most practicable method available to the Permittee which minimizes the present and future threat to human health and the environment.

2. Recording Requirements

If Condition II.Q.1. is applicable, then the Permittee shall maintain copies of this certification in the facility operating record as required by AAC 335-14-5-.05(4).

3. **Solid Waste Minimization Objectives**

If Condition II.Q.1. is applicable, then the Waste Minimization program required under II.Q.1. should address the objectives listed in Attachment 8.

II.R. LAND DISPOSAL RESTRICTIONS

1. **General Restrictions**

AAC 335-14-9 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances which an otherwise prohibited waste may continue to be placed on or in a land TSD unit. The Permittee shall maintain compliance with the requirements of AAC 335-14-9. Where the Permittee has applied for an extension, waiver, or variance under AAC 335-14-9 the Permittee shall comply with all restrictions on land disposal under this part once the effective date for the waste has been reached pending final approval of such application.

2. **Land Disposal Prohibitions and Treatment Standards**

a. A restricted waste identified in AAC 335-14-9-.03 may not be placed in a land disposal unit without further treatment unless the requirements of AAC 335-14-9-.03 and/or .04 are met.

b. The storage of hazardous wastes restricted from land disposal under AAC 335-14-9 is prohibited unless the requirements of AAC 335-14-9-.05 are met.

II.S. PAS FILTRATION SYSTEM CARBON FILTERS

This section applies only to the PAS Filtration System (PFS) carbon filters for the LIC, DFS, and MPF.

1. The PFS carbon filters and the associated reheaters for the LIC, DFS, and MPF shall be operational at all times during agent processing for each furnace that is in operation.

2. The PFS carbon filters shall be monitored as follows:

a. Temperature of the exhaust stream entering the PFS carbon filters shall be continuously monitored;

b. Pressure drop across the inlet and outlet HEPA filter within each PFS carbon filter shall be continuously monitored; and

c. The mid-bed DAAMS tube will be analyzed for the presence of agent on a weekly basis.

3. At each carbon change out and at project completion, carbon contained within the units will be removed and disposed of IAW the Waste Analysis Plan (see Application Section III C-2).

4. The Permittee shall monitor the pressure drop across the PFS filter beds and shall use DAAMS tubes to monitor the mid-bed of the carbon as additional indicators to determine carbon change out. The criteria for change out shall be as follows:

   a. If an upset condition in the furnace occurs, the DAAMS tube on the mid-bed of the PFS carbon filter will be analyzed. If any analysis of any mid-bed DAAMS tube indicates agent breakthrough of the first bed of a PFS carbon filter, then that carbon filter must be taken out of service. The filter cannot be placed back into service until the first bed of carbon has been replaced and leak checked.

   b. If a 0.2 ASC is confirmed by monitoring of the duct downstream of the PFS carbon filter(s) (two carbon filters associated with the DFS) then that carbon filter(s) must be taken out of service. The filter(s) cannot be placed back into service until all of the carbon has been replaced and leak checked.

Table 2-1: ANCDF Site Process Areas and Equipment

UNPACK AREA

- Conveyor Systems
- Airlock

ROCKET PROCESS SYSTEM

- Computerized Process Control System Interlocks
- Monorail With Lifting Device System
- Indexing Drum
- Rotary Metering Input Assembly
- Blast Gate Valves
- Blast Gates/Doors
- Airhole puncher
- Drain puncher
- Rocket Shear Machine/Burster Size Reduction Machine
- Conveyor System

MINE PROCESS SYSTEM

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Glove Box
- Blast Gates/Doors
- Blast Gate Valves
- Mine Machine
- Drain Station
- Pushout Station

PROJECTILE AND MORTAR PROCESSING SYSTEMS

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Blast Gates/Doors
- Blast Gate Valves
- Projectile/Mortar Disassembly Machines
- Linear Projectile / Mortar Disassembly Machines
- Multiposition Loader
- Lift Station
- Pick & Place Device

TON CONTAINER PROCESSING SYSTEM

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Bulk Drain Station
- Lift Station

Table 2-2: Carbon Change-Out Schedule for the MDB Filter System

Chemical Agent	Detection Level	Monitor Location	Banks to be Replaced	Time Frame for Banks Replacement
VX, GB, Mustard	> STL	Between Banks 2 and 3	Replace Banks 1 and 2 of the affected unit, or;	Suspension of chemical agent processing being addressed by the filter unit and immediate replacement
			Replace Banks 1, 2, and 3 of the affected unit	Within 3 months of detection
	> STL	Between Banks 3 and 4	Replace Banks 1, 2, and 3 of the affected unit	Suspension of chemical agent processing being addressed by the filter unit and immediate replacement
	> STL	Between Banks 4 and 5	Replace all banks of the affected unit	
	0.2 ASC	Filter stack		

Abbreviations:
>.....greater than
MDB.....Munitions Demilitarization Building
ASC.....Allowable Stack Concentration
STL.....Short-Term Level

Table 2-3: Carbon Change-Out Schedule for the LAB Filter System

Chemical Agent	Detection Level	Monitor Location	Banks to be Replaced	Time Frame for Banks Replacement
VX, GB, Mustard	> STL	Between Banks 1 and 2	Replace bank 1 of the affected unit	Immediate replacement
	0.2 ASC	Filter stack	Replace all banks of the affected unit	

Abbreviations:
>.....greater than
LAB.....Laboratory
ASC.....Allowable Stack Concentration
STL.....Short-Term Level

Table 2-4: Subpart CC Regulated Units

Unit Identification	Unit Type	Subpart CC Status/Control Option	Operational Status
ACS-TANK-101	Tank	Level 1 Controls/40 CFR 264.1084(c)	Operational
ACS-TANK-102			
SDS-TANK-101	Tank	Level 1 Controls/40 CFR 264.1084(c)	Operational
SDS-TANK-102			
SDS-TANK-103			
BRA-TANK-101	Tank	Exempt	Not Applicable
BRA-TANK-102			
Industrial Hazardous Waste Storage Bldg (Building 466)	Container Storage	Level 1 Controls/40 CFR 264.1086(c)	Operational
Hazardous Waste Storage Bldg (Building 512)			
Hazardous Waste Storage Bldg (Building 527)			
TWS-TANK-900	Tank	Exempt	Not Applicable
TWS-TANK-901			
TWS-TANK-902			
TWS-TANK-903			
BRA-FILT-902	Tank	Exempt	Not Applicable
BRA-FILT-903			
BRA-FILT-904			
BRA-FILT-905			
BRA-FILT-906			
BRA-FILT-907			
BRA-WTPK-900	Tank	Exempt	Not Applicable
BRA-WTPK-901			
BRA-WTPK-902			

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MODULE III: ANCDF CONTAINER STORAGE

The ANCDF site is permitted for six container storage areas:

1) Container Handling Building (CHB) divided into two parts designated as the East and West Storage Areas (Figure 3-1),
2) Toxic Maintenance Area (TMA) (Figure 3-2),
3) Waste Transfer Facility (WTF) (Figure 3-3),
4) Upper Munition Corridor (UMC) (Figure 3-4),
5) Lower Munition Corridors (LMC) (Figure 3-4), and
6) Buffer Storage Area (BSA) (Figure 3-5).

The CHB shall be limited to the storage of munitions and various munition components containing chemical agents, explosives, and propellants; bulk containers containing chemical agents; and secondary waste from chemical agent activity. The material stored in the CHB, TMA, WTF, LMC, UMC, and BSA shall only have hazardous waste numbers D001 through D043, F001 through F005, P042, P081, U002 through U003, U044, U070, U080, U117, U154, U159, U161 and U220. Primary waste is defined as munitions, ton containers, nerve agents GB and VX and mustard agents HD and HT; and, secondary waste is defined as all waste that is not primary waste. Secondary waste will be managed IAW the Waste Analysis Plan (see Application Section III C-2). The TMA is permitted to store all primary and secondary wastes. The WTF shall be limited to the storage of waste that is below the Short Term Limit (STL) or WCL. The UMC/LMC and BSA are permitted to store all primary and secondary wastes.

The ANCDF will also have less than 90 calendar day storage areas. If the 90-day storage period is exceeded and a variance cannot be attained from the Department, then a permit modification shall be submitted to the Department. All containers in these areas shall be managed IAW the generator requirements of ADEM Administrative Code 335-14-3 as less than 90 calendar day storage areas.

The permitted container storage area has conveyor tracks that route the EONCs to the MDB for demilitarization processing.

III.A. CONTAINER HANDLING BUILDING

1. CHB Operation

The Permittee shall operate the CHB as specified in Sections III D-3a(1) of the Application.

2. Permitted and Prohibited Waste in the CHB Storage Area

a. The Permittee shall only store primary and secondary waste containing the hazardous wastes listed in Table 3-1 in the permitted storage areas of the CHB IAW the terms of this Permit. Primary waste shall be stored in the CHB permitted storage areas only when contained within an EONC.

b. The permitted container storage area shall consist of the areas within the CHB as designated in Figure 3-1. The Permittee shall not store EONCs

within the unloading areas, the conveyor corridor, or the lift areas of the CHB.

c. The Permittee shall not store more than 24 EONCs in the East or West Storage Areas or more than a total of 48 EONCs in the permitted storage area of the CHB at any one time.

d. The Permittee shall not exceed the maximum allowable number of munitions per individual EONC as specified below and shall not exceed the maximum allowable number of munitions in the permitted storage area of the CHB as specified below:

Munition	Maximum Allowable Munitions/EONC	Maximum Allowable Munitions/CHB
155-mm Projectile	72	3,456
4.2-inch Projectile	144	6,912
105-mm Projectile	96	4,608
M55 Rocket	30	1,440
Mine (w/activators and fuzes)	36	1,728
Ton Container	2	96

e. The permitted secondary waste storage area shall consist of the areas within the CHB as designated in Figure 3-1. The Permittee shall only store waste in the unloading areas and in the areas allowed for EONC storage.

f. Any container of secondary waste containing free liquids shall be provided with a secondary containment device in the CHB. The Permittee shall inspect secondary containment in the CHB for containers of secondary wastes that have free liquids weekly.

3. <u>EONC Design and Maintenance</u>

a. If an EONC holding primary waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the Permittee shall transfer the EONC to the TMA for unloading of its contents. If agent is detected inside the EONC, the Permittee shall decontaminate the EONC to less than WPL prior to removal from the TMA.

b. If an EONC has been found to not be in good condition as specified in Condition III.C.2, the EONC shall not be used to transport chemical agent containing munitions or ton containers until the defective EONC has been decontaminated if required, repaired and re-certified IAW the manufacturer's specifications.

4. **Compatibility of Waste with EONCs**

The Permittee shall assure that the ability of the EONCs to contain the primary waste is not impaired, IAW AAC 335-14-5-.09(3).

5. **Management of EONCs**

a. The Permittee shall deliver EONCs to the CHB only during daylight hours. EONCS will be leak checked prior to opening or weekly in accordance with RCRA Permit Application Section III F-2. The Permittee shall keep all EONCs closed during storage and transport. The Permittee shall not handle or store EONCs in a manner which may rupture the EONC or cause it to leak. EONCs containing leaking munitions will be handled in accordance with Section III D-2b of the Application.

b. EONCs containing leaking munitions shall not be returned to the igloos for storage or accumulation without ADEM approval.

c. The Permittee shall not place any munition in an EONC that previously held leaking munitions unless the EONC has been decontaminated to less than the WPL.

d. The Permittee shall ensure that each EONC is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Individual munitions will not be labeled.

6. **Secondary Containment System**

a. The EONC provides secondary containment for munitions and meets the requirements of AAC 335-14-5-.09(6) for the munitions contained within the CHB. Secondary waste containing free liquids will be placed upon self contained secondary containment devices IAW AAC-335-14-5-.09(6).

b. EONCs shall be tested for vapor tightness every time agent filled chemical munitions or bulk containers are placed into them.

c. Records of vapor tightness testing shall be kept on site as part of the ANCDF operating record and shall be subject to inspection.

d. If the ability of an EONC to contain vapors is impaired (i.e., fails a leak test), the EONC will be moved to the TMA. EONCs which failed the leak test may be repaired and retested. If the EONC cannot be repaired, the munitions will be unloaded in the TMA.

e. The CHB provides the third level of containment for agent. In the event of a spill from the EONCs, the Permittee shall send those liquids that are to be suspected to be contaminated by chemical agent to a Spent Decontamination Storage Tank. Non-agent contaminated liquids will be managed in accordance with applicable regulations.

7. **Inspection Schedules and Procedures**

The Permittee shall inspect the CHB weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspection data shall be recorded and the records shall be placed in the operating record IAW Condition II.I.

8. **Recordkeeping**

The Permittee shall document the results of any waste analyses and tests in the operating record IAW Condition II.I.

9. **Closure**

At closure of the CHB area, the Permittee shall remove all chemical agent and hazardous waste from the CHB IAW the approved Closure Plan.

10. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.B. TOXIC MAINTENANCE AREA

1. **TMA Operation**

The Permittee shall operate the TMA as specified in Section III D-3a(1) of the ANCDF Application.

2. **Permitted and Prohibited Waste in the TMA Storage Area**

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the TMA IAW the terms of this Permit.

b. The permitted container storage area shall consist of the entire area of the TMA shown in Figure 3-2. The TMA may contain both primary and secondary wastes.

c. The TMA shall provide storage of secondary waste that is contaminated to varying degrees of chemical agent. It will also provide storage for primary and secondary waste that is in process and awaiting thermal decontamination.

d. "In process" refers to any waste - Primary or Secondary – loaded for charging entering through the UPA/TMA configured with the intent of processing through the furnace.

3. **Compatibility of Waste with Containers**

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3). In the event of a

spill that does not involve chemical agent, those liquids will be containerized for off-site disposal IAW Section C-2, Waste Analysis Plan.

4. **Management of Containers**

   a. The Permittee shall keep all containers containing waste closed during storage and transport.

   b. The Permittee shall ensure that containers other than munitions and ton containers are clearly marked to identify its content and the date each period of accumulation began as specified in AAC 335-14-9-.05(1).

5. **Secondary Containment System**

   The primary sump system in the TMA will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the TMA A, A/B, and C areas. A secondary containment device will be used for containers of secondary waste containing free liquids to meet the secondary containment requirements of AAC 335-14-5-.09(6) in the TMA D area.

6. **Inspection Schedules and Procedures**

   The Permittee shall inspect the TMA storage areas and containers weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

   The Permittee shall document the results of all waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

   At closure of the TMA, the Permittee shall remove all hazardous waste from the TMA IAW the approved Closure Plan.

9. **Reactive Waste**

   The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.C. WASTE TRANSFER FACILITY

1. **WTF Operation**

   The Permittee shall operate the WTF as specified in Section III D-3a(1) of the ANCDF Application.

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2. **Permitted and Prohibited Waste in the WTF Storage Area**

   a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the WTF IAW the terms of this Permit.

   b. The permitted container storage area shall consist of the entire WTF as designated in Figure 3-3. The WTF may contain wastes that are less than the Short Term Limit (STL) or not greater than the Waste Control Limit (WCL) levels for chemical agent.

3. **Compatibility of Waste with Containers**

   The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3). In the event of a spill that does not involve chemical agent, those liquids will be containerized for off-site disposal IAW Section C-2, Waste Analysis Plan.

4. **Management of Containers**

   a. The Permittee shall keep all containers containing waste closed during storage and transport.

   b. The Permittee shall ensure that each container is clearly marked to identify its content and the date each period of accumulation began as specified in AAC 335-14-9-.05(1).

5. **Secondary Containment System**

   The WTF secondary containment system must satisfy the secondary containment requirements of AAC 335-14-5-.09(6) for the WTF.

6. **Inspection Schedules and Procedures**

   The Permittee shall inspect the WTF weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

   The Permittee shall document the results of all waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

   At closure of the WTF area, the Permittee shall remove all hazardous waste from the WTF IAW the approved Closure Plan.

9. **Reactive Waste**

   The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.D. UPPER AND LOWER MUNITION CORRIDORS STORAGE AREAS

1. UMC/LMC Operation

The Permittee shall operate the UMC and LMC as specified in Section III D-3a(1) of the ANCDF Application.

2. Permitted and Prohibited Wastes in the UMC and LMC

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage of the UMC and LMC IAW the terms of this Permit.

b. The permitted container storage areas shall consist of the entire UMC and LMC as designated in Figure 3-4. The UMC and LMC shall provide storage of secondary waste that is contaminated to varying degrees of chemical agent. It will also provide storage for primary and secondary waste that is in process and awaiting thermal decontamination.

c. "In process" refers to any waste - Primary or Secondary – loaded for charging entering through the UPA/TMA configured with the intent of processing through the furnace.

3. Compatibility of Waste with Containers

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3).

4. Management of Containers

a. Munitions and ton containers in the UMC and LMC areas will be tracked using the HMMS (Hazardous Materials Management System). Secondary waste will be tracked using a logbook.

b. The Permittee shall ensure that each container is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Waste that is "in process" shall not require labeling of containers nor shall the containers be required to be closed.

5. Secondary Containment System

The primary sump systems in the LMC and UMC will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the LMC and UMC areas.

6. Inspection Schedules and Procedures

The Permittee shall inspect the containers located in the UMC and LMC weekly either by physical inspection or remotely by CCTV to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed

in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

The Permittee shall document the results of any waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

At the closure of the UMC and the LMC, the Permittee shall remove all hazardous waste from the UMC and the LMC IAW the approved closure plan.

9. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.E. BUFFER STORAGE AREA

1. **BSA Operation**

The Permittee shall operate the BSA as specified in Section III D-3a(1) of the ANCDF Application.

2. **Permitted and Prohibited Wastes in the BSA**

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the BSA IAW the terms of this Permit.

b. The permitted container storage area shall consist of the entire BSA as designated in Figure 3-5. The BSA shall provide storage of secondary waste of varying levels of agent contamination. It will also provide a buffer for primary waste that is in process and awaiting thermal decontamination.

3. **Compatibility of Waste with Containers**

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5.09(3).

4. **Management of Containers**

a. Waste in the BSA areas will be tracked using the HMMS. In addition, secondary waste will be tracked using a logbook.

b. The Permittee shall ensure that each container is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Primary waste that is designated as "in process" shall not require labeling of containers. Also, primary waste that is designated as "in process" shall not be required to be in closed containers provided that they are under engineering controls in the designated permitted storage areas within the MDB.

5. **Secondary Containment System**

The primary sump system in the BSA will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the BSA area.

6. **Inspection Schedules and Procedures**

The Permittee shall inspect the BSA weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

The Permittee shall document the results of all waste analyses and tests IAW Condition II.I.

8. **Closure**

At the closure of the BSA, the Permittee shall remove all hazardous waste from the BSA IAW the approved closure plan.

9. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

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Table 3-1: Hazardous Wastes to be Stored in the Permitted Area of the CHB

Description of Hazardous Waste	ADEM Hazardous Waste I.D. Numbers
Agent GB	D003, D004-D011
Agent VX	D003,D004-D011
Mustard Agent - HD	D003, D004-D011, D022, D028, D043
Explosives	D003
Propellants	D003, D030[2] (M6, M67)
Fuzes	D003
Detonators	D003, D005, D008
Squibs	D003, D008
Igniters	D003
Initiators	D003
Bursters	D003
Rocket Components	D003
Munition Body Components	D003
Mine Drums	D003
Secondary Waste	D001-D011, TC Organics (D012-D043)[1,3]

Footnotes:
(1) Toxicity Characteristic organic waste codes D022, D028, and D043 apply to mustard agent only.
(2) Toxicity Characteristic organic waste code D030 applies to the M6 and M67 propellant, which contains 2,4-dinitrotoluene.
(3) ANCA secondary wastes, specifically laboratory and miscellaneous wastes may carry codes D001 to D043.

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D001	Waste Mixed Fuels (Diesel, Gasoline, Kerosene)/ Miscellaneous Lab Waste (Liquid)/ Miscellaneous Waste Ignitable Materials/Reactive Waste Materials/Waste Paint and Paint Related Materials/Waste Flammable Gases Managed in Cylinders (punched) (maximum of 25 units per furnace charge)/Waste Flammable Materials Lab Packs/Waste Adhesives and Sealants/Aerosols.
D002	Miscellaneous Waste Corrosive Waste/Waste Lead Acid Batteries/Waste Acids/ Miscellaneous Lab Waste (Liquid)/Waste Corrosive Materials Lab Packs/ Waste Adhesives and Sealants/Waste Citric Acid.
D003	Waste Activated Carbon/Miscellaneous Waste Air and/or Water Reactive Chemicals & Related Waste/ Miscellaneous and Related Waste/Miscellaneous ignitable Wastes/ Miscellaneous Lab Waste (Liquid)/ Waste Flammable Gases Managed in Cylinders/Waste (i.e. waste that is above STL, Waste that is between the WPL and STL and Waste that is below the WPL) Materials (Halogen & non-Halogen Plastic, Conveyors, Chains, Rollers, Links, Gears, Bearings, Bushings, Wheels, Idlers, Gear Boxes, Gasket Materials, Seals, Collets, Drain Probes, Shear Blades, Punches, Paper, Cloth, Pads, Wood, Pallets, Gearboxes, Turntable Projectile Bushings, Projectile Pickup Heads, Carbon Absorber Trays, Pusher Assemblies, Jaw Gripper Assemblies, Pillows, Spill Adsorbents / Absorbents / Cleanup Residues, Sump Solids, Projectile Cans, Hoists, Crimp Jaws & Pins, Bore Station Blades, Motors, Conduit Solenoids, Light Fixtures, Switches, Pumps, Accumulator Bladders, Valves (Hand, Solenoid, Agent Decon, Hydraulic), Piping, Fittings, Tubing, Fittings, Spray Nozzles, Filters Cartridges/Elements & Associated Residue / Cleanup Material (Including AQS/ACS/SDS Filter Elements), Pipe Gaskets, Hydraulic Tubing, Hydraulic Motors, Hydraulic Cylinders, Chemical Seals, Pressure Regulators, Flow Control Valves, Pneumatic Actuators, Hydraulic Hose Fittings, Sensors, Load Cells, Speakers, Transmitters, Transducers, Pressure Gauges, Thermocouples, Thermowells, Test Equipment, (Meters, Gauges, etc.),Switches (Flow, Pressure, & Proximity), Cameras or Camera Parts, Low Volume Agent Samplers, Hand Tools, Grating, Glassware, Plaster, Metal Buckets, Pans & Barrels, Scrub Brushes, Banding Material, Empty Overpacks, Drums, Silicone Parts, Monitoring Sample Probes (DAAMS, etc.), PPE, LAB Debris, MDB Maintenance Equipment/DFS Cyclone Residue/ Waste Ruby Mortar, Fire Brick, Fire Brick Insulation, HARCO Bond Mortar/M55 Rocket Residue/ LIC Slag/ Kicker Chute Residues/Empty Rocket Overpacks/Empty projectile Overpacks/Agent VX/Agent GB, Mark I Antidote Kits (1 atropine and 1 pralidoxime injector), DPE leather overgarments, plastic bags used to contain contaminated wastes; metal brackets, stands, fixtures, etc,; escape air tank, mask and regulators .

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D004-D011	Waste Carbon /Waste Adhesives & Sealants / Spent Hydraulic Fluid/Miscellaneous Toxic or Other-Regulated Waste (Heavy Metals, Organics; Solid & Liquid)/ Waste Citric Acid/Waste Acid/Waste Hydrochloric Acid residue from various operations /Waste Materials that are between the WPL and STL (Halogen and non-Halogen Plastic, Conveyors, Chains, Rollers, Links, Gears, Bearings, Bushings, Wheels, Idlers, Gear Boxes, Gasket Materials, Seals, Collets, Drain Probes, Shear Blades, Punches, Paper, Cloth, Pads, Wood, Pallets, Gearboxes, Turntable Projectile Bushings, Projectile Pickup Heads, Carbon Absorber Trays, Pusher Assemblies, Jaw Gripper Assemblies, Pillows, Spill Adsorbents / Absorbents / Cleanup Residues, Sump Solids, Projectile Cans, Hoists, Crimp Jaws and Pins, Bore Station Blades, Motors, Conduit Solenoids, Light Fixtures, Switches, Pumps, Accumulator Bladders, Valves (Hand, Solenoid, Agent Decon, Hydraulic), Piping, Fittings, Tubing, Fittings, Spray Nozzles, Filters Cartridges/Elements & Associated Residue / Cleanup Material(Including AQS/ACS/SDS Filter Elements),Pipe Gaskets, Hydraulic Tubing, Hydraulic Motors, Hydraulic Cylinders, Chemical Seals, Pressure Regulators, Flow Control Valves, Pneumatic Actuators, Hydraulic Hose Fittings, Sensors, Load Cells, Speakers, Transmitters, Transducers, Pressure Gauges, Thermocouples, Thermowells, Test Equipment,(Meters, Gauges, etc.),Switches (Flow, Pressure, & Proximity), Cameras or Camera Parts, Low Volume Agent Samplers, Hand Tools, Grating, Glassware, Plaster, Metal Buckets Pans and Barrels, Scrub Brushes, Banding Material, Empty Overpacks, Drums, Silicone Parts, Monitoring, Sample Probes (DAAMS, etc.), PPE, LAB Debris, MDB Maintenance Equipment), MDB Sump Sludge/Demister Fiber & Frames/LIC Slag/Furnace Clean Out Debris/Spent Carbon/HEPA and Prefilters/Aluminum, Bulk Metal, Concrete, Foam/Insulation, Rags/Cotton, Toxic Area Protective Gear, M-40 masks, M-40 cartridges, fiberglass/Filter Media, Leather Gloves, LSS Air Hose, DPE Suits, Teflon Wire, ACS Sludge, SDS Sludge, Paint Chips/Agent GB/Agent VX/ Miscellaneous Lab Waste (Liquid & Solid)/ DFS Cyclone Residue/ Waste Ruby Mortar, Fire Brick, Fire Brick Insulation, HARCO Bond Mortar/ LIC Slag/M55 Rocket Residue (including Kicker Chute Residue)/ Spent Hydraulic Fluid, Oils and/or Ethylene Glycol/ Miscellaneous Waste Materials Containing Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and/or Silver/ Metal Parts Furnace Residue/Waste Paint and Paint Related Materials/Waste Batteries/Lead Acid Batteries/ Spent Fluorescent Light Bulbs, Mark I Antidote Kits (1 atropine and 1 pralidoxime injector), DPE leather overgarments, plastic bags used to contain contaminated wastes; metal brackets, stands, fixtures, etc.; escape air tank, mask and regulators .
D012	Miscellaneous Waste Materials Containing Endrin
D013	Miscellaneous Waste Materials Containing Lindane
D014	Miscellaneous Waste Materials Containing Methoxychlor
D015	Miscellaneous Waste Materials Containing Toxaphene
D016	Miscellaneous Waste Materials Containing 2,4-D

D017	Miscellaneous Waste Materials Containing 2,4,5-TP (Silvex)

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D018	Waste Gasoline/Waste Diesel/Waste Kerosene / Miscellaneous Waste Materials Containing Benzene
D019	Miscellaneous Waste Materials Containing Carbon Tetrachloride
D020	Miscellaneous Waste Materials Containing Chlordane
D021	Miscellaneous Waste Materials Containing Chlorobenzene
D022	Miscellaneous Waste Materials Containing Chloroform/ Mustard Agent - HD
D023	Miscellaneous Waste Materials Containing o-Cresol
D024	Miscellaneous Waste Materials Containing m-Cresol
D025	Miscellaneous Waste Materials Containing p-Cresol
D026	Miscellaneous Waste Materials Containing Cresol
D027	Miscellaneous Waste Materials Containing 1,4-dichlorobenzene
D028	Miscellaneous Waste Materials Containing 1,2-Dichloroethane/ Mustard Agent - HD
D029	Miscellaneous Waste Materials Containing 1,1-Dichloroethylene
D030	Miscellaneous Waste Materials Containing 2,4-Dinitrotoluene
D031	Miscellaneous Waste Materials Containing Hepachlor (and its Epodide)
D032	Miscellaneous Waste Materials Containing Hexachlorobenzene
D033	Miscellaneous Waste Materials Containing Hexachlorobutadiene
D034	Miscellaneous Waste Materials Containing Hexachloroethane
D035	Miscellaneous Waste Materials Containing Methyl Ethyl Ketone
D036	Miscellaneous Waste Materials Containing Nitrobenzene
D037	Miscellaneous Waste Materials Containing Pentrachlorophenol

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D038	Miscellaneous Waste Materials Containing Pyridine
D039	Miscellaneous Waste Materials Containing Tetrachloroethylene
D040	Miscellaneous Waste Materials Containing Trichloroethylene
D041	Miscellaneous Waste Materials Containing 2,4,5-Trichlorophenol
D042	Miscellaneous Waste Materials Containing 2,4,6- Trichlorophenol
D043	Miscellaneous Waste Materials Containing Vinyl Chroride/ Mustard Agent - HD
F001	Spent Solvents
F002	Spent Solvents
F003	Spent Solvents/ Adhesives and Sealants
F004	Spent Solvents
F005	Spent Solvents/ Adhesives and Sealants
P042	Medical Pharmaceuticals Waste (Epinephrine)
P081	Medical Pharmaceuticals Waste (Nitroglycerin)
U002	Waste Acetone
U003	Miscellaneous Lab Waste (Solids and Liquids)
U044	Miscellaneous Lab Waste (Solids and Liquids)
U070	Miscellaneous Lab Waste (Solids and Liquids)
U080	Miscellaneous Lab Waste (Solids and Liquids)
U117	Miscellaneous Lab Waste (Solids and Liquids)
U154	Miscellaneous Lab Waste (Solids and Liquids)

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
U159	Miscellaneous Lab Waste (Solids and Liquids)
U161	Miscellaneous Lab Waste (Solids and Liquids)
U220	Miscellaneous Lab Waste (Solids and Liquids)

Figure 3-1: Permitted Storage Areas in the CHB

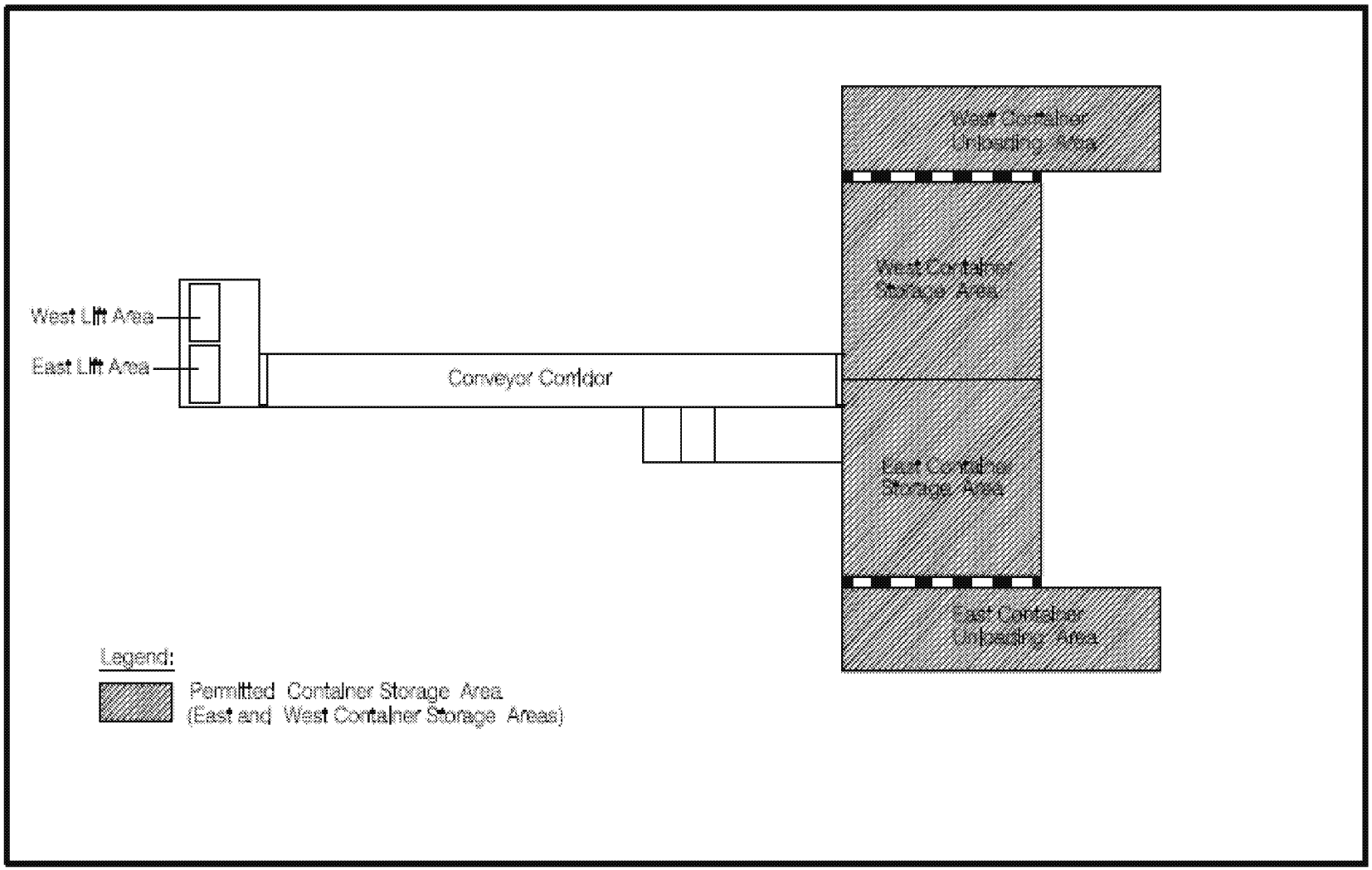


Figure 3-2: Permitted Storage in TMA

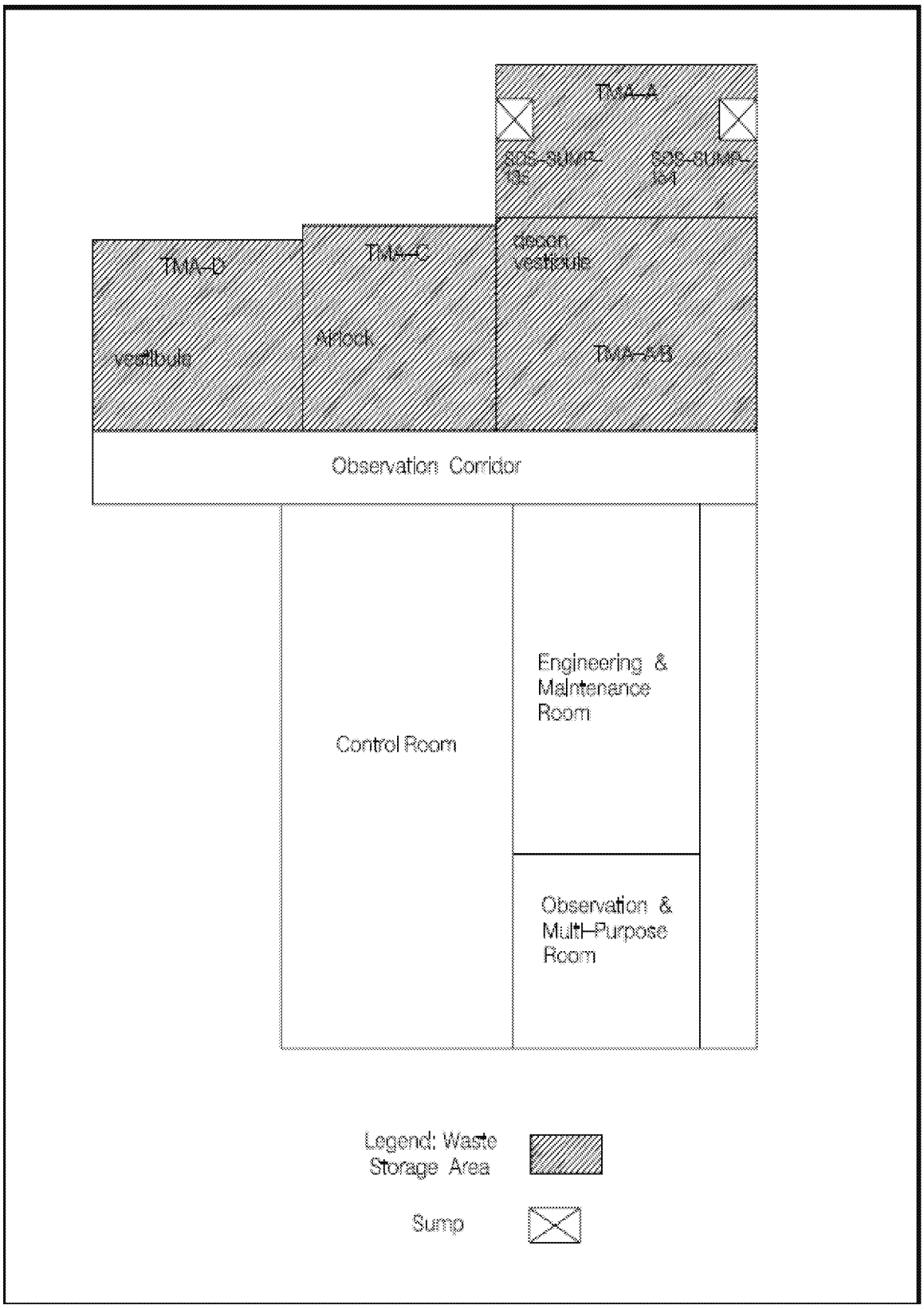


Figure 3-3: Permitted Storage at the WTF

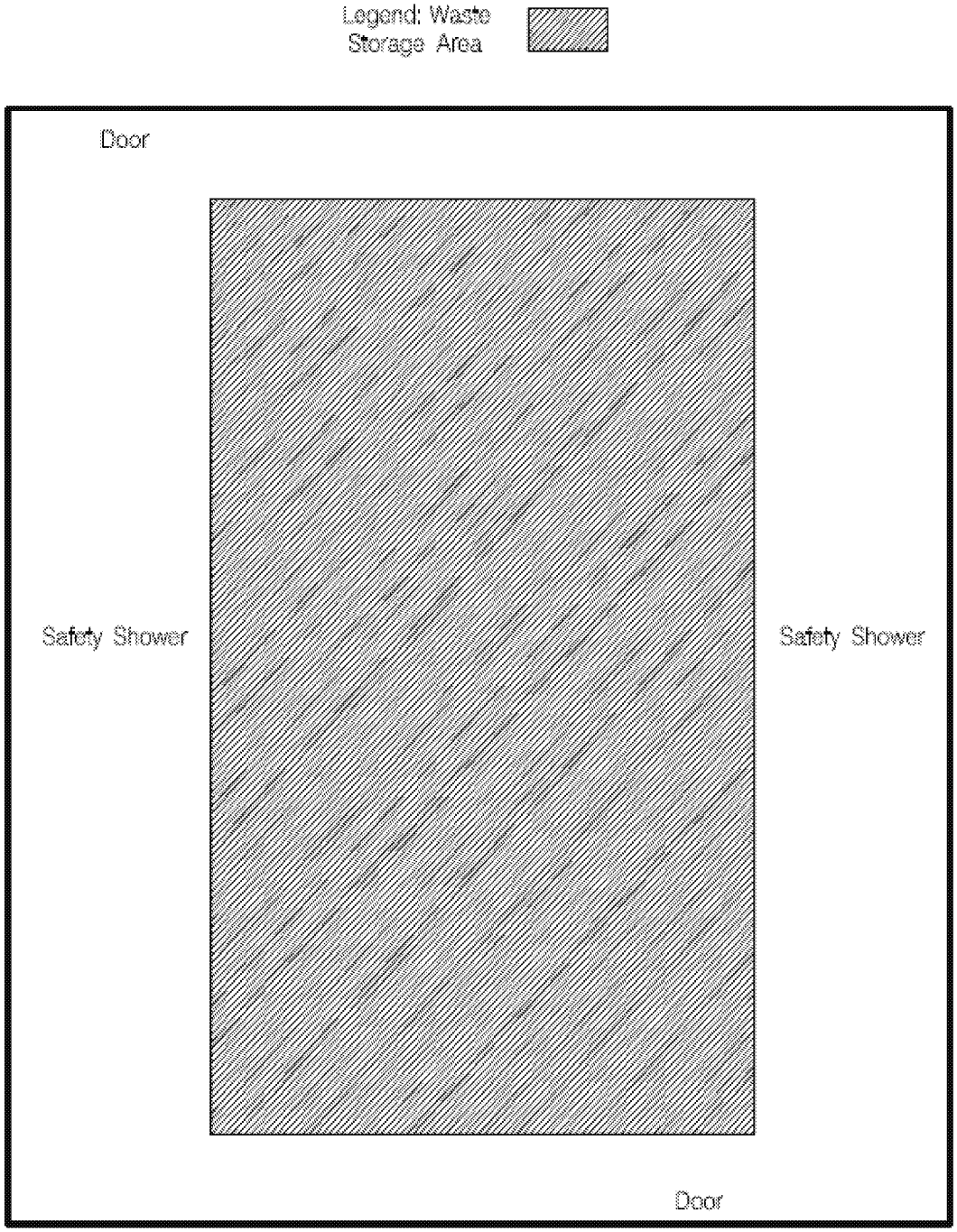


Figure 3-4: Permitted Storage at the UMC and LMC

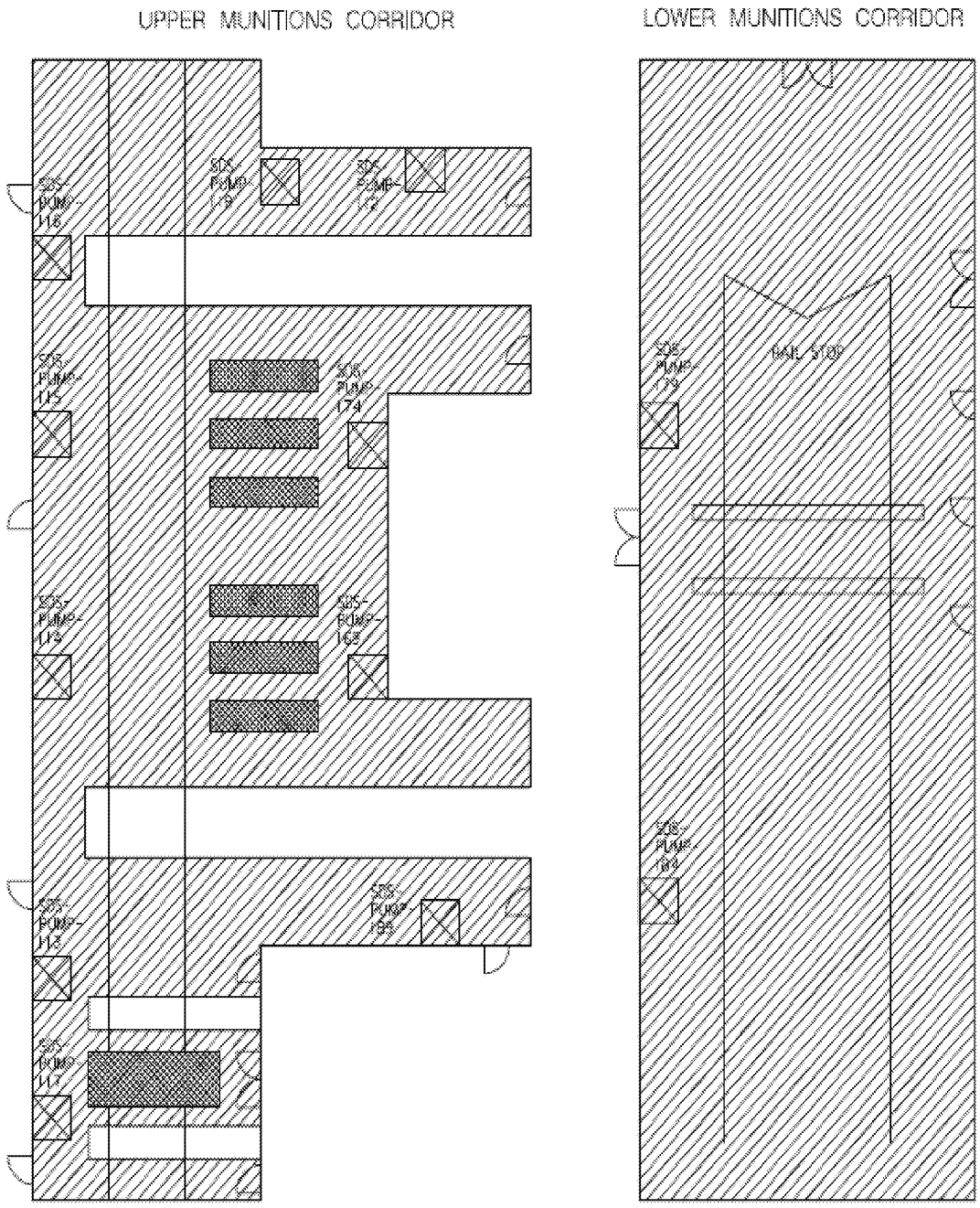
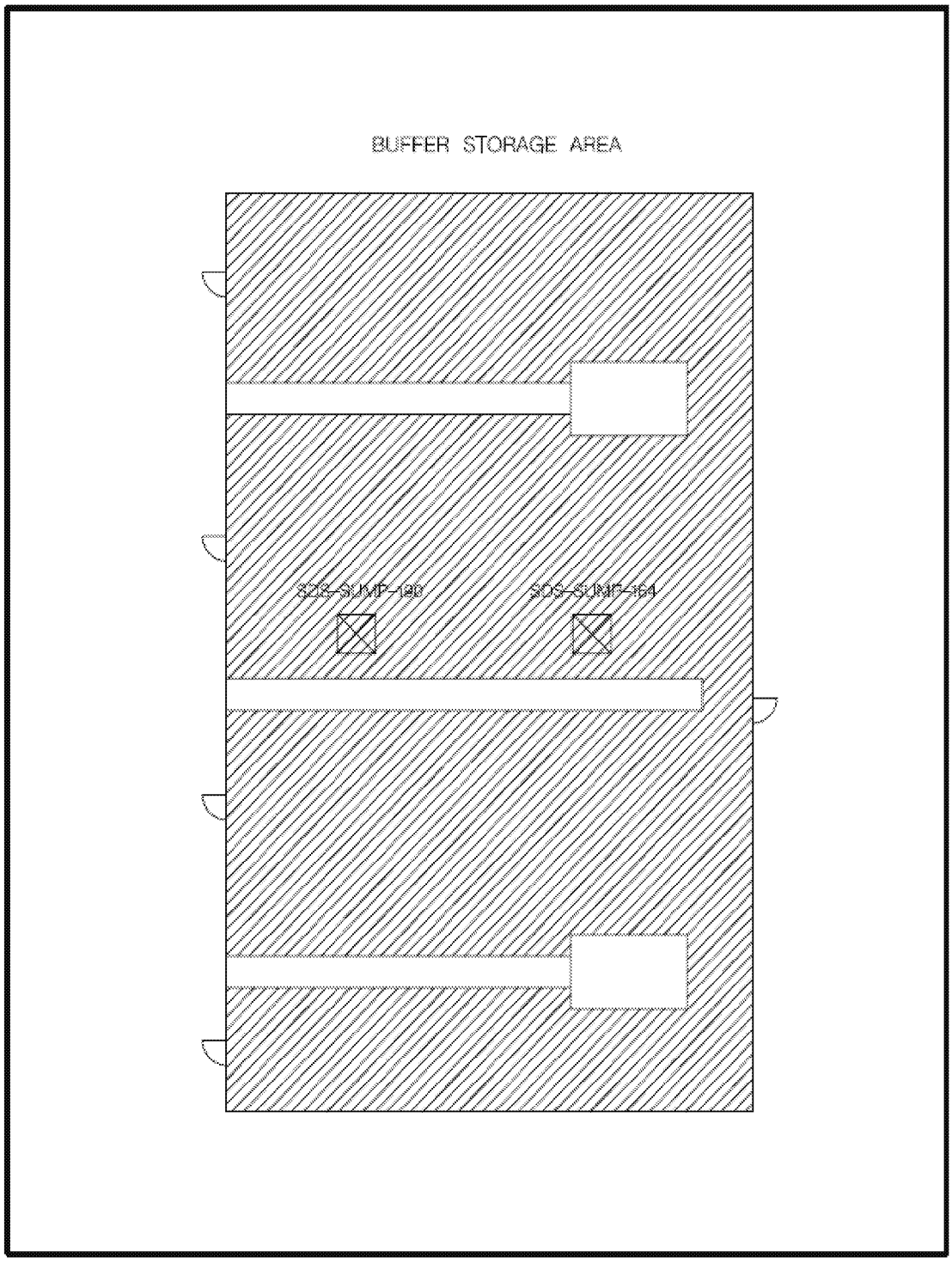


Figure 3-5: Permitted Storage in the BSA



MODULE IV: TANK SYSTEMS

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MODULE IV: TANK SYSTEMS

This Module describes the tank systems at the ANCDF. There are four permitted tank systems at the ANCDF site. These four tank systems (listed in Table 4-1) include the following: Agent Collection Tank System and Spent Decontamination Holding Tank System, Brine Surge Tank System, and Brine Treatment System. A tank system generally consists of holding tanks and/or surge tanks, containment sumps or trenches, pumps, associated piping, and any ancillary equipment.

IV.A. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. Subject to the terms of this Permit, the Permittee shall store only the specified chemical agent or hazardous wastes in the specified tank systems identified in Tables 4-1 and 4-2 during the shakedown, trial burn, and post-trial burn periods for chemical agents as detailed in Module VI.
2. Subject to the terms of this Permit, the Permittee shall store only the specified chemical agent or hazardous wastes in the hazardous waste tank systems identified in Tables 4-1 and 4-2 during normal operations detailed in Module VII.
3. The Permittee is prohibited from storing chemical agent or hazardous wastes not listed in Table 4-1 in the hazardous waste tank systems listed in Tables 4-1 and 4-2 except as identified in Condition I.A.

IV.B. TANK SYSTEM DESIGN AND CONSTRUCTION

1. The Permittee shall maintain the Agent Collection Tank System (ACS-TANK-101 and ACS-TANK-102), Spent Decontamination Holding Tank System (SDS-TANK-101, SDS-TANK-102, and SDS-TANK-103), Brine Surge Tank System (BRA-TANK-101, BRA-TANK-102), and the Brine Treatment System (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, TWS-TANK-903, WPTK-900, WPTK-901, WPTK-902, BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) as specified in:
   a. All applicable drawings in III Appendix D-3 of the ANCDF Application;
   b. The applicable specifications referenced in Section III D-4 and III Appendix D-3-3 of the Application.
2. The Permittee shall maintain the primary containment and secondary containment sump systems identified in Tables 4-2 and 4-3 as specified in:
   a. All applicable drawings in Attachment D of the ANCDF Application;
   b. The applicable specifications found in III Appendix D-3-3 of the Application; and

c. Table 4-4.

3. The Permittee shall provide the external corrosion protection for the tank systems identified in Tables 4-1, 4-2, and 4-3 using the methods in III Appendix D-3-3 of the Application.

4. The Permittee shall not install any altered hazardous waste tank system until such time that the Department has:

   a. Received certification from a qualified professional engineer, that attests to the structural integrity and the suitability of the altered tank system for handling the specified chemical agent or hazardous waste IAW AAC 335-14-5-.10.;

   b. Approved the design and specifications of the altered tank system; and

   c. Received and approved a permit modification IAW AAC 335-14-8-.04.

IV.C. TANK SYSTEM INSTALLATION

1. The Permittee shall maintain the following installation documentation on file at the ANAD/ANCDF facility until such time that the tank system is certified closed IAW Condition II.J.:

   a. A written certification from a qualified professional engineer attesting that proper installation procedures were used for each tank system listed in Tables 4-1 and 4-2. The tank system installation inspection and subsequent written certification, shall consider, but not be limited to, the following tank system installation documentation:

      i. Field installation report with date of installation;

      ii. Approved welding procedures;

      iii. Welder qualifications and certifications;

      iv. Hydro-test reports IAW the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII, Division 1;

      v. Tester credentials;

      vi. Field inspector credentials;

      vii. Field inspection reports;

      viii. Field waiver reports; and

      ix. Non-compliance reports and corrective action (including field waiver reports) and repair reports.

   b. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation

certification documentation submitted to the Department for the Agent Collection Tank System (ACS-TANK-101/102) and Spent Decontamination Holding Tank System (SDS-TANK-101/102/103), shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Vessel wall thickness and nozzle reinforcement calculations;

iii. Vessel structural support calculations;

iv. Approved welding procedures;

v. Welder qualifications and certifications;

vi. Materiel reports and mill certifications;

vii. Results of X-ray testing;

viii. Tester credential;

ix. Non-compliance reports and corrective action;

x. Hydrotest reports;

xi. ASME code data report;

xii. Shop inspection reports; and

xiii. Shop inspector credentials.

c. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the Department for the Brine Surge Tanks (BRA-TANK-101 and BRA-TANK-102) shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Design calculations, including seismic and wind loading;

iii. Approved welding procedures;

iv. Welder qualifications and certifications;

v. Materiel reports and mill certifications;

vi. Results of non-destructive examinations;

vii. Qualifications of NDE inspectors;

viii. Non-compliance report and corrective action;

ix. Leak test report;

x. Shop inspection reports; and

xi. Shop inspector credentials.

d. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the Department for the Brine Treatment System Tanks (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, TWS-TANK-903, WPTK-900, WPTK-901, WPTK-902, BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Design calculations, including seismic and wind loading;

iii. Approved welding procedures;

iv. Welder qualifications and certifications;

v. Materiel reports and mill certifications;

vi. Results of non-destructive examinations;

vii. Qualifications of NDE inspectors;

viii. Non-compliance report and corrective action;

ix. Leak test report;

x. Shop inspection reports; and

xi. Shop inspector credentials.

e. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the department for the primary containment system sumps listed in Table 4-2 shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Approved welding procedures;

iii. Materiel reports and mill certifications;

iv. Shop inspection reports; and

v. Shop inspector credentials.

2. The Permittee shall provide the installation documentation by certified mail, express mail, or hand delivery to the Department within 15 calendar days upon written request.

IV.D. GENERAL OPERATING REQUIREMENTS

1. The Permittee shall not place chemical agent, hazardous wastes, treatment reagents, or other materials in the tank system(s) if they could cause the tank system(s) to rupture, leak, corrode, or otherwise fail.
2. The Permittee shall operate the tank systems to prevent spills and overflows using the procedures and equipment described in Section III D-4 of the ANCDF Application.
3. The Permittee shall install tank level transmitters indicating an alarm at a high-high level corresponding to the maximum allowable liquid height given in Table 4-1.
4. The Permittee shall install primary containment and secondary containment level transmitters for the sumps listed in Tables 4-2 and 4-3 that shall indicate and send alarms to the CON at a low and high level.
5. The Permittee shall ensure that each tank is clearly marked with a description of its contents, the quantity of each chemical agent or hazardous waste received, and the date each period of accumulation begins, or such information for each tank is recorded and maintained in the operating record as specified in AAC 335-14-9-.05(1).

IV.E. AGENT COLLECTION TANK SYSTEM OPERATING CONDITIONS

1. The Agent Collection Tank system consists of the agent holding tank (ACS-TANK-102), agent surge tank (ACS-TANK-101), agent tank secondary containment sump (MDB-SUMP-151), pumps (ACS-PUMP-102/201), associated piping, and ancillary equipment.

IV.F. SPENT DECONTAMINATION HOLDING TANK SYSTEM OPERATING CONDITIONS

1. The Spent Decontamination Holding Tank System consists of three spent decontamination holding tanks (SDS-TANK-101/102/103), primary containment sump (as listed in Table 4-2), pumps (SDS-PUMP-271/172), trenches, associated piping, and ancillary equipment.

2. The Permittee shall maintain a minimum of one Spent Decontamination Holding Tank (either SDS-TANK-101, 102, or 103) empty during agent processing at the ANCDF.3. The Permittee may utilize the empty tank specified in Condition IV.F.2. in the event of an agent waste spill (i.e., Agent Collection Tank failure, Spent Decontamination Tank failure, munition overpack failure, etc.).

4. Upon completion of munitions and ton container processing according to Section III.D of the Application, the Permittee may utilize the empty SDS tank specified in Condition IV.F.2 in conjunction with the other two tanks.

5. The Permittee shall not process any munitions which have not passed the Explosive Containment Vestibule in the munition processing line at the time of an agent waste spill until such time that the circumstance(s) which resulted in the waste spill has been rectified and a minimum of one Spent Decontamination Holding Tank is empty as specified in Condition IV.F.2.

6. The Permittee shall characterize the waste in the Spent Decontamination Holding Tank System IAW the Waste Analysis Plan (see Section III C-2 of the Application).

IV.G. BRINE SURGE TANK SYSTEM OPERATING CONDITIONS

1. The Brine Surge System consists of two Brine Surge Tanks (BRA-TANK-101/, BRA-Tank-102), secondary containment sump, vault, pumps, associated piping, and ancillary equipment.

2. The Permittee shall begin the procedure to switch waste feed from the brine surge tank receiving waste to the empty brine surge tank when the receiving tank's high level is reached.

3. The Permittee shall sample and analyze the waste in the Brine Surge System IAW the Waste Analysis Plan (see Section III C-2 of the Application).

IV.H. BRINE TREATMENT SYSTEM OPERATING CONDITIONS

1. The Brine Treatment System consists of four Treated Water Storage Tanks (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, and TWS-TANK-903), three Chelating Resin Columns (WPTK-900, WPTK-901, and WPTK-902), six filter vessels (BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) secondary containment sump, pumps, associated piping, and ancillary equipment.

2. The Permittee shall sample and analyze the waste in the Brine Surge System IAW the Waste Analysis Plan (see Section C-2 of the ANCDF Application).

3. The Permittee shall be required to minimize accumulation of moisture within the interstitial space of the Treated Water Storage Tanks for the Brine Treatment

System. Methods employed for this purpose must include the ability to limit accumulation, and should liquid be identified within the interstitial space, an analytical method (such as pH, alkalinity, chlorine levels, etc.) must be available to verify the liquid is not a result of a leak of the primary vessel.

IV.I. OPERATING PROCEDURES FOR PRIMARY CONTAINMENT SUMPS

1. The primary sump system shall consist of the sumps listed in Table 4-2.
2. The Permittee shall operate the primary sump system IAW Section III D-4 of the ANCDF Application.
3. Operation of the sump level indicators and interstitial probes shall be inspected and tested per the Inspection Schedule (see Section III F-2 of the ANCDF Application).
4. The Permittee shall use a boroscope to visually inspect the metal sump liner and underlying concrete (or remove the metal sump) annually and before commencement of each chemical agent campaign to visually inspect for any signs of deterioration of the coating, leakage or corrosion of the metal sump, or cracking of the concrete liner. The use of the boroscope is contingent upon obtaining clear photographs documenting the condition of the sump and underlying concrete.
5. All primary sumps shall have a dedicated sump pump and sump level indicators. All liquids evacuated from these sumps shall be pumped to the Spent Decontamination Tanks.
6. The Permittee shall maintain a liquid level in any of the primary containment sumps no higher than the low level assigned in Table 4-2.
7. All primary sumps may be used to treat agent and agent contaminated hazardous wastes with decontamination solution before they are pumped to the Spent Decontamination Holding Tanks. Wastes that have been treated shall not remain in these sumps for more than 24 hours above the allowable level described in Condition IV.G.6.
8. As part of every chemical agent changeover, primary sumps in rooms where agent was processed shall be rinsed with decontamination solution to remove residual chemical agent after room decontamination activities are complete.
9. The permittee may exceed the capacity of the sumps identified in Table 4-2 during a toxic area entry, in the event that the sump pump ceases to work and the subsequent decontamination of entrants causes the sump capacity to be exceeded and the decontamination is necessary to ensure a safe exit from the room or in the event of a failure of any of the Spent Decontamination Holding Tanks or Agent Collection Tanks. If this occurs, the Permittee shall record in the Operating

Record the circumstances that caused the overfill and shall remove the waste as soon as it can be safely accomplished.

10. The permittee may store waste in the sumps listed in Table 4-2 for greater than 24 hours if a toxic area entry necessary to support waste removal cannot be initiated or completed for any of the following reasons:

    a. Agent concentrations exceed the authorized level for the PPE to be worn.

    b. A breach or tear occurs in a DPE suit.

    c. A loss of communications occurs between the parties involved in an entry.

    d. The room temperature is too high to allow for an entry.

    e. Any of the participants in an entry suffer from an illness or heat stress.

    f. A loss of Life Support System (LSS) air occurs.

    g. A loss of either utility power or the Heating, Ventilation, and Air Conditioning (HVAC) system occurs.

    h. Explosive components are present, endanger worker safety, and cannot be removed so as to allow for removal of waste from the sump within 24 hours.

    i. For those instances where waste is not removed from the sumps within 24 hours, the permittee shall record in the Operating Record the circumstances that prevented removal within 24 hours and shall remove the waste as soon as it can be safely accomplished. In addition, the onsite ADEM compliance staff will be notified of the condition in a timely manner.

    j. Should a condition listed above occur, all maintenance activities will be postponed until they can be performed safely.

    k. Severe weather restrictions.

IV.J. OPERATING PROCEDURES FOR SECONDARY CONTAINMENT SUMPS

1. The secondary containment sumps shall consist of all sumps listed in Table 4-3.

2. The Permittee shall operate the secondary containment sumps IAW Section III D-4 of the Application.

3. The Permittee shall consider any materials or liquids detected in the secondary sumps of the Agent Collection Tank System and Spent Decontamination Holding Tank System to be a hazardous waste until the Permittee has sampled and analyzed the materials or liquids for chemical agent, TCLP metals, TCLP organics and any other suspected hazardous waste or hazardous waste constituents, IAW the methods of the Waste Analysis Plan (see Section III C-2 of

the ANCDF Application) of this Permit. The Permittee shall consider any materials or liquid in the secondary containment for the Brine Surge Tank System to be non-hazardous unless a leak has been detected from the tank system. If a leak has been detected, the liquid will be considered hazardous waste until analyzed for chemical agent, TCLP metals, TCLP organics, and any other suspected hazardous constituents. Liquids in the secondary containment for the brine surge tank system shall be analyzed for pH and sheen prior to discharge as stormwater.

4. The Permittee shall send those liquids that are determined to be hazardous waste and contain chemical agent to a Spent Decontamination Holding Tank. For materials or liquids that are sampled and analyzed and found to be chemical agent free and not to be hazardous waste, they shall be managed as not being hazardous waste but must be evacuated from the sump.

5. The Permittee shall remove all materials or liquids in the secondary sumps by either a vacuum truck or dedicated sump pump. The dedicated sump pump system may not leave a residual liquid depth of more than 3 inches. All sumps evacuated using a vacuum truck shall not leave pumpable residual liquids in the sump. The low level alarm will activate when the level from the bottom of the sump reaches 3 inches.

6. Operation of the sump level indicators shall be visually inspected per the Inspection Schedule (see Section III F-2 of the Application) and shall be tested upon installation, annually, and between every chemical agent change as specified in Section III F-2 of the Application.

IV.K. RESPONSE TO LEAKS OR SPILLS

1. In the event of a leak or a spill from a hazardous waste tank system, or if a hazardous waste system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions:

   a. Stop the flow of chemical agent or hazardous waste into the system and inspect the system to determine the cause of the release.

   b. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and allow inspection and repair of the system. If the Permittee finds that it shall be impossible to meet this time period, the Permittee shall notify the Department and demonstrate that the longer time period is required.

   c. If the collected material is a hazardous waste and contains chemical agent, it shall be managed IAW all applicable requirements of AAC 335-14-3, 335-14-4, and 335-14-5.

   d. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment

and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.

e. Close the system IAW the Closure Plan specified in Section III I of the Application unless the following actions are taken:

i. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.

ii. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.

iii. For a release to the environment caused by a leak from an aboveground portion of the ancillary equipment that does not have secondary containment, the Permittee shall repair the tank system or ancillary equipment before returning it to service.

iv. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in AAC 335-14-5-.10.

2. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee shall obtain a certification by a qualified professional engineer that the repaired system is capable of handling chemical agent or hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner; repair of a ruptured tank; or, repair or replacement of a secondary containment vault.

3. The Permittee shall submit to the Department all certifications of major repairs to correct leaks within 7 calendar days from returning the hazardous waste tank systems to use.

IV.L. INSPECTION SCHEDULES AND PROCEDURES

1. The Permittee shall inspect the hazardous waste tank systems, IAW the Inspection Schedule (see Section III F-2 of the Application).

2. The Permittee shall inspect the overfill controls, IAW the Inspection Schedule (see Section III F-2 of the Application).

IV.M. RECORDKEEPING AND REPORTING

1. The Permittee shall verbally report to the Department within 24 hours of detection, when a leak or spill occurs from a hazardous waste tank system to the environment, IAW Condition I.E.17.

2. Releases from a hazardous waste tank system that are contained within a secondary containment system shall be reported as required in Condition IV.L.1. and shall be recorded in the Operating Record required by Condition II.I.1.

3. In addition to complying with the requirements of Condition I.E.17.b., within 30 calendar days of detecting a release to the environment from a hazardous waste tank system, the Permittee shall submit a written report detailing, at a minimum, the following to the Department:

   a. Likely route of migration of the release;

   b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);

   c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it shall be impossible to meet this time period, the Permittee shall provide the Department with a schedule of when the results shall be available. This schedule must be provided before the required 30 calendar day submittal period expires;

   d. Proximity of downgradient drinking water, surface water, and populated areas; and

   e. Description of response actions taken or planned.

4. The Permittee shall obtain, and keep on file at the ANAD facility, the written statements by those persons required to certify the design and installation of the hazardous waste tank systems as specified in Condition IV.C.4. until such time that the tank system is certified closed IAW Condition II.J.7.

5. The Permittee shall keep on file at the ANAD facility the written hazardous waste tank system assessments IAW AAC 335-14-5-.10 of each hazardous waste tank system's integrity and suitability for handling chemical agent and hazardous waste, until such time that the hazardous waste tank system is certified closed IAW Condition II.J.7.

6. The Permittee shall maintain at the ANAD facility a record of the results of leak tests and integrity tests conducted, IAW Conditions IV.C.4. or IV.J.2.

7. In the event that a hazardous waste tank (including primary containment sumps) exceeds the maximum allowable capacity designated for that tank in Tables 4-1 and 4-2, the Permittee shall document in the Operating Record, as required by Condition II.I.1., the following information:

   a. The date and time of occurrence;

b. Identify the tank by the identification number specified in Tables 4-1 and 4-2;

c. Indicate if any other available tank storage volume, within the system, is available and identify such tank by the tank identification number, specified in Tables 4-1 or 4-2;

d. Indicate if the tank system automatically switched the feed or if an operator manually switched the feed from the high level tank to the tank with the available storage;

e. If no additional storage capacity was available within the storage system, indicate if the associated collection and/or treatment activities were automatically cut-off;

f. Indicate if the high-high level tank(s) intake valves were automatically closed;

g. Indicate if any associated incinerator AWFCO interlocks were required. Identify the required interlock and whether the interlocks were successfully activated; and

h. Describe the operating control procedures that allowed the tank system to reach the high-high level volume (e.g., why the operator was not successful in managing the waste within the high level volume (i.e., the working capacity)).

8. The Permittee shall document compliance with Conditions IV.L.2. and IV.L.3. and place this documentation in the operating record for the ANCDF site.

9. The Permittee shall document and record the results of each Spent Decontamination Holding Tank System waste analysis required by Condition IV.F.5. in the Operating Record specified in Condition II.I.1.

10. The Permittee shall document in the Operating Record, specified in Condition II.I.1., the results of each Brine Surge Tank System waste analysis and any subsequent treatment required by Condition IV.G.3.

11. The permittee shall document in the Operating Record, specified in Condition II.I.1., the results of each Brine Treatment System waste analysis and any subsequent treatment required by Condition IV.H.2.

IV.N. CLOSURE

1. The Permittee shall close the hazardous waste tank systems listed in Tables 4-1 and 4-2 IAW the Closure Plan, included as Section III I of the Application.

2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, at closure, the Permittee shall comply with the Condition II.J.9.

IV.O. SPECIAL TANK PROVISIONS FOR INCOMPATIBLE WASTES

1. The Permittee shall not place chemical agent or hazardous waste in a tank system that has not been decontaminated and that previously held a different chemical agent and/or incompatible material.

2. The Permittee shall only place the type of chemical agent (e.g., GB, VX, HD, or HT) specified for the particular campaign in the tank systems during any one chemical agent campaign.

3. Prior to initiating a campaign with a new chemical agent, the Permittee shall rinse the ACS, Brine Surge Tank, and Brine Treatment Systems with the appropriate decontamination solution to remove chemical agent residuals. The decontamination solution generated from these activities shall be collected in the SDS tanks and treated in the Liquid Incinerator secondary combustion chamber IAW Condition VI.B. of this Permit during shakedown, trial burn, and post trial burn and in Condition VII.B. of this Permit during normal operations. If no agent is detected above WCL in BRA-TANK-101/102 at the end of the campaign, rinsing is not required.

Table 4-1: Hazardous Waste Storage Tank Systems Permitted for Use During Shakedown Periods I and II, Surrogate and Chemical Agent Trial Burns and Normal Chemical Agent Operations

Tank I.D. Number	Maximum Allowable Capacity (gallons)	Maximum Allowable Liquid Height[1] (feet)	Dimensions of Tank (feet)	Secondary Containment Required (gallons)	Permitted Hazardous Waste Activity	Permitted Hazardous Waste Codes
ACS-TANK-101	582	7.5	3.5 Diameter 8.0 Height	660	Storage of drained chemical agent	D003 to D011, D022, D028, and D043
ACS-TANK-102	1,130	8.75	5.0 Diameter 10.0 Height	1,300		
SDS-TANK-101	2,168	9.25	6.0 Diameter 10.25 Height	2,379	Storage of spent decontamination and lab waste	D004 to D011, D022, D028, D030 and D043
SDS-TANK-102						
SDS-TANK-103						
BRA-TANK-101	42,629	18.25	20.0 Diameter 20.0 Height	47,000	Liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
BRA-TANK-102						
TWS-TANK-900	33,970	29.5	14 Diameter 30 Height	None. Tanks are double walled tanks with interstitial space monitoring	Storage of treated liquids from brine treatment system	D004 to D011, D022, D028, D030 and D043
TWS-TANK-901						
TWS-TANK-902						
TWS-TANK-903						
WPTK-900	962	7.25 (from bottom of tank)	5 Diameter 6 Height (tangent)	6867 gal. total secondary containment	Treatment of liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
WPTK-901						
WPTK-902						

BRA-FILT-902	7	2	Dia=10”, Ht=55”	6867 gal. total secondary containment	Treatment of liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
BRA-FILT-903	7	2	Dia=10”, Ht=55”			
BRA-FILT-904	7	2	Dia=10”, Ht=55”			
BRA-FILT-905	7	2	Dia=10”, Ht=55”			
BRA-FILT-906	21	3	Dia=14”, Ht=66”			
BRA-FILT-907	21	3	Dia=14”, Ht=66”			

Footnote:
(1) High-high level alarm.

Table 4-2: Hazardous Waste Primary Containment Sump Systems

Sump I.D. Number[1,2]	Maximum Sump Capacity (gallons)	Dimensions of Sump (feet)	Maximum Allowable Liquid Height[3] (inches)	Secondary Containment Volume (gallons)	Location Reference			
					RCRA Drawing Reference	Floor	Location	Room Name/ Number[4]
SDS-SUMP-106	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-6	ECR/05-212
SDS-SUMP-107	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	C-6	ECR/05-211
SDS-SUMP-108	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	J-10	ECV/04-213
SDS-SUMP-109	89	2.3x2.3x2.25	3.0	134	AN-1-G-508	2	D-10	ECV/04-213
SDS-SUMP-110	89	2.3x2.3x2.25	3.0	134	AN-1-G-508	2	B.1-10	ECV/04-213
SDS-SUMP-112	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-7	M-CR/05-210
SDS-SUMP-113	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	M-3	M-CR/05-210
SDS-SUMP-114	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-3	M-CR/05-210
SDS-SUMP-115	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	D-3	M-CR/05-210
SDS-SUMP-116	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-3	M-CR/05-210
SDS-SUMP-117	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	N-3	M-CR/05-210
SDS-SUMP-118	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-5	M-CR/05-210
SDS-SUMP-124	89	2.3x2.3x2.25	3.0	134	AN-G-1-510	2	B.1-4	M-CR-AL/06-221*
SDS-SUMP-125	89	2.3x2.3x2.25	3.0	134	AN-1-G-507	1P	L-5	AL/06-169*
SDS-SUMP-126	89	2.3x2.3x2.25	3.0	134	AN-G-1-511	2	L-8	MPB-AL/06-217
SDS-SUMP-134	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	T-6	M-CR-AL/06-164
SDS-SUMP-135	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	L-3	TMA/12-120
SDS-SUMP-145	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	N-11	MPB/10-205
SDS-SUMP-146	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	N-8	MPB/10-205
SDS-SUMP-147	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	L-11	MPB/10-205
SDS-SUMP-148	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	L-8	MPB/10-205

Table 4-2: Hazardous Waste Primary Containment Sump Systems (Continued)

Sump I.D. Number[1,2]	Maximum Sump Capacity (gallons)	Dimensions of Sump (feet)	Maximum Allowable Liquid Height[3] (inches)	Secondary Containment Volume (gallons)	Location Reference			
					RCRA Drawing Reference	Floor	Location	Room Name/ Number[4]
SDS-SUMP-149	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	L-6	MPB/10-205
SDS-SUMP-153	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	P-5	DECON AREA/12-118
SDS-SUMP-154	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	L-6	TMA/12-120
SDS-SUMP-164	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-11	BSA/17-146
SDS-SUMP-168	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	N-6	MPB/10-205
SDS-SUMP-169	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-6	M-CR/05-210
SDS-SUMP-174	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	D-6	M-CR/05-210
SDS-SUMP-175	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	M-11	MPB/10-205
SDS-SUMP-179	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-6	M-CR/05-153
SDS-SUMP-184	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	Q-6	M-CR/05-153
SDS-SUMP-189	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	K-7	M-CR/05-210
SDS-SUMP-190	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-9	BSA/17-146

Footnotes:
(1) Hazardous waste sumps (meeting the RCRA definition of a tank) must comply with all applicable hazardous waste tank system requirements (ADEM Admin. Code R. 335-14-5-.10).
(2) SDS = Spent Decontamination Solution
(3) Low-level alarm height. This is the level at which the sumps shall be maintained.
* Indicates location on platform level.

Abbreviations:
AL.....Airlock
DECON .....Decontamination
ECV .....Explosive Containment Room Vestibule
M-CR.....Munition Corridor
MPB-AL.....Munitions Processing Bay Airlock
TMA .....Toxic Maintenance Area
BSA .....1st Floor Buffer Storage Area
ECR .....Explosive Containment Room
I.D. .....identification
M-CR-AL .....Munitions Corridor Airlock
RCRA .....Resource Conservation and Recovery Act

Table 4-3: Hazardous Waste Secondary Containment Sumps Systems

Sump I.D. Number	Maximum Allowable Capacity (gallons)	Dimensions of Sump (feet)	Location Reference					
			Drawing Column - Row	Floor	Location	Room Name/ Number	Comments	Purpose
SDS-SUMP-151	511	4.42x4.42x3.5	AN-1-G-504	1	J-8	TOX/11-141	In Pit	2,072 gallons Secondary Containment
SDS-SUMP-150	85	2.25x2.25x2.25	AN-1-G-504	1	H-7	SDS/21-140	In Pit	3,060-gallons Secondary Containment
BRA-SUMP-103	85	2.25x2.25x2.25	AN-2-D-501	-	Within diked area of Brine Surge Tanks	Outside of PUB	Vault	48,862-gallons Secondary Containment
BRA-SUMP-104	85	2.25x2.25.2.25	AN-2-D-503	1	PUB	PUB Interior	-	6,867 gallons Secondary Containment

Abbreviations:
I.D. ..... identification
SDS ..... spent decontamination solution
BRA brine reduction area
PUB ..... Process and Utility Building
TOX ..... Toxic Cubicle

Table 4-4: Sump Systems Design Standards

Sump And Trench Design Standards[1]	Sump Systems			
	Primary Containment Sumps	**Secondary Containment Sumps of the TOX and SDS Room**	**Vault Outside of PUB Within Diked Area of Brine Surge Tanks**	**Secondary Containment Sump Inside PUB**
PRIMARY CONTAINMENT:				
Construction Material:	Welded carbon steel	See below	See below	See below
Shell Thickness	3/16 inch	See below	See below	See below
Grating Material	Reinforced fiberglass	See below	See below	See below
Protective Coating	Chemical resistant epoxy coating	See below	See below	See below
SECONDARY CONTAINMENT:				
Construction Material	Concrete	Concrete with embedded steel lining	Concrete	Concrete
Grating Material	See above	Reinforced Fiberglass	Galvanized Steel	Reinforced Fiberglass
Thickness	6 inches	6 inches	6 inches	6 inches
Protective Coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating
LEAK DETECTION SYSTEM	Visually inspect manually, visually inspect by borescope, and by level indicator	Visually inspect and by level indicator	Visually inspect and by level indicator	Visually inspect and by level indicator

Footnote:
(1) Standards apply to trenches (for sump collection system designed with trench).

Abbreviations:
TOX.....Toxic Cubicle
SDS.....Spent Decontamination Solution
PUB .....Process and Utility Building

MODULE V: MISCELLANEOUS TREATMENT UNITS (SUBPART X)

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MODULE V: MISCELLANEOUS TREATMENT UNITS (SUBPART X)

V.A. MISCELLANEOUS TREATMENT UNIT REQUIREMENTS

1. This Module allows the thermal treatment of conventional waste military munitions (WMM) and chemical agent munitions, disassembled explosive components of WMM and chemical munitions, including hazardous energetic and energetic-contaminated wastes, and non-energetic contaminated wastes within permitted miscellaneous treatment units. Additionally, the units may be used to treat by-products from non-permitted activities such as test programs, Resource, Recovery, and/or Recycle (R3) Program, surveillance, emergency response operations including components described in Permit Condition V.C.5 as described in the Section IV of the facility permit application. The thermal treatment units described in this module are regulated under AAC 335-14-5-.24. The following units are permitted for thermal treatment of wastes:

    a. Open Burning (OB) Unit #1 – SWMU 16

    b. Open Detonation (OD) Unit – SWMU 17

    c. Static Detonation Chamber (SDC) – SWMU 70

2. All thermal treatment operations shall be accomplished by trained explosives personnel in accordance with Department of Defense (DOD) Standard Operating Procedures (SOPs), Sections III K-H, IV J-H, and IV-H of the facility permit application, and the conditions of this permit.

3. The Permittee shall maintain an operating record describing the thermal treatment activities. The record shall include the following information:

    a. Description and quantity [number and Net Explosive Weight (NEW)] of each hazardous waste munition, initiator, and donor received and treated in each tray fed into the SDC unit, each pan of the OB unit and each detonation pit for the OD unit. For processing operations in the SDC that are consistent (same type and number of munitions per event) within a processing day, one record is acceptable provided it captures the initial evaluation and time of each subsequent tray,

    b. All agent feed quantities associated with the SDC unit,

    c. The annual running total of the NEW of all energetics treated at the thermal treatment units,

    d. Date of thermal treatment,

e. Copies of all documents showing the disposition of residues transported from the thermal treatment units,

f. Current copies of all SOPs used at the thermal treatment units,

g. Meteorological conditions during each treatment (open burn or open detonation) as listed in Condition V.D of this permit,

h. All information to characterize waste including information to support Condition V.B of this permit,

i. Copies of all inspection records for each unit,

j. Copies of all employee training records in accordance with Sections III K-H, IV J-H, and IV H of the facility permit application,

k. All groundwater monitoring reports required by Permit Condition X.B.6.

l. For SDC unit operations, the date and time of all Feed Prohibitive Interlock (FPI) malfunctions including the cause, corrective action, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the FPI function failures including the corrective measures taken to correct the condition that caused the failure, and

m. For SDC unit operations, all monitoring equipment data and inspection records of monitoring equipment compiled under the conditions of this permit.

V.B. DESCRIPTION OF THERMAL TREATMENT UNITS

1. Open Burning (OB):

a. The Open Burning unit occupies approximately 17 acres in the northwestern corner of the Ammunition Storage Area (ASA) [also referred to as the Ammunition Limited Area (ALA)]. Treatment by OB may be conducted in ten burn pans within the designated open burn unit encompassing an area of soil approximately 400 feet by 800 feet. All burn pans shall be similarly constructed, as shown in Figure IV B-2 of the permit application. The general arrangement of the OB unit within the facility boundary is located in Figure IV.B-1 of the facility permit application. The general arrangement of the OB pans within the OB unit is shown in Figure IV.B-8 of the permit application. Photographs of the area layout and the burn pans are located in Figures IV.B-4 and IV.B-5 of the permit application.

b. The OB unit is dedicated to the thermal destruction of Hazard Class 1 explosives including propellants, WMM, and explosive-contaminated wastes. The OB unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

2. Open Detonation (OD):

a. The OD unit occupies approximately 51 acres in the northwestern corner of the ASA. Treatment by OD may be conducted within an approximate 900 feet by 300 feet area designated for digging of pits which are used for detonation stations. No more than 8 detonation pits shall be used during any detonation series. Detonation stations may be ignited electrically or non-electrically. Both above ground and buried detonations are allowed. The general arrangement of the OD unit within the facility boundary is located in Figure IV.B-1 of the permit application. Photographs of the detonation pit are located in Figure IV.B-6 and IV.B-7 of the permit application. A sediment retention basin for the control of run-off from the OD operations is located within the western OD unit boundary. Sediment removed from the basin may be reused within the OD unit boundary.

b. The OD unit is dedicated to the detonation of Hazard Class 1 explosives including WMM and explosive-contaminated wastes. The OD unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

3. Static Detonation Chamber (SDC)

a. The Static Detonation Chamber (SDC) is located on the west side of G block near Building 695 in the Chemical Limited Area (CLA) of ANAD. The footprint for the structure is approximately 70 x 100 feet. Treatment by SDC shall be conducted by loading ammunition trays which are conveyed into the SDC unit. No more than one feed tray may be loaded into the SDC per feed event. The general arrangement of the SDC facility is located in Figure III.K-5 of the Permit Application.

b. The SDC unit is dedicated to the detonation of chemical and/or WMM munitions which are either explosively or not-explosively configured and secondary waste generated by the SDC operations. The explosive capacity of the SDC unit shall not exceed 6.7 pounds (lbs) of explosive material, both mass and non-mass detonating. The SDC unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

V.C. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. The majority of WMM treated by OB, OD, and SDC at ANAD require disposal because the munition has exceeded its shelf life and the Designated Disposition Authority (DDA) has determined that it cannot be reused or recycled. These

military munitions become hazardous WMM when they are removed from the munitions storage igloos in accordance with the military munitions rule (AAC 335-14-7-.13).

2. WMM treated at the OB, OD, and SDC units may exhibit the reactivity (D003) hazardous waste characteristic as defined in ADEM Admin. Code R.335-14-2-.03(4) and include small arms ammunition (hazard class 1.4). In addition, these wastes may also exhibit the ignitability characteristic (D001), corrosivity (D002), and/or nine toxicity characteristics (D004, D005, D006, D007, D008, D009, D011, D030 or D039).

3. The wastes treated at the OB and OD units shall not contain pesticides, herbicides, dioxins, or polychlorinated biphenyls (PCBs). Conventional waste types and waste characteristics are detailed in Sections IV.C of the permit application. All WMM must be identified using the procedures in Section IV.C of the permit application. Only the Munitions Items Disposition Action System (MIDAS) classifications listed in Table IV.C-9 of the permit application may be treated by ANAD at the OB and OD units.

4. Thermal treatment of hazardous waste by means other than as specifically authorized by this permit is prohibited. Recovered liquid-filled rounds, chemical warfare material, components of recovered liquid filled rounds or chemical warfare material, and liquid agent-contaminated explosive components may be treated in the SDC, but are prohibited to be processed at the OB and OD units. No other agent munitions except those containing mustard may be treated at the SDC. Mustard contaminated waste types and waste characteristics are detailed in Section III.C of the permit application.

5. Items containing depleted uranium, either loaded or expended, are prohibited at all locations. Treatment of loaded munitions or components containing colored smokes, white phosphorous, red phosphorous, hexachlorethane, or riot control agents may also be treated at the SDC or during an emergency operation as determined by facility Quality Assurance Surveillance, Ammunition Specialists (QASAS) in accordance with Section IV D-3f(1) of the permit application.

6. Disassembled explosive components of chemical munitions may be processed by open/buried detonation once they have been verified agent free by monitoring in accordance with the Waste Analysis Plan in Section III.J of the facility permit application. If not verified agent free, these components may only be treated in the SDC.

7. The donor charge and placement geometry for OB and OD/BD thermal treatment operations shall be optimized to minimize the generation of unburned and un-detonated waste and residue. All re-burns and re-detonations shall be recorded in the operating record.

8. Under no circumstances shall the facility receive any materials originating from any chemical weapons stockpile other than Anniston Army Depot pursuant to the ***Code of Alabama 1975***, *§§ 22-30-C-1-4,**et. seq.**, as amended,* otherwise referred to as the "Chemical Weapons Destruction Limitation Act".

9. The SDC facility may receive recovered liquid-filled rounds, chemical warfare material or components of recovered liquid filled rounds or chemical warfare material recovered from off-site locations within the boundary of the State of Alabama only. Receipt of recovered items from outside the State of Alabama is prohibited.

V.D. THERMAL TREATMENT OPERATIONS

1. Open Burning (OB)
   a. Meteorological Restrictions

      The listed meteorological restrictions are applicable to open burning treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

      i. Less than a 50 percent chance of precipitation (including thunderstorms or electrical storms),

      ii. Average wind speed between 3 and 20 miles per hour,

      iii. Cloud cover less than 80 percent and ceilings greater than 2,000 feet, and

      iv. Wind direction which will not carry emissions over any publicly accessible area within one mile of the unit boundary.

   b. Other Restrictions

      i. Open burning operations are limited to the hours between 8:00am and 4:00pm Monday through Saturday, and

      ii. Open burning may be conducted in each pan no more than once per day

   c. Treatment Quantities and Daily Maximum Limits

      The following quantity of material may be treated at the OB unit, expressed as net explosive weight (NEW). NEW represents the combined explosives weight of all energetics contained in a munitions item and initiators. Explosive limits have been established for the OB unit and these limits shall not be exceeded at any time. The volume of WMM treated at the OB unit varies based on the disposal and demilitarization needs of DoD. The operating limits are as follows:

i. Open Burning (OB): Shall not exceed 2,000 pounds NEW per pan (total daily limit of 20,000 pounds NEW for ten open burn pans). Only one burn per pan is allowed in an operating day. Treatment of WMM on the ground is prohibited. Burn pan lids shall remain in place at all times when the pans are not in use.

d. Residue Control

The open burning operation of WMM results in the generation of treatment residues in the forms of residue and scrap metal. The OB residue is a fine powdery or feathery material resembling ash. These residues shall be handled in the following manner:

i. Ash Residue

At the completion of each burn, the Permittee will allow a 1-hour cooling period and then verify via visual inspection that all of the reactive material has been properly treated. Within 24-hours following the treatment event and verification that all explosives have been treated, or in as timely a manner as is possible to prevent harm to human health and the environment, the ash residue shall be removed from the pan and placed into DOT-approved containers. The containers shall be properly labeled with the appropriate hazardous waste designation including the applicable RCRA waste codes and the date(s) where appropriate. All containers must be managed in accordance with the conditions set forth in Module IX of this permit and all appropriate state and Federal regulations governing hazardous waste accumulation, storage, and disposal. Filled containers may be removed to a permitted hazardous waste storage area (Building 466, 512 or 527) before disposal. Accumulation of up to 55 gallons of waste residue is allowed at the OB area in accordance with 335-14-3-.03(5)(c). All waste in containers shall be characterized in accordance with Section IV.C-2 (Waste Analysis Plan) of the permit application. Wind dispersal of ash shall be controlled by limiting burns in accordance with Permit Condition V.D.1.a. When ash is present following the cooling period and prior to removal, lids are to be placed on the burn pans in order to prevent precipitation from accumulating in the burn pans.

ii. Scrap Metal from Open Burning

At the completion of each burn, the Permittee will allow a 1-hour cooling period. Metal fragments shall be visually inspected, certified, and verified as free of explosives on a ANMC Form 55-6 (or equivalent document). The scrap metal shall be collected, loaded into containers, and transported to the Permittee's Defense

Reutilization Marketing Office (DRMO) or suitable scrap vendor for recycling or disposal. The ANMC Form 55-6 (or equivalent document) shall be retained by the ANMC as the document of record.

2. Open Detonation (OD) / Buried Detonation (BD)

a. Meteorological Restrictions

The listed meteorological restrictions are applicable to open detonation treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

i. Less than a 50 percent chance of precipitation (including thunderstorms or electrical storms),

ii. Average wind speed between 3 and 20 miles per hour,

iii. Cloud cover less than 80 percent and ceilings greater than 2,000 feet,

iv. Wind direction which will not carry emissions over any publicly accessible area within one mile of the unit boundary, and

v. When any of the above weather conditions have changed after a detonation has been set, wired and buried and it is determined that under such conditions it would be unsafe to leave the explosives in place without detonating.

b. Other Restrictions

i. Open detonations are limited to the hours between 8:00am and 4:00pm Monday through Saturday, and

ii. Open detonation is limited to no more than sixteen (16) detonations per day.

c. Treatment Quantities and Daily Maximum Limits

The following quantity of material may be treated at the OD unit, expressed as net explosive weight (NEW). NEW represents the combined explosives weight of all energetics contained in a munitions item and donor material. Explosive limits have been established for the OD unit and these limits shall not be exceeded at any time. The volume of WMM treated at the OD unit varies based on the disposal and demilitarization needs of DoD. The operating limits are as follows:

i. Open (above ground) Detonation (OD): Shall not exceed 15 pounds NEW per detonation (maximum daily limit of 240 pounds

NEW for the eight detonation stations). No more than two detonations may be conducted per station per operating day.

ii. Buried Detonation (BD): Shall not exceed 1,000 pounds NEW per detonation station (maximum daily limit 16,000 pounds NEW for the eight detonation stations). No more than sixteen detonations may be conducted per operating day. Buried detonations shall not occur at depths below 14 feet or above 1 foot below ground surface.

d. Residue Control

i. The open detonation operation may generate unexploded ordnance (UXO), munitions components containing energetic material, and metal fragments ejected from the open detonation area. Residue must be managed in accordance with the procedures in Section IV.F-6 of the facility Part B application. The OD Unit has been defined by three areas – the Active Area, the Validation Area, and the Assessment Area. Figure IV.F-8 of the Part B permit application shows the individual areas and the GPS coordinates of the boundaries associated with each area.

a). Active Area of the OD Unit

1). At the completion of each detonation series, the Permittee will visually inspect the Active Area of the OD Unit for the presence of UXO. Any UXO or munitions containing unreacted material shall be retreated with the next available detonation.

2). At the completion of each operating day, the Permittee shall visually inspect the Active Area of the OD Unit for the presence of metal fragments that are (1) observable on the soil and (2) measure 4 inches or greater in any dimension. Any metal fragments meeting the above criteria shall be collected and removed. Any fragment found shall be visually inspected to verify that the energetic component of the waste munitions has been successfully treated. Any UXO or munitions components containing unreacted material shall be retreated with the next available detonation. Metal fragments will be certified as explosive-free and removed as scrap metal.

b). Validation Area

At least monthly (during months which have at least one operating day), the Permittee shall visually inspect the Validation Area of the OD Unit for the presence of UXO, munitions components containing unreacted material and metal fragments that are (1) observable on the soil and (2) measure 4 inches or greater in any dimension. Any metal fragments meeting the above criteria shall be collected and removed. The location of any UXO or munitions components containing UXO or munitions components containing unreacted material will be identified on a site map which will be maintained in the Pit Office and will be retreated with the next available detonation. Metal will be certified as explosive-free and removed as scrap metal.

c). Assessment Area

1). In the event that UXO or munitions components containing unreacted material are found during inspection of the Validation Area, the corresponding quadrant of the Assessment Area will also be inspected. The location of any UXO or munitions components containing unreacted material will be identified on the site map maintained at the Pit Office and retreated with the next available detonation. The presence of UXO or munitions components containing unreacted material within the Assessment Area will result in re-evaluation of the shot configuration and re-evaluation of the site map boundaries

2). The Department must be notified within 24 hours of the discovery of UXO within the Assessment Area. The permittee shall submit a written report within 15 days showing the results of the boundary re-evaluation. If the evaluation indicates that currently permitted boundaries are ineffective in keeping all UXO or munitions components containing unreacted material within the permitted boundaries, then a permit modification to justify re-evaluation of permitted boundaries shall be submitted in accordance with Condition I.K.3 of this permit.

ii. Sediment from Retention Basins

Any run-off sediment collected and removed from the retention basin may be reused within the OD unit boundary. However, any

sediment applied onto the soil surface outside the OD unit boundary shall constitute land disposal and, as such, must comply with all applicable Land Disposal Restriction (LDR) treatment standards under AAC 335-14-9. Any sediment disposed of off-site must be properly characterized and disposed of in accordance with the ANAD Waste Analysis Plan.

3. Static Detonation Chamber (SDC)

a. Meteorological Restrictions

There are no meteorological restrictions for the SDC, as it is an enclosed system.

b. Hours of Operation

The SDC has no restriction on the hours of operation.

c. Treatment Quantities and Maximum Limits

The following quantity of material may be treated at the SDC unit, expressed as net explosive weight (NEW). NEW represents the combined explosives weight of all energetics contained in a munitions item. Explosive limits have been established for the SDC unit and these limits shall not be exceeded at any time. The volume of WMM treated at the SDC unit may vary based on the disposal and demilitarization needs of DoD but shall not exceed the limits below. Conventional WMM listed in Table IV.C. of the permit application (including small arms, projectiles, mines, rockets, grenades, pyrotechnics, and explosives contaminated material, toxic containing materials, fuses, detonators, etc.), mustard containing chemical munitions, and secondary waste generated by the SDC may be processed in the SDC provided the following boundary conditions are not exceeded. An event shall be defined as processing of one tray within the SDC.

i. No shape charges unless shape charge is disengaged or altered prior to feeding in order to prevent equipment damage,

ii. Mustard agent ≤ 56.6 lbs/hr (see table 5-2).

iii. Overall weight < 330.7 lbs/event (including feed tray),

iv. Chlorine < 11.1 lbs/event,

v. Sulfur < 6.3 lbs/event,

vi. Non-Mass Detonating Explosives < 6.7 lbs NEW/event, and

vii. Mass Detonating Explosives < 6.7 lbs NEW/event.

d. Maintenance

i. All RCRA and MACT required process monitors shall be equipped with alarms operated to warn of deviation from the limits specified in Table 5-1.

ii. Modifications to the design plans, specifications, and operating conditions in the ANCDF Application for the SDC shall be allowed only IAW Permit Condition II.A.2.

iii. Prior to treating hazardous waste in the SDC unit, the Permittee shall install and test all process monitoring and control instrumentation specified in Table 5-1 according to manufacturer specifications and the ANCDF Laboratory Analysis and Monitoring Plan (LAMP).

iv. The Permittee shall not process hazardous waste in the SDC until such time that the Permittee has demonstrated compliance with the certification of construction or modification requirements, as specified in Permit Condition I.E.14 of this permit.

v. The Permittee shall maintain the SDC during systemization, emissions testing, post emissions testing, and normal operating periods such that when operated IAW the operating requirements specified in this Permit, it shall meet the applicable performance standards specified in the Emissions Test Plan and Section V.D.3.f of this permit.

vi. The off-gas treatment system (OGT and carbon filtration system shall be maintained and operated so as to minimize the emissions of air contaminants. This equipment shall be properly operated and maintained in accordance with Section III.K of the facility permit application. Carbon filter disposal shall be managed in accordance with Section III.K.C.2a and Table III K-5 of the facility permit application.

vii. SDC Carbon Filtration Systems shall be monitored in accordance with the ANCDF LAMP and the RCRA Permit.

a) The OGT Safeguard Filtration unit must be operational at all times during Chemical or Conventional WMM processing. If agent breakthrough is confirmed by mid-bed monitoring with DAAMS (>) 0.2 Allowable Stack Concentration (ASC), then the filter must be taken out of service until both carbon banks have been replaced and leak checked.

b) The SDC-Sprung Structure Filtration unit must be operational at all times during Chemical Agent operations and until agent decontamination at the SDC is complete. If agent breakthrough is indicated by mid-bed monitoring with DAAMS at (>) STL, then the filter must be taken out of service until banks 1 and 2 have been replaced and leak checked.

c) The first bank of each carbon filtration unit shall contain Sulfur Impregnated Carbon (SIC) as demonstrated during emissions testing for mercury removal.

e. Emissions Test Plan and Data Submittal

i. The Permittee shall operate and monitor the SDC unit during the short-term periods (systemization, emissions testing, and post emissions testing) as specified in the approved Emissions Test Plan for both mustard and conventional munitions dated February 2010 and revised August 2010.

ii. The emissions test plan for both mustard and conventional munitions shall be submitted by the Permittee as a request for major permit modification(s) at least 180 calendar days prior to the proposed start date of the systemization period for each test. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed.

iii. The emissions test plan shall define operating conditions and waste feed rates that shall be used to determine SDC performance IAW AAC 335-14-8-.06(2)(b).

iv. The Permittee shall not start a systemization period in the SDC unit until the Department has approved the emissions test plan for the SDC unit.

v. The Permittee shall submit a summary of all data collected during the emissions test to the Department upon completion of each test period. The Permittee shall submit to the Department an emissions test report within 90 calendar days of completion of each test. All submissions shall be certified IAW AAC 335-14-8-.02(2).

vi. If the preliminary calculations show that one or more of the performance standards listed in this permit for the SDC were not met during the emissions test, the Permittee shall immediately stop waste feed to the SDC system. The Department shall be verbally notified within 24 hours of this discovery. If necessary, a revised post-emissions test feed rate may be submitted to the Department for approval.

f. Systemization

i. The systemization period for the SDC shall be conducted IAW the approved emissions test plans provided.

ii. The systemization period for the SDC shall begin with the introduction of conventional munitions into the SDC unit and shall end with the start of the emissions test. There will be a separate systemization period for the mustard munitions emissions test.

iii. Each systemization period shall not exceed 720 operating hours. The Permittee may petition the Department for one extension of any systemization period for up to 720 additional operational hours IAW AAC 335-14-8-.06(2)(a).

g. Reporting

i. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced with mustard agent stack gas monitors and, (for periods in which such ambient air monitoring was required), ambient air mustard agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

a) Identification of the monitor experiencing the problem

b) Identification of the type of problem

c) Date the problem was experienced

d) Frequency of the problem

e) Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW AAC 335-3-11-.06 [56] within 60 calendar days of the date of the tests.

h. Performance Standards

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the SDC must achieve a destruction and removal efficiency (DRE) of 99.9999% for mustard agent

(HD/HT). The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall control emissions of products of incomplete combustion (PICs) from the stack such that the CO level in the stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, instantaneous.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

iii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall monitor emissions of mustard agent being treated from the SDC using an ACAMS installed at the stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	HD/HT
ROHA	0.006
Instantaneous	0.03

iv. During the systemization, emissions test, post-emissions test, and normal operating periods, the PM emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

v. During the systemization and emissions test periods, emissions limits must be established for the following parameters in grams/second (g/s);

a) HCl emissions

b) Metal emission rates for antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorous, selenium, silver, thallium, tin, vanadium, and zinc

c) Volatile, semivolatile, and total organic compound emissions

d) Dioxin/furan emissions

e) Energetic emissions

During normal operations, the established emissions limits shall be met by limiting the overall feed rate into the SDC. The Permittee shall submit a request to modify this permit to include numerically specified data for the above parameters not later than 90 days following the emissions test.

i. Limitations on Waste Feed

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall treat only the hazardous wastes that meet the requirements listed in Section V.D.3.c and Table 5-2 and in compliance with the operating requirements specified in Condition V.D.3.h.

ii. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 50 % of the maximum feed rates indicated in Tables 5-2 for all hazardous waste processing.

iii. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 75% of the maximum feed rates indicated in Tables 5-2 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Section V.D.3.h.

iv. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 100% of the maximum feed rates demonstrated during the previous emissions test for the SDC upon submittal and Departmental approval of the following:

a) A complete emissions test report,

b) A submittal proposing operating conditions for post-emissions test and normal operating periods; and

c) An updated RAA and/or a final HHRA report.

v. Reserve flush tank solution meeting the requirements in Section V.D.3. may be fed to the SDC during the systemization, emissions test, post-emissions test, and normal operating periods.

vi. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall verify that the waste feed is within the physical and chemical composition limits specified in this Permit. Mustard agent and metal feed rates will be based upon the results of emissions testing. Feed rates for sulfur, chlorine and energetics (NEW) will be established by using munitions specific data available from MIDAS. Feed determinations must be made for each feed event to the SDC. One determination is sufficient for identical feed trays.

vii. During the systemization and emissions testing periods, the SDC is limited to only the conventional munitions from the ANAD storage igloos which are required to conduct performance and emissions testing. This includes up to 68 pyrotechnic rounds and up to 24 60mm rounds per hour. Normal operating periods for the SDC may include conventional munitions processing upon completion of the chemical weapons stockpile destruction and decontamination of the unit.

viii. During the systemization, emissions testing, post-emissions testing, and normal operating periods, the SDC will only process from the ANAD chemical weapons stockpile overpacked mustard munitions, reject mustard munitions, mustard munitions with limited safety features, and mustard munitions necessary for demonstrating testing such as emissions testing and feasibility until such time as all chemical stockpile items have been destroyed. Upon completion of the stockpile and decontamination of the unit, the SDC may be used to process conventional munitions in accordance with the conditions of this permit.

j. Operating Conditions

i. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall operate the SDC in order to maintain the system and process parameters listed in Table 5-1.

ii. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall operate the FPI systems, specified in Table 5-1, to automatically prohibit waste feed to the SDC when the monitored operating conditions deviate from the setpoints specified in Table 5-1.

iii. After approval of the emissions test report, the Permittee shall operate the SDC in accordance with the feed limitations specified

in this Section. The agent waste feed shall be limited to the rates specified in Table 5-2.

k. Monitoring Requirements

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table 5-1 while treating hazardous waste.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall not treat any hazardous waste in the SDC at any time if any of the monitoring instruments listed in Table 5-1, fail to operate properly.

l. Feed Prohibitive Interlock (FPI) Requirements

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall operate the systems, specified in Table 5-1, to automatically prohibit hazardous waste feed to the SDC when the monitored operating conditions deviate from the setpoints specified in Table 5-1. The destruction sequence may not resume until the parameter(s) which cause the interlock is/are restored to permit limits and all other parameters are within permit limits.

ii. In the event of a malfunction of the FPI systems listed in Table 5-1 during the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed prohibitive condition is/are restored to permit limits and all other parameters are within permit limits.

iii. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition V.D.3.i unless the deviation automatically activates the FPI sequence.

V.E. INSPECTION

The Permittee is required to conduct routine inspections at the OB, OD, and SDC units. During such inspections, the Permittee will check for malfunction and/or deterioration, operator error, and evidence of discharge, that may cause or lead to the release of hazardous constituents or that may have caused or lead to a potential threat to human health or the environment. These inspections shall be conducted at frequencies specified in Tables III.K-3, IV.J-3, and IV.F-1 of the facility permit application.

Any equipment or structure deterioration or malfunction identified in the inspection must be promptly remedied to ensure that operations remain in compliance with permit conditions and do not cause environmental or human health hazards. If a hazard is determined to be imminent, or has already occurred, remedial action must be taken immediately. No further OB, OD, or SDC operation is allowed to commence if the deterioration or malfunction has the potential to cause an imminent hazard to human health or the environment. The Department shall be notified within 24 hours of the determination of an imminent hazard in accordance with the reporting requirements of Conditions I.17 and I.18 of this permit.

OB and OD inspections shall be performed in accordance with Section IV.F-2 of the permit application. OB and OD inspections shall be documented in accordance with Figures IV.F-1, IV.F-2, and IV.F-3 (inspection log sheets) of the facility permit application.

SDC inspections shall be performed in accordance with Sections III.K.F and IV.J.F of the permit application and in accordance with the SDC inspection log sheets.

V.F. GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program shall be established for the OB and OD units in accordance with the requirements in Module X of this permit.

V.G. AIR MONITORING

The Permittee shall operate the thermal treatment units to protect human health of on-site workers and off-site receptors and to minimize significant effects to the ecosystem surrounding the treatment areas. The Permittee shall adhere to the following conditions to minimize risk of cancer and non-cancer effects due to exposure to thermal treatment air emissions:

1. The Permittee shall conduct a Human Health and Ecological Risk Assessment based upon operational limits of the thermal treatment units in Section V.C of this permit.

2. A cumulative assessment of cancer risk to off-site receptors posed by the Anniston Chemical Agent Disposal Facility (ANCDF) and ANAD's OB, OD, and SDC units must be evaluated to determine cancer risk. Results of the cumulative

evaluation must indicate that the summation of the risk estimates is below the cancer risk factor of 1×10^{-5}.

3. The maximum NEW, including donors and initiators, to be treated shall not exceed the values in Condition V.D.

4. Any changes in operational limits of the thermal treatment units shall require submission of a revised risk assessment to the Department under permit modification pursuant to condition I.K of this permit.

5. The Permittee shall perform sampling and analysis of the waste and exhaust emissions at the SDC to verify that the operating requirements established in the permit achieve the performance standards delineated in this Permit. Initial testing must be done within 6 months after start up of the SDC. Subsequent tests shall be conducted no later than 61 months after the previous test. The Department must be notified in writing at least one year prior to the scheduled date of the test.

6. During the systemization, emissions test, and post-emissions test periods for the SDC, the Permittee shall calibrate the oxygen (O_2) and carbon monoxide (CO) Continuous Emissions Monitoring Systems (CEMS) specified in this Permit IAW the Performance Specifications for CEMS referenced by AAC 335-3-11-.06[56].

V.H. CLOSURE AND POST-CLOSURE PLAN

The Permittee shall close the OB, OD, and SDC units in accordance with ADEM Admin. Code R. 335-14-5-.07 and Sections III.K.I, VI.K.I, and IV.I of the facility permit application. If clean closure according to ADEM Admin. Code R. 335-14-5-.07(2) cannot be obtained, then the Permittee shall submit a post-closure plan as part of a permit modification in accordance with Permit Condition I.K.

1. Closure Procedures

   a. All untreated reactive hazardous wastes, contaminated ash residue, unexploded ordnance (UXO), contaminated concrete pads, and contaminated soils shall be removed from the OB and OD units as described in Section IV.G of the facility permit application and disposed in accordance with all state and Federal regulations governing hazardous waste handling and disposal. Sediments within the OD retention basin shall be sampled, removed, and managed in accordance with Condition V.D.2.d.iii of this permit.

   b. All burn pans and lids shall be decontaminated or disposed as required by ADEM Admin. Code R 335-14-5-.07(5) and as described in Section IV.G of the facility permit application. Decontaminated burn pans and lids may be removed from the OB unit and disposed as scrap metal or may be put to other use at ANAD. All SDC equipment shall be decontaminated or

disposed of as required by ADEM Admin. Code R335-14-5-.07(5) and as described in Sections III.K.I and IV.J.I of the facility permit application.

c. Concrete pads shall be decontaminated and/or cleaned to remove untreated waste and/or ashes as required by ADEM Admin. Code R 335-14-5-.07 and as described in Section IV.I of the facility permit application. The supports and pads may be left in place if decontaminated to acceptable criteria approved by the Department or disposed of as a non-hazardous waste. If concrete cannot be cleaned and properly decontaminated, it shall be disposed of in accordance with Permit Condition V.H.1.a.

d. All soil in the OB and OD unit areas shall be sampled for contamination in accordance with the ADEM approved closure plan required by Permit Condition V.H. If removal or remediation of all contaminated soil cannot be attained during approved closure activities, the OB and OD units shall be closed in accordance with ADEM Admin. Code R 335-14-5-.07 and an approved post-closure plan.

e. If the OB, OD, and SDC units cannot be clean-closed and certified for unrestricted use pursuant to the Uniform Environmental Covenant Act (UECA)[AAC 335-5], then a Land Use Control Plan must be developed and submitted in the post-closure plan.

2. Groundwater

a. Groundwater underlying the OB and OD units is required to be monitored throughout the operating life of the OB and OD units in accordance with Permit Conditions X.A through X.E and Section IV.I of the facility permit application. If at the time of closure the current and historical groundwater monitoring results indicate no evidence of contamination from the OB and OD units, then the groundwater will be considered un-impacted by OB and OD operations. If groundwater contamination is present from OB and OD operations, then the Permittee must address continued groundwater monitoring and corrective action in the post-closure plan.

Table 5-1: FPI Conditions for Mustard and Conventional WMM[1]

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000°F
SDC-FPI-03	TICS 310 AVG	Thermal Oxidizer Temperature	MIN	1,741° F
SDC-FPI-04	PICS 310 AVG	Thermal Oxidizer Pressure	MAX	- 0.01 psi
SDC-FPI-05	TICS 320 AVG	Spray Dryer Temperature	MAX	400° F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	170° F
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200° F
SDC-FPI-11	AAhh-900	CO Concentration	MAX	100 ppm, dry basis @7% O_2 (instantaneous)

Footnote:

1. Operational parameter(s) interlock will prohibit the transfer from loading chamber 1 into chamber 2 until all conditions are met or are within range.

Abbreviations:

%.....percent
°F .....degrees Fahrenheit
FPI .....feed prohibitive interlock
MAX.....maximum
MIN .....minimum
ppm.....parts per million
ROHA.....rolling hourly average
TBD .....to be determined
@ .....at
CO.....carbon monoxide
cfm.....cubic feet per minute
mg/m^3.....milligrams per cubic meter
O_2.....oxygen
psi .....pounds per square inch
SDC .....Static Detonation Chamber
WMM .....waste military munition

Table 5-2: Systemization, Emissions Test, Post-Emissions Test, and Normal Operations Feed Rates for Mustard and Conventional WMM

Munition Type	Munition Content (lbs/munition)		Feed Rate (munitions/hr)[1]	Total Feed Rate (lbs/tray)		Total Feed Rate (lbs/hr) [1]	
	Agent	Explosive		Agent	Explosive	Agent	Explosive
4.2-inch Mortars	6.0	0.14	10	12	0.29	56.6	1.44
105mm Projectiles	2.97	0.26	19	11.9	1.04	56.6	4.94
155mm Projectiles	11.7	0.41	3	23.4	0.82	56.6	1.23
Combined	N/A	N/A	6(2)	12	0.66	56.6	1.33
Conventional	N/A	6.7	N/A	N/A	6.7	N/A	134

Footnotes:
1. Combined example shown for one (1) over packed mortar, with two (2) 105mm projectiles twice per hour.

Table 5-3: Metal and Chloride Feed Rates for Munitions and WMM Feed Events[1,2]

Metal	Total Feed Rate (lbs/hr)	Metal	Total Feed Rate (lbs/hr)
Antimony	5.6E-01	Manganese	1.53E00
Arsenic	3.1E-01	Mercury	1.7E-02
Barium	1.12E+01	Nickel	1.1E-01
Beryllium	2.4E-03	Phosphorus	2.25E00
Boron	3.4E-01	Selenium	7.2E-03
Cadmium	8.3E-03	Silver	1.2E-02
Chloride	3.92E+02	Thallium	1.5E-03
Chromium	2.64E00	Tin	2.3E-01
Cobalt	3.9E-02	Vanadium	4.6E-03
Copper	4.1E-01	Zinc	3.1E-01
Lead	2.58E+01		

Footnotes:
1. These rates were demonstrated during Conditions 3 and 4b emissions testing.
2. Rates shown here are extrapolated from the demonstrated values using allowable MACT rules as explained in the Final SDC Emissions Test Report for Condition 4b, section 8.5.

MODULE VI: INCINERATION – SHAKEDOWN, TRIAL-BURN AND POST TRIAL-BURN

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MODULE VI: INCINERATION – SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN

This module covers the incinerator shakedown, trial burn, and post-trial burn periods for each incinerator. For clarity, this module is organized as follows:

- Section VI.A. - Conditions applicable to all incinerators,
- Section VI.B. - Liquid Incinerator,
- Section VI.C. - Metal Parts Furnace,
- Section VI.D. - Deactivation Furnace System, and
- Section VI.E. - Combined stack for the LIC, MPF, and DFS.

VI.A. GENERAL CONDITIONS DURING SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN FOR ALL INCINERATORS AT THE ANCDF SITE

1. Maintenance

a. All process monitors required, pursuant to Conditions VI.B.4., VI.C.4, VI.D.4., and VI.E.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Tables 6-3, 6-7, 7-3, 7-7, and 7-10.

b. Modifications to the design plans and specifications in the ANCDF Application for any incinerator shall be allowed only IAW Condition II.A.2.

c. Prior to treating hazardous waste in any incinerator, the Permittee shall install and test all process monitoring and control instrumentation specified in Tables 7-3, 7-7, and 7-10 for the incinerators IAW the design plans in Sections D-5 through D-7 of the ANCDF Application.

d. The Permittee shall not feed hazardous wastes into any incinerator until such time that the Permittee has demonstrated compliance with the certification of construction or modification requirements, as specified in Condition I.E.14.

e. The Permittee shall maintain each incinerator during shakedown, trial burn, and post-trial burn periods such that when operated, IAW the operating requirements specified in this Permit, it shall meet the applicable performance standards specified in Conditions VI.B.1., VI.C.1., VI.D.1., and VI.E.1.

f. All air pollution control devices and capture systems for which this Permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

2. Inspection Requirements

a. The Permittee shall inspect each incinerator IAW the Inspection Schedule (see Section III F-2 of the Application).

b. The inspection data for each incinerator shall be recorded, and the records shall be placed in the operating record for the respective incinerator, IAW Condition II.I.

3. Monitoring Requirements

a. Upon receipt of a written request from the Department, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the permit achieve the performance standards delineated in this Permit.

b. All monitoring, recording, maintenance, calibration, and test data shall be recorded and the records for each incinerator shall be placed in the operating record for each respective incinerator, IAW Condition II.I.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall calibrate the oxygen (O_2) and carbon monoxide (CO) Continuous Emission Monitoring Systems (CEMS) specified in this Permit IAW the Performance Specifications for CEMS referenced by AAC 335-3-11-.06[56].

4. Recordkeeping

a. The Permittee shall record and maintain in the operating record for each incinerator, all monitoring and inspection data compiled under the conditions of this Permit, IAW Condition II.I.

b. The Permittee shall record in the operating record the date, time, and duration of all AWFCOs, including the triggering parameters, reason for the deviation, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the AWFCO function failures, including the corrective measures taken to correct the condition that caused the failure.

c. A quarterly report as defined below will be submitted to the Director each calendar quarter within 30 days following the end of the quarter. The report will include the following information (all times in hours) (operating time does not include standby):

i. Total operating time since introduction of agent in device,

ii. Operating time in quarter (by Month), which is defined as rolling 12 month total)

iii. Date/time of all startups and shutdowns,

iv. Date/time/duration/cause/corrective action taken for all shutdowns caused by malfunction of either process or control equipment, and

v. Date/time/duration/cause/corrective action taken for all instances of waste feed cutoff.

5. Trial Burn Plan and Data Submittal

a. The Permittee shall operate and monitor each incinerator during the short-term periods (shakedown, trial burn, and post-trial burn) as specified in Module VI and in the trial burn plans for each different chemical agent for the applicable furnace.

b. The individual trial burn plan for each different chemical agent for the incinerator treating such agent shall be submitted by the Permittee as major permit modification(s) at least 180 calendar days prior to the proposed start date of the shakedown period for each trial burn. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed.

c. The trial burn plans shall define operating conditions and waste feed rates that shall be used to determine incinerator performance IAW AAC 335-14-8-.06(2)(b). The trial burn plans shall also include ramp up procedures during the shakedown periods and a plan detailing the allocation of resources during the shakedown and trial burn periods. Shakedown periods shall not begin until permit modifications IAW Condition VI.A.5.b. have been approved by the Department.

d. The Permittee may not start a shakedown period in any furnace system until the Department has approved the specific trial burn plan for that furnace system.

e. The Permittee shall submit a summary of all data collected during the trial burn to the Department upon completion of each trial burn period. The Permittee shall submit to the Department a trial burn test report within 90 calendar days of completion of each trial burn. All submissions shall be certified IAW AAC 335-14-8-.02(2).

f. If the preliminary calculations show that one or more of the performance standards listed in this permit for the respective incinerator were not met during the trial burn, the Permittee shall immediately stop waste feed to the incinerator system. The Department shall be verbally notified within 24 hours of this discovery. As necessary, a revised post-trial burn feed rate may be submitted to the Department for approval that shall allow the Permittee to dispose of the remaining hazardous wastes present in the tank systems.

6. Shakedown

a. Shakedown periods for each incinerator shall be conducted IAW the approved trial burn plans provided for in Condition VI.A.5.

b. Shakedown periods for each incinerator shall begin with the introduction of chemical agent into the furnace system and shall end with the start of

the trial burn. There shall be a separate shakedown period for each chemical agent.

c. Each shakedown period shall not exceed 720 operating hours. The Permittee may petition the Department for one extension of any shakedown period for up to 720 additional operational hours IAW AAC 335-14-8-.06(2)(a).

d. A natural gas-only trial burn, consisting of three valid test runs, shall be performed as part of the initial agent trial burn (ATB) for each furnace/incinerator system. The natural gas-only trial burn for each furnace/incinerator system shall commence at a time to be determined by the Department and shall occur during either the agent shakedown period or within a reasonable time as determined by the Department after the commencement of the initial trial burn for that furnace/incinerator. The sample locations and parameters collected and analyzed from the natural gas-only trial burn shall be the same as those collected/analyzed from the ATB for that system.

7. <u>Reporting</u>

a. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced with hydrogen chloride (HCl) chemical agent stack gas monitors and, (for periods in which such ambient air monitoring was required), ambient air mustard agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

i. Identification of the monitor experiencing the problem;

ii. Identification of the type of problem (e.g., borderline or deficient recoveries);

iii. Date problem experienced;

iv. Frequency of problem; and

v. Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW Condition VI.A.7.i. within 60 calendar days of the date of the tests.

VI.B. LIQUID INCINERATOR

1. <u>Performance Standards</u>

a. During the shakedown, trial burn, and post-trial burn periods, the LIC must achieve a destruction and removal efficiency (DRE) of 99.9999% for the chemical agents GB, VX, and Mustard (HD/HT). The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the particulate matter (PM) emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dry standard cubic feet (dscf).

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the LIC shall not exceed 5.99E-03 grams per second (g/s). The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the LIC as specified in Condition VI.B.2.g.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the LIC shall not be exceeded:

Antimony	6.44E-05 g/s	Arsenic	9.73E-05 g/s
Barium	6.44E-05 g/s	Beryllium	1.29E-05 g/s
Boron	1.70E-03 g/s	Cadmium	1.61E-05 g/s
Chromium	1.88E-05 g/s	Cobalt	3.22E-05 g/s
Copper	3.22E-05 g/s	Lead	1.98E-04 g/s
Manganese	2.47E-03 g/s	Mercury	3.08E-05 g/s
Nickel	3.22E-05 g/s	Phosphorous	2.54E-03 g/s
Selenium	3.30E-05 g/s	Silver	6.44E-05 g/s
Thallium	6.44E-06 g/s	Tin	1.22E-04 g/s
Vanadium	3.83E-05 g/s	Zinc	9.96E-04 g/s

The above emission limits shall be met by limiting feed rate of each metal into the LIC as specified in Condition VI.B.2.g.

e. During the shakedown period, trial burn, and post-trial burn periods, the following emission rates from the LIC shall not be exceeded:

HCl	5.99E-03 g/s	Cl_2	5.99E-03 g/s
HF	1.21E-02 g/s	Tetra CDD	3.32E-11 g/s
Penta CDD	1.66E-10 g/s	Hexa CDD	4.98E-10 g/s
Hepta CDD	1.66E-10 g/s	Octa CDD	3.32E-10 g/s
Tetra CDF	4.81E-11 g/s	Penta CDF	3.32E-10 g/s
Hexa CDF	6.64E-10 g/s	Hepta CDF	4.68E-10 g/s

Octa CDF	3.32E-10 g/s	Benzene	1.36E-04 g/s
Vinyl Chloride	1.82E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the LIC.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emissions of products of incomplete combustion (PICs) from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor emissions of chemical agents being treated from the LIC using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.B.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.B.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.B.3. is not sufficient to ensure compliance with the performance standards specified in Conditions VI.B.1.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. Limitation on Waste Feed

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall incinerate only the hazardous wastes in Table 6-1 in the LIC, in compliance with the operating requirements specified in Condition VI.B.3.

b. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-1 and 6-2 and shall not deviate from the operating conditions specified in Tables 6-3 and 7-3.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-1 and 6-2 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.B.1.

d. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 100% of the maximum feed rates demonstrated during the previous trial burn for the LIC upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

e. SDS and aqueous laboratory liquids may be fed to the secondary chamber of the LIC during the shakedown period only when the operating conditions as specified in Condition VI.B.3. are satisfied.

f. During the trial burn and post-trial burn the SDS and laboratory aqueous liquid wastes shall be fed only into the secondary combustion chamber of the LIC with, or without, the chemical agent feed to the primary combustion chamber.

g. During the shakedown, trial burn, and post-trial burn periods, the feed rates of metals and chlorine/chloride to the LIC shall not exceed the limits in Table 6-2.

h. During the chemical agent post-trial burn periods, the Permittee shall incinerate the chemical agent that has been test burned during a preceding ATB at the feed rates specified in Table 6-1.

i. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall conduct sufficient analysis of the waste treated in the LIC to verify that the waste feed is within the physical and chemical composition limits specified in this Permit.

j. Only one chemical agent shall be fed to the LIC, at any given time.

3. <u>Operating Conditions</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the LIC in order to maintain the system and process parameters listed in Table 7-1 within the ranges or setpoints specified in Table 7-1.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems, specified in Table 6-3, to

automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 6-3.

c. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the LIC has operated within the planned trial burn operating setpoints in Table 6-3 and at a minimum of 90% of the feed rates in Table 6-1 for a minimum of an 8 consecutive hour period on 2 consecutive processing days.

d. The Permittee shall not burn chemical agent in the primary combustion chamber of the LIC until the primary and secondary combustion chambers are within the operating parameters in Conditions VI.B.3.a. and b.

e. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the LIC until agent concentration within the LIC primary chamber room is below 1 ASC.

4. <u>Monitoring Requirements</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 6-3 and 7-3, while incinerating hazardous waste.

b. During the shakedown, trial burn, and post-trial burn periods, hazardous wastes shall not be fed to the LIC if any of the monitoring instruments listed in Table 7-3, fail to operate properly.

5. <u>Waste Feed Cut-Off Requirements</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the systems, specified in Table 6-3, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 6-3. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 6-3 during the shakedown, trial burn, and post-trial burn, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the

operating conditions deviate from the limits specified in Condition VI.B.3. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.B.5.i.

VI.C. METAL PARTS FURNACE

1. Performance Standards

a. During the shakedown, trial burn, and post-trial burn periods, the MPF shall achieve a DRE of 99.9999% for the chemical agents GB, VX, and Mustard (HD/HT) and secondary waste-like material using surrogate potential organic hazardous constituents (POHCs) Hexachloroethane and Monochlorobenzene. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the PM emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the MPF shall not exceed 8.18E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the MPF as specified in Condition VI.C.2.e.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the MPF shall not be exceeded:

Antimony	1.19 E-04 g/s	Arsenic	8.52 E-05 g/s
Barium	2.95 E-04 g/s	Beryllium	2.38 E-05 g/s
Boron	2.29 E-03 g/s	Cadmium	7.30 E-05 g/s
Chromium	8.62 E-05 g/s	Cobalt	5.95 E-05 g/s
Copper	5.95 E-05 g/s	Lead	1.82 E-04 g/s
Manganese	1.57 E-03 g/s	Mercury	4.29 E-05 g/s
Nickel	1.46 E-04 g/s	Phosphorous	1.16 E-03 g/s
Selenium	7.23 E-05 g/s	Silver	1.19 E-04 g/s
Thallium	1.19 E-05 g/s	Tin	1.19 E-04 g/s
Vanadium	2.38 E-05 g/s	Zinc	2.09 E-04 g/s

The above emission limits shall be met by limiting feed rate of each metal into the MPF as specified in Condition VI.C.2.e.

e. During the shakedown, trial burn, and post-trial burn periods, the following emission rates from the MPF shall not be exceeded:

HCl	8.18 E-03 g/s	Cl_2	2.58 E-02 g/s
HF	1.93 E-02 g/s	Tetra CDD	9.17 E-11 g/s
Penta CDD	4.58 E-10 g/s	Hexa CDD	4.58 E-10 g/s
Hepta CDD	4.58 E-10 g/s	Octa CDD	9.77 E-10 g/s
Tetra CDF	9.17 E-11 g/s	Penta CDF	7.64 E-10 g/s
Hexa CDF	1.20 E-09 g/s	Hepta CDF	2.28 E-09 g/s
Octa CDF	1.36 E-09 g/s	Benzene	3.16 E-04 g/s
Vinyl Chloride	5.66 E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the MPF.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emission of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor emissions of chemical agents being treated from the MPF using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.C.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.C.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.C.3., is not sufficient to ensure compliance with the performance standards specified in Conditions

VI.C.1.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. Limitation on Waste Feed

a. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-4, 6-5 and 6-6 and shall not deviate from the operating conditions specified in Tables 6-7 and 7-7.

b. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-4, 6-5 and 6-6 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.C.1.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 100% of the maximum feed rates demonstrated during the previous trial burn for the MPF upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

d. During the chemical agent shakedown, trial burn, and post-trial burn periods, the Permittee shall incinerate the hazardous wastes in Table 6-4 and 6-5, in compliance with the operating requirements specified in Condition VI.C.3.

e. During the shakedown, trial burn, and post-trial burn, the feed rates of metals and chlorine to the MPF shall not exceed the limits in Table 6-6.

f. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the MPF to verify that the waste feed is within the physical and chemical composition limits specified in this Permit.

g. Only one chemical agent munition type shall be fed to the MPF, at any given time.

3. **Operating Conditions**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the MPF in order to maintain the system and process parameters within the ranges or setpoints specified in Table 6-7.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems, specified in Table 6-7, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoints specified in Table 6-7.

c. Only one loaded tray/WIC containing the waste materials shall be fed into the MPF at any given time, with a minimum interval between each tray feed.

d. The hourly feed rate of the residual chemical agent contained in the MPF feed, which was calculated based on the estimated drain from each munition type and from the amount of chemical agent in the munitions, shall not exceed the limits provided in Table 6-5. The following should be performed for munitions that cannot be drained to below the approved agent feed rate:

i. The Permittee shall provide the Department verbal notice of the detection of the munition/ton container that cannot be drained to below the maximum feed rates as set forth in Table 6-5 indicating its type and its location (i.e., process line leading to furnace, temporary holding location) and the efforts expended to facilitate additional draining.

ii. The Permittee must provide the Department with written procedures for processing of munitions that cannot be drained to below the maximum feed rates as set forth in Table 6-5. Operating procedures must be consistent with the following:

(I) the temperature and residence time in Zones 1, 2, and 3 shall not vary from limits set forth in Table 6-7.

(II) The temperature maintained in the afterburner shall be IAW Conditions VI.C.3.a and b.

iii. The Permittee shall develop a vaporization curve and calculations for the munition type and the quantity of residual chemical agent..

iv. The Permittee receives approval from the Department for processing the munitions that cannot be drained to below the maximum feed rates as set forth in Table 6-5.

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e. The Permittee shall keep a record of the percentage heel for each munition.

f. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the MPF has operated within the planned trial burn operating setpoints in Table 6-7 and at a minimum of 90% of the feed rates in Table 6-5 for a minimum of an 8 consecutive hour period on each of 2 consecutive processing days. (NOTE: Processing days for purposes of this requirement shall not be separated by more than 5 calendar days.)

g. The Permittee shall not burn chemical agent in the primary combustion chamber of the MPF until the primary chamber and afterburner are within the operating parameters in Conditions VI.C.3.a. and b.

h. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the MPF until agent concentration within the MPF primary chamber room is below 1 ASC.

i. Trays/WICs/containment devices containing secondary waste shall be prepared IAW limits in Table 6-4. In addition, they shall comply with the following requirements:

   i. Each tray/WIC/containment device shall contain only one type of waste (e.g. metal parts, wood, PPE, absorbent materials, sludge, etc.), or

   ii. If waste types are combined in a single tray/WIC/containment device;

      (I) Bulk metal shall be considered to be a metal item with less than 10% combustible material or aluminum integrated into the piece.

      (II) Rubblized concrete, refractory, and scabbled concrete shall be processed in WICs containing pans and heat transfer fins, and shall be filled to a maximum depth of 7 inches.

      (III) Sludge shall be processed in tray/WICs/containment devices to a depth no greater than 1.5 inches and shall not be fed in combination with any other waste.

      (IV) Bulk combustible waste is any combustible waste that is not polyethylene, polystyrene or halogenated plastic. When WICs are used to process bulk combustibles, metal pans should be placed in the WICs and,

         1. Waste shall be placed in the WIC loosely packed in plastic bags or spread evenly in the WIC. Wastes shall not be rolled or bunched.

2. Wood and other dense combustible items shall be placed towards the top of loaded WIC's.
3. Toxicological agents protective (TAP) gear and LSS air hoses shall not be processed together in the same WIC.
4. M-40 masks shall be limited to one (1) mask per WIC.
5. M-40 Respirator Cartridges shall be limited to 2 cartridges per WIC unless the cartridges are opened, exposing the cartridge interior prior to loading.

(V) All non-munition wastes that envelop an interior space (e.g., gauges, cans, escape air tanks, overpacks, glassware, etc.) must be opened or punctured before being placed in the MPF.

iii.. The permittee shall prepare an inventory/feed sheet of all secondary waste contents in each tray/WIC/containment device; to contain an inventory of each waste type, including weight, Btu value of each waste type, chlorine, and metal contents.

iv. Secondary waste shall not be processed in the MPF until the construction of the Cool-Down Conveyor enclosure has been certified and approved by the Department pursuant to Condition I.E.14. and a DRE of 99.9999% for agent has been documented to the Department.

j. Munitions and secondary waste shall not be fed to the MPF at the same time.

k. In the event of a low temperature related AWFCO while processing trays/WICs/containment devices in the primary chamber of the MPF, forward zone movement of trays/WICs shall be governed as follows:

i. Trays containing ton containers, or WICs containing bulk combustibles (defined as any combustible waste that is not polyethylene, polystyrene or halogenated plastics), or bulk wastes containing interior or enveloping spaces (i.e., pumps, gauges) will either be held in position, moved forward to the MPF Discharge Airlock awaiting return to the furnace to complete the necessary treatment cycle, or returned to the charge airlock or lower munitions corridor awaiting return to the furnace for treatment.

ii. Trays containing other munition types or WICs containing secondary waste other than bulk combustibles, will be assessed in

accordance with the treatment requirements identified in Tables 6-4 or 6-5 for the respective waste or munition type. Trays/WICs that have completed the entirety of the residence time identified in Tables 6-4 or 6-5, regardless of the Zone in which the treatment occurred, will be transferred to the MPF Discharge Airlock for monitoring and discharge in accordance with this Permit. Trays/WICs that have not completed the required residence times will be managed in accordance with the requirements specified in VI.C.3 k.i above.

When furnace conditions are returned to operating parameters listed in Table 6-7, all zone timers shall be reset to zero (0) and no forward zone movement shall occur until the residence times listed in Tables 6-4 and 6-5 are completed.

l. In the event of an ACAMS alarm in the MPF Cool-Down Conveyor enclosure, the Permittee shall immediately:

i. Cease hazardous waste feed into the charge airlock of the MPF and out of the discharge air lock of the MPF.

ii. Automatically secure the cool-down enclosure louvered discharge fans.

iii. Secure the enclosure area doors.

iv. Vent the enclosure through ducting into the LIC 1 Secondary Room and thus through the MDB HVAC.

v. Analyze DAAMS from all monitoring stations within the Cool-Down Conveyor enclosure for the time period up to and including the ACAMS alarm, and

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then waste feed may be restarted upon return to the operating parameters listed in Table 6-7.

(II) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VI.3.k.v.(II) and upon return to operating parameters listed in Table 6-7.

vi. Identify the tray/WIC/containment device that initiated the alarm and return it to the MPF for further treatment or overpack and process through the TMA.

4. **Monitoring Requirements**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 6-7 and 7-7, while incinerating hazardous waste.

b. During the shakedown, trial burn, and post-trial burn periods, hazardous wastes shall not be fed to the MPF if any of the monitoring instruments listed in Tables 6-7 and 7-7, fails to operate properly.

5. **Waste Feed Cut-Off Requirements**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the systems, specified in Table 6-7, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoint specified in Table 6-7. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. During the shakedown, trial burn, and post-trial burn periods, in the event of a malfunction of the AWFCO systems listed in Table 6-7, the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cutoff or lockout is/are restored to permit limits and all other parameters are within permit limits.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Table 6-7, unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.C.5.a.

d. During the shakedown, trial burn, and post-trial burn periods, the ACAMS monitoring the exhaust from the Metal parts Furnace Cool-Down Conveyor Enclosure (MPF-32 and MPF-33) may be operated as follows:

i. During the treatment of munitions or waste, the ACAMS may be taken off-line to perform maintenance or calibration under the following conditions:

I. No waste will be discharged from the MPF Discharge Airlock while the ACAMS are off-line.

II. Secondary waste meeting the definition of sludge has not been discharged from the MPF during a 1-hour period prior to taking the ACAMS off-line, and

III. No waste will be removed from the Cool-Down Conveyor Enclosure until the ACAMS has been returned to service and has been in operation for a period of at least 15-minutes.

ii. If the maintenance or calibration activities fail to return the ACAMS to service within two hours of taking the instrument off-line, no additional feed will be charged to the MPF until such time as the ACAMS has been returned to service.

VI.D. DEACTIVATION FURNACE SYSTEM

1. Performance Standards

a. During the shakedown, trial burn, and post-trial burn periods, the DFS must achieve a DRE of 99.9999% for the chemical agents GB and VX. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: Pc = corrected concentration of PM

Pm = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the DFS shall not exceed 8.46E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the DFS as specified in Condition VI.D.2.e.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the DFS shall not be exceeded:

Antimony	1.53E-04 g/s	Arsenic	4.41E-05 g/s
Barium	8.82E-05 g/s	Beryllium	6.50E-06 g/s
Boron	1.95E-03 g/s	Cadmium	1.96E-05 g/s
Chromium	5.10E-05 g/s	Cobalt	1.76E-05 g/s
Copper	5.64E-05 g/s	Lead	5.21E-04 g/s
Manganese	4.42E-03 g/s	Mercury	1.54E-05 g/s
Nickel	3.20E-05 g/s	Phosphorous	1.18E-03 g/s
Selenium	4.41E-05 g/s	Silver	1.76E-05 g/s

Thallium	8.82E-06 g/s	Tin	1.80E-04 g/s
Vanadium	4.41E-05 g/s	Zinc	9.45E-04 g/s

The metals emission limits shall be met by limiting feed rate of each metal into the DFS as specified in Condition VI.D.2.e.

e. During the shakedown, trial burn, and post-trial burn periods, the emission from the DFS shall not exceed the following limits:

HCl	8.46E-03 g/s	Cl_2	9.09E-03 g/s
HF	1.77E-02 g/s	Tetra CDD	5.71E-11 g/s
Penta CDD	2.85E-10 g/s	Hexa CDD	8.55E-10 g/s
Hepta CDD	6.11E-10 g/s	Octa CDD	1.23E-09 g/s
Tetra CDF	1.87E-10 g/s	Penta CDF	6.10E-10 g/s
Hexa CDF	1.25E-09 g/s	Hepta CDF	7.27E-10 g/s
Octa CDF	5.71E-10 g/s	Benzene	2.30E-04 g/s
Vinyl Chloride	1.37E-05 g/s	Nitroglycerine	3.34E-05 g/s
2,4-Dintirotoluene	1.47E-05 g/s	2,6-Dinitrotoluene	1.47E-05 g/s
2,4,6-Trinitrotoluene	4.04E-05 g/s	Diphenylamine	2.90E-05 g/s
RDX	3.59E-05 g/s	HMX	2.71E-06 g/s

The above emission limits shall be met by limiting the overall feed rate into the DFS.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emission of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall, not exceed 100 ppm, dry volume, over a ROHA.

$$Co_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor and control emission of chemical agents from the DFS using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.D.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.D.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.D.3. is not sufficient to ensure compliance with the performance standards specified in Conditions VI.D.1.g. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. <u>Limitation on Waste Feed</u>

a. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-8 and 6-9 and shall not deviate from the operating conditions specified in Table and 7-10.

b. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-8 and 6-9 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.D.1.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 100% of the maximum feed rates demonstrated during the previous trial burn for the DFS upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

d. During the ATB, the Permittee shall incinerate the hazardous wastes in Table 6-8 in the DFS, in compliance with the operating requirements specified in Condition VI.D.3.

e. During the shakedown, trial burn, and post-trial burn periods, the feed rate of metals and chlorine to the DFS shall not exceed the limits in Table 6-9.

f. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the DFS to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the WAP (see Section III C-2).

g. Only one chemical agent, or waste containing one chemical agent, shall be fed to the DFS, at any given time.

3. Operating Conditions

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the DFS in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-10.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints.

c. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the DFS has operated within the planned trial burn operating setpoints in Table 6-11 and at a minimum of 90% of the feed rates in Table 6-8 for a minimum of an 8 consecutive hour period on 2 consecutive processing days.

d. The rate of movement to the discharge conveyor shall be controlled during the GB and VX campaigns so as to provide a minimum solid retention time of 15 minutes inside the heated enclosure. Since the discharge conveyor will not be heated during the mustard campaign, this requirement will be met by either reducing the kiln speed or by placing the kiln in oscillation to ensure the treatment cycle is satisfied. This is only required for mustard contaminated components within the kiln

e. The rocket shear blade shall be sprayed with a SDS or process water (PRW) at all times when a rocket piece is at the blast gate and the shear blade is in operation; or at all times when a rocket piece is at the blast gate and the gate is jammed. The flow rate of the SDS or PRW to the rocket shear blade shall be continuously monitored and recorded during rocket processing operations.

f. A time delay of 30 seconds shall be provided for feeding M55 rocket sections before and after feeding fuses to the DFS, with the exception that tailfins from the previous rocket and nose plugs can be fed with the fuses.

g. The Permittee shall not burn chemical agent in the rotary kiln of the DFS until the rotary kiln and the afterburner are within the operating parameters in Conditions VI.D.3.a. and b.

h. During startup, with the afterburner temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the rotary kiln of the DFS until agent concentration within the DFS rotary kiln room is below 1 ASC.

i. The Permittee shall continue to operate the burners in the primary combustion chamber of the DFS for at least 21 minutes after feed to the DFS has ceased.

j. In the event of an ACAMS alarm in the Discharge Conveyor (DC) bin enclosure which occurs while the enclosure door is closed and the enclosure is under engineering controls, the Permittee shall immediately:

i. Stop waste feed.

ii. Place DFS kiln in oscillate mode.

iii. Stop DC motion.

iv. Recover and analyze A and B DAAMS tubes.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VI.3.j.iv.(II) and upon return to the operating parameters.

k. In the event of an ACAMS alarm in the DC bin enclosure which occurs while the enclosure door is open or the enclosure is otherwise not under engineering controls, the Permittee shall immediately:

i. Stop waste feed.

ii. Place DFS kiln in oscillate mode.

iii. Stop DC motion.

iv. Recover and analyze the associated DAAMS monitors.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(IV) Normal operations and waste feed may be restarted after completion of the requirements in Conditions VI.3.k.iv.(II) and (III) and upon return to the operating parameters.

l. In the event waste is charged to the DFS that has been contaminated with HD/HT, the permittee will ensure the waste is contained within the confines of the rotary kiln to ensure destruction of the agent prior to discharge from the kiln to the DC.

4. <u>Monitoring Requirements</u>

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table 7-10, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the DFS if any of the monitoring instruments listed in Table 7-10 fail to operate properly.

5. <u>Waste Feed Cut-Off Requirements</u>

a. The Permittee shall maintain the systems to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In case of a malfunction of the AWFCO systems the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VI.D.3., unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.D.5.a.

VI.E. COMMON STACK FOR LIC, MPF, AND DFS

1. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall install and maintain three ACAMS in the common stack. The instruments installed on the common stack will be configured so that two are alternating sampling and analysis and the third is in standby to replace either of the two active instruments in case one must be removed from service for any reason.

2. During the shakedown, trial burn, and post-trial burn periods, the exhaust gas monitoring systems specified in Condition VI.E.1., shall be calibrated, inspected and operated IAW the applicable elements of Conditions VI.A.2. and VI.A.3.

3. During the shakedown, trial burn, and post-trial burn periods, the chemical agent emission from the common stack, monitored as specified in Condition VI.E.2., shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

4. During the shakedown, trial burn, and post-trial burn periods, the waste feeds to all contributing incinerator(s) shall be automatically cut-off or lock-out when the chemical agent emission level in the common stack exceeds the values specified in Condition VI.E.3.

Table 6-1: Maximum Feed Rates to the LIC

Feed Stream	Shakedown, Trial Burn, and Post-Trial Burn [ROHA]		Shakedown, Trial Burn, and Post-Trial Burn [2MRA (Hourly/30)(1.1)][1]	
	Agent	Surrogate	Agent	Surrogate
Surrogate	---	1,015 lbs/hr	---	37 lbs/2-min
GB	1,015 lbs/hr	---	34.5 lbs/2-min	---
VX	675 lbs/hr	---	22.5 lbs/2-min	---
HD	1275 lbs/hr	---	46.8 lbs/2-min	---
HT	1275 lbs/hr	---	46.8 lbs/2-min	---
SDS, Laboratory, Aqueous Liquid Wastes	2,000 lbs/hr when not processing agent or 1,600 lbs/hr when processing agent	2,000 lbs/hr	---	---

Footnote:
1 The feedrates listed in this table are the intended limits to be demonstrated during the associated agent trial burns. AWFCO limitations are contained in Table 6-3.

Abbreviations:
2MRA.....2-minute rolling average
lbs/2-min.....pounds per 2-minute average
ROHA.....rolling hourly average
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
SDS.....spent decontamination solution

Table 6-2: Maximum Metals and Chlorine/Chloride Feed Rates to the LIC during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	519.0
Antimony	0.4577
Arsenic	0.0865
Barium	0.0693
Beryllium	0.0229
Boron	4.655
Cadmium	0.0229
Chromium	0.0343
Cobalt	0.0286
Copper	0.1264
Lead	2.928
Manganese	0.1020
Mercury	0.0179
Nickel	0.0696
Phosphorus	243.2
Selenium	0.0347
Silver	0.3647
Thallium	0.2286
Tin	0.8686
Vanadium	0.0347
Zinc	0.8524

Abbreviations:
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
ROHA.....rolling hourly average

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-01	TAHH-710	Primary Chamber Temperature High-High	2,750° F	2,750° F	2,750° F	2,900° F
LIC-02	TSLL-710	Primary Chamber Temperature Low-Low	2,475° F	2,475° F	2,475° F	2,400° F
LIC-03	TAHH-782	Secondary Chamber Temperature High-High	2,150° F	2,150° F	2,150° F	2,200° F
LIC-04	TSLL-782	Secondary Chamber Temperature Low-Low	1,850° F	1,850° F	1,850° F	1,800° F
LIC-05	PSHH-845	Primary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc	-0.25 inwc with 10 second delay
LIC-06	PSHH-896	Secondary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc	-0.25 inwc with 10 second delay
LIC-07	PDAH-855	Secondary Chamber Flue Gas Flow Rate High	0.7 inwc	0.7 inwc	0.7 inwc	0.7 inwc with 10 second delay
LIC-08	AAHH-778C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA
LIC-09	AAHH-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis	15% dry basis
LIC-10	AALL-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis	3% dry basis
LIC-11	PSLL-737C	Primary Chamber Atomizing Air Pressure Low-Low	55 psig	55 psig	55 psig	55 psig
LIC-12	PSL-809	Secondary Chamber Atomizing Air Pressure Low	65 psig	65 psig	65 psig	65 psig
LIC-14	FAHH-731C	Feed Rate High-High 2MRA (hourly/30)(1.1)	47.3 lbs/2 min	25 lbs/2 min	37 lbs/2 min[2]	37 lbs/2 min
LIC-15	FAHH-731D	Feed Rate High-High ROHA	1,290 lbs/hr	740 lbs/hr	1,110 lbs/hr[2]	1,100 lbs/hr
LIC-16	FAHH-763	SDS Feed Rate High-High	1,600 lbs/hr			2,000 lbs/hr
LIC-17	PDALL-814	Venturi Scrubber Pressure Differential Low-Low	23 inwc	23 inwc	20 inwc	18 inwc

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-18	FALL-828	Venturi Scrubber Brine Flow Rate Low-Low	135 gpm with 10 second delay	135 gpm with 10 second delay	126 gpm with 10 second delay	126 gpm with 30 second delay
LIC-19	DAHH-835	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.28 sgu	1.28 sgu
LIC-20	FALL-825	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm	540 gpm
LIC-21	AALL-832	Scrubber Tower pH Low-Low	7.28	7.28	6.5	6.5
LIC-22	TSHH-800	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215° F	215° F
LIC-23	PALL-170	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig	25 psig
LIC-24	LSHH-02/06	Brine Surge Tank Level High-High	219 inches	219 inches	219 inches	18 feet 3 inches
LIC-25	PSLL-760	Chemical Agent Feed Pressure Low-Low	5 psig	5 psig	5 psig	Not applicable
LIC-26	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not applicable	Not applicable	0.0003 mg/m^3	Not applicable
LIC-27	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not applicable	Not applicable	0.00006 mg/m^3	Not applicable
LIC-28	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not applicable	Not applicable	0.0003 mg/m^3	Not Applicable
LIC-29	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	Not applicable	Not applicable	0.00006 mg/m^3	Not Applicable
LIC-30[3]	TAHH-433	PFS Carbon Filter Inlet Exhaust Gas Temperature High-High	180° F	180° F	180° F	Not Applicable
LIC-31[3]	PDAH-436B PDAH-438B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
LIC-32[3]	PDAH-436E PDAH-438E PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-33	ACAM-911-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3	Not Applicable	Not Applicable
LIC-34	ACAM-911-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3	Not Applicable	Not Applicable
LIC-35	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3	Not Applicable	Not Applicable
LIC-36	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006mg/m^3	Not Applicable	Not Applicable
LIC-37	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-38	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-39	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-40	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Footnotes:

(1) All values are instantaneous unless otherwise noted.

(2) Post-trial burn feed rate to be reduced to Table 6-1 limits within 24 hours of the conclusion of the trial burn period.

(3) Stop feed parameters only apply to the on-line PFS unit. PDAH-436B and E are installed within PFS-FILT-209 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the LIC through the MPF PFS or the common spare PFS. As such, PDAH-438B and E or PDAH-487B and E will be the units of measure in the event that the exhaust from the LIC is being channeled through any of the other filter units.

(4) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Abbreviations:

%.....percent
AAHH.....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm .....gallons per minute
inwc .....inches of water column
lbs/hr .....pounds per hour
LSHH.....level switch high-high
MPF .....Metal Parts Furnace
PALL .....pressure alarm high-high
PDAH .....pressure differential alarm high
PFS .....Pollution Abatement System Filtration System
PSHH .....pressure switch high-high
PSL .....pressure switch low
RCRA .....Resource Conservation and Recovery Act
SDS.....spent decontamination solution
TAHH .....temperature alarm high-high
2MRA.....2-minute rolling average
°F ..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF..... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL ..... flow alarm low-low
HEPA..... high efficiency particulate air
lbs/2-min..... pounds per 2-minute average
LIC..... Liquid Incinerator
mg/m^3 ..... milligrams per cubic meter
O_2 ..... oxygen
PDAH ..... pressure differential alarm high
PDALL ..... pressure differential alarm low-low
ppm..... parts per million
psig ..... pounds per square inch gauge
PSLL..... pressure switch low-low
ROHA..... rolling hourly average
sgu ..... specific gravity unit
TSLL ..... temperature switch low-low

Table 6-4: Maximum Feed Rates of Secondary Waste to the MPF during Agent Shakedown, Trial Burn, and Post-Trial Burn

Secondary Waste Type	Max Units per Charge	Feed Interval per Charge[1] (min)	Max Weight per Charge (lbs)
Chlorine	---	90	93
Organic Material	---	90	335
Sludge	---	90	---[2]
Embedded Metals	---	90	1,920
BTU value (MM)	4	90	---

Footnotes:
(1) Time required in Zones 1 and 2 or as specified in VI.C.3.j.
(2) Sludge to be fed in containment pans, spread to a depth no greater than 1.5 inches.

Abbreviations:
BTU .....British thermal unit
MM.....million
MPF .....Metal Parts Furnace
lbs .....pounds
min.....minutes

Table 6-5: Maximum Munition Feed Rates to the MPF during Agent Shakedown, Trial Burn, and Post-Trial Burn

Munition Type	Agent Type	Max Units per Tray	Feed Interval per Tray[a] (min)	Max Weight per Tray[b] (lbs)	Maximum Feed Rate (lbs/hr)[d]		
					VX	GB	HD/HT
M121A1 Proj., 155MM	VX	48	35	16.5	28.3	---	---
M121A1/M122 Proj., 155MM[c]	GB	48	35	---	---	148	---
M426 Proj., 8-inch	GB	27	35	---	---	148	---
M360 Proj., 105MM	GB	96	35	---	---	148	---
M2/M2A1 Proj., 4.2-inch (Condition 1 – proposed)	HD/HT	96	25	83.5	---	---	200.4
M2/M2A1 Proj., 4.2-inch (Condition 2 – 75% demonstrated)	HD/HT	96	60	540.9	---	---	600
M60 Proj., 105MM	HD	96	68	285	---	---	251.5
M110 Proj., 155MM	HD	48	80	562	---	---	421.5
Ton Container	HD	1	125	0 to ≤ 220	---	---	105.6
Ton Container	HD	1	140	>220 to ≤ 450	---	---	192.9
Ton Container	HD	1	165	>450 to ≤ 600	---	---	218.2

Footnotes:
(a) Time required in Zones 1 and 2 or as specified in VI.C.3.k.
(b) Agent only, does not include the weight of the base, tray, or munition bodies.
(c) Not to exceed 25% agent heel per munition. Permit Condition VI.C.2 feed rates shall also apply.
(d) The feedrates listed in this table are the intended limits to be demonstrated during the associated agent trial burns. AWFCO limitations are contained in Table 6-7. The instantaneous Maximum Feed Rate in pounds per hour is calculated by Max Weight per Tray (lbs) x 1 tray/feed interval (min) x 60 min/hr.

Abbreviations:
--- ..... not applicable
lbs ..... pounds
min ..... minutes
MPF ..... Metal Parts Furnace
% ..... percent
lbs/hr ..... pounds per hour
MM ..... millimeter

Table 6-6: Maximum Metals and Chlorine/Chloride Feed Rates to the MPF during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	312(1)
Antimony	0.9262(2)
Arsenic	0.2856(2)
Barium	11.37(2)
Beryllium	0.0167(2)
Boron	2.037(2)
Cadmium	5.862(2)
Chromium	3.277(2)
Cobalt	0.0418(2)
Copper	2.050(2)
Lead	20.51(2)
Manganese	0.7416(2)
Mercury	0.0583(2)
Nickel	5.862(2)
Phosphorus	60.8
Selenium	0.0508(2)
Silver	0.7323(2)
Thallium	0.0083(2)
Tin	0.1733(2)
Vanadium	0.0167(2)
Zinc	0.3702(2)

Footnotes:
(1) Maximum chlorine feed rate for munitions. Secondary waste chlorine maximum feed rates per Table 6-4 is 93 lbs/WIC.
(2) Feed Rates do not include embedded metal from such items as munition bodies.

Abbreviations:
lbs .....pounds
lbs/hr.....pounds per hour
MPF.....Metal Parts Furnace
ROHA.....rolling hourly average
WIC .....waste incineration container

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-01	TAHH-152	Primary Chamber Zone 1 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-02	TALL-152	Primary Chamber Zone 1 Temperature Low-Low [2]	1,175 ° F	1,175 ° F	1,125 ° F	1,000 ° F
MPF-03	TAHH-141	Primary Chamber Zone 2 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-04	TALL-141	Primary Chamber Zone 2 Temperature Low-Low [2]	1,175 ° F	1,175 ° F	1,125 ° F	1,000 ° F
MPF-05	TAHH-153	Primary Chamber Zone 3 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-06	TALL-153	Primary Chamber Zone 3 Temperature Low-Low [2]	1,175° F	1,175° F	1,125 ° F	1,000 ° F
MPF-07	TAHH-87	Afterburner Temperature High-High	2,250 ° F	2,150 ° F	2,150 ° F	2,150 ° F
MPF-08	TSLL-87	Afterburner Temperature Low-Low	1,772 ° F	1,772 ° F	1,720 ° F	1,600 ° F
MPF-09	PSHH-34	Primary Chamber Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-10	PSHH-390	Afterburner Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-11	PDAHH-786	Afterburner Flue Gas Flow Rate High-High	0.5 inwc	0.5 inwc	0.5 inwc	1.5 inwc
MPF-12	AAHH-384C	Exhaust Blower Duct Flue Gas CO Level High-High	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA
MPF-13	AAHH-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis	15% dry basis
MPF-14	AALL-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis	3% dry basis
MPF-15	Programmed Feed Permissive	Munitions Feed Rate High	Condition 1: 220 lbs/hr Condition 2: 704 lbs/hr	16.5 lbs/tray	300 lbs/hr [M426 Proj., 8-inch (GB)]	730 lbs/hr Surrogate
		Secondary Waste Feed Rate High	Chlorine: 93 lbs/ WIC Organic Material: 335 lbs/WIC Sludge: 1.5 inches in containment pan Embedded Metals: 1,920 lbs/WIC BTU: 4.0 MM/WIC			3,300 lbs/hr SWLM

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-16	PDALL-222	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc	18 inwc
MPF-17	FALL-218	Venturi Scrubber Brine Flow Rate Low-Low	130 gpm with 10-second delay	130 gpm with 10-second delay	130 gpm with 10-second delay	126 gpm with 30-second delay
MPF-18	DAHH-216	Venturi Scrubber Brine Density High-High	1.24 sgu	1.10 sgu	1.28 sgu	1.28 sgu
MPF-19	FALL-248	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm	540 gpm
MPF-20	AALL-247	Scrubber Tower pH Low-Low	7.12	7.12	6.5	6.5
MPF-21	BSLL-883 BSLL-884 BSLL-885 BSLL-886 BSLL-887 BSLL-888 BSLL-889 BSLL-890 BSLL-891 BSLL-892	Primary Chamber Flame Loss Low-Low	Zone 1 all burners out or 2 burners out and the zone temperature less than 1,400° F Zone 2 all burners out or 2 burners out and zone temperature less than 1,400° F Zone 3 both burners out or 1 burner out and zone temperature less than 1,400° F.			
MPF-22	TSHH-223	Quench Tower Flue Gas Temperature High- High	215 ° F	215 ° F	215 ° F	215 ° F
MPF-23	PALL-358	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig	25 psig
MPF-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches	219 inches
MPF-25	ACAM-167 ACAM-907	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-26	ACAM-167 ACAM-907	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.00006 mg/m^3 GB	Not Applicable
MPF-27	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-28	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	Not Applicable	0.00006 mg/m^3 GB	Not Applicable

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-29	TAHH-097	PFS Carbon Filter Exhaust Gas Temperature High-High	180 ° F	180 ° F	180 ° F	Not Applicable
MPF-30[3]	PDAH-436B PDAH-438B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
MPF-31[3]	PDAH-436E PDAH-438E PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
MPF-32[5]	ACAM-401A (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-33[5]	ACAM-401-SC (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-34	ACAM-908-SC ACAM-909-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-35	ACAM-908-SC ACAM-909-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3 VX	Not Applicable	Not Applicable
MPF-36	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-37	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006 mg/m^3 VX	Not Applicable	Not Applicable
MPF-38	ACAM-932-SC ACAM-933-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-39	ACAM-932-SC ACAM-933-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-40	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-41	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO(1,4) Setpoints			
			HD/HT ATB	HD/HT ATB	HD/HT ATB	HD/HT ATB
MPF-42	ACAM-401A (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Footnotes:
(1) All values are instantaneous unless otherwise noted.
(2) In the event of an AWFCO, all zone timers will be reset.
(3) Stop feed parameters only apply to the on-line PFS unit. PDAH-438B and E are installed within PFS-FILT-111 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the MPF through the LIC PFS or the common spare PFS. As such, PDAH-436B and E or PDAH-487B and E will be the units of measure in the event that the exhaust from the MPF is being channeled through any of the other filter units.
(4) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).
(5) The ACAMS may be taken off-line during processing in accordance with VI.C.5.d.

Abbreviations:
%..... percent
AAHH..... analyzer alarm high-high
AIT ..... analyzer indicator transmitter
AWFCO..... automatic waste feed cut-off
FAHH ..... flow alarm high-high
gpm ..... gallons per minute
inwc ..... inches of water column
lbs/hr ..... pounds per hour
LSHH..... level switch high-high
MPF ..... Metal Parts Furnace
PALL ..... pressure alarm high-high
PDAH ..... pressure differential alarm high
PFS ..... Pollution Abatement System Filtration System
PSHH..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
SWLM ..... secondary waste-like material
TSLL.....temperature switch low-low
°F.....degrees Fahrenheit
AALL.....analyzer alarm low-low
ANCDF.....Anniston Chemical Agent Disposal Facility
CO.....carbon monoxide
FALL.....flow alarm low-low
HEPA .....high efficiency particulate air
lbs/2-min .....pounds per 2-minute average
LIC .....Liquid Incinerator
mg/m^3.....milligrams per cubic meter
O_2.. .....oxygen
PDAH.....pressure differential alarm high
PDALL.....pressure differential alarm low-low
ppm .....parts per million
psig .....pounds per square inch gauge
PSLL .....pressure switch low-low
ROHA .....rolling hourly average
sgu. .....specific gravity unit
TAHH.....temperature alarm high-high

Table 6-8: Maximum Munition Feed Rates to the DFS during Agent Shakedown, Trial Burn, and Post-Trial Burn

Munition Type	Agent Type	Max Units per Hour	Min Feed Interval (sec)	Maximum Feed Rate (lbs/hr)			
				VX[f]	GB	EXPLOSIVES	PROPELLANTS
M55/56 Rocket	GB	40[a]/14	90[a]/106	---	50[b,c]/149.8	123.5	767.7
M55/56 Rocket	VX	34	---	17	---	108.8	656.2
M121A1 Proj., 155MM	VX	---	---	---	---	635.25	---
M121A1/M122 Proj., 155MM	GB	---	---	---	---	374[d]	---
M426 Proj., 8-inch	GB	---	---	---	---	416.1	---
M360 Proj., 105MM	GB	---	---	---	---	337[d]	---
M2/M2A1 Proj., 4.2-inch	HD/HT	[g]	[g]	---	---	[g]	---
M60 Proj., 105MM	HD	[g]	[g]	---	---	[g]	---
M110 Proj., 155MM	HD	[g]	[g]	---	---	[g]	---
M23 Landmine	VX	60[e]	60[e]	31.5[e]	---	58[e]	---
Explosive Contaminated Solids	---	---	---	17/31.5[e]	149.8	123.5	767.7
Explosive Contaminated Sludges	---	---	---	17/31.5[e]	105.8	123.5	767.7

Footnotes:

(a) Feed rate of drained or gelled rockets during GB agent shakedown and trial burn (drained/gelled). M55 rockets that are suspected to be gelled (based on inventory of lot numbers) shall not be fed to the DFS during the post-trial burn condition.

(b) Maximum feed rate during agent shakedown and trial burn periods of the drainable rocket condition shall be 50 lbs/hr. Maximum feed rate during agent shakedown and trial burn periods of the gelled rocket condition shall be 149.8 lbs/hr.

(c) Maximum post-trial burn feed rate for all conditions shall be limited by Condition VI.D.2.

(d) TNT equivalent.

(e) Should a VX ATB need to be re-conducted with an insufficient inventory of M55 rockets, the M23 landmines will be utilized for retesting purposes. If a M23 landmine contingency ATB is not necessary, an additional DFS VX DRE landmine ATB will be performed to re-establish a munition and VX agent feed rate using M23 landmines.

(f) Agent weight only.

(g) Mustard agents HD/HT will not be fed to the DFS during the HD/HT trial burn operations. If mustard contaminated components are encountered, they will be treated within the DFS kiln at sufficient time and temperature requirements as to ensure 5X decontamination is achieved in accordance with VII.D.4.k.

Table 6-8: Maximum Munition Feed Rates to the DFS during Agent Shakedown, Trial Burn, and Post-Trial Burn (continued)

Abbreviations:

--- ..... not applicable
DFS ..... Deactivation Furnace System
sec ..... seconds
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
TNT ..... trinitrotoluene

Table 6-9: Maximum Metals and Chlorine/Chloride Feed Rates to the DFS during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	88.3
Antimony	1.132(1)
Arsenic	0.2005(1)
Barium	6.154(1)
Beryllium	0.0051(1)
Boron	11.526(1)
Cadmium	3.190(1)
Chromium	1.856(1)
Cobalt	0.0246(1)
Copper	0.2933(1)
Lead	19.36(1)
Manganese	0.2509(1)
Mercury	0.0036(1)
Nickel	3.331(1)
Phosphorus	33.12
Selenium	0.0344(1)
Silver	0.0138(1)
Thallium	0.0069(1)
Tin	0.1341(1)
Vanadium	0.0344(1)
Zinc	0.6869(1)

Footnote:
(1) Feed rates do not include embedded metal from such items as munition bodies.

Abbreviations:
lbs/hr.....pounds per hour
DFS.....Deactivation Furnace System
ROHA.....rolling hourly average

Table 6-10: DFS AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-01	TAHH-182	Rotary Kiln Temperature High-High	(5)	1,650° F	1,650° F	1,950° F
DFS-02	TALL-182	Rotary Kiln Temperature Low-Low	(5)	965° F	950° F	950° F
DFS-03	TAHH-92	Afterburner Temperature High-High	(5)	2,160° F	2,160° F	2,160° F
DFS-04	TALL-92	Afterburner Temperature Low-Low	(5)	1,850° F	1,850° F	1,850° F
DFS-05	PSHH-204	Rotary Kiln Pressure High-High	(5)	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay
DFS-06	PAH-65	Afterburner Pressure High	(5)	-0.1 inwc	-0.1 inwc	-0.1 inwc
DFS-07	PDAH-813	Afterburner Flue Gas Flow Rate High	(5)	1.0 inwc	1.0 inwc	1.0 inwc
DFS-08	AAHH-59C	Exhaust Blower Duct Flue Gas CO Level High-High	(5)	100 ppm, 7% O_2 dry basis ROHA	100 ppm, 7% O_2 dry basis ROHA	100 ppm, 7% O_2 dry basis ROHA
DFS-09	AAHH-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	(5)	15% dry basis	15% dry basis	15% dry basis
DFS-10	AALL-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	(5)	3% dry basis	3% dry basis	3% dry basis
DFS-11	TALL-184	DC (Upper) Temperature Low-Low	Not Applicable [4]	1,000° F	1,000° F	1,000° F
DFS-12	TALL-42	DC (Lower) Temperature Low-Low	Not Applicable [4]	1,000° F	1,000° F	1,000° F
DFS-13	PLC Software	Munitions Feed Rate High-High	(5)	Rockets 19 lbs/hr and/or 36 rockets/hr Mines 34.7 lbs/hr and/or 66 mines/hr	Condition 1 40 Rockets/hr (M55) or 50 lbs/hr Condition 2 14 Rockets/hr (M55) or 149.8 lbs/hr	382.0 lbs/hr
DFS-14	PDALL-08	Venturi Scrubber Pressure Differential Low-Low	(5)	25 inwc	25 inwc	18 inwc
DFS-15	FAL-06	Venturi Scrubber Brine Flow Rate Low	(5)	300 gpm with 10 second delay	300 gpm with 10 second delay	275 gpm with 30 second delay
DFS-16	DAHH-33	Venturi Scrubber Brine Density High-High	(5)	1.20 sgu	1.28 sgu	1.28 sgu
DFS-17	FALL-30	Scrubber Tower Clean Liquor Flow Rate Low-Low	(5)	1,635 gpm	1,635 gpm	1,575 gpm
DFS-18	AALL-34	Scrubber Tower pH Low-Low	(5)	7.48	6.5	6.5
DFS-19	TAHH-51A/B/C/D/E	Rotary Kiln Shell Temperature High-High	(5)	1,600° F	1,600° F	1,600° F

Table 6-10: DFS AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-20	SAHH-602	Rotary Kiln Rotational Speed High-High	(5)	2 rpm	2 rpm	2 rpm
DFS-21	SALL-602	Rotary Kiln Rotational Speed Low-Low	(5)	0.33 rpm	0.33 rpm	0.33 rpm
DFS-22	XS-58/821	DC Operation (jam)	Not Applicable [4]	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-23	SAL-57	DC Operation (no motion)	Not Applicable[4]	No motion	No motion	No motion
DFS-24	XS-207/209	Feed Chute Operation	(5)	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-25	TSHH-01	Quench Tower Flue Gas Temperature High-High	(5)	215° F	215° F	215° F
DFS-26	PALL-344	Scrubber Tower Clean Liquor Pressure Low-Low	(5)	25 psig	25 psig	25 psig
DFS-27	LSHH-02/06	Brine Surge Tanks Level High-High	(5)	219 inches	219 inches	18 feet 3 inches
DFS-28	ACAM-297	Chemical Agent Emissions High-High Instantaneous (Cyclone Enclosure)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-29	ACAM-183 ACAM-910-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable
DFS-30	ACAM-183 ACAM-910-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-31	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable
DFS-32	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-33	TAHH-430	PFS Carbon Filter Exhaust Gas Temperature High-High	(5)	180° F	180° F	Not Applicable
DFS-34	PDAH-436B PDAH-438B PDAH-440B PDAH-442B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	(5)	5 inwc	5 inwc	Not Applicable
DFS-35	PDAH-436E PDAH-438E PDAH-440E PDAH-442D PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	(5)	5 inwc	5 inwc	Not Applicable

TABLE 6-10: DFS AWFCO PARAMETERS DURING SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN (CONTINUED)

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-36	ACAM-365	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable

Footnotes:

(1) All values instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAH-440B and E and PDAH-442B and E are installed within PFS-FILT-111 and -112 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the DFS through any of the PFS units. As such, PDAH-436B and E, PDAH-438B and E, or PDAH-487B and E will be the units of measure in the event that the exhaust from the DFS is being channeled through any of the other filter units.

(3) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).

(4) The Discharge Conveyor will not be heated during the mustard campaign, but shall remain heated during both the GB and VX campaigns. Mustard contaminated components within the kiln will be processed for greater than 15 minutes at 1000° F.

(5) HD/HT ATB AWFCO Parameters are listed in Table 7-9 as the DFS will not conduct agent trial burn operations for HD/HT.

Abbreviations:

%..... percent
AAHH ..... analyzer alarm high-high
AIT ..... analyzer indicator transmitter
AWFCO... automatic waste feed cut-off
FAHH ..... flow alarm high-high
gpm..... gallons per minute
inwc ..... inches of water column
lbs/hr..... pounds per hour
LSHH..... level switch high-high
MPF..... Metal Parts Furnace
PALL ..... pressure alarm high-high
PDAH ..... pressure differential alarm high
PFS ..... Pollution Abatement System Filtration System
PSHH..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
TAHH ..... temperature alarm high-high
°F..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF ... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL..... flow alarm low-low
HEPA ..... high efficiency particulate air
lbs/2-min . pounds per 2-minute average
LIC ..... Liquid Incinerator
mg/m^3..... milligrams per cubic meter
O_2..... oxygen
PDAH..... pressure differential alarm high
PDALL.... pressure differential alarm low-low
ppm..... parts per million
psig..... pounds per square inch gauge
PSLL ..... pressure switch low-low
ROHA ..... rolling hourly average
sgu..... specific gravity unit
TSLL ..... temperature switch low-low

MODULE VII: INCINERATION – NORMAL OPERATION

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MODULE VII: INCINERATION - NORMAL OPERATION

Three types of incinerators are used to deactivate and destroy the components of the waste generated from the CSDP – LIC, MPF, and DFS. All of these incinerators are new and each one is provided with a PAS. One exhaust stack is shared by the LIC, MPF, and DFS (hereafter referred to as "common stack").

Liquid chemical agents drained from munitions, liquid laboratory wastes, and SDS are incinerated in the LIC. Explosives, propellants, and explosive contaminated solids and sludges are incinerated in the DFS. In general, metal parts and a variety of secondary waste streams are decontaminated and detoxified in the MPF.

This module covers the incineration normal operation periods. For clarity, this module is organized as follows:

- Section VII.A. - Conditions applicable to all incinerators
- Section VII.B. - Liquid Incinerator
- Section VII.C. - Metal Parts Furnace
- Section VII.D. - Deactivation Furnace System
- Section VII.E. - Combined Stack for the LIC, MPF, and DFS

VII.A. GENERAL CONDITIONS FOR ALL INCINERATORS AT THE ANCDF SITE

1. Requirements for Entering Normal Operation

Prior to commencing normal operations provided for in Module VII, all requirements provided in Module VI shall have been met by the Permittee and approved by the Department, the trial burn results and the HRA provided for in Condition II.N. shall have been evaluated and approved by the Department, and the applicable numerical values represented with an asterisk (*) in the conditions and tables of Module VII shall have been established.

2. Limitation on Waste Feed

The Permittee shall not incinerate any chemical agent, or any waste containing the chemical agent, in which treatment has not been successfully demonstrated through a chemical agent trial burn IAW Module VI.

3. Inspection Requirements

a. The Permittee shall inspect each incinerator IAW the Inspection Schedule (see Section III F-2 of the Application).

b. The inspection data for each incinerator shall be recorded, and the records shall be placed in the operating record for the respective incinerator IAW Condition II.I.

4. **Monitoring Requirements**

a. Upon receipt of a written request from the Department, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established achieve the performance standards delineated in this Permit.

b. All monitoring, recording, maintenance, calibration, and test data shall be recorded and the records for each incinerator shall be placed in the operating record for each respective incinerator IAW Condition II.I.

c. The Permittee shall calibrate the O_2 and CO CEMS specified in this Permit IAW the Performance Specifications for Continuous Emission Monitoring Systems referenced by AAC 335-3-11-.06[56].

5. **Reporting**

a. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced with HCl and chemical agent stack gas monitors and, (for periods in which such ambient air monitoring was required), ambient air mustard agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

i. Identification of the monitor experiencing the problem;

ii. Identification of the type of problem (e.g., borderline or deficient recoveries);

iii. Date problem experienced;

iv. Frequency of problem; and

v. Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

b. The Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW VII.A.4.c. within 60 calendar days of the date of the tests.

c. A quarterly report as defined below will be submitted to the Director each calendar quarter within 30 days following the end of the quarter. The report will include the following information (all times in hours) (operating time does not include standby):

i. Total operating time since introduction of agent in device,

ii. Operating time in quarter (by Month, which is defined as rolling 12 month total),

iii. Date/time of all startups and shutdowns,

iv. Date/time/duration/cause/corrective action taken for all shutdowns caused by malfunction of either process or control equipment,

v. Date/time/duration/cause/corrective action taken for all instances of waste feed cut-off,

vi. A calculation of the site specific upset factor(s) derived from ANCDF facility operating data using the methodology described by the Risk Assessment Protocol. The value of the site specific upset factor shall be compared to that value used in the Preliminary Risk Assessment (PRA) Report. If the actual facility upset factor is greater than that value used in the PRA Report, than a RAA shall also be submitted to the Department which describes any potential increase in risk.

6. Closure

At closure, the Permittee shall follow the procedures in the Closure Plan, Section III I of the Application as revised IAW Condition II.J.3.

7. Recording

a. The Permittee shall record and maintain, in the operating record for each incinerator, all monitoring and inspection data compiled under the requirements of Condition II.I.

b. The Permittee shall record in the operating record the date, time, and duration of all AWFCOs, including the triggering parameters, reason for the deviation, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the AWFCO function failures, including the corrective measures taken to correct the condition that caused the failure.

VII.B. LIQUID INCINERATOR

The LIC shall be used to burn liquid wastes. The LIC is provided with a PAS that includes a quench tower, venturi scrubber, packed-bed scrubber tower, clean liquor air coolers, demister, gas-fired reheater, and carbon bed filter. Both combustion chambers of the LIC are refractory-lined and are equipped with natural gas burners which are used to preheat and to maintain the required combustion temperature in each chamber while burning the liquid wastes. The stack emissions shall be monitored for the presence of chemical agents and other emissions. The LIC shall shut down automatically when the monitor detects the presence of chemical agent at the ASC level, see Condition VII.B.2.g.

1. Maintenance

a. All process monitors required, pursuant to Condition VII.B.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.B.4.

b. The Permittee shall test all process monitoring and control instrumentation for the LIC IAW the design plans in Section III D-5 of the Application, specifications approved by the Department, and IAW the calibration, performance specifications, and maintenance procedures contained in Table 7-3 prior to treating hazardous waste in the LIC.

c. Modifications to the design plans and specifications in the Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the LIC such that, when operated IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.B.2.a. through g.

e. All air pollution control devices and capture systems for which this Permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

2. <u>Performance Standards</u>

a. The LIC must achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emission from the LIC shall not exceed 5.99E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the LIC as specified in Condition VII.B.3.c.

d. The following metal emission rates from the LIC shall not be exceeded:

Antimony	6.44E-05 g/s	Arsenic	9.73E-05 g/s
Barium	6.44E-05 g/s	Beryllium	1.29E-05 g/s
Boron	1.70E-03 g/s	Cadmium	1.61E-05 g/s
Chromium	1.88E-05 g/s	Cobalt	3.22E-05 g/s
Copper	3.22E-05 g/s	Lead	1.98E-04 g/s
Manganese	2.47E-03 g/s	Mercury	3.08E-05 g/s

Nickel	3.22E-05 g/s	Phosphorous	2.54E-03 g/s
Selenium	3.30E-05 g/s	Silver	6.44E-05 g/s
Thallium	6.44E-06 g/s	Tin	1.22E-04 g/s
Vanadium	3.83E-05 g/s	Zinc	9.96E-04 g/s

The above emission limits shall be met by limiting the feed rate of each metal into the LIC as specified in Condition VII.B.3.c.

e. The following emission rates from the LIC shall not be exceeded:

HCl	5.99E-03 g/s	Cl_2	5.99E-03 g/s
HF	1.21E-02 g/s	Tetra CDD	3.32E-11 g/s
Penta CDD	1.66E-10 g/s	Hexa CDD	4.98E-10 g/s
Hepta CDD	1.66E-10 g/s	Octa CDD	3.32E-10 g/s
Tetra CDF	4.81E-11 g/s	Penta CDF	3.32E-10 g/s
Hexa CDF	6.64E-10 g/s	Hepta CDF	4.68E-10 g/s
Octa CDF	3.32E-10 g/s	Benzene	1.36E-04 g/s
Vinyl Chloride	1.82E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the LIC.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the LIC using an ACAMS installed in the duct work feeding the common stack. The emission levels shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. Compliance with the operating conditions specified in Condition VII.B.4., shall be regarded as compliance with the required performance standards

identified in Conditions VII.B.2.a. through g. However, if it is determined during the effective period of this Permit that compliance with the operating conditions in Condition VII.B.4. is not sufficient to ensure compliance with the performance standards specified in Conditions VII.B.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. Limitation on Waste Feed

a. Except during the short-term periods specified in Conditions VI.B. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate the hazardous wastes in the LIC, as specified in Table 7-1, in compliance with the operating requirements specified in Condition VII.B.4.

b. The SDS and laboratory aqueous liquid waste shall be fed only into the secondary combustion chamber of the LIC with, or without, the chemical agent feed to the LIC primary combustion chamber.

c. The feed rates of metal and chlorine to the LIC based on a ROHA shall not exceed the following limits:

Antimony	0.4577 lbs/hr	Arsenic	0.0865 lbs/hr
Barium	0.0693 lbs/hr	Beryllium	0.0229 lbs/hr
Boron	4.655 lbs/hr	Cadmium	0.0229 lbs/hr
Chromium	0.0343 lbs/hr	Cobalt	0.0286 lbs/hr
Copper	0.1264 lbs/hr	Lead	2.928 lbs/hr
Manganese	0.1020 lbs/r	Mercury	0.0179 lbs/hr
Nickel	0.0696 lbs/hr	Phosphorus	243.2 lbs/hr
Selenium	0.0347 lbs/hr	Silver	0.3647 lbs/hr
Thallium	0.2286 lbs/hr	Tin	0.8686 lbs/hr
Vanadium	0.0347 lbs/hr	Zinc	0.8524 lbs/hr
Chlorine	519.0 lbs/hr		

d. The Permittee shall conduct sufficient analysis of the waste treated in the LIC to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

e. Only one chemical agent shall be fed to the LIC, at any given time.

4. Operating Conditions

a. During normal operations, the Permittee shall operate the LIC in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-3.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-2, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 7-2 based on the agent type being processed.

c. The Permittee shall not burn chemical agent in the primary combustion chamber of the LIC until the primary and secondary combustion chambers are within the operating parameters in Conditions VII.B.4.a. and b.

d. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the LIC until agent concentration within the LIC primary chamber room is below 1 ASC.

5. <u>Monitoring Requirements</u>

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-2 and 7-3, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the LIC if any of the monitoring instruments listed in Tables 7-2 and 7-3 fail to operate properly.

6. <u>Waste Feed Cut-Off Requirements</u>

a. The Permittee shall operate the systems, specified in Table 7-2, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 7-2. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 7-2, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.B.4. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.B.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-2 for the LIC is activated greater than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the

Department the information required in Condition VII.A.7.b. by the close of the following business day.

VII.C. METAL PARTS FURNACE

The MPF treats projectiles, bulk items, and a variety of secondary waste IAW Section III C-2 of the Application. No explosives are fed to the MPF. The MPF is a direct-fired, roller-hearth furnace with an afterburner. The chemical agent-contaminated metals parts or munitions and bulk items containing chemical agent are placed on trays and conveyed through the heated furnace to be detoxified of chemical agents. Secondary waste is placed on trays, WICs, and/or containment devices and conveyed through the furnace for thermal treatment. The vaporized chemical agents from the metal parts undergo thermal destruction in the furnace and the afterburner. The PAS is of similar design to that of the LIC, and is comprised of a quench tower, venturi scrubber, packed scrubber tower, clean liquor air coolers, demister, gas-fired reheater, and carbon bed.

1. Maintenance

a. All process monitors required, pursuant to Condition VII.C.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.C.4.

b. The Permittee shall test all process monitoring and control instrumentation for the MPF IAW the design plans in Section III D-6 of the Application, specifications approved by the Department, and IAW the calibration, performance specifications and maintenance procedures contained in Table 7-7 prior to treating hazardous waste in the MPF.

c. Modifications to the design plans and specifications in the ANCDF Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the MPF such that, when operated IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.C.2.a. through g.

2. Performance Standards

a. The MPF shall achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emissions from the MPF shall not exceed 8.18 E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the MPF as specified in Condition VII.C.3.b.

d. The following metal emission rates from the MPF shall not be exceeded:

Antimony	1.19 E-04 g/s	Arsenic	8.52 E-05 g/s
Barium	2.95 E-04 g/s	Beryllium	2.38 E-05 g/s
Boron	2.29 E-03 g/s	Cadmium	7.30 E-05 g/s
Chromium	8.62 E-05 g/s	Cobalt	5.95 E-05 g/s
Copper	5.95 E-05 g/s	Lead	1.82 E-04 g/s
Manganese	1.57 E-03 g/s	Mercury	4.29 E-05 g/s
Nickel	1.46 E-04 g/s	Phosphorous	1.16 E-03 g/s
Selenium	7.23 E-05 g/s	Silver	1.19 E-04 g/s
Thallium	1.19 E-05 g/s	Tin	1.19 E-04 g/s
Vanadium	2.38 E-05 g/s	Zinc	2.09 E-04 g/s

The above emission limits shall be met by limiting the feed rate of each metal into the MPF as specified in Conditions VII.C.3.b.

e. The following emission rates from the MPF shall not be exceeded:

HCl	8.18 E-03 g/s	Cl_2	2.58 E-02 g/s
HF	1.93 E-02 g/s	Tetra CDD	9.17 E-11 g/s
Penta CDD	4.58 E-10 g/s	Hexa CDD	4.58 E-10 g/s
Hepta CDD	4.58 E-10 g/s	Octa CDD	9.77 E-10 g/s
Tetra CDF	9.17 E-11 g/s	Penta CDD	7.64 E-10 g/s
Hexa CDF	1.20 E-09 g/s	Hepta CDD	2.28 E-09 g/s
Octa CDF	1.36 E-09 g/s	Benzene	3.16 E-04 g/s
Vinyl Chloride	5.66 E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the MPF.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the MPF using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. Compliance with the operating conditions specified in Condition VII.C.4., shall be regarded as compliance with the required performance standards identified in Conditions VII.C.2.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Conditions VII.C.4., is not sufficient to ensure compliance with the performance standards specified in Conditions VII.C.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. Limitation on Waste Feed

a. Except during the short-term periods specified in Conditions VI.C. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate the following hazardous wastes in the MPF, as specified in Tables 7-4 and 7-5, in compliance with the operating requirements specified in Condition VII.C.4.

b. The feed rates of metal and chlorine to the MPF based on a ROHA shall not exceed the following limits:

Antimony	0.9262 lb/hr	Arsenic	0.2856 lb/hr
Barium	11.37 lb/hr	Beryllium	0.0167 lb/hr
Boron	2.037 lb/hr	Cadmium	5.862 lb/hr
Chromium	3.277 lb/hr	Cobalt	0.0418 lb/hr
Copper	2.050 lb/hr	Lead	20.51 lb/hr
Manganese	0.7416 lb/hr	Mercury	0.0583 lb/hr
Nickel	5.862 lb/hr	Phosphorous	60.8 lb/hr
Selenium	0.0508 lb/hr	Silver	0.7323 lb/hr
Thallium	0.0083 lb/hr	Tin	0.1733 lb/hr
Vanadium	0.0167 lb/hr	Zinc	0.3702 lb/hr
Cl_2	312.0 lb/hr		

c. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the MPF to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

d. The hourly feed rate of the residual chemical agent contained in the MPF feed, which was calculated based on the estimated drain from each munition type and from the amount of chemical agent in the munitions, shall not exceed the limits provided in Table 7-6 and Condition VII.C.3.a., unless the following conditions are met:

i. The Permittee has provided the Department verbal notice of the following:

(I) The detection of a munition/ton container that cannot be drained to below the maximum feed rates as set forth in Table 7-6, indicating its type and its location (i.e., process line leading to furnace, temporary holding location).

(II) The amount of chemical agent heel remaining in the munition.

(III) Efforts expended to facilitate additional draining of the munition.

ii. The Permittee has provided the Department written procedures for processing of the munition that cannot be drained below the maximum feed rates as set forth in Table 7-6. These procedures must be consistent with the following:

(I) The temperature and residence time in Zones 1, 2, and 3 shall be specified based on the development of a vaporization curve and calculations for the munition type and the quantity and type of residual chemical agent remaining. The supporting vaporization curve and calculations shall be provided with the procedures to the Department.

(II) The temperature maintained in the afterburner shall be IAW Table 7-6 and Condition VII.C.3.a.

iii. The Permittee receives approved procedures from the Department for processing the munition that cannot be drained below the maximum feed rates as set forth in Table 7-6.

e. Trays/WICs/containment devices containing secondary waste shall be prepared IAW limits in Condition VII.3.a. In addition, they shall comply with the following requirements:

i. Each tray/WIC/containment device shall contain only one type of waste (e.g., metal parts, wood, PPE, absorbent materials, sludge, etc.), or

ii. If waste types are combined in a single tray/WIC/containment device;

(I) Bulk metal shall be considered to be a metal item with less than 10% combustible material or aluminum integrated into the piece.

(II) Rubblized concrete, refractory, and scabbled concrete shall be processed in WIC's containing pans and heat transfer fins, and shall be filled to a maximum depth of 7 inches.

(III) Sludge shall be processed in trays/WICs/containment devices to a depth no greater than 1.5 inches and shall not be fed in combination with any other waste.

(IV) Bulk combustible waste is any combustible waste that is not polyethylene, polystyrene, or halogenated plastic. When WICs are used to process bulk combustibles, metal pans shall be placed in the WICs and,

1. Waste shall be placed in the WIC loosely packed in plastic bags or spread evenly in the WIC. Wastes shall not be rolled or bunched.

2. Wood and other dense combustible items shall be placed towards the top of loaded WICs.

3. Toxicological agents protective (TAP) gear and Life Support System (LSS) air hoses shall not be processed together in the same WIC.

4. M-40 masks shall be limited to one (1) mask per WIC.

5. M-40 respirator cartridges shall be limited to 2 cartridges per WIC unless the cartridges are opened, exposing the cartridge interior prior to loading.

(V) All non-munition wastes that envelop an interior space (e.g., gauges, cans, escape air tanks, overpacks, glassware, etc.) must be opened or punctured before being placed in the MPF.

iii. The Permittee shall prepare an inventory/feed sheet of all secondary waste contents in each tray/WIC/containment device; to contain an inventory of each waste type, including weight, Btu value of each waste type, chlorine, and metal contents.

f. Munitions and secondary waste shall not be fed to the MPF at the same time.

g. In the event of a low temperature related AWFCO while processing trays/WICs/containment devices in the primary chamber of the MPF, forward zone movement of trays/WICs shall be governed as follows:

i. Trays containing ton containers, or WICs containing bulk combustibles (defined as any combustible waste that is not polyethylene, polystyrene or halogenated plastics), or bulk wastes containing interior or enveloping spaces (i.e., pumps, gauges) will either be held in position, moved forward to the MPF Discharge Airlock awaiting return to the furnace to complete the necessary treatment cycle, or returned to the charge airlock or lower munitions corridor awaiting return to the furnace for treatment.

ii. Trays containing munitions or WICs containing secondary waste other than those identified in VII.C.3.g.i above will be assessed in accordance with the treatment requirements identified in Tables 7-4 and 7-5 for the respective waste or munition type. Trays/WICs that have completed the entirety of the residence time identified in Tables 7-4 and 7-5, regardless of the Zone in which the treatment occurred, will be transferred to the MPF Discharge Airlock for monitoring and discharge in accordance with this Permit. Trays/WICs that have not completed the required residence times will be managed in accordance with the requirements specified in VII.C.3.g.i above.

When furnace conditions are returned to operating parameters listed in Table 7-6, all zone timers shall be reset to zero (0) and no forward zone movement shall occur until the residence times listed in Tables 7-4 and 7-5 are completed.

h. In the event of an ACAMS alarm in the MPF Cool-Down Conveyor Enclosure, the Permittee shall immediately:

i. Cease hazardous waste feed into the charge airlock and out of the discharge airlock of the MPF.

ii. Automatically secure the cool-down enclosure louvered discharge fans.

iii. Secure the enclosure area doors.

iv. Vent the enclosure through ducting into the LIC 1 Secondary Room and thus through the MDB HVAC.

v. Analyze DAAMS from all monitoring stations within the Cool-Down Conveyor Enclosure for the time period up to and including the ACAMS alarm, and

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then waste feed may be restarted upon return to the operating parameters listed in Table 7-6.

(II) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VII.3.h.v.(II) and upon return to operating parameters listed in Table 7-6.

vi. Identify the tray/WIC/containment device that initiated the alarm and return it to the MPF for further treatment or overpack and process through the TMA.

i. Only one chemical agent munition type shall be fed to the MPF, at any given time.

4. <u>Operating Conditions</u>

a. During normal operations, the Permittee shall operate the MPF in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-7.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-6, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoints specified in Table 7-6 based on the agent type being processed.

c. Only one loaded tray containing the waste materials shall be fed into the MPF at any given time, with a minimum interval between each tray feed as specified in Condition VII.C.3.a.

d. The Permittee shall not burn chemical agent in the primary combustion chamber of the MPF until the primary chamber and afterburner are within the operating parameters in Conditions VII.C.4.a. and b.

e. During startup, with the afterburner temperature less than 1,400° F, the Permittee shall not burn fuel in or purge the primary chamber of the MPF until agent concentration within the MPF primary chamber room is below 1 ASC.

5. **Monitoring Requirements**

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-6 and 7-7, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the MPF if any of the monitoring instruments listed in Tables 7-6 and 7-7 fails to operate properly.

6. **Waste Feed Cut-Off Requirements**

a. The Permittee shall operate the systems, specified in Table 7-6, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoint specified in Table 7-6. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 7-6, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until all parameter(s) which caused the waste feed cut-off or lock-out is/are restored to within the permit limits and all other parameters are also within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.C.4., unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.C.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-6 for the MPF is activated more than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the Department the information required in Condition VII.A.7.b. by the close of the following business day.

e. During the shakedown, trial burn, and post-trial burn periods, the ACAMS monitoring the exhaust from the Metal parts Furnace Cool-Down Conveyor Enclosure (MPF-32 and MPF-33) may be operated as follows:

i. During the treatment of munitions or waste, the ACAMS may be taken off-line to perform maintenance or calibration under the following conditions:

I. No waste will be discharged from the MPF Discharge Airlock while the ACAMS are off-line.

II. Secondary waste meeting the definition of sludge has not been discharged from the MPF during a 1-hour period prior to taking the ACAMS off-line, and

III. No waste will be removed from the Cool-Down Conveyor Enclosure until the ACAMS has been returned to service and has been in operation for a period of at least 15-minutes.

ii. If the maintenance or calibration activities fail to return the ACAMS to service within two hours of taking the instrument off-line, no additional feed will be charged to the MPF until such time as the ACAMS has been returned to service.

7. <u>Closure</u>

a. All scabbling of concrete outside the MPF area must be completed and processed before securing the MPF.

b. The facility shall certify to the Department in writing that all agent contaminated materials such as filters, scabbled concrete, secondary waste, which require decontamination in the MPF according to the closure plan, have been processed, and obtain written Departmental concurrence with this certification, prior to MPF final shutdown.

c. The facility shall notify the Department in writing once the MPF has been dismantled and the ability to process waste on site is no longer available. Shipping of any demolition waste that does not meet the disposal requirements in the WAP must have written Departmental approval before being shipped off-site.

VII.D. DEACTIVATION FURNACE SYSTEM

The DFS incinerates fuzes, explosives and propellants from drained rockets, mines and other munitions and explosive contaminated solids and sludges. The DFS consists of a rotary kiln, a cyclone, and an afterburner. The chemical agent-contaminated or noncontaminated, highly reactive and explosive materials are fed into the retort and deactivated while the vaporized chemical agents undergo thermal destruction in the retort as well as in the afterburner. The PAS is of similar design to that of the LIC and MPF, and consists of a quench tower, venturi scrubber, packed scrubber tower, clean liquor air coolers, gas-fired reheater, demister, and carbon bed filter.

1. <u>Maintenance</u>

a. All process monitors required, pursuant to Condition VII.D.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.D.4.

b. The Permittee shall test all process monitoring and control instrumentation for the DFS IAW the design plans in Section D-7 of the ANCDF Application, specifications approved by the Department, and IAW the calibration, performance specifications, and maintenance procedures contained in Table 7-10, prior to handling hazardous waste in the DFS.

c. Modifications to the design plans and specifications in the ANCDF Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the DFS such that when operated, IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.D.2.a. through g.

2. <u>Performance Standards</u>

a. The DFS must achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emissions from the DFS shall not exceed 8.46E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the DFS as specified in Conditions VII.D.3.b.

d. The following metal emission rates from the DFS shall not be exceeded:

Antimony	1.53E-04 g/s	Arsenic	4.41E-05 g/s
Barium	8.82E-05 g/s	Beryllium	6.50E-06 g/s
Boron	1.95E-03 g/s	Cadmium	1.96E-05 g/s
Chromium	5.10E-05 g/s	Cobalt	1.76E-05 g/s
Copper	5.64E-05 g/s	Lead	5.21E-04 g/s
Manganese	4.42E-03 g/s	Mercury	1.54E-05 g/s
Nickel	3.20E-05 g/s	Phosphorous	1.18E-03 g/s
Selenium	4.41E-05 g/s	Silver	1.76E-05 g/s
Thallium	8.82E-06 g/s	Tin	1.80E-04 g/s
Vanadium	4.41E-05 g/s	Zinc	9.45E-04 g/s

The metal emission limits shall be met by limiting the feed rate of each metal into the DFS as specified in Condition VII.D.3.b.

e. The organic emission rates from the DFS shall not be exceeded:

HCl	8.46E-03 g/s	Cl_2	9.09E-03 g/s
HF	1.77E-02 g/s	Tetra CDD	5.71E-11 g/s
Penta CDD	2.85E-10 g/s	Hexa CDD	8.55E-10 g/s
Hepta CDD	6.11E-10 g/s	Octa CDD	1.23E-09 g/s
Tetra CDF	1.87E-10 g/s	Penta CDF	6.10E-10 g/s
Hexa CDF	1.25E-09 g/s	Hepta CDF	7.27E-10 g/s
Octa CDF	5.71E-10 g/s	Benzene	2.30E-04 g/s
Vinyl Chloride	1.37E-05 g/s	Nitroglycerine	3.34E-05 g/s
2,4-Dintirotoluene	1.47E-05 g/s	2,6-Dinitrotoluene	1.47E-05 g/s
2,4,6-Trinitrotoluene	4.04E-05 g/s	Diphenylamine	2.90E-05 g/s
RDX	3.59E-05 g/s	HMX	2.71E-06 g/s

The above emission limits shall be met by limiting the overall feed rate into the DFS.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall, not exceed 100 ppm, dry volume, over a ROHA.

$$Co_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the DFS using an ACAMS installed in the duct work feeding the common stack. The emission levels shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous		0.0003	0.03
	0.0003		

h. Compliance with the operating conditions specified in Condition VII.D.4., shall be regarded as compliance with the required performance standards identified in Conditions VII.D.2.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Conditions VII.D.4., is not sufficient to ensure compliance with the performance standards specified in Conditions VII.D.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. <u>Limitation on Waste Feed</u>

a. Except during the short-term periods specified in Condition VI.D. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate only the hazardous wastes in the DFS, as specified in Table 7-8, in compliance with the operating requirements specified in Condition VII.D.4.

b. The feed rate of metals and chlorine to the DFS based on a ROHA shall not exceed the following limits:

Antimony	1.132 lbs/hr	Arsenic	0.2005 lbs/hr
Barium	6.154 lbs/hr	Beryllium	0.0051 lbs/hr
Boron	11.526 lbs/hr	Cadmium	3.190 lbs/hr
Chromium	1.856 lbs/hr	Cobalt	0.0246 lbs/hr
Copper	0.2933 lbs/hr	Lead	19.36 lbs/hr
Manganese	0.2509 lbs/hr	Mercury	0.0036 lbs/hr
Nickel	3.331 lbs/hr	Phosphorous	33.12 lbs/hr
Selenium	0.0344 lbs/hr	Silver	0.0138 lbs/hr
Thallium	0.0069 lbs/hr	Tin	0.1341 lbs/hr
Vanadium	0.0344 lbs/hr	Zinc	0.6869 lbs/hr
Cl	88.3 lbs/hr		

c. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the DFS to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

d. Only one chemical agent, or waste containing one chemical agent, shall be fed to the DFS, at any given time.

4. **Operating Conditions**

a. During normal operations, the Permittee shall operate the DFS in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-10.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-9, to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints specified in Table 7-9 based on the agent type being processed.

c. The rate of movement to the discharge conveyor shall be controlled during the GB and VX campaigns so as to provide a minimum solid retention time of 15 minutes inside the heated enclosure. Since the discharge conveyor will not be heated during the mustard campaign, this requirement will be met by either reducing the kiln speed or by placing the kiln in oscillation to ensure the treatment cycle is satisfied. This is only required for mustard contaminated components within the kiln.

d. The rocket shear blade shall be sprayed with SDS or PRW at all times when a rocket piece is at the blast gate and the shear blade is in operation; or at all times when a rocket piece is at the blast gate and the gate is jammed. The flow rate of SDS or PRW to the rocket shear blade shall be continuously monitored and recorded during rocket processing operations.

e. A time delay of 30 seconds shall be provided for feeding M55 rocket sections before and after feeding fuses to the DFS, with the exception that the tailfins from the previous rocket and nose plugs can be fed with the fuses.

f. The Permittee shall not burn chemical agent in the rotary kiln of the DFS until the rotary kiln and afterburner are within the operating parameters in Conditions VII.D.4.a. and b.

g. During startup, with the afterburner temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the rotary kiln of the DFS until agent concentration within the DFS rotary kiln room is below 1 ASC.

h. The Permittee shall continue to operate the burners in the primary combustion chamber of the DFS for at least 21 minutes after feed to the DFS has ceased.

i. In the event of an ACAMS alarm in the DC Bin Enclosure which occurs while the enclosure door is closed and the enclosure is under engineering controls, the Permittee shall immediately:

   i. Stop waste feed,

   ii. Place DFS kiln in oscillate mode,

iii. Stop DC motion, and

iv. Recover and analyze DAAMS tubes.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters listed in Table 7-9.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VII.4.i.iv.(II) and upon return to the operating parameters listed in Table 7-9.

j. In the event of an ACAMS alarm in the DC Bin Enclosure which occurs while the enclosure door is open or the enclosure is otherwise not under engineering controls, the Permittee shall immediately:

i. Stop waste feed,

ii. Place DFS kiln in oscillate mode,

iii. Stop DC motion, and

iv. Recover and analyze the associated DAAMS monitors.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters listed in Table 7-9.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(IV) Normal operations and waste feed may be restarted after completion of the requirements in Conditions VI.3.xi.d.(II) and (III) and upon return to the operating parameters listed in Table 7-9.

k. In the event waste is charged to the DFS that has been contaminated with HD/HT, the permittee will ensure the waste is contained within the confines of the rotary kiln to ensure destruction of the agent prior to discharge from the kiln to the DC.

5. **Monitoring Requirements**

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-9 and 7-10, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the DFS if any of the monitoring instruments listed in Tables 7-9 and 7-10 fail to operate properly.

6. **Waste Feed Cut-Off Requirements**

a. The Permittee shall operate the systems, specified in Table 7-9, to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoint specified in the Table 7-9. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In case of a malfunction of the AWFCO systems listed in Table 7-9, the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until all parameters specified in Table 7-9 are restored to within permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.D.4. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.D.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-9 for the DFS is activated greater than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the Department the information required in Condition VII.A.7.b. by the close of the following business day.

VII.E. COMMON STACK FOR LIC, MPF, AND DFS

1. The Permittee shall maintain three ACAMS for the current agent campaign in the common stack. The instruments installed on the common stack will be configured so that two are alternating sampling and analysis and the third is in standby to replace either of the two active instruments in case one must be removed from service for any reason. Additionally, the facility will be required to

maintain monitoring for previous agent campaigns in the common stack until such time as the conditions in section 4.10 of the ANCDF LAMP are fulfilled and the Department concurs in writing that monitoring may be discontinued either permanently or for an extended period. Written concurrence is not required for normal operational outage periods where monitoring will be restored after a brief, predetermined period of time such as for munition changeovers, furnace outage periods or other similar period.

2. The exhaust gas monitoring systems specified in Condition VII.E.1., shall be calibrated, inspected and operated IAW with the applicable subparagraphs of Conditions VII.A.4.c. and VII.A.5.

3. The chemical agent emissions from the common stack, monitored as specified in Condition VII.E.2., shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

4. The waste feeds to all contributing incinerator(s) shall be automatically cut-off or lock-out when the chemical agent emission level(s) in the common stack exceeds the values specified in Condition VII.E.3.

Table 7-1: Maximum Feed Rates to the LIC during Normal Agent Operations

Description of Hazardous Waste	Maximum Feed Rate	
	ROHA	2MRA
GB	1,015 lbs/hr	34.5 lbs/2-min
VX	675 lbs/hr	23.00 lbs/2-min
HD	1,111 lbs/hr	37lbs/2-min
HT	1,111 lbs/hr	37lbs/2-min
SDS, Laboratory, Aqueous Liquid Wastes	1,600 lbs/hr	Not Applicable

Footnotes:

Abbreviations:
2MRA.....2-minute rolling average
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
SDS.....spent decontamination solution
ATB.....agent trial burn
lbs/2-min.....pounds per 2-minute average
ROHA.....rolling hourly average

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-01	TAHH-710	Primary Chamber Temperature High-High	2,750° F	2,750° F	2,750°F
LIC-02	TSLL-710	Primary Chamber Temperature Low-Low	2,475° F	2,475° F	2,475°F
LIC-03	TAHH-782	Secondary Chamber Temperature High-High	2,150° F	2,150° F	2,150°F
LIC-04	TSLL-782	Secondary Chamber Temperature Low-Low	1,850° F	1,850° F	1,850°F
LIC-05	PSHH-845	Primary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc
LIC-06	PSHH-896	Secondary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc
LIC-07	PDAH-855	Secondary Chamber Flue Gas Flow Rate High	0.7 inwc	0.7 inwc	0.7 inwc
LIC-08	AAHH-778C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA
LIC-09	AAHH-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High	15% dry basis	15% dry basis	15% dry basis
LIC-10	AALL-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis
LIC-11	PSLL-737C	Primary Chamber Atomizing Air Pressure Low-Low	55 psig	55 psig	55 psig
LIC-12	PSL-809	Secondary Chamber Atomizing Air Pressure Low	65 psig	65 psig	65 psig

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-14	FAHH-731C	Agent Feed Rate High-High 2MRA	37 lbs/2-min	23.00 lbs/2-min	34.5 lbs/2-min
LIC-15	FAHH-731D	Agent Feed Rate High-High ROHA	1,111 lbs/hr	675 lbs/hr	1,015 lbs/hr
LIC-16	FAHH-763	SDS Feed Rate High-High	1,600 lb/hr	1,600 lb/hr	1,600 lb/hr
LIC-17	PDALL-814	Venturi Scrubber Pressure Differential Low-Low	23 inwc	23 inwc	23 inwc
LIC-18	FALL-828	Venturi Scrubber |Flow Rate Low-Low	135 gpm with 10 second delay	135 gpm with 10 second delay	135 gpm with 10 second delay
LIC-19	DAHH-835	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.20 sgu
LIC-20	FALL-825	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm
LIC-21	AALL-832	Scrubber Tower pH Low-Low	7.28	7.28	7.28
LIC-22	TSHH-800	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215°F
LIC-23	PALL-170	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
LIC-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches
LIC-25	PALL-761	Chemical Agent Feed Pressure Low-Low	5 psig	5 psig	5 psig

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-26[4]	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3	NA	0.0003 mg/m^3
LIC-27[4]	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3	NA	0.00006 mg/m^3
LIC-28[3]	ACAM-129/225/223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	NA	0.0003 mg/m^3
LIC-29[3]	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	NA	0.00006 mg/m^3
LIC-30[2]	TAHH-433	PFS Carbon Filter Exhaust Gas Temperature High-High	180° F	180° F	180°F
LIC-31[2]	PDAHH-436B PDAHH-438B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
LIC-32[2]	PDAHH-436 PDAHH-438E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
LIC-33	ACAM-911SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	NA	0.0003 mg/m^3	NA
LIC-34	ACAM-911SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	NA	0.00006 mg/m^3	NA

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-35[3]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	0.0003 mg/m^3	NA
LIC-36[3]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	0.00006 mg/m^3	NA
LIC-37[3]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3	NA	NA
LIC-38[3]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3	NA	NA

Footnotes:

(1) All values are instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAHH-436B and E are installed within PFS-FILT-209 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the LIC through the MPF PFS or the common spare PFS. As such, PDAHH-438B and E or PDAHH-487B and E will be the units of measure in the event that the exhaust from the LIC is being channeled through any of the other filter units.

(3) Common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

(4) ACAM 134 was converted from GB to HD monitoring during agent changeover for HD processing.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
inwc .....inches of water column
°F ..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF ... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL ..... flow alarm low-low
HEPA ..... high efficiency particulate air
lbs/2-min.. pounds per 2-minute average

Abbreviations (continued):

lbs/hr .....pounds per hour
LSHH.....level switch high-high
MPF .....Metal Parts Furnace
PALL .....pressure alarm high-high
PDAH .....pressure differential alarm high
PFS .....Pollution Abatement System Filtration System
PSHH.....pressure switch high-high
PSL .....pressure switch low
RCRA .....Resource Conservation and Recovery Act
SDS.....spent decontamination solution
TAHH .....temperature alarm high-high
2MRA.....2-minute rolling average
LIC ..... Liquid Incinerator
mg/m^3 ..... milligrams per cubic meter
O_2 ..... oxygen
PDAH ..... pressure differential alarm high
PDALL .... pressure differential alarm low-low
ppm..... parts per million
psig ..... pounds per square inch gauge
PSLL..... pressure switch low-low
ROHA..... rolling hourly average
sgu ..... specific gravity unit
TSLL ..... temperature switch low-low

Table 7-3: LIC System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Primary Chamber Temperature 13-TIT-710	LIC-01/02	Thermocouple	212 to 3,000°F	±1.0% of Range
2 [a,b]	Secondary Chamber Temperature 13-TIT-782	LIC-03/04		32 to 2,400°F	
3 [a]	Primary Chamber Pressure 13-PSHH-845	LIC-05	Diaphragm	-5.0 to 0.5 inwc	±3.0% of Range
4 [a,b]	Primary Chamber Pressure 13-PIT-706	LIC-05		-20.0 to 5.0 inwc	±1.0% of Range
5 [a]	Secondary Chamber Pressure 13-PSHH-896	LIC-06		-5.0 to 5.0 inwc	±3.0% of Range
6 [a,b]	Secondary Chamber Flow Rate 13-PDIT-855	LIC-07	Orifice and D/P Cell	0 to 3.00 inwc	±1.0% of Range
7 [a,b]	Exhaust Blower Duct CO Level 24-AIT-778A/B	LIC-08	Non-Dispersive Infrared Cell Analyzer	0 – 200 to 0 – 3,000 ppm	Refer to ANCDF CEMS Certification Plan
8 [a,b]	Exhaust Blower Duct O_2 Concentration 24-AIT-798A/B	LIC-09/10	Zirconium Oxide Cell Analyzer	0 to 25%	
9 [a]	Primary Chamber Atomizing Air Pressure 13-PSLL-737C	LIC-11	Diaphragm	12 to 100 psig	±3.0% of Range

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a]	Secondary Chamber Atomizing Air Pressure 13-PSL-809	LIC-12	Diaphragm	12 to 100 psig	±3.0% of Range
11	Deleted	LIC-13	---	---	---
12 [a,b]	Agent Feed Rate 13-FT-731A/B	LIC-14/15	Mass Flow Meter Vibrating U-Tube Type	0 to 1,500 lb/hr	±1.0% of Range
13 [a,b]	SDS Flow Rate 13-FIT-763	LIC-16		0 to 5 gpm	
14 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-814	LIC-17	D/P Cell	0 to 50 inwc	
15 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-828	LIC-18	Electromagnetic Flow Meter	0 to 200 gpm	
16 [a,b]	Venturi Scrubber Brine Density 24-DIT-835	LIC-19	Magnetically Vibrated Tube (PAS-PUMP 211/212 Discharge to Suction)	0.6 to 1.4 sgu	±3.0% of Range
17 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-825	LIC-20	Electromagnetic Flow Meter	0 to 1,000 gpm	±1.0% of Range
18 [a,b]	Scrubber Tower pH 24-AIT-832A/B	LIC-21	Electrodes (PFS-PUMP-234/235 Discharge to Suction)	0 to 14 pH units	±3.0% of Range
19 [a]	Quench Tower Flue Gas Temperature 24-TSHH-800	LIC-22	Filled System Temperature Switch	100 to 300°F	

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
20 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-816	LIC-22	Thermocouple	0 to 300°F	±1.0% of Range
21 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-170	LIC-23	D/P Cell	0 to 100 psig	
22 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	LIC-24	Ultrasonic	0 to 216 inches	
23 [a]	Brine Surge Tanks 23-LSHH-02/06	LIC-24	Level Switch	On or Off	Not Applicable
24 [a]	Chemical Agent Feed Pressure 13-PIT-761	LIC-25	D/P Cell	0 to 25 psig	±1.0% of Range
25 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-134	LIC-26/27 AIT-134	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
26 [a,b]	Chemical Agent Emissions Common Stack ACAM-129 ACAM-223 ACAM-225	LIC-28/29 AIT-129			
27 [a]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-433	LIC-30	Temperature Switch	68 to 203°F	±3.0% of Range

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
28 [a,b]	PFS HEPA Filter Inlet Pressure Drop 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	LIC-31	D/P Transmitter	0 to 6 inwc	±1.0% of Range
29 [a,b]	PFS HEPA Filter Outlet Pressure Drop 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	LIC-32			
30 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-911SC	LIC-33/34 AIT-134	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
31 [a,b]	Chemical Agent Emissions Common Stack ACAM-904/905/906SC	LIC-35/36 AIT-129			
32 [a,b]	Chemical Agent Emissions Common Stack ACAM-923/924/925SC	LIC-37/38 AIT-129	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	

Footnotes:
a Continuous monitoring
b Continuous recording

Abbreviations:

%.....percentage
AAH .....analyzer alarm high
AIT .....analyzer indicating transmitter
AWFCO.....automatic waste feed cutoff
D/P.....differential pressure
°F .....degrees Fahrenheit
FT .....flow transmitter
gpm.....gallons per minute
lb/ft^3 .....pounds per cubic feet
LIC.....Liquid Incinerator
LSHH.....level switch high-high
PSHH.....pressure switch high-high
PFS .....PAS filtration System
ppm.....parts per million
psig .....pounds per square inch gauge
PSL .....pressure switch low
sgu .....specific gravity units
TIT.....temperature indicating transmitter
ZS .....position switch
±.....plus/minus
AAL .....analyzer alarm low
ANCDF.....Anniston Chemical Agent Disposal Facility
CEMS .....Continuous Emission Monitoring System
DIT .....density indicating transmitter
FIT .....flow indicating transmitter
IAW .....in accordance with
inwc .....inches of water column
lb/hr.....pounds per hour
LIT .....level indicating transmitter
PAS.....Pollution Abatement System
PDIT .....pressure differential indicating transmitter
PIT .....pressure indicating transmitter
PRW .....process water
PSHH.....pressure switch high-high
PSLL.....pressure switch low-low
SDS.....spent decontamination solution
TSHH.....temperature switch high-high

Table 7-4: Maximum Feed Rates of Munitions to the MPF during Normal Agent Operations

Munition Type	Agent Type	Max Units per Tray	Feed Interval per Tray[a] (min)	Max Weight per Tray[b] (lbs)	Maximum Feed Rate (lbs/hr)[c]		
					VX	GB	HD/HT
M121A1 Proj., 155MM	VX	48	35	13.9	23.8	---	---
M121A1/M122 Proj., 155MM	GB	48	35	---	---	147.9	---
M426 Proj., 8-inch	GB	27	35	---	---	147.9	---
M360 Proj., 105MM	GB	96	35	---	---	147.9	---
M2/M2A1 Proj., 4.2-inch (Condition 1 – drained)	HD/HT	96	30	66.2	---	---	132.4
M2/M2A1 Proj., 4.2-inch (Condition 2 – undrained)	HD/HT	96	60	540.9	---	---	540.9
M60 Proj., 105MM	HD	96	68	285	---	---	540.9
M110 Proj., 155MM	HD	48	80	540.9	---	---	540.9
Ton Container	HD	1	125	0 to ≤ 220	---	---	540.9
Ton Container	HD	1	140	>220 to ≤ 450	---	---	540.9
Ton Container	HD	1	165	> 450 to ≤ 540.9	---	---	540.9

Footnotes:
(a) Time required in Zones 1 and 2 or as specified in VII.C.3.g.
(b) Agent only, does not include the weight of the base, tray, or munition bodies nor any HD collected by the Froth Collection System
(c) The instantaneous feed rate in pounds per hour is calculated by Max Weight per Tray (lbs) x 1 tray/feed interval (min) x 60 min/hr not to exceed 540.9 lb/hr HD.

Abbreviations:
--- ..... not applicable
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
MM ..... millimeter
% ..... percent
lbs ..... pounds
min ..... minutes
MPF ..... Metal Parts Furnace

Table 7-5: Maximum Feed Rates of Secondary Waste to the MPF during Normal Agent Operations

Secondary Waste Type	Max Units per Charge	Feed Interval per Charge[1] (min)	Max Weight per Charge (lbs)
Chlorine	---	90	93
Organic Material	---	90	335
Sludge	---	90	---[2]
Non-Combustible Waste [4]	---	30	---[4]
Embedded Metals[3]	---	90	4,050
BTU value (MM)	4	90	---
VX Agent	---	90	13.9

Footnotes:
(1) Time required in Zones 1 and 2 or as specified in VII.C.3.g.
(2) Sludge to be fed in containment pans, spread to a depth no greater than 1.5 inches.
(3) -Embedded is defined as the metallic content of a munition body or secondary waste; e.g., projo bodies, overpacks, pumps, etc.
(4) Non-combustible secondary waste such as bulk embedded metals, concrete, etc. will be fed to the MPF with zone timers of 30 minutes for Zones 1 and 2 and a zone timer of 20 minutes for Zone 3, as the treatment within the MPF is for thermal decontamination to the 5X level.

Abbreviations:
ACT .....Agent Collection Tank
lbs .....pounds
min.....minutes
SDS.....spent decontamination solution
BTU .....British thermal unit
MM.....million
MPF .....Metal Parts Furnace

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-01	TAHH-152	Primary Chamber Zone 1 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-02	TALL-152	Primary Chamber Zone 1 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-03	TAHH-141	Primary Chamber Zone 2 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-04	TALL-141	Primary Chamber Zone 2 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-05	TAHH-153	Primary Chamber Zone 3 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-06	TALL-153	Primary Chamber Zone 3 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-07	TAHH-87	Afterburner Temperature High-High	2,150° F	2,150° F	2,150° F
MPF-08	TSLL-87	Afterburner Temperature Low-Low	1,772° F	1,772° F	1,772° F
MPF-09	PSHH-34	Primary Chamber Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-10	PSHH-390	Afterburner Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-11	PDAHH-786	Afterburner Flue Gas Flow Rate High-High	0.5 inwc	0.5 inwc	0.5 inwc
MPF-12	AAHH-384C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm	100 ppm	100 ppm
MPF-13	AAHH-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry	15% dry	15% dry
MPF-14	AALL-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry	3% dry	3% dry
MPF-15	Programmed Feed Permissive	Munitions Feed Rate High	132.4 lbs/hour – Condition 1 540.9 lbs/hour – Condition 2	23.8 lbs/hour	147.9 lbs/hour
		Secondary Waste Feed Rate High	Chlorine: 93 lbs/WIC Organic Material: 335 lbs/WIC Sludge: 1.5 inches in containment pan VX: 13.9 lbs/tray Non-embedded Metals: 1,920 lbs/WIC BTU: 4.0 MM/WIC		

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-16	PDALL-222	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc
MPF-17	FALL-218	Venturi Scrubber Brine Flow Rate Low-Low	130 gpm (10 second delay)	130 gpm (10 second delay)	130 gpm (10 second delay)
MPF-18	DAHH-216	Venturi Scrubber Brine Density High-High	1.10 sgu	1.10 sgu	1.10 sgu
MPF-19	FALL-248	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm
MPF-20	AALL-247	Scrubber Tower pH Low-Low	7.12 pH	7.12 pH	7.12 pH
MPF-21	BSLL-883 BSLL-884 BSLL-885 BSLL-886 BSLL-887 BSLL-888 BSLL-889 BSLL-890 BSLL-891 BSLL-892	Primary Chamber Flame Loss Low-Low	Zones 1 and 2, all or 2 burners out: <1,400° F		

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-22	TSHH-223	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215° F
MPF-23	PALL-358	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
MPF-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 in	219 in	219 in
MPF-25	ACAM-167 ACAM-907	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.0003 mg/m^3
MPF-26	ACAM-167 ACAM-907	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.00006 mg/m^3
MPF-27[5]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	Not Applicable	0.0003 mg/m^3

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-28[5]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	Not Applicable	0.00006 mg/m^3
MPF-29	TAHH-097	PFS Carbon Filter Exhaust Gas Temperature High-High	180° F	180° F	180° F
MPF-30[3]	PDAHH-436B PDAHH-438B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
MPF-31[3]	PDAHH-436E PDAHH-438E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
MPF-32[4]	ACAM-401A	Chemical Agent Emissions High-High Instantaneous (Cool-Down Conveyor Enclosure)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable
MPF-33[4]	ACAM-401	Chemical Agent Emissions High-High Instantaneous (Cool Down Conveyor Enclosure)	Not Applicable	0.0003 mg/m^3	Not Applicable
MPF-34	ACAM-908-SC ACAM-909SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3	Not Applicable

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-35	ACAM-908-SC ACAM-909SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3	Not Applicable
MPF-36[5]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3	Not Applicable
MPF-37[5]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006 mg/m^3	Not Applicable
MPF-38	ACAM-932SC ACAM-933SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	NA	NA
MPF-39	ACAM-932SC ACAM-933SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	NA	NA
MPF-40[5]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	NA	NA
MPF-41[5]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	NA	NA

Footnotes:
(1) All values are instantaneous unless otherwise noted.
(2) In the event of an AWFCO, all zone timers will be reset.

Footnotes (continued):

(3) Stop feed parameters only apply to the on-line PFS unit. PDAHH-438B and E are installed within PFS-FILT-111 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the MPF through the LIC PFS or the common spare PFS. As such, PDAHH-436B and E or PDAHH-487B and E will be the units of measure in the event that the exhaust from the MPF is being channeled through any of the other filter units.

(4) The ACAMS may be taken off-line during processing in accordance with VII.C.6.e.

(5) All common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
inwc .....inches of water column
lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF.....Metal Parts Furnace
PALL .....pressure alarm high-high
PDAH .....pressure differential alarm high
PDALL .....pressure differential alarm low-low
ppm.....parts per million
psig .....pounds per square inch gauge
PSLL.....pressure switch low-low
ROHA.....rolling hourly average
sgu .....specific gravity unit
TSLL .....temperature switch low-low

°F ..... degrees Fahrenheit
AALL..... analyzer alarm low-low
ANCDF..... Anniston Chemical Agent Disposal Facility
CO..... carbon monoxide
FALL ..... flow alarm low-low
HEPA..... high efficiency particulate air
lbs/2-min..... pounds per 2-minute average
LIC..... Liquid Incinerator
mg/m^3..... milligrams per cubic meter
O_2..... oxygen
PAS..... Pollution Abatement System
PDAH ..... pressure differential alarm high
PFS..... PAS Filtration System
PSHH ..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
TAHH ..... temperature alarm high-high

Table 7-7: MPF System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Primary Chamber Zone 1 Temperature 14-TIT-152	MPF-01/02	Thermocouple	0 to 2,000°F	±1.0% of Range
2 [a,b]	Primary Chamber Zone 2 Temperature 14-TIT-141	MPF-03/04			
3 [a,b]	Primary Chamber Zone 3 Temperature 14-TIT-153	MPF-05/06			
4 [a,b]	Afterburner Temperature 14-TIT-87	MPF-07/08		0 to 2,282°F	
5 [a,b]	Primary Chamber Pressure 14-PIT-34	MPF-09	Diaphragm	-10.0 to 0.0 inwc	
6 [a,]	Afterburner Pressure 14-PSHH-390	MPF-10		-15.0 to 15 inwc	±3.0% of Range
7 [a,b]	Afterburner Flow Rate 14-PDIT-786	MPF-11	D/P Cell	0 to 2.0 inwc	±1.0% of Range
8 [a,b]	Exhaust Blower Duct CO Level 24-AIT-384A/B	MPF-12	Non-Dispersive Infrared Analyzer	0 – 200 to 0 - 3,000 ppm	Refer to ANCDF CEMS Certification Plan
9 [a,b]	Exhaust Blower Duct O_2 Concentration 24-AIT-81A/B	MPF-13/14	Zirconium Oxide Cell Analyzer	0 to 25%	

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-222	MPF-16	D/P Cell	0 to 50 inwc	± 1.0% of Range
11 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-218	MPF-17	Electromagnetic flow meter (In-line)	0 to 200 gpm	± 1.0% of Range
12 [a,b]	Venturi Scrubber Brine Density 24-DIT-216	MPF-18	Magnetically Vibrated Tube (PAS-PUMP-102/103 Discharge to Suction)	0.6 to 1.40 sgu	±2.0% of Range
13 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-248	MPF-19	Electromagnetic Flow Meter (In-line)	0 to 1,500 gpm	±1.0% of Range
14 [a,b]	Scrubber Tower pH 24-AIT-247A/B	MPF-20	Electrodes (PFS-PUMP-136/137 Discharge to Suction)	0 to 14 pH units	±3.0% of pH Unit
15 [a]	Quench Tower Flue Gas Temperature 24-TSHH-223	MPF-22	Filled System Temperature Switch	175 to 360°F	±3.0% of Range
16 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-509		Thermocouple	0 to 300°F	±1.0% of Range
17 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-358	MPF-23	D/P Cell (In-line)	0 to 100 psig	±3.0% of Range
18 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	MPF-24	Ultrasonic	0 to 216 inches	±1.0% of Range

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
19 [a]	Brine Surge Tanks Level 23-LSHH-02/066	MPF-24	Level Switch	On or Off	Function Tested
20 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-167 ACAM-907	MPF-25/26 AIT-167	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application	
21 [a,b]	Chemical Agent Emissions Common Stack ACAM-129	MPF-27/28 AIT-129			
22 [a,b]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-97	MPF-29	Temperature Switch	75 to 205°F	±3.0% of Range
23 [a,b]	PFS HEPA Filter Inlet Pressure drop 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	MPF-30	D/P Transmitter	0 to 6 inwc	±1.0% of Range
24 [a,b]	PFS HEPA Filter Outlet Pressure drop 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	MPF-31			
25 [a,b]	Chemical Agent Emissions DAL Cool-Down Conveyor Enclosure ACAM-401A	MPF-32 AIT-401	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application	

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range
26 [a,b]	Chemical Agent Emissions DAL Cool-Down Conveyor Enclosure ACAM-401	MPF-33 AIT401	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application
27 [a,b]	Chemical Agent Emissions High-High (Exhaust Blower Duct) ACAM-908SC ACAM-909SC	MPF-34 MPF-35 AIT-167		
28 [a,b]	Chemical Agent Emissions High-High (Common Stack) ACAM-904SC ACAM-905SC ACAM-906SC	MPF-36 MPF-37 AIT-129		
29 [a,b]	Chemical Agent Emissions High-High (Exhaust Blower Duct) ACAM-932SC ACAM-933SC	MPF-38 MPF-39 AIT-167		
30 [a,b]	Chemical Agent Emissions High-High (Common Stack) ACAM-923SC ACAM-924SC ACAM-925SC	MPF-40 MPF-41 AIT-129		

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Footnotes:
(a) Continuous monitoring
(b) Continuous recording

Abbreviations:

±.....plus or minus
ACAMS.....automatic continuous air monitoring system
ANCDF.....Anniston Chemical Agent Disposal Facility
CEMS.....Continuous Emissions Monitoring System
D/P.....differential pressure
°F.....degrees Fahrenheit
gpm.....gallons per minute
inwc.....inches of water column
LSHH.....level switch high-high
O_2.....oxygen
PDIT.....pressure differential indicating transmitter
PIT.....pressure indicating transmitter
PSHH.....pressure switch high-high
RCRA.....Resource Conservation and Recovery Act
TIT.....temperature indicating transmitter
%.....percent
AIT.....analyzer indicating transmitter
AWFCO.....automatic waste feed cut-off
CO.....carbon monoxide
DIT.....density indicating transmitter
FIT.....flow indicating transmitter
IAW.....in accordance with
LIT.....level indicating transmitter
MPF.....Metal Parts Furnace
PAS.....Pollution Abatement System
PFS.....PAS Filtration System
ppm.....parts per million
psig.....pounds per square inch gauge
sgu.....specific gravity unit
TSHH.....temperature switch high-high

Table 7-8: Maximum Feed Rates of Munitions to the DFS during Normal Agent Operations

Munition Type	Agent Type	Max Units per Hour	Min Feed Interval (sec)	Maximum Feed Rate (lbs/hr)			
				VX	GB	EXPLOSIVES	PROPELLANT
M55/56 Rocket	GB	34	90	---	149.8	123.5	767.7
M55/56 Rocket	Gelled GB	17/10[1]	---	---	105.8	108.8	656.2
M55/56 Rocket	VX	31	---	4.48	---	102.4	617.6
M121A1 Proj., 155MM	VX	259	---	---	---	635.25	---
M121A1/M122 Proj., 155MM	GB	136	---	---	---	374	---
M426 Proj., 8-inch	GB	59	---	---	---	416.1	---
M360 Proj., 105MM	GB	300	---	---	---	337	---
M2/M2A1 Proj., 4.2-inch[3]	HD/HT	2150	---	---	---	632[2]	---
M60 Proj., 105MM[3]	HD	1680	---	---	---	591[2]	---
M110 Proj., 155MM[3]	HD	1600	---	---	---	658[2]	---
M23 Landmines	VX	44	---	4.48	---	58	---
Explosive Contaminated Solids	---	---	---	4.48	149.8	123.5	767.7
Explosive Contaminated Sludges	---	---	---	4.48	105.8	123.5	767.7

Footnotes:
(1) 17 rockets per hour if drain is greater than 93%; if not, 10 rockets per hour if drain is less than 93% (see Conditions VII.D.3.d. to g.).
(2) TNT equivalent
(3) Mustard agents HD/HT are not fed to the DFS during normal operations. As a result, mustard agent feed rates to the DFS have not been established. Should mustard agent contaminated energetic components be encountered, they will be treated within the DFS kiln at sufficient time and temperature requirements as to ensure 5X decontamination is achieved in accordance with VII.D.4.c and VII.D.4.k.

Abbreviations:
--- ..... not applicable
DFS ..... Deactivation Furnace System
sec ..... seconds
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
TNT ..... trinitrotoluene

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-01	TAHH-182	Rotary Kiln Temperature High-High	1,650°	1,650°	1,650°F
DFS-02	TALL-182	Rotary Kiln Temperature Low-Low	965°	965°	950°F
DFS-03	TAHH-92	Afterburner Temperature High-High	2,160°F	2,160°F	2,160°F
DFS-04	TALL-92	Afterburner Temperature low-low	1,850°F	1,850°F	1,850°F
DFS-05	PSHH-204	Rotary Kiln Pressure High-High	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay
DFS-06	PAH-65	Afterburner Pressure High	-0.1 inwc	-0.1 inwc	-0.1 inwc
DFS-07	PDAH-813	Afterburner Flue Gas Flow Rate High	1.0 inwc	1.0 inwc	1.0 inwc
DFS-08	AAHH-59C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2 dry basis ROHA	100 ppm 7% O_2 dry basis ROHA	100 ppm 7% O_2 dry basis ROHA
DFS-09	AAHH-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis
DFS-10	AALL-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis
DFS-11	TALL-184	DC (Upper) Temperature Low-Low	Not Applicable [3]	1,000°F	1,000°F
DFS-12	TALL-42	DC (Lower) Temperature Low-Low	Not Applicable [3]	1,000°F	1,000°F

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-13	PLC software	Munitions Feed Rate High-High	See Table 7-8	31 rockets/hr 4.48 lbs/hr agent 44 landmines/hr 4.48lbs/hr agent	34 rockets/hr - 12lbs/hr agent (drainable) or 17 rockets/hr if drain ≥93% 10 rockets/hr if drain < 93% (gelled)
DFS-14	PDALL-08	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc
DFS-15	FAL-06	Venturi Scrubber Brine Flow Rate Low	300 gpm with 10 second delay	300 gpm with 10 second delay	300 gpm with 10 second delay
DFS-16	DAHH-33	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.20 sgu
DFS-17	FALL-30	Scrubber Tower Clean Liquor Flow Rate Low-Low	1,635 gpm	1,635 gpm	1,635 gpm
DFS-18	AALL-34	Scrubber Tower pH Low-Low	7.48	7.48	7.48
DFS-19	TAHH-51A/B/C/D/E	Rotary Kiln Shell Temperature High-High	1,600°F	1,600°F	1,600°F
DFS-20	SAHH-602	Rotary Kiln Rotational Speed High-High	2 rpm	2 rpm	2 rpm
DFS-21	SALL-602	Rotary Kiln Rotational Speed Low-Low	0.33 rpm	0.33 rpm	0.33 rpm
DFS-22	XS-58/821	DC Operation (jam)	Not Applicable [3]	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-23	SAL-57	DC Operation (no motion)	Not Applicable [3]	No motion	No motion
DFS-24	XS-207/209	Feed Chute Operation	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-25	TSHH-01	Quench Tower Flue Gas Temperature High-High	215°F	215°F	215°F
DFS-26	PALL-344	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
DFS-27	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches
DFS-28	ACAM-297	Chemical Agent Emissions High-High Instantaneous (Cyclone Enclosure)	0.006 mg/m^3 HD/HT	0.00006 mg/m^3 VX	0.00006 mg/m^3 GB
DFS-29	ACAM-183 ACAM-910SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	0.0003 mg/m^3 VX	0.0003 mg/m^3 GB
DFS-30	ACAM-183 ACAM-910SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	0.00006 mg/m^3 VX	0.00006 mg/m^3 GB

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-31[4]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	NA	0.0003 mg/m^3 GB
	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	0.0003 mg/m^3 VX	NA
	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	NA	NA
DFS-32[4]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	NA	0.00006 mg/m^3 GB
	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	0.00006 mg/m^3 VX	NA
	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	NA	NA
DFS-33	TAHH-430	PFS Carbon Filter Exhaust Gas Temperature High-High	180°F	180°F	180°F

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

DFS-34(2)	PDAHH-436B PDAHH-438B PDAHH-440B PDAHH-442B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
DFS-35(2)	PDAHH-436E PDAHH-438E PDAHH-440E PDAHH-442E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
DFS-36	ACAM-365	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area)	0.03 mg/m^3 HD/HT	0.0003 mg/m^3 VX	0.0003 mg/m^3 GB

Footnotes:

(1) All values instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAHH-440B and E and PDAHH-442B and E are installed within PFS-FILT-111 and -112 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the DFS through any of the PFS units. As such, PDAHH-436B and E, PDAHH-438B and E, or PDAHH-487B and E will be the units of measure in the event that the exhaust from the DFS is being channeled through any of the other filter units.

(3) The Discharge Conveyor will not be heated during the mustard campaign, but shall remain heated during both the GB and VX campaigns. Mustard contaminated components will be processed within the kiln for greater than 15 minutes at 1000° F.

(4) Common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
HEPA.....high efficiency particulate air
°F ..... degrees Fahrenheit
AALL..... analyzer alarm low-low
ANCDF..... Anniston Chemical Agent Disposal Facility
CO..... carbon monoxide
FALL ..... flow alarm low-low
DC..... Discharge Conveyor
inwc..... inches of water column

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Abbreviations (continued):

lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF.....Metal Parts Furnace
PALL.....pressure alarm high-high
PDAH.....pressure differential alarm high
PDALL.....pressure differential alarm low-low
ppm.....parts per million
psig.....pounds per square inch gauge
PSLL.....pressure switch low-low
ROHA.....rolling hourly average
sgu.....specific gravity unit
TSLL.....temperature switch low-low
LIC.....Liquid Incinerator
mg/m^3.....milligrams per cubic meter
O_2.....oxygen
PAS.....Pollution Abatement System
PDAH.....pressure differential alarm high
PFS.....PAS Filtration System
PSHH.....pressure switch high-high
PSL.....pressure switch low
RCRA.....Resource Conservation and Recovery Act
SDS.....spent decontamination solution
TAHH.....temperature alarm high-high

Table 7-10: DFS System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Rotary Kiln Temperature 16-TIT-182/244	DFS-01/02	Thermocouple	0 to 2,300°F	±1.0% of Range
2 [a,b]	Afterburner Temperature 16-TIT-92	DFS-03/04		32 to 2,400°F	
3 [a,b]	Rotary Kiln Pressure 16-PIT-18	DFS-05	Diaphragm	-20 to 5 inwc	
4 [a]	Rotary Kiln Pressure 16-PSHH-204	DFS-05		-0.07 to –0.15 inwc	±3.0% of Range
5 [a,b]	Afterburner Pressure 16-PIT-65	DFS-06	D/P Cell	-20 to 5 inwc	±1.0% of Range
6 [a,b]	Afterburner Flow Rate 16-PDIT-813	DFS-07	Orifice and D/P Cell	0 to 3.0 inwc	
7 [a,b]	Exhaust Blower Duct CO Level 16-AIT-59A/B	DFS-08	Non-Dispersive Infrared Cell Analyzer	0 – 200 to 0 - 3,000 ppm	Refer to ANCDF CEMS Certification Plan
8 [a,b]	Exhaust Blower Duct O_2 Concentration 16-AIT-175A/B	DFS-09/10	Zirconium Oxide Cell Analyzer	0 to 25%	
9 [a,b]	DC Temperature 16-TIT-42/184	DFS-11/12	Thermocouple	0 to 1,600°F	±1.0% of Range

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-08	DFS-14	D/P Cell	0 to 50 inwc	±1.0% of Range
11 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-06	DFS-15	Electromagnetic flow meter	0 to 500 gpm	
12 [a,b]	Venturi Scrubber Brine Density 24-DIT-33	DFS-16	Magnetically Vibrated Tube (PAS-PUMP-106/107 Discharge to Suction)	0.6 to 1.4 sgu	±2.0% of Range
13 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-30	DFS-17	Electromagnetic flow meter	0 to 3,000 gpm	±1.0% of Range
14 [a,b]	Scrubber Tower pH 24-AIT-34A/B	DFS-18	Electrodes (PAS-PUMP-138/139 Discharge to Suction)	0 to 14 pH units	±3.0% of pH unit
15 [a,b]	Rotary Kiln Shell Temperature 16-TIT-51-A/B/C/D/E	DFS-19	Photometric	800 to 1,800°F	±1.0% of Range
16 [a]	Rotary Kiln Rotational Speed 16-SS-602	DFS-20/21	Ferromagnetic sensor	Not Applicable	
17 [a]	DC Operation Jam 16-XS-58 16-XS-821	DFS-22	Position Switches		Not Applicable
18 [a]	DC Operation No Motion 16-SSL-57	DFS-23	Proximity Switches	0 to 4 rpm	±1.0% of Range

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
19 [a]	Feed Chute Operation Jam 16-XS-207/209	DFS-24	Position Switches	Not Applicable	Not Applicable
20 [a]	Quench Tower Flue Gas Temperature 24-TSHH-01	DFS-25	Filled System Temperature Switch	95 to 219.65°F	±3.0% of Range
21 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-374	DFS-25	Thermocouple	0 to 300°F	±1.0% of Range
22 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-344	DFS-26	D/P Cell	0 to 100 psig	±1.0% of Range
23 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	DFS-27	Ultrasonic	0 to 216 inches	
24 [a]	Brine Surge Tanks Level 23-LSHH-02/06	DFS-27	Level Switch	On or Off	Function Tested
25 [a,b]	Chemical Agent Emissions Cyclone Enclosure ACAM-297	DFS-28 AIT-297	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
26 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-183	DFS-29/30 AIT-183			
27 [a,b]	Chemical Agent Emissions Common Stack ACAM-129	DFS-31/32 AIT-129			

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
28 [a]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-430	DFS-33	Temperature Switch	68 to 203°F	±3.0% of Range
29 [a,b]	PFS HEPA Filter Inlet Pressure drop 114-PDIT-440B 114-PDIT-442B 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	DFS-34	D/P Transmitter	0 to 6 inwc	±1.0% of Range
30 [a,b]	PFS HEPA Filter Outlet Pressure drop 114-PDIT-440E 114-PDIT-442E 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	DFS-35			
31 [a,b]	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area) ACAM-365	DFS-36 AIT-262	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	

Footnotes:
a Continuous monitoring
b Continuous recording

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Abbreviations:

%.....percent
ACAMS.....automatic continuous air monitoring system
ANCDF.....Anniston Chemical Agent Disposal Facility
CEMS .....Continuous Emission Monitoring System
D/P.....differential pressure
DIT .....density indicating transmitter
FIT .....flow indicating transmitter
DC .....discharge conveyor
inwc .....inches of water column
LSHH.....level switch high-high
PAS.....pollution abatement system
PFS .....PAS Filtration System
ppm.....parts per million
psig .....pounds per square inch gauge
rpm.....revolutions per minute
SS.....speed switch
TSHH.....temperature switch high-high
XS.....position switch
±.....plus or minus
AIT .....analyzer indicating transmitter
AWFCO.....automatic waste feed cut off
CO .....carbon monoxide
DFS.....Deactivation Furnace System
°F .....degrees Fahrenheit
gpm.....gallons per minute
HEPA.....high efficiency particulate
LIT.....level indicating transmitter
O_2 .....oxygen
PDIT .....pressure differential indicating transmitter
PIT .....pressure indicating transmitter
PSHH.....pressure switch high-high
RCRA .....Resource Conservation and Recovery Act
sgu.....specific gravity unit
SSL .....speed switch low
TIT.....temperature indicating transmitter

MODULE VIII
CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

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MODULE VIII

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

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MODULE VIII

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

VIII.A. SOLID WASTE MANAGEMENT UNITS

1. The Conditions of this module apply to the solid waste management units (SWMUs) and areas of concern (AOCs) identified in Table 8-1 of this Permit, which require a RCRA Facility Investigation (RFI).

2. The Conditions of this module apply to the SWMUs identified in Table 8-2 of this Permit, which require no further investigation under this permit at this time.

3. The Conditions of this module apply to the SWMUs and AOCs identified in Table 8-3 of this Permit which are RCRA regulated units under this permit.

4. The Conditions of this module apply to the SWMUs and AOCs identified in Table 8-4 of this Permit which are remediated by other programs.

5. The Conditions of this module apply to any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; As used in this Part of the Permit, the terms "discover", "discovery", or "discovered" refer to the date on which the Permittee either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified release of hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment.

6. For all SWMUs identified in both the Conditions VIII.A.1. through VIII.A.4 of this Permit and the Federal Facility Agreement (FFA), dated June 13, 1990, all requirements of Conditions VIII.D., VIII.E.,VIII.G. and VIII.H. of this Permit will be met in accordance with the terms, conditions, and schedules of the FFA. Should interim measures be required at any of these SWMUs, requirements for such measures will be complied with in accordance with Condition VIII.F. of this Permit.

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7. For all SWMUs and AOCs not identified in Condition VIII.A.6. of this Permit, the Permittee shall comply with all applicable terms, conditions, and schedules of this Permit. Also, for those SWMUs and AOCs which are identified in Condition VIII.A.6. of this Permit, if additional activities are required to comply with the terms of this permit beyond the requirements of the FFA, then those additional activities shall be in accordance with the terms, conditions, and schedules of this permit.

8. The Conditions of this module apply to contamination which has migrated beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied. On-site measures to address such releases shall be determined on a case-by-case basis.

VIII.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUS AND AOCS

1. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Condition VIII.A.5. of this Permit. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). If the Department determines that further investigation of an AOC is required, the permit shall be modified in accordance with ADEM Admin. Code R. 335-14-8-.04(2).

2. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any additional SWMU as discovered under Condition VIII.A.5. of this Permit.

3. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition VIII.B.1. of this Permit. At a minimum, the SAR shall provide the following information:

   a. Location of unit(s) on a topographic map of appropriate scale such as required under ADEM Admin. Code R. 335-14-8-.02(5)(b)19.

   b. Designation of type and function of unit(s).

c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

d. Dates that the unit(s) was operated.

e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

4. Based on the results of the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Conditions VIII.D.1. of this Permit.

VIII.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SWMUS OR AOCS

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Condition VIII.A.2 of this Permit or SWMU or AOCs identified in Condition VIII.A.5 of this Permit for which further investigation was not required.

2. If the Department determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall initiate an investigation as outlined in Permit condition VIII.D immediately upon receiving notification of the Department's determination.

VIII.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform a RCRA Facility Investigation (RFI) for any SWMU or AOC identified by the Department in Permit Conditions VIII.A.1., VIII.B.4., or VIII.C.2. of this Permit.

2. The RFI must completely identify the concentration of hazardous constituents released from each SWMU and AOC and fully delineate the area where such hazardous constituents have come to be located.

3. The RFI must fully characterize the nature and extent of contamination released from each SWMU or AOC under investigation.,

4. The RFI must be performed in a manner consistent with the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

5. Except as provided by Permit Condition VIII.D.6, the RFI must be completed within 180 calendar days from the effective date of this permit, or for SWMUs or AOCs identified pursuant to Permit Condition VIII.B. and VIII.C., within 180 calendar days from the receipt of notification from the Department that an RFI is required. If, prior to the effective date of this permit, the Department has approved a work plan that includes a schedule for completing the RFI, the RFI shall be completed in accordance with the approved schedule.

6. RFI Schedule of Compliance

   a. For RFIs expected to require greater than 180 calendar days to complete, the Permittee may submit a schedule of compliance subject to Department approval and/or modification.

   b. Submittal of a RFI Schedule of Compliance does not delay or otherwise postpone the Permittee's obligation to initiate the RFI.

   c. The Schedule of Compliance must include:

      i. A detailed narrative discussion, which explains why the RFI cannot be completed within 180 days; and,

      ii. A detailed and chronological listing of milestones with estimated durations that provides sufficient information to track the progress of the investigation.

   d. The RFI Schedule of Compliance shall be reviewed by the Department in accordance with Permit Condition VIII.G.

   e. The Permittee shall complete the RFI in accordance with the approved RFI Schedule of Compliance.

7. RFI Progress Reports

   a. For an RFI being conducted in accordance with the approved RFI Schedule of Compliance, the Permittee must submit progress reports on a monthly basis.

   b. The RFI Progress Reports must include:

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i. A description of the portion RFI activities completed during the reporting period;

ii. Summaries of any problems or potential problems encountered during the reporting period;

iii. Actions taken to rectify problems;

iv. Changes in relevant personnel;

v. Projected work for the next reporting period;

vii. Any proposed revisions to the RFI Schedule of Compliance. Modifications of the RFI Schedule of Compliance are subject to approval by the Department; and,

vii. A summary of any data collected during the reporting period, including:

A. The location of each sampling point identified on a site map;

B. The concentration of each hazardous constituent detected at each sampling point; and,

C. Submittal of RFI Progress Reports, work plans, or other documents during the RFI does not alter the approved RFI Schedule of Compliance.

8. RFI Reports

a. The Permittee shall prepare and submit to the Department an RFI Report within 60 calendar days from the completion of investigation activities in accordance with the approved RFI Schedule of Compliance, if applicable.

b. The RFI Report must provide a detailed description of all required elements of the investigation as described in the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

c. The RFI Report shall be reviewed by the Department in accordance with Permit VIII.G.

VIII.E. SELECTION OF CORRECTIVE MEASURES AND PERMIT MODIFICATION

1. The Permittee shall develop and submit to the Department a Corrective Measures Implementation (CMI) Plan for any areas of the Permittee's site where hazardous constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMI Plan must include all applicable elements of the proposed remedy pursuant to the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

2. The CMI Plan shall be submitted to the Department within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.

3. The CMI Plan shall be submitted along with a request for permit modification pursuant to ADEM Admin. Code R. 335-14-8-.04(2), and shall include any applicable fees pursuant to ADEM Admin. Code R. 335-1-6. This modification will serve to incorporate the proposed final remedy, including all procedures necessary to implement and monitor the remedy, into this permit.

4. Within 120 calendar days after this Permit has been modified in accordance with Permit Condition VIII.E.3., the Permittee shall demonstrate financial assurance for completing the approved remedy.

VIII.F. INTERIM MEASURES (IM)

1. IM Work Plan(s)

   a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Department determines is necessary. IM are necessary in order to minimize or prevent further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in VIII.F.1.b. Such IM may be conducted concurrently with investigations required under the terms of this Permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Permit Condition VIII.F.

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b. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

c. The IM Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan.

d. The IM Report shall be reviewed by the Department in accordance with Permit Condition VIII.G.

2. IM Implementation

a. The Permittee shall implement the IM in accordance with the approved IM Work Plan.

b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan.

c. Final approval of corrective action required under ADEM Admin. Code R. 335-14-5-.06(12), which is achieved through IM, shall be in accordance with ADEM Admin. Code R. 335-14-8-.04(2) and Permit Condition VIII.E.

3. IM Reports

a. If the time required for completion of IM is greater than one year, the Permittee shall provide the Department with progress reports at intervals specified in the approved work plan. The Progress Reports shall, at a minimum, contain the following information:

i. A description of the portion of the IM completed;

ii. Summaries of <u>any</u> deviations from the IM Work Plan during the reporting period;

iii. Summaries of <u>any</u> problems or potential problems encountered during the reporting period; and

iv. Projected work for the next reporting period.

v. Copies of laboratory/monitoring data.

b. The Permittee shall prepare and submit to the IM Report to the Department within ninety (90) calendar days of completion of IM conducted under Permit Condition VIII.F. The IM Report shall, at a minimum contain the following information:

i. A description of IM implemented;

ii. Summaries of results;

iii. Summaries of all problems encountered;

iv. Summaries of accomplishments and/or effectiveness of IM; and,

v. Copies of all relevant laboratory/monitoring data, *etc.* in accordance with Permit Condition I.E.11.

VIII.G. SUBMITTALS

1. All work plans, reports, schedules, and other documents ("submittals") required by this permit shall be subject to approval by the Department to assure that such submittals and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as directed by the Department.

2. The Department will review all submittals in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. If the Department disapproves a submittal, the Department shall: (1) notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal, (2) revise the submittal and notify the Permittee of the revisions, or (3) conditionally approve the submittal and notify the Permittee of the conditions. Permit Condition VIII.H. shall apply only to submittals that have been disapproved and revised by the Department, or that have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.

3. All submittals shall be submitted within the time frame specified by the Department and in accordance with the approved schedule of compliance. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.

4. All submittals required by this permit shall be signed and certified in accordance with ADEM Admin. Code Rule 335-14-8-.02(2).

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5. Two (2) copies of all submittals shall be provided by the Permittee to the Department in accordance with Permit Condition I.H.

VIII.H. DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by the permit, the following may, at the Permittee's discretion apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within thirty (30) calendar days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth:

    a. The specific matters in dispute;

    b. The position the Permittee asserts should be adopted as consistent with the requirements of the permit;

    c. The basis for the Permittee's position; and,

    d. Any matters considered necessary for the Department's determination.

2. The Department and the Permittee shall have an additional thirty (30) calendar days from Department's receipt of the notification provided for in Condition VIII.H.1. of this Permit to meet or confer to resolve any disagreement.

3. In the event agreement is reached, the Permittee shall submit the revised submittal and implement the same in accordance with and within the time frame specified in such agreement.

4. If agreement is not reached within the 30-day period, the Department shall notify the Permittee in writing of its decision concerning the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Land Division Chief.

5. 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 the permit that the Department determines are not affected by the dispute.

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TABLE 8-1 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REQUIRING A RCRA FACILITY INVESTIGATION (RFI)

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 65	Burning Ground #2	RCRA- regulated Unit (interim status) – non operating. RCRA Closure plan necessary.	Soil
SWMU 69	Abandoned Phenol Basin at Industrial Wastewater Treatment Plant	RFI required for confirmatory sampling and/or remediation of possible contamination.	Groundwater, Soil
SWMU 71	Western Area "Clean Fill Site"	Investigation required for confirmatory sampling and/or remediation of possible contamination.	Soil
AOC B	Underground Storage Tanks in Chemical Limited Area	Brine contents were removed and tanks taken out of service. RFI should address closure of these tanks.	Groundwater, Soil
AOC J	Defense National Stockpiles	RFI required for confirmatory sampling and/or remediation of possible contamination.	Soil
AOC K	Underground Pipe Release at Building 504	RFI required for confirmatory sampling and/or remediation of possible contamination.	Groundwater

TABLE 8-2 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REQUIRING NO FURTHER ACTION AT THIS TIME

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 6	Valve Disposal Pit	SIA – Phase II RI, May 1998	
SWMU 14	Laundry Waste Leaching Facility	ASA – OU-3 final ROD, July 2006	
SWMU 26	North TNT Burial Pit	ASA – OU-3 final ROD, July 2006	
SMWU 36	Drill and Transfer System Site (Toxic Demilitarization Site)	ASA – Site Expansion Report, 1994	
SWMU 39	Dynamometer Wastewater Treatment System	SIA – Phase I RI ,1995	
SWMU 44	Dry Creek	SIA – OU-1 IROD	
SWMU 45	Building 410 former UST	SIA - GW Code R335-6-15.26-.29/2005 ARBCA Evaluation	
SWMU 47	Building 385 former UST	Approved UST Removal March 28, 1996	
SWMU 66	Less than 90 Day Storage Areas (SWMU 16, millvans OB/OD, Buildings 114, 129, 130, 409, 431, 433, 432, 503, 512, 520	RCRA Regulated Units	
SWMU 67	Building 129 Test Range for M16	RCRA Regulated Units	
SWMU 68	Building 129 Test Range for Handguns	RCRA Regulated Units	
AOC C	Tank 77 Release	GW Sampling 2004-2005. Remediation complete , 5/2006.	

TABLE 8-3 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REGULATED BY THIS PERMIT

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 16	Burning Ground #1	RCRA-permitted Unit (interim status)	Groundwater, Soil
SWMU 17	Demolition Pit	RCRA-permitted Unit (interim status)	Groundwater, Soil
SWMU 32	Hazardous Waste Storage Building 512	RCRA-permitted Unit	Soil
SWMU 33	Hazardous Waste/Roll-off Box Storage Building 466	RCRA-permitted Unit	Soil
SWMU 34	Chemical Storage Igloos (Total of 155)	RCRA-permitted Unit	Soil
SWMU 48	Hazardous Waste Storage Building (Building 527)	RCRA-permitted Unit	Soil
SWMU 49	Conventional Waste Munitions/Components Storage Igloos (Total of 3)	RCRA-permitted Unit	Soil
SWMU 50	Brine Evaporation System	RCRA- permitted Unit	Groundwater, Soil
SWMU 51	Container Handling Building	RCRA- permitted Unit	Groundwater, Soil
SWMU 52	Brine Surge Tank System	RCRA- permitted Unit	Groundwater, Soil
SWMU 53	Toxic Maintenance Area	RCRA- permitted Unit	Groundwater, Soil
SWMU 54	Upper Munitions Corridor	RCRA- permitted Unit	Groundwater, Soil
SWMU 55	Buffer Storage Area	RCRA- permitted Unit	Groundwater, Soil
SWMU 56	Liquid Incinerator	RCRA- permitted Unit	Groundwater, Soil
SWMU 57	Deactivation Furnace System	RCRA- permitted Unit	Groundwater, Soil
SWMU 58	Brine Drum Dryers	RCRA- permitted Unit	Groundwater, Soil
SWMU 59	Agent Collection Tank System	RCRA- permitted Unit	Groundwater, Soil
SWMU 60	Waste Transfer Facility	RCRA- permitted Unit	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 61	Lower Munitions Corridor	RCRA- permitted Unit	Groundwater, Soil
SWMU 62	Spent Decontamination Holding Tank System	RCRA- permitted Unit	Groundwater, Soil
SWMU 63	Metal Parts Furnace	RCRA- permitted Unit	Groundwater, Soil
SWMU 64	HDC Bin Lay Down Area – Container Handling Building	RCRA- permitted Unit	Groundwater, Soil
SWMU 70	Static Detonation Chamber	RCRA-permitted Unit – 5/5/10	Groundwater, Soil

TABLE 8-4 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REMEDIATED BY OTHER PROGRAMS, I.E. CERCLA, MMRP.

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 1	Chemical Sludge Waste Pits	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 2	Sanitary Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD and LUCs as specified by Interim Status Post Closure Care (Code R335-14.5.07 and R335-13.4.20) pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 3	Old Industrial Wastewater Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 4	New Industrial Wastewater Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 5	Sink Hole Disposal Area	ASA – Requires monitoring and maintenance approved in the final OU-3 ROD	Groundwater
SWMU 7	Chemical Waste Burial Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 8	Acid Disposal Pit	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 9	Calcium Hypochlorite Burial Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 10	TNT Washout Facility	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 11	Sedimentation Leaching Bed-TNT Washout Facility	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 12	Facility 414 (Old Lagoon)	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 13	SIA Acid Chemical Waste Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 15	Propellant Disposal Facility	ASA – OU-3 final ROD, July 2006. Continue SI to determine extent of NDMA contamination	Groundwater, Soil
SWMU 18	WIA Old Sewage Treatment Plant	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
SWMU 19	SIA Old Sewage Treatment Plant and Drying Beds	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 20	New Sewage Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 21	Abrasive Dust Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 22	A-Block Lagoon	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 23	Asbestos Waste Disposal Trench	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 24	Old Sanitary Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 25	Building 130 Sump	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 27	South TNT Burial Pit	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 28	Waste Wood Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 29	Old Lumber Disposal Yard	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 30	Northeast Lagoon Area	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 31	Building 114 Metal Plating Shop	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 35	Deactivation Furnace/Popping Furnace	ASA – Requires monitoring and remediation approved in the final OU-3 ROD	Groundwater, Soil
SWMU 37	Vehicle Wash Rack (Building 45)	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
SWMU 38	Air Emission Baghouses (Buildings 5, 111, 114, 127, 129, 130, 145, 147, 186, 409, 410, 413, 431, 432, 433, PUB)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 40	Oil-Water Separator Building 501 and 501 UST Site	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 41	Steam Cleaning Buildings (Buildings 128A, 129, 130,409, 421, 503)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 42	Paint Booths (Buildings 8, 74A, 113, 117, 128A, 129, 130, 143, 409, 433, 501, 652)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 43	Cyanide Pretreatment System Building 506	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 46	Building 6 former UST	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
AOC A	Western Industrial Area	OU-5, Requires completion of Site Investigation	Groundwater, Soil
AOC D	Recoilless Rifle Range	MMRP Proposed RI	Groundwater, Soil
AOC E	Pistol Range	RI/FS	Groundwater, Soil
AOC F	Burning Ground Buffer Zone	RI/FS	Groundwater, Soil
AOC G	Competition Pistol Range	MMRP Phase II Remediation	Groundwater, Soil
AOC H	Tank Howitzer and Small Arms Range	MMRP Phase II Remediation	Groundwater, Soil
AOC I	Pyrotechnics Range	MMRP Phase II Remediation	Groundwater, Soil

MODULE IX
MANAGEMENT IN CONTAINERS AT THE ANAD HAZARDOUS WASTE STORAGE FACILITIES

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MODULE IX

MANAGEMENT IN CONTAINERS AT THE ANAD HAZARDOUS WASTE STORAGE FACILITY

IX.A. WASTE IDENTIFICATION

1. In the Hazardous Waste Storage Buildings listed in Table 9-1, the Permittee may store, in containers at the facility, the Industrial/Process hazardous wastes listed in Table II.C-1 of the facility permit application, subject to the terms of this permit. Storage of any waste not listed in Table II.C-1 of the facility permit application of this permit is prohibited.

2. In the Conventional Waste Munitions Igloos listed in Table 9-2 the Permittee may store, in containers at the facility, the Conventional Munitions hazardous waste listed in Table II.C-1 of the facility permit application, subject to the terms of this permit. Conventional Munitions hazardous waste may consist of conventional munitions related waste and/or conventional waste munitions. Storage of any waste not listed in Table II.C-1 of the facility permit application is prohibited.

3. In the Chemical Agent Igloos listed in Table 9-3 the Permittee may store Chemical Agent Munitions or Chemical Agent Related wastes generated by ANAD chemical agent munitions storage, reconfiguration operations and/or the ANCDF operations. Chemical Agent Munitions and Chemical Agent related wastes will not be stored in the same igloos at the same time. Storage of any waste not listed in Table III.C-1 of the facility permit application is prohibited.

4. The maximum total storage capacity for the 3 conventional waste munitions igloos is 180,249 gallons. Individual igloo storage limits for conventional waste munitions storage are specified in Table 9-2. The maximum total storage capacity of the 3 industrial hazardous waste storage buildings is 182,543 gallons. Individual building storage limits for industrial hazardous waste are specified in Table 9-1. The maximum total storage capacity of the 155 igloos for chemical agent munitions and chemical agent related waste is 7,552,687 gallons. Individual igloo storage limits for chemical agent storage are as specified in Table 9-3. For containers, these maximum storage capacities are based on the capacity of the containers stored therein; for munitions, these maximum storage capacities are based on the volume occupied by the munitions as they are packaged for storage.

IX.B. STORAGE IN CONTAINERS

1. The Permittee shall comply with the container storage capacity restrictions listed in Part IX.A of this permit.

2. The maximum combined quantity of hazardous and non-hazardous waste (excluding Waste Chemical Agent Munitions) stored in a given area shall not exceed ten times the capacity of the containment system for that area.

3. No individual container may be stored in a given area if the volume exceeds the capacity of the containment system for that area.

4. In addition to the other requirements of Module IX, storage of Waste Chemical Agent Munitions shall comply with all the requirements of ADEM Admin. Code R. 335-14-5-.31.

5. A minimum of 30 inches of aisle space will be maintained at all times within the hazardous waste storage igloos and storage buildings (excluding Waste Chemical Agent Munitions) to provide adequate access for emergency equipment and inspection.

6. Containers (excluding Waste Chemical Agent Munitions) having a capacity greater than or equal to 30 gallons shall not be stacked over two containers high at any time.

7. In addition to the other requirements of Module IX, storage of Conventional Waste Munitions shall comply with all of the requirements of ADEM Admin. Code R. 335-14-7-.13(6)(a)1. and (b).

8. In order to meet the requirement of ADEM Admin. Code R. 335-14-9-.05(1), each container of hazardous waste must be marked with the words, "Hazardous Waste," the applicable EPA hazardous waste number(s), and the date each period of accumulation begins.

IX.C. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, upon discovery the Permittee shall immediately transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this permit, as required in ADEM Admin. Code R. 335-14-5-.09(2).

IX.D. COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittee shall assure that the ability of the container to contain the waste is not impaired, as required by ADEM Admin. Code R. 335-14-5-.09(3).

IX.E. MANAGEMENT OF CONTAINERS

1. The Permittee shall manage containers as required by ADEM Admin. Code R. 335-14-5-.09(4).

2. A container holding hazardous or non-regulated waste must always be closed during storage, except when it is necessary to add, remove, sample, or inspect the waste.

3. A container holding hazardous or non-regulated waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

IX.F. CONTAINMENT

1. The Permittee shall maintain the containment systems for those hazardous waste storage areas listed in Table 9-1 in accordance with the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b).

2. The Permittee shall maintain an impervious coating for those hazardous waste storage areas listed in Table 9-1 that is free of cracks, gaps, or other deterioration on all containment system surfaces which may be exposed to hazardous wastes or hazardous constituents (or releases of hazardous wastes or hazardous constituents).

3. The Permittee shall provide secondary containment in the storage igloos listed in Table 9-3 for any container containing free liquids (excluding chemical agent munitions). The secondary containment must meet the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b). Employments of drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirement.

4. The Permittee shall provide secondary containment in the storage igloos listed in Table 9-2 for any container containing free liquids. The secondary containment must meet the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b). Employments of drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirement.

IX.G. INSPECTIONS

The Permittee shall inspect areas where containers are stored or handled. The purpose of this inspection is to detect leaking containers and deterioration of containers or containment systems and to ensure that containers having a capacity greater than 30 gallons are not stacked over two containers high. The Permittee shall adhere to the inspection requirements of ADEM Admin. Code R. 335-14-5-.09(5).

IX.H. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

The Permittee shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line as required by ADEM Admin. Code R. 335-14-5-.09 (7).

IX.I. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTE

1. The Permittee shall separate containers of incompatible wastes as specified in Section II.F-5 of the facility permit application.

2. The Permittee shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material.

3. The Permittee must document compliance with Conditions IX.I.1. and IX.I.2. of this permit as required by ADEM Admin. Code R. 335-14-5-.05(4) and place this documentation in the operating record.

4. The Permittee shall separate containers of incompatible wastes as required by ADEM Admin. Code R. 335-14-5-.09(8)(c).

IX.J. CLOSURE

The Permittee shall close the container storage area in accordance with the requirements of the Closure Plan, Section I of the ANAD Part B Application, and Rules 335-14-5-.07(2) and 335-14-5-.09(9) of the ADEM Administrative Code.

IX.K PERMITTED HAZARDOUS WASTE STORAGE FACILITIES

The Permittee may operate the hazardous waste storage facility storage units described in Table 9-1, Table 9-2, and Table 9-3 of Part IX of this permit, subject to the terms of this permit. Operation of any process or unit not listed in Part IX of this permit, operation of any process in a unit or area other than that for which the process is listed, or exceedance of any capacity listed therein, for the storage of hazardous waste is prohibited.

IX.l SAMPLING OF CONTAINERS WITHIN WASTE STORAGE FACILITIES

1. The Permittee shall sample all unknown waste located in any of the Hazardous Waste Storage Facilities listed in Table 9-1. The waste shall be sampled within five (5) days of arrival in the Waste Storage Facility.

2. The results of the sampling of unknown wastes within the Waste Storage Facility must be determined in a period not to exceed seventy-five (75) days from the date of the original sampling event.

3. The date waste was placed into storage, the sampling date, and the date and results of the sampling event must be documented by the Permittee. This documentation shall be maintained for a period of no less than three (3) years.

TABLE 9-1

INDUSTRIAL/PROCESS HAZARDOUS WASTE STORAGE BUILDINGS*

Storage Building	Storage Dimensions	Max. Volume (gallons)**
466–A Side	100′ x 50′	27720
466-B Side	100′ x 60′	69300
512	40′ x 60′	25440
527	50′ x 80′	60083
Roll-off Box Storage Building	36′ x 60′	4 roll-off boxes; 132 cubic yards

Note: (*) Non-regulated waste includes solid and universal waste, used oil, etc.
(**) Max. Volume includes all waste stored (regulated and non-regulated)

TABLE 9-2

CONVENTIONAL WASTE MUNITIONS/CONVENTION WASTE MUNITIONS COMPONENTS STORAGE IGLOOS

Igloo	Storage Dimensions	Max. Volume (gallons)**
I-103	23′6″ x 80	60083
F-704A	23′6″ x 80	60083
F-405	23′6″ x 80	60083

Note: (**) Max. Volume includes all waste stored (regulated and non-regulated)

TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS*

Igloo	Dimensions	Max.Volume (gallons)	Igloo	Dimensions	Max.Volume (gallons)
G101	23'6"X60'	45945	G302	23'6"X60'	45945
G102	23'6"X60'	45945	G303	23'6"X60'	45945
G102A	23'6"X80'	60083	G303A	23'6"X80'	60083
G103	23'6"X60'	45945	G304	23'6"X60'	45945
G104	23'6"X60'	45945	G304A	23'6"X80'	60083
G105	23'6"X60'	45945	G305	23'6"X60'	45945
G106	23'6"X60'	45945	G306	23'6"X60'	60083
G107	23'6"X60'	45945	G306A	23'6"X80'	60083
G108	23'6"X60'	45945	G307	23'6"X60'	45945
G108A	23'6"X60'	45945	G307A	23'6"X80'	60083
G109	23'6"X60'	45945	G308	23'6"X60'	45945
G110	23'6"X60'	45945	G308A	23'6"X80'	60083
G200A	23'6"X60'	45945	G309	23'6"X60'	45945
G201	23'6"X60'	45945	G310	23'6"X60'	45945
G202	23'6"X60'	45945	G311	23'6"X60'	45945
G202A	23'6"X80'	60083	G312	23'6"X60'	45945
G203	23'6"X60'	45945	G313	23'6"X60'	45945
G203A	23'6"X80'	60083	G401	23'6"X60'	45945
G204	23'6"X60'	45945	G402	23'6"X60'	45945
G205	23'6"X60'	45945	G403	23'6"X60'	45945
G206	23'6"X60'	45945	G404	23'6"X60'	45945
G206A	23'6"X80'	60083	G404A	23'6"X80'	60083
G207	23'6"X60'	45945	G405	23'6"X60'	45945
G208	23'6"X60'	45945	G405A	23'6"X80'	60083
G208A	23'6"X80'	60083	G406	23'6"X60'	45945
G209	23'6"X60'	45945	G407	23'6"X60'	45945
G209A	23'6"X80'	60083	G408	23'6"X60'	45945
G210	23'6"X60'	45945	G408A	23'6"X80'	60083
G211	23'6"X60'	45945	G409	23'6"X60'	45945
G211A	23'6"X80'	60083	G410	23'6"X60'	45945
G212	23'6"X60'	45945	G411	23'6"X60'	45945
G213	23'6"X60'	45945	G501	23'6"X60'	45945
G301	23'6"X60'	45945	G502	23'6"X60'	45945

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TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS, continued

Igloo	Dimensions	Max.Volume (gallons)	Igloo	Dimensions	Max.Volume (gallons)
G502A	23'6"X80'	60083	G610	23'6"X60'	45945
G503	23'6"X60'	45945	G611	23'6"X60'	45945
G503A	23'6"X80'	60083	G612	23'6"X60'	45945
G504	23'6"X60'	45945	G1001	23'6"X40'	28274
G504A	23'6"X80'	60083	G1002	23'6"X40'	28274
G505	23'6"X60'	45945	C701	23'6"X60'	45945
G505A	23'6"X80'	60083	C702	23'6"X60'	45945
G506	23'6"X60'	45945	C703	23'6"X60'	45945
G506A	23'6"X80'	60083	C704	23'6"X60'	45945
G507	23'6"X60'	45945	C705	23'6"X60'	45945
G507A	23'6"X80'	60083	C706	23'6"X60'	45945
G508	23'6"X60'	45945	C707	23'6"X60'	45945
G508A	23'6"X80'	60083	C707A	23'6"X80'	60083
G509	23'6"X60'	45945	C708	23'6"X60'	45945
G510	23'6"X60'	45945	C801	23'6"X60'	45945
G511	23'6"X60'	45945	C802	23'6"X60'	45945
G512	23'6"X60'	45945	C803	23'6"X60'	45945
G601	23'6"X60'	45945	C804	23'6"X60'	45945
G601A	23'6"X80'	60083	C805	23'6"X60'	45945
G602	23'6"X60'	45945	C806	23'6"X60'	45945
G602A	23'6"X80'	60083	C807	23'6"X60'	45945
G603	23'6"X60'	45945	C808	23'6"X60'	45945
G603A	23'6"X80'	60083	C808A	23'6"X80'	60083
G604	23'6"X60'	45945	C809	23'6"X60'	45945
G604A	23'6"X80'	60083	C901	23'6"X60'	45945
G605	23'6"X60'	45945	C902	23'6"X60'	45945
G605A	23'6"X80'	60083	C903	23'6"X60'	45945
G606	23'6"X60'	45945	C904	23'6"X60'	45945
G607	23'6"X60'	45945	C905	23'6"X60'	45945
G607A	23'6"X80'	60083	C906	23'6"X60'	45945
G608	23'6"X60'	45945	C907	23'6"X60'	45945
G609	23'6"X60'	45945	C907A	23'6"X80'	60083
G609A	23'6"X80'	60083	C908	23'6"X60'	45945

TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS, continued

Igloo	Dimensions	Max.Volume (gallons)
C1001	23'6"X60'	45945
C1002	23'6"X60'	45945
C1003	23'6"X60'	45945
C1004	23'6"X60'	45945
C1005	23'6"X60'	45945
C1006	23'6"X60'	45945
C1007	23'6"X60'	45945
C1008	23'6"X60'	45945
C1009	23'6"X60'	45945
C1101	23'6"X60'	45945
C1102	23'6"X60'	45945
C1103	23'6"X60'	45945
C1104	23'6"X60'	45945
C1105	23'6"X60'	45945
C1106	23'6"X60'	45945
C1107	23'6"X60'	45945
C1108	23'6"X60'	45945
C1201	23'6"X60'	45945
C1202	23'6"X60'	45945
C1203	23'6"X60'	45945
C1204	23'6"X60'	45945
C1205	23'6"X60'	45945
C1206	23'6"X60'	45945

* The storage volume of the Chemical Agent Storage Igloos was calculated by determining the maximum volume occupied by the M55 rockets as they are packaged for storage. Waste Chemical Agent Munitions shall be stored in accordance with ADEM Admin. Code R. 335-14-5-.31. Chemical Agent Related Waste must be stored in accordance with Condition IX.B of this Permit.

MODULE X: GROUNDWATER MONITORING AND CORRECTIVE ACTION

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MODULE X
GROUNDWATER MONITORING AND CORRECTIVE ACTION

X.A REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition X.B and the Detection Monitoring Program contained in Permit Condition X.C.

2. The Permittee shall commence groundwater monitoring as required by this permit not later than 120 calendar days after the effective date of this permit.

X.B. GENERAL GROUNDWATER MONITORING PROGRAM

1. Well Location, Installation, and Construction

   The Permittee shall install and/or maintain a groundwater monitoring system to comply with the requirements of ADEM Admin. Code Rules 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11) as applicable and as specified below:

   a. The Permittee shall maintain all groundwater monitoring wells at the facility as identified in Table 10-1 of this permit, at the locations specified on Figure IV.E-1 and Figure IV.E-2 of the facility permit application.

      i. All groundwater monitoring wells shall be maintained in accordance with the plans and specifications presented in Section IV.F of the facility permit application and in accordance with ADEM Admin. Code Rule 335-14-5-.06.

      ii. A groundwater monitoring well shall not be removed from any monitoring program specified in this permit without an approved permit modification pursuant to Permit Condition I.K.3.

      iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, to include a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. Within 30 calendar days after the well is repaired, the Permittee shall submit a written notification to the Department that the well repair activities were conducted in accordance with the approved procedures.

      iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit in accordance with Permit Conditions X.B.1.a.i and I.K.3., it shall be abandoned within 90 calendar days after deletion in accordance with the most recent version of the Alabama Environmental Investigation and Remediation Guidance (AEIRG). Within 30 calendar days after the well is abandoned, the Permittee shall submit a written notification to the Department that the well

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abandonment activities were conducted in accordance with the approved procedures.

b. Groundwater monitoring wells 05CW16-1, 05CW16-2, 05CW16-3, and 05CW16-4 shall define the points of compliance for the OB unit. Groundwater monitoring wells 05CW17-1, 05CW17-2, 91B18 and 91B19 shall define the points of compliance for the OD unit.

c. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in migration and contaminant levels of any plume or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code Rules 335-14-5-.06(6), 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11), as applicable. A plan in the form of a permit modification request specifying the design, location and installation of any additional monitoring wells should be submitted to the Department within 90 calendar days prior to installation. At a minimum, the plan shall include:

i. Well construction techniques including casing depths and proposed total depth of well(s);

ii. Well development method(s);

iii. A complete description of well construction materials;

iv. A schedule of implementation for construction; and,

v. Provisions for determining the lithologic characteristics, hydraulic conductivity, grain size distribution, and porosity for the applicable aquifer unit(s) at the location of the new well(s).

2. General Groundwater Monitoring Requirements

a. The Permittee shall determine the groundwater surface elevation from all monitoring wells listed in Table 10-1 of this permit at least semi-annually and each time a sampling event is conducted. The results of these determinations should be submitted in accordance with Permit Condition X.B.6. Elevation data should be recorded and reported as mean sea level (MSL) and referenced to an appropriate national geodetic vertical datum (NGVD) benchmark.

b. The Permittee shall determine the groundwater flow rate and direction in the underlying aquifer(s) at least annually and submit the results in accordance with Permit Condition X.B.6.

c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit in accordance with Section IV.E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(g).

3. Groundwater Protection Standard

a. The groundwater protection standard, as required under ADEM Admin. Code Rule 335-14-5-.06(3), shall consist of Table 10-2 of this permit which lists the hazardous constituents and their respective concentration limits.

b. The groundwater protection standard applies to all hazardous waste or hazardous constituent releases as deemed appropriate by the Department to protect human health and the environment.

4. Compliance Period

a. The compliance period, during which the groundwater protection standard specified in Permit Condition X.B.3 applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition X.D.) or the corrective action monitoring program (Permit Condition X.E.), whichever is earlier.

b. The compliance period shall continue (after beginning pursuant to Permit Condition X.B.4.a.) until the groundwater protection standard as defined by Permit Condition X.B.3.a. has not been exceeded for a period of three consecutive years.

c. If the Permittee is engaged in a corrective action program pursuant to Permit Condition X.E., then the compliance period shall continue as required by ADEM Admin. Code Rule 335-14-5-.06(7)(c) until the groundwater protection standard has not been exceeded for a period of three consecutive years after corrective action has been terminated and this permit has been modified, in accordance with Permit Condition I.K., to implement a compliance monitoring program pursuant to Permit Condition X.D. or a detection monitoring program pursuant to Permit Condition X.C as required by ADEM Admin. Code Rule 335-14-5-.06(11)(f).

5. Sampling and Analysis Procedures

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition X.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code Rules 335-14-5-.06(8)(d), (e), and (g):

a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Section IV.E of the facility permit application.

b. Samples shall be analyzed according to the procedures specified in Section IV.E of the facility permit application, the most recent edition of SW-846 or other appropriate methods approved by the Department. Analytical method detection limits shall be less than or equal to the concentration limits specified in Table 10-2, unless otherwise approved in writing by the Department.

c. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section IV.E of the facility permit application.

d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Section IV.E of the facility permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(h).

e. All samples taken in accordance with this permit shall not be filtered prior to analysis.

6. Recordkeeping and Reporting

a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions X.B., X.C., X.D., and X.E. as required by Permit Condition I.E.11.

b. The Permittee shall submit to the Department a written report to include all analytical sampling data, established background values, statistical evaluations, groundwater elevations, associated potentiometric maps, and the annual groundwater flow rate and direction determinations. The analytical method and the method detection limit (MDL) for each constituent must be integrated into all reports of analysis. The report shall be submitted within 60 calendar days after the first sampling event and on an annual basis thereafter. Copies of this report shall be kept at the facility in accordance with Permit Condition I.E.11.

c. The Permittee shall submit progress reports to the Department describing implementation of groundwater monitoring and/or corrective action activities at the site as required by Part V of this permit on a quarterly basis. The progress reports shall continue until such time as the required monitoring and/or corrective action systems and activities required by this permit are fully constructed and operational. In the event that additional monitoring and/or corrective action requirements are imposed through a permit modification, the quarterly reporting requirement shall resume, commencing upon the effective date of the permit modification and continuing until the required monitoring and/or corrective action systems and activities are again fully constructed and operational.

X.C. DETECTION MONITORING PROGRAM

The requirements of this Condition are applicable to OB and OD units. Except as specified otherwise in this permit, the Detection Monitoring Program shall be implemented in accordance with Section IV.E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(9).

1. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition X.B.2., the Permittee shall:

a. Sample all point of compliance wells and background wells and analyze for the constituents listed in Table 10-2 of this permit, on a semi-annual basis in accordance with Permit Condition X.B.5.

b. Sample all background and point of compliance monitoring wells and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard

units) each time the well is sampled in accordance with Permit Condition X.B.5. The data obtained should be submitted as raw data in the reports required by Permit Condition X.B.6.

c. Sample all designated background monitoring wells and analyze, in accordance with Permit Condition X.B.2, for the constituents listed in Table 10-2 of this permit in all monitoring events.

2. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition X.B.6:

a. The Permittee shall determine whether there is statistically significant evidence of contamination above background levels at each monitoring well within 45 calendar days after completion of each sampling event. The statistical evaluation of monitoring well analytical data shall be performed pursuant to Permit Condition X.B.5 and ADEM Admin. Code Rule 335-14-5-.06(9)(f).

b. If the Permittee determines, pursuant to Permit Condition X.C.2.a, that there is statistically significant evidence of contamination above background levels for any chemical parameters or hazardous constituents listed in Table 10-2 of this permit at any monitoring well at the point of compliance, he or she must comply with ADEM Admin. Code R. 335-14-5-.06(10)(g).

X.D. COMPLIANCE MONITORING PROGRAM

If statistically significant evidence of contamination is found during the baseline sampling monitoring program, in compliance with AAC 335-14-5-.06(10)(h)(2) and (3), the groundwater shall be sampled in all monitoring wells to determine whether constituents in the list of Appendix IX of AAC 335-14-5 are present and, if so, at what concentration. For any Appendix IX compounds found, the analysis may be repeated in1 month. If the analysis is repeated and the results of the second analysis confirm the initial results, then these constituents will form the basis of compliance monitoring. Alternatively, the Permittee may elect to have the hazardous constituents found in the initial Appendix IX monitoring serve as the basis for compliance monitoring. Within 90 days after the discovery of statistically significant evidence of contamination, ANAD shall submit to ADEM an application for a permit modification. The permit modification application will include the following information:

1. Identification of the concentration of any Appendix IX constituent detected in the groundwater at each monitoring well at the point of compliance. [AAC 335-14-5-.06(10)(h)].

2. Any proposed changes to the groundwater monitoring system at the OB and OD units necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].

3. Any proposed corrective actions, additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].

X.E. CORRECTIVE ACTION MONITORING PROGRAM (RESERVED)

TABLE 10-1: MONITORING WELL DESIGNATIONS FOR THE OB/OD UNITS

WELL NUMBER	WELL TYPE[2]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft btoc)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE
05CW16-1[1]	POC	85° 59' 48.10"	33° 39' 56.50"	OB	23	713.75	10.0-20.0	Residuum
05CW16-2	POC	85° 59' 55.80"	33° 40' 06.10"	OB	18	688.09	5.0-15.0	Residuum
05CW16-3	POC	85° 59' 55.00"	33° 40' 04.00"	OB	18	693.36	4.5-14.5	Residuum
05CW16-4	POC	85° 59' 53.00"	33° 40' 04.60"	OB	22	695.81	9.5-19.5	Residuum
05CW17-1	POC	86° 00' 00.40"	33° 40' 59.63"	OD	23	616.04	1.0-20.0	Residuum
05CW17-2	POC	85° 59' 53.00"	33° 40' 55.35"	OD	18	623.91	5.0-15.0	Residuum
91B18[1]	POC	85° 59' 30.50"	33° 40' 47.77"	OD	18	652.00	5.0-15.0	Residuum
91B19	POC	85° 59' 52.52"	33° 40' 56.72"	OD	23	621.57	10.0-20.0	Residuum

Footnotes:

1 – Background Wells
2 - POC – Point of Compliance Wells

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TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	PRELIMINARY SCREENING VALUES (PSVs)[c] (mg/L)	GROUNDWATER REFERENCE
Inorganics (metals)			
Aluminum	OB and OD	3.60E+00	a
Antimony	OB and OD	6.00E-03	a
Arsenic	OB and OD	1.00E-02	a
Barium	OB and OD	2.00E+00	a
Beryllium	OB and OD	4.00E-03	a
Cadmium	OB and OD	5.00E-03	a
Chromium	OB and OD	4.00E-01	a
Cobalt	OB and OD	7.30E-02	a
Copper	OB and OD	1.30E+00	a
Iron	OB and OD	1.10E+00	a
Lead	OB and OD	1.50E-02	a
Manganese	OB and OD	8.80E-02	a
Mercury	OB and OD	2.00E-03	a
Nickel	OB and OD	1.00E-01	a
Selenium	OB and OD	5.00E-02	a
Silver	OB and OD	1.80E-02	a
Thallium	OB and OD	2.00E-03	a
Vanadium	OB and OD	3.60E-03	a
Zinc	OB and OD	1.10E+00	a
Explosives			
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	OB and OD	6.10E-04	a
HMX (Octahydro-,3,5,7- tetranito-1,3,5,7-tetrazocine)	OB and OD	1.80E-01	a
1,3,5-Trinitrobenzene	OB and OD	1.10E-01	a
1,2-Dinitrobenzene	OB and OD	3.70E-03	b
1,3-Dinitrobenzene	OB and OD	3.70E-03	b
1,4-Dinitrobenzene	OB and OD	3.70E-03	b
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	OB and OD	3.60E-02	a
2-Amino-4,6-dinitrotoluene	OB and OD	7.30E-02	b
4-Amino-2,6-dinitrotoluene	OB and OD	7.30E-02	b
Nitrobenzene	OB and OD	3.40E-04	a
2,4,6-Trinitrotoluene	OB and OD	2.20E-03	a
2,4-Dinitrotoluene	OB and OD	7.30E-03	a
2,6-Dinitrotoluene	OB and OD	3.60E-03	a
2-Nitrotoluene	OB and OD	3.10E-04	b
3-Nitrotoluene	OB and OD	7.30E-01	b
4-Nitrotoluene	OB and OD	4.20E-03	b
Nitroglycerin	OB and OD	3.70E-03	b
Semi-Volatile Organic Compounds (SVOCs)			
1,2,4-Trichlorobenzene	OB and OD	7.00E-02	a
1,2-Dichlorobenzene	OB and OD	6.00E-01	a
1,3-Dichlorobenzene	OB and OD	1.80E-02	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	PRELIMINARY SCREENING VALUES (PSVs)[c] (mg/L)	GROUNDWATER REFERENCE
1,4-Dichlorobenzene	OB and OD	7.50E-02	a
2,4,5-Trichlorophenol	OB and OD	3.60E-01	a
2,4,6-Trichlorophenol	OB and OD	3.60E-04	a
2,4-Dimethylphenol	OB and OD	7.30E-02	a
2,4-Dichlorophenol	OB and OD	1.10E-02	a
2,4-Dinitrotoluene	OB and OD	7.30E-03	a
2,6-Dinitrotoluene	OB and OD	3.60E-03	a
2-Chloronaphthalene	OB and OD	4.90E-02	a
2-Chlorophenol	OB and OD	3.00E-03	
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	OB and OD	3.70E-03	b
2-Methylnaphthalene	OB and OD	6.26E-03	a
2-Methylphenol (o-Cresol)	OB and OD	1.80E-01	a
2-Nitroaniline	OB and OD	1.10E-02	a
3,3'-Dichlorobenzidine	OB and OD	1.50E-04	a
3-Methylphenol (m-Cresol)	OB and OD	1.80E-01	a
4-Methylphenol (p-Cresol)	OB and OD	1.80E-02	a
3-Nitroaniline	OB and OD	1.10E-02	a
4-Chloro-3-methylphenol	OB and OD	1.41E-02	a
4-Chloroaniline	OB and OD	1.50E-02	a
4-Nitroaniline	OB and OD	3.40E-03	b
4-Nitrophenol	OB and OD	1.25E-02	a
Acenaphthene	OB and OD	3.70E-02	a
Anthracene	OB and OD	1.80E-01	a
Benzo(a)anthracene	OB and OD	9.20E-05	a
Benzo(a)pyrene	OB and OD	2.00E-04	a
Benzo(b)fluoranthene	OB and OD	9.20E-05	a
Benzo(g,h,i)perylene	OB and OD	4.69E-02	a
Benzo(k)fluoranthene	OB and OD	9.20E-04	a
Benzoic acid	OB and OD	1.50E+01	a
Benzyl alcohol	OB and OD	1.10E+00	a
Bis(2-chloroethoxy)methane	OB and OD	1.10E-01	a
Bis(2-chloroethyl)ether	OB and OD	1.00E-05	a
Bis(2-chloroisopropyl)ether	OB and OD	2.70E-04	a
Bis(2-ethylhexyl)phthalate (DEHP)	OB and OD	6.00E-03	a
Butyl benzyl phthalate	OB and OD	7.30E-01	a
Chrysene	OB and OD	9.20E-03	a
Dibenzo(a,h)anthracene	OB and OD	9.20E-06	a
Dibenzofuran	OB and OD	1.20E-03	a
Diethyl phthalate	OB and OD	2.90E+00	a
Dimethyl phthalate	OB and OD	3.60E+01	a
Di-n-butyl phthalate	OB and OD	3.60E-01	a
Di-n-octyl phthalate	OB and OD	1.50E-01	a
Fluoranthene	OB and OD	1.50E-01	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	PRELIMINARY SCREENING VALUES (PSVs)[c] (mg/L)	GROUNDWATER REFERENCE
Fluorene	OB and OD	2.40E-02	a
Hexachlorobenzene	OB and OD	1.00E-03	a
Hexachlorobutadiene	OB and OD	8.60E-04	b
Hexachlorocyclopentadiene	OB and OD	5.00E-02	a
Hexachloroethane	OB and OD	4.80E-03	a
Indeno(1,2,3-cd)pyrene	OB and OD	9.20E-05	a
Isophorone	OB and OD	7.10E-02	a
Nitrobenzene	OB and OD	3.40E-01	a
N-Nitrosodimethylamine	OB and OD	1.30E-06	a
n-Nitroso-di-n-propylamine	OB and OD	9.60E-06	a
N-Nitrosodiphenylamine/Diphenylamine	OB and OD	1.40E-06	a
Pentachlorophenol	OB and OD	1.00E-03	a
Phenanthrene	OB and OD	4.69E-02	a
Phenol	OB and OD	1.10E+00	a
Pyrene	OB and OD	1.80E-02	a
Volatile Organic Compounds (VOCs)			
Acetone	OB and OD	5.50E-01	a
Benzene	OB and OD	5.00E-03	a
Bromobenzene	OB and OD	2.00E-02	b
Bromodichloromethane	OB and OD	8.00E-02	a
Bromoform	OB and OD	8.00E-02	a
Bromomethane	OB and OD	8.70E-04	a
2-Butanone (Methyl Ethyl Ketone)	OB and OD	7.00E-01	a
sec-Butylbenzene	OB and OD	2.40E-02	a
tert-Butylbenzene	OB and OD	2.40E-02	a
Carbon disulfide	OB and OD	1.00E-01	a
Carbon tetrachloride	OB and OD	5.00E-03	a
Chlorobenzene	OB and OD	1.00E-01	a
Chloroethane	OB and OD	4.60E-03	a
Chloroform	OB and OD	8.00E-02	a
Chloromethane	OB and OD	1.60E-03	a
2-Chlorotoluene	OB and OD	1.20E-02	a
4-Chlorotoluene	OB and OD	2.60E+00	b
Dibromochloromethane	OB and OD	8.00E-02	a
1,2-Dibromo-3-chloropropane	OB and OD	2.00E-04	a
1,2-Dibromoethane (EDB)	OB and OD	5.00E-05	a
1,2-Dichlorobenzene	OB and OD	6.00E-01	a
1,3-Dichlorobenzene	OB and OD	1.80E-02	a
1,4-Dichlorobenzene	OB and OD	7.50E-02	a
Dichlorodifluoromethane	OB and OD	3.90E-02	a
1,1-Dichloroethane	OB and OD	8.10E-02	a
1,2-Dichloroethane	OB and OD	5.00E-03	a
1,1-Dichloroethene	OB and OD	7.00E-03	a
cis-1,2-Dichloroethene	OB and OD	7.00E-02	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	PRELIMINARY SCREENING VALUES (PSVs)[c] (mg/L)	GROUNDWATER REFERENCE
trans-1,2-Dichloroethylene	OB and OD	1.00E-01	a
1,2-Dichloropropane	OB and OD	5.00E-03	a
1,3-Dichloropropane	OB and OD	7.30E-01	b
cis-1,3-Dichloropropene	OB and OD	4.00E-04	a
trans-1,3-Dichloropropene	OB and OD	4.00E-04	a
Ethylbenzene	OB and OD	7.00E-01	a
Hexachlorobutadiene	OB and OD	8.60E-04	a
Isopropylbenzene	OB and OD	6.60E-01	a
Methylene chloride (Dichloromethane)	OB and OD	5.00E-03	a
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	OB and OD	2.00E-01	a
Naphthalene	OB and OD	6.20E-04	a
Styrene	OB and OD	1.00E-01	a
1,1,1,2-Tetrachloroethane	OB and OD	4.30E-04	a
1,1,2,2-Tetrachloroethane	OB and OD	5.50E-05	a
Tetrachloroethene	OB and OD	5.00E-03	a
Toluene	OB and OD	1.00E+00	a
1,2,4-Trichlorobenzene	OB and OD	7.00E-02	a
1,1,1-Trichloroethane	OB and OD	2.00E-01	a
Trichloroethene	OB and OD	5.00E-03	a
Trichlorofluoromethane	OB and OD	1.30E-01	a
1,2,3-Trichloropropane	OB and OD	5.60E-06	a
1,2,4-Trimethylbenzene	OB and OD	1.20E-03	a
1,3,5-Trimethylbenzene	OB and OD	4.10E-02	a
Vinyl chloride	OB and OD	2.00E-03	a
Total Xylenes	OB and OD	1.00E+01	a
Other Analytes			
Cyanide	OB and OD	2.00E-01	a
Perchlorate	OB and OD	2.45E-02	a
Nitrate	OB and OD	1.00E+01	a
Nitrite	OB and OD	1.00E+00	a

Groundwater References:

a Alabama Risk Based Corrective Action Guidance Manual

b EPA Regional Screening

c Preliminary Screening Values (PSVs) are found in Table 2-2 of the Alabama Risked Based Corrective Action (ARBCA) Guidance Manual dated April 2008..

ATTACHMENT 1:

RESERVED

(Part A found in Section I of Part B Application)

PART 1 OF ATTACHMENT 2:

RESERVED

PART 2 OF ATTACHMENT 2:

RESERVED

Part 1 of Attachment 3:

RESERVED

Part 2 of Attachment 3

RESERVED

ATTACHMENT 4

RESERVED

ATTACHMENT 5

RESERVED

ATTACHMENT 6

RESERVED

ATTACHMENT 7:

RESERVED

ATTACHMENT 8:
WASTE MINIMIZATION CERTIFICATION OBJECTIVES

The Waste Minimization Program should include the following elements:

1. Top Management Support

   a. Dated and signed policy describing management support for waste minimization and for implementation of a waste minimization plan.

   b. Description of employee awareness and training programs designed to involve employees in waste minimization planning and implementation to the maximum extent feasible.

   c. Description of how a waste minimization plan has been incorporated into management practices so as to ensure ongoing efforts with respect to product design, capital planning, production operations, and maintenance.

2. Characterization of Waste Generation

   Identification of types, amounts, and hazardous constituents of waste streams, with the source and date of generation.

3. Periodic Waste Minimization Assessments

   a. Identification of all points in a process where materials can be prevented from becoming a waste, or can be recycled.

   b. Identification of potential waste reduction and recycling techniques applicable to each waste, with a cost estimate for capital investment and implementation.

   c. Description of technically and economically practical waste reduction/recycling options to be implemented, and a planned schedule for implementation.

   d. Specific performance goals, preferably quantitative, for the source reduction of waste by stream. Whenever possible, goals should be stated as weight of waste generated per standard unit of production, as defined by the generator.

4. Cost Allocation System

   a. Identification of waste management costs for each waste, factoring in liability, transportation, recordkeeping, personnel, pollution control, treatment, disposal, compliance, and oversight costs to the extent feasible.

   b. Description of how departments are held accountable for the wastes they generate.

c. Comparison of waste management costs with costs of potential reduction and recycling techniques applicable to each waste.

5. Technology Transfer

Description of efforts to seek and exchange technical information on waste minimization from other parts of the company, other firms, trade associations, technical assistance programs, and professional consultants.

6. Program Evaluation

a. Description of types and amounts of hazardous waste reduced or recycled.

b. Analysis and quantification of progress made relative to each performance goal established and each reduction technique to be implemented.

c. Amendments to waste minimization plan and explanation.

d. Explanation and documentation of reduction efforts completed or in progress before development of the waste minimization plan.

e. Explanation and documentation regarding impediments to hazardous waste reduction specific to the individual facility.

References:

"Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program", 54 FR 25056, June 12, 1989.

"Waste Minimization Opportunity Assessment Manual", EPA/625/7-88/003, July 1988.

SECTION IV: CONVENTIONAL MUNITIONS TREATMENT

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IV B Facility Description

IV B General Description
ADEM Admin. Code R335-14-8-.02(5)(b)1

This section provides a general description of the Anniston Army Depot (ANAD), Anniston, Alabama.

In accordance with Alabama Department of Environmental Management (ADEM) Admin. Code R.335-14-8-.02 (5)(b) 1, Section II B-1 provides the general description of the facility and overall program for management of hazardous waste.

Section II B-2 provides and discusses the ANAD topographic map required by ADEM Admin. Code R.335-14-8-.02(5)(b) 19.

Section II B-3 describes the design of the storage areas required under ADEM Admin. Code R.335-14-5-.09.

Section II B-4 addresses the location information requirements of ADEM Admin. Code R.335-14-8-.02(5)(b) 11.

Section II B-5 describes ANAD's traffic pattern as required by ADEM Admin. Code R.335-14-8-.02(5)(b) 10.

IV B-1 General Description
ADEM Admin. Code R.335-14-8-.02(5)(b)1

Section II B addresses the General Description of the treatment units.

IV B-1a Applicability of Part B to this Facility

Section II B-1 addresses the applicability of Part B to these treatment units.

Operation of the OB/OD units are required to fulfill ANAD's mission. Submittal and approval of a modification to the Part B permit is required to change the status of the OB/OD units from interim operating status to permitted operating status.

In support of its mission, ANAD participates in a variety of test programs, resource, recovery, and recycling (R3) programs, and additionally conducts emergency response operations. Though the ANAD OB and OD units are primarily used for the disposal of waste military munitions, the units may additionally be used for non-permitted purposes in support of the above listed programs and activities.

Munitions-related activities that are deemed "use for intended purpose" are not solid waste management activities, and thereby do not require a permit. Such activities are identified in 40 CFR Part 266.202 (Military Munitions Rule) and 270.1(c)(3)(D) (actions to remove a threat of

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imminent discharge). Non-permitted activities that may be conducted within the bounds of the OB and OD units include:

- The use of military munitions in the training of military personnel, to include emergency response specialists;
- Research, Development, Test and Evaluation (RDT&E) activities to include but not limited to safety testing, developmental testing, surveillance function testing, static fire, or quality control or assurance testing; and
- Emergency response operations.

IV B-1b Manages Waste Generated Onsite and Offsite

The OB/OD units manage waste generated onsite and offsite from other DoD installations.

IV B-1c Location

Section II B-1c addresses the location of the treatment units.

IV B-1d Owner or Operators Name

Section I addresses the owner or operator's name of the treatment units.

IV B-1e Types of Waste Management Activities

Section II B-1e addresses the types of waste management activities at ANAD.

The specific waste management activities conducted at the ANAD OB and OD units include thermal treatment of conventional waste military munitions (WMM) and related energetic wastes as approved by ADEM.

The capacity for the OB and OD units is:

— 2,000 lb/pan and 20,000 lb/day net explosive weight (NEW) for the OB unit;

— 15 lb/detonation station aboveground, 1,000 lb/detonation station below ground and 16,000 lb/day NEW for the OD unit.

Operations of the OB and OD units began in coincidence with the installation's founding as an Army Ordnance Depot in the early 1940s. Little has changed since these operations first began. The OB and OD units are generally located as they were when they were first constructed, though the area of the units has grown somewhat to the maximum size that they currently occupy.

One exception to the above is the use of an area adjacent to the current OB unit to burn a single workload of the igniting charges for the 90mm. The igniting charges were placed in a line on the soil surface, covered with hay and ignited. At one time, ANAD sought to include the area comprising Burning Ground #2 as a separate OB unit in its RCRA application. However, this was short lived and ANAD no longer seeks to permit Burning Ground #2. The use of Burning Ground #2 is noted in scarce historical documentation and the area identified as Burning Ground #2 is undergoing closure as a solid waste management unit (SWMU). The location of the former Burning Ground #2 is noted on Figure IV B-1.

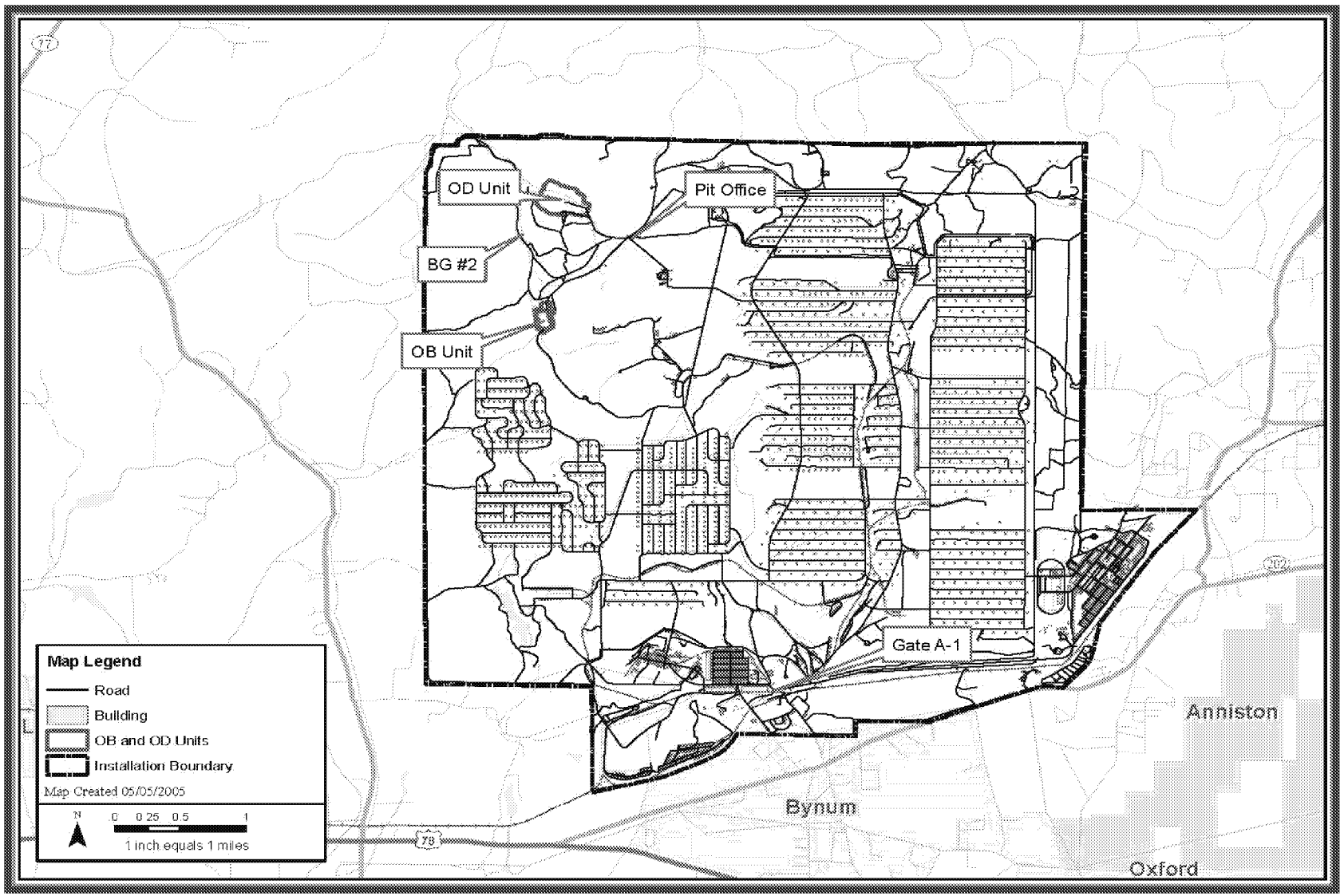

Figure IV.B-1. ANAD Facility OB/OD Units

OB and OD operations have also changed very little over time. The bulk of OB operations have always been completed within burn pans though some items that could not be contained within the pans (e.g., rocket motors) have occasionally been burned on the soil surface or in shallow pits. The specific locations of such historical burns within the unit is not known. A "burn cage", which has been removed, operated for an unknown period of time. The "burn cage" was used to burn small arms ammunition. Small arms ammunition and dunnage was placed into the cage and ignited. The burn cage had not been used for more than 15 years and was removed as part of routine maintenance of the site in 2009. The minor changes in procedures and processes at the OD unit have related primarily to increased awareness in safety and advancements in the functioning of explosives donor charges.

The ANAD WMM waste stream has varied as the stockpile of military munitions requiring demilitarization has changed throughout time.

In 2007, ANAD received special authorization under a separate emergency permit from ADEM for the ANMC to destroy 22 Spartan motors. The 12,000-pound motor is part of a conventional Spartan missile. Burn procedures were developed to allow the propellant to burn without causing a propulsive state. Based on the SOP and timeline approved, the burn of the first motor was scheduled for June 2007. The first motor was successfully burned on 8 June 2007 with the last motor burn completed on 10 November 2007. Destruction of the Spartan motors occurred within the bounds of the OD unit.

IV B-1f Type of Storage Units

Section II addresses all ANAD RCRA permitted container storage units with the exception of those associated with the ANCDF. Section III addresses the Anniston Chemical Demilitarization Facility (ANCDF) related storage units. The hazardous waste management process will consist of container storage (S01) and other storage (S99).

The ANAD OB and OD units (included in this section) are classified as miscellaneous units and are used to thermally treat conventional waste military munitions (WMM).

IV B-1g Engineering Drawings

Figures IV B-2a and IV B-3 are as-built drawings for the OB unit. There are no engineering drawings for the OD unit. The OD unit consists of an open area. Detonations occur on the soil surface or in trenches. OB is conducted within the confines of OB pans. A more detailed description of the units is provided in Section IV B-1j. Additional detail regarding the OB and OD processes is provided in Section IV B-3.

IV B-1h Specifications of Wastes that have been Managed at the Storage Units

The OB and OD units are used to thermally treat conventional WMM that result from demilitarization of existing munitions stockpiles and off-specification materials. The term "waste military munitions" encompasses all military munitions, ordnance, propellants, explosive devices and components, etc., as defined by AAC 335-14-7-.13 and disposed of at the OB and OD units. These wastes are managed at ANAD following a determination by the Designated Disposition Authority (DDA). DDA is the authorized military official. Only

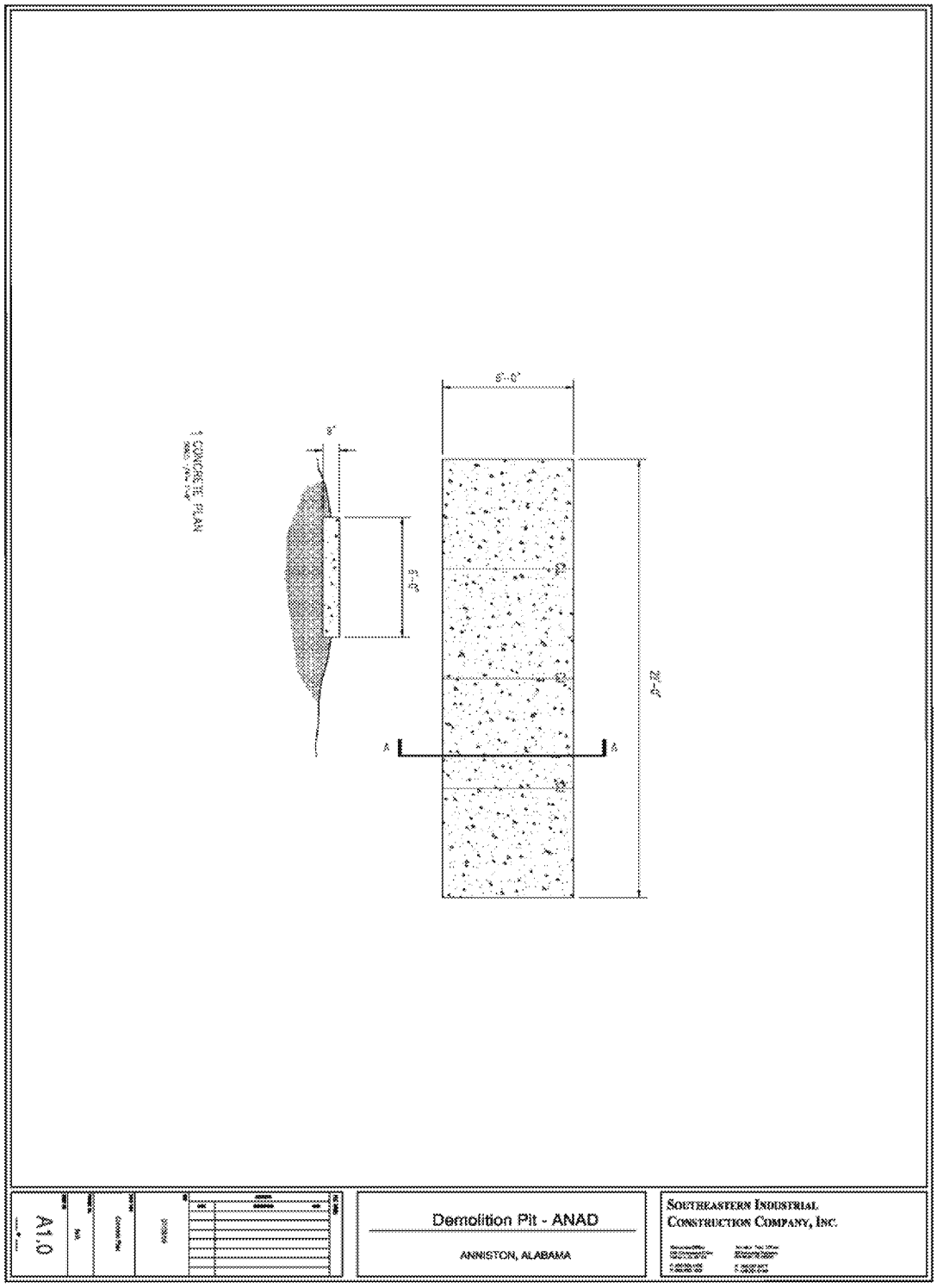

FIGURE IV B-2A
OB Pan Concrete Pads

1
2
3

FIGURE IV B-3
As-Built Diagram of Burn Pan and Lid Construction

DDA is authorized to declare a military munitions item as a waste, unless the determination is made by circumstance as defined by AAC 335-14-7-.13(3).

The total quantities of propellants, explosives, and pyrotechnics (PEP) disposed of in 2005 to 2007 are:

2005: 1,416,269 lb OD and 34 lb OB, total weight
2006: 1,294,358 lb OD and 1,631 lb OB, total weight
2007: 1,215,596 lb OD and 27,752 lb OB, total weight

See Section IV C for a detailed description of wastes managed at the OB and OD units.

IV B-1i Wind Rose

Section II B-1i addresses the wind rose.

IV B-1j General Dimensions and Structural Description

The OB and OD units are shown on Figures IV B-4 through IV B-10.

IV B-1j(1) Open Burning Unit

The OB unit consists of 10 open pans, each measuring 20-21 feet long, 5-6 feet wide, and 3 feet high. The burn pans are located on I-beams that rest on concrete pads in a clear plot approximately 122 meters (400 feet) by 243.9 meters (800 feet). Figure IV B-8 shows the general arrangement of these features. Each pan can be used to burn up to 1,000 kilograms (kg) (2,000 lb) of WMM/energetic waste.

A maximum of one burn event is accomplished in a single operational day. Approximately 1-hour cool down period is required following the burn. Further details regarding the burn process are included in Section IV D.

Treatment residue remaining after burning, if any, is treated as hazardous waste, placed in DOT-approved containers, and removed for temporary storage prior to disposal. The drums are moved to one of three permitted waste storage areas (Buildings 466, 512, or 527) for contractor pick-up and disposal.

Specific details regarding the construction and design of the burn pans and OB unit including run-on and run-off controls are included in Section IV D.

IV B-1j(2) Open Detonation Unit

The area depicted in Figure IVB-10 as the OD area encompasses approximately 52 acres. OD is conducted over an open area of soil approximately 274.3 meters (900 feet) by 91.5 meters (300 feet). Figures IV B-6 and IV B-7 are photographs depicting the OD unit. The site is currently used for surface detonations of up to 6.8 kg (15 lb) NEW of conventional WMM at each detonation station or buried detonation of up to 450 kg (1,000 lb) NEW of conventional WMM at each detonation station at depths of up to 4.3 meters (14 feet). Detonations are either initiated electronically using electric blasting caps tied into a line from one of four firing posts (each post has three lines) or non-electronically using non-electric blasting caps and time fuse.

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FIGURE IV B-6
WMM in Detonation Pit

FIGURE IV B-7
OD Unit as Pictured from South to North

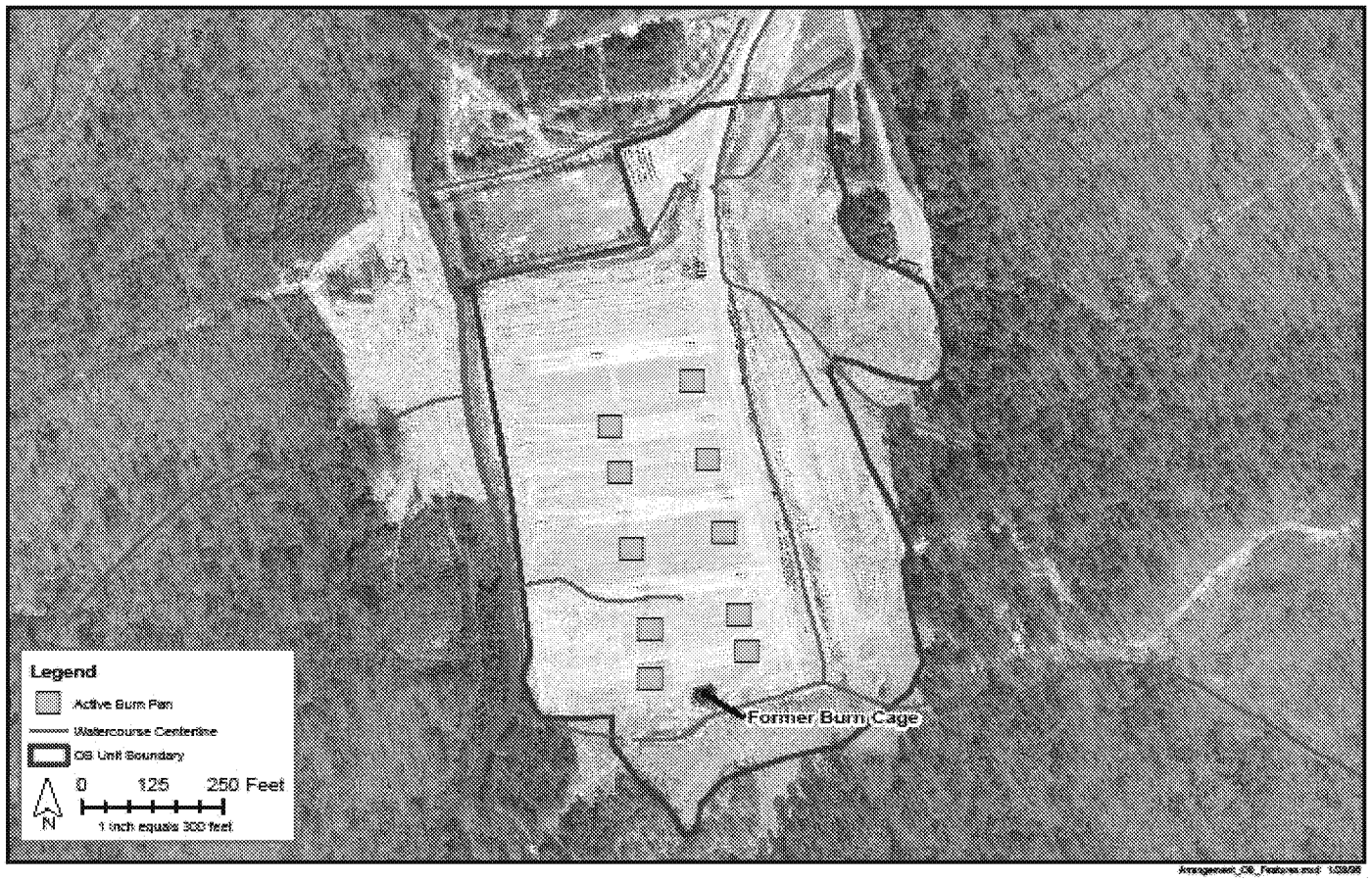

FIGURE IV B-8
General Arrangement of OB Unit Features

Although the existing electrical firing system allows for up to 12 detonation stations (three lines per each of four firing posts), the maximum number of detonation stations historically used has been 10 because of space limitations. Although up to 10 detonation stations have been performed in the past, current operations are limited to a maximum of 8 electrically ignited detonation stations per shot. ANAD typically accomplishes two OD shots per day; though, additional shots, using less than 8 detonation stations, can be accommodated as long as there are no more than 16 individual detonations in one operating day. For example, ANAD may complete 2 shots at 5 detonation stations per shot and 1 shot at 6 detonation stations for a total of 16 individual detonations. The air modeling and risk assessment that supports this application assumed a maximum of 16 individual detonations per day. OD is typically accomplished below ground with only a small fraction of surface detonations. Further details regarding the OD process are included in Section IV D.

Specific details regarding the construction and design of the OD unit including run-on and run-off controls are included in Section IV D. OD operations are generally conducted along the center line as depicted on Figure IVB-10, but soil that is ejected from the pits during the detonation is deposited in the area surrounding the pits within the bounds of the OD unit.

OD occasionally results in the generation of metal munitions fragments. These fragments may be thrown from the detonation pits and land on the soil surface within the OD unit. Routine housekeeping procedures require the collection of metal fragments. Additional detail regarding collection and management of the treatment residues including metal fragments from the OD unit is contained in Sections IV D-3d and IV F-6.

WMM is treated upon transfer from conventional munitions storage igloos or the designated WWM storage igloos (I103, F704A, and F405) and is not stored at either the OB or OD units. Conventional munitions are stored in conventional munitions igloos throughout the Ammunition Limited Area (ALA). Under the Military Munitions Rule, these conventional munitions become a waste when removed from the igloo for the purpose of treatment or disposal. In addition, conventional WMM are stored in designated WMM storage igloos (I103, F704A, and F405). Treatment residue resulting from OB is stored in one of three permitted waste storage areas (Buildings 466, 512, or 527) for contractor pick-up and disposal. Therefore, storage is not addressed in this section of the permit modification application.

IV B-2 Topographic Maps
ADEM Admin. Code R.335-14-8-.02(5)(b) 19

IV B-2a General Requirements

The topographic maps for the OB and OD units are shown on Figures II B-1, IV B-9, and IV B-10. These maps show the following required data:

- Scale and date – all figures
- The 100-year floodplain area – Figure II B-2
- Surface waters – Figures IV B-9 and IV B-10
- Surrounding land use – Figures IV B-9 and IV B-10

1

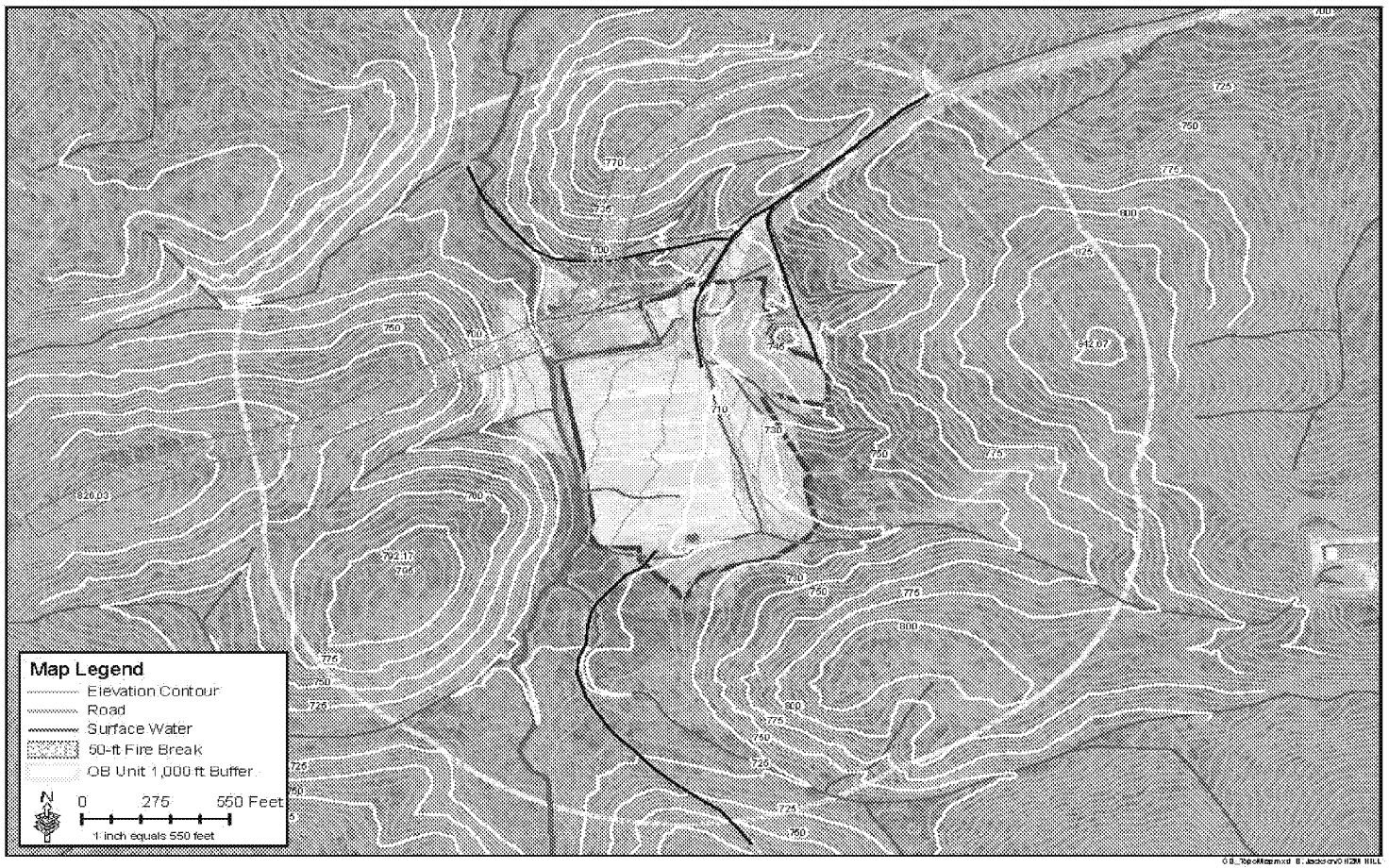

FIGURE IV B-9
Topographic Map of OB Unit

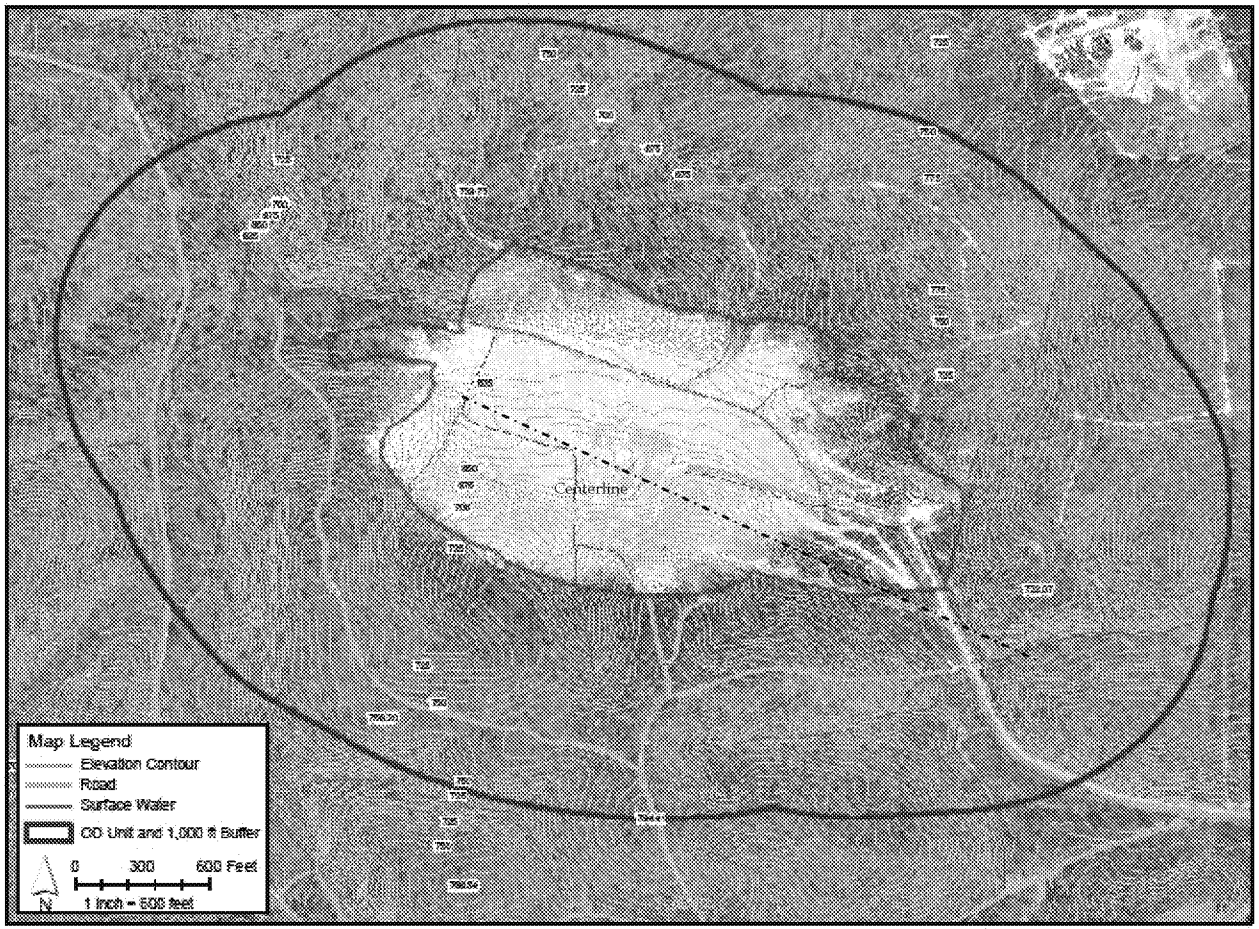

FIGURE IV B-10
Topographic Map of OD Unit

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FIGURE IV B-10
Topographic Map of OD Unit

- Map orientation – all figures
- Legal boundaries – Figure II B-1
- Access control – Figures IV B-9 and IV B-10
- Injection and withdrawal wells (onsite and offsite) – none exist within 1,000 feet of the OB and OD units
- Buildings and other structures – Figure IV B-1
- Drainage and flood control barriers – run-on and run-off is controlled via interceptor ditches bounding the OB and OD units as shown on Figures IV E-1 and IV E-2 and a sediment retention basin at the OD unit as shown on Figure IV D-6.
- Roads and fire lanes – IV B-9 and IV B-10
- Location of the operational units – Figure II B-1
- Distance to property boundaries – Figure II B-1. The distances from the OB and OD units to the closest depot boundary are approximately 4,790 feet and 3,000 feet respectively.
- Distance to buildings onsite and offsite – Figure II B-1. The distances from the OB and OD units to the nearest onsite building (Pit Office) are 5,065 feet, and 3,110 feet, respectively. For the purpose of assessing potential damage, the nearest offsite building is assumed to be located at the closest property boundary (see above). For the purpose of assessing potential damage, the nearest offsite building is assumed to be located away from the western boundary (the northern boundary is occupied by Pelham Range) at 7,469 feet.
- Distance to public roadways – Figure II B-1. The distances from the OB and OD units to the closest public roadway (Mudd Street) are 16,627 feet and 17,707 feet, respectively.
- Distance to closest receptor [AAC 335-14-8-.02(14)(e)] – assumed to be at the closest property boundary (see above). Human and ecological receptor locations for the purpose of risk assessment are defined in the Risk Assessment contained in Attachment 1 of this permit modification request.
- Clean-up areas (AAC 335-14-8-.02(1()(xii) – none
- The distance to the closest water sources and the permanently stationed emergency equipment is equivalent to the distance to the pit office (5,065 feet from OB unit and 3,110 feet from OD unit)
- Both OB and OD units are located adjacent to the nearest surface water body (intermittent stream)

The farthest distance that wastes to the OB or OD unit would be transported from an igloo is approximately three miles.

The topographic maps are on a scale of 1 inch = 400 feet and a contour interval of 5 feet. A waiver of the requirement to present topographic maps at a scale of 1 inch = 200 feet and

contour elevations of 2 feet is requested. The size of the facility requires the use of the larger scale. Contour intervals are not available at 2 feet. The OB and OD units lie within the watershed shown on Federal Emergency Management Agency (FEMA) Flood Hazard Map for Community #0010013, Panel #0250B (see Figure II B-2). The units are entirely above the 100-year flood level. The OB and OD units have no physical demarcation between the cleared sites and the surrounding woodland.

IV B-2b Additional Information on the Topographic Map

Additional topographic information requirements for protection of groundwater are provided in Section IV D-6.

IV B-3 Description of Treatment Units
ADEM Admin. Code R.335-14-8-.02(14)(e)

IV B-3a Location

Section II B discusses the location of the OB and OD units.

IV B-3b Design

Section IV B-1j discusses the design of the OB and OD units.

IV B-3c Operation

Section IV D discusses the operation of the OB and OD units.

IV B-3d Maintenance

Section IV D addresses the monitoring of the OB and OD units.

IV B-3e Monitoring

Section IV D addresses the monitoring of the OB and OD units.

IV B-3f Inspection

Section IV D addresses the inspections of the OB and OD units.

IV B-3g Closure

Section IV I discusses the closure of the treatment units.

IV B-4 Location Information
ADEM Admin. Code R. 335-14-8-.02(5)(b)11

IV B-4a Seismic Considerations

Section II B-4a addresses the seismic considerations of the Facility.

IV B-4b Floodplain Standard
ADEM Admin. Code R.335-14-8-.02(5)(b)

Section II B-4b addresses the floodplain standard for the Facility.

IV B-5 Traffic Information of Existing Roads ADEM Admin. Code R.335-14-8-.02(5)(b)10

The information in this section describes the general traffic patterns and roads at ANAD, and details the procedures used when transporting WMM onsite.

IV B-5a Estimate of Number and Types of Vehicles Around the Facility

Traffic information is provided in Section II B-5.

IV B-5b Information About Waste Transfer or Pick-Up Stations

The coordination for transfer of WMM at ANAD is the responsibility of Anniston Munitions Center (ANMC) Munitions Division.

The following procedure is followed for the transport of WMM from offsite to ANAD:

1. The generating activity coordinates the shipment with the ANMC Transportation Officer.
2. The generating activity is responsible for transportation and completing necessary shipping documents [as required AAC 335-14-7.13(4)(a)1.(ii) for WMM shipped under the Conditional Exemption for WMM transportation] including either a DA Form 4508 (see Figure IV B-24) or EPA hazardous waste manifest for the purpose of waste tracking.
3. All WMM shipments from offsite enter ANAD by way of State Highway 202 and through Gate A-1.
4. WMM received from offsite is transported via enclosed tractor-trailer by the most direct route from Gate A-1 to one of three designated conventional WMM storage igloos (I-103, F-704A, or F-405) or may be transported directly to the OB or OD units. WMM may be temporarily held in a 90 day storage area such as the MilVans located just southwest of the Pit Office or other designated 90 day storage igloos/locations.
5. WMM are transported by way of either Elwood Road or Lance Road to the OB or OD units and off-loaded from the trailer and moved to the WMM storage igloo or to the treatment unit by forklift.

The following procedure is followed for the transport of WMM from onsite conventional munitions storage igloos or conventional WMM storage igloos to the OB and OD units:

1. The Chief, ANMC Ammunition Maintenance Division (AMD) schedules the treatment activity.
2. On the day of transport, WMM is loaded by forklift to an enclosed tractor-trailer.
3. WMM is transported by the most direct route from the storage igloo to the OB or OD units. WMM may be temporarily held in a 90 day storage area such as the MilVans located just southwest of the Pit Office and northeast of the OB area (or other designated 90 day storage igloos/locations) while the OD unit is being prepared or if a weather delay is indicated. The WMM shipment is accompanied by a DA Form 4508 (see Figure IV B-11).

AMMUNITION TRANSFER RECORD
For use of this form, see TM 743-200-1; the proponent agency is DARCOM.

DATE PREPARED | CONTROL NUMBER

FROM	STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	L T												SERIAL	LOT											

REMARKS

TYPE OF ACTION
- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR | DATE OF ACTION

APPROVED/DATE

APPROVED/DATE

DA FORM 1 MAY 76 4508

FIGURE IV B-11
Form DA 4508

4. WMM are transported by way of either Elwood Road or Lance Road to the OB or OD units and off-loaded from the trailer and moved to the WMM storage igloo or to the treatment unit by forklift.

IV B-5c Quantity of Waste Moved per Movement per Vehicle

The maximum vehicle weight of any vehicle entering the OB or OD units is 21,000 lb. The maximum weight of waste carried by any vehicle is approximately 14,000 lb. Normal capacity of vehicles used to supply OB and OD operations is approximately seven pallets with an average weight of 2,000 lb/pallet. Annually, based on 251 work days per year, there are approximately 502 shipments.

IV B-5d Traffic Control Signs and Persons

Traffic control signs and persons are described in Section II B-5.

IV B-5e Road Surface Composition and Load-Bearing Capacity

Traffic control signs and persons are described in Section II B-5.

IV B-5e(1) Ammunition Storage and Service Area

Coosa Avenue, the main artery leading into the igloo area, was originally concrete surface up to the intersection of the road leading to Building 65. This road is 6.7 meters (22 feet) wide and in generally good condition. Other north-south arteries and Alabama, Benicia, and Elwood Avenues are low bituminous, 6.4 meters (21 feet) wide. East-west main connecting roads are also 6.4 meters (21 feet) wide, low bituminous. Igloo access roads, in A through G Blocks, are mostly gravel, ranging in width from 4.9 meters (16 feet) to 7.9 meters (26 feet) and are in good condition. The road leading from Building S-662 to the OD unit is low bituminous, 6.7 meters (22 feet) wide, and in good condition. The perimeter road around the igloo area is gravel and in good condition.

IV B-5e(2) OB and OD Units

The OB and OD units are served primarily by chert roads, approximately 6.1 meters (20 feet) wide.

IV B-5e(3) Load-Bearing Capacity

Both paved and unpaved roads are found within the ALA at ANAD. Most of the roads used to access the OB and OD units are paved roads composed of asphalt. Inside the OB and OD units there are both paved and unpaved roads. The paved roads are composed of asphalt, while the unpaved roads consist of dirt and gravel.

The Directorate of Public Works is responsible for ANAD road construction and maintenance and have verified that the load bearing capacity for the roads exceed the 32,000-pound loads transported to the units.

IV C Waste Characteristics

The chemical and physical characteristics of waste thermally treated at the open burn (OB) and open detonation (OD), units are described in this section along with a Waste Analysis Plan (WAP) for sampling, testing, and evaluating the waste to ensure that sufficient information is available for its safe handling. The information provided in this section:

- Identifies the waste types that are managed
- Identifies the waste properties of concern
- Establishes the basis for the use of process knowledge to characterize the conventional waste military munitions (WMM) waste stream treated
- Describes the sampling and analysis scheme employed to ensure proper management of residues after treatment

IV C-1 Chemical and Physical Analysis of Wastes ADEM Admin. Code R.335-14-8-.02(5)(b)2

OB and OD is used at ANAD to thermally treat WMM in support of the ANAD conventional munitions demilitarization program. Ancillary to this program, ANAD is charged with munitions recycling, testing, and surveillance. Though the bulk of energetic wastes treated at ANAD is comprised of WMM, a fraction consists of waste streams generated as a by-product of these ancillary activities. The physical and chemical characteristics of WMM are described in Section IV C-1(a) – C-1(c), while the ancillary energetic waste streams are described in the last two paragraphs of C-1(h)(3).

IV C-1a Volume and Composition of Wastes

The volume of WMM treated at the OB and OD units fluctuates based on the demilitarization and disposal needs of the DoD.

The maximum allowable treatment quantities for the OB and OD units are as follows:

- OB: 2,000 lb NEW/pan and 20,000 lb NEW/day
- OD: 15 lb NEW/pit aboveground and 1,000 lb NEW/below ground (subsurface) per detonation station and 16,000 lb NEW/day

The above limits are expressed in terms of NEW or Net Explosives Weight. The NEW of a munitions item represents the combined explosives weight of all energetics contained in a munitions item or items. NEW is used to consistently represent a munitions items explosives capacity, taking into consideration the various energetics compositions that may be contained therein. The NEW of an item or combination of items is used to determine Explosives Safety Quantity Distance (ESQD) arc requirements [i.e., the distance required between a potential explosion site (the point of detonation) and an exposed site (an inhabited building or public transportation route, for example). The limits imposed at ANAD are largely a result of ESQD requirements. That is, detonations larger than authorized would potentially result in

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fragmentation outside of the established safety arcs. Other contributing factors to establishing limits at OD sites include personnel and equipment limitations and noise considerations.

To ensure that the NEW limits are not exceeded, ANMC identifies the NEW using the Joint Hazard Classification System (JHCS). ANMC multiplies the NEW per item times the number of items along with any donor material to determine the total NEW per detonation station/pan. ANMC ensures that each shot is configured to not exceed the NEW limits.

Though the NEW determination is important to maintaining proper safety arcs, ANMC tracks its WMM disposal activities by total weight rather than NEW.

The total quantity WMM disposed of at ANAD in 2005, 2006, and 2007 was:

2005: 1,416,269 lb OD and 34 lb OB, total weight

2006: 1,294,358 lb OD and 1,631 lb OB, total weight

2007: 1,215,596 lb OD and 27,752 lb OB, total weight

In addition to the volumes shown above for routine operations in 2007, ADEM also authorized destruction of 22 Spartan Missile Motors under a separate emergency permit. Additional details of the special burn event conducted under the emergency permit issued by ADEM on 8 June 2007 (and related extension) are provided in Section IVB-1e.

ANAD currently uses OB and OD to thermally treat WMM.

Tables IVC-1 and IVC-2 are intended to provide information regarding the general types of munitions that may be treated in the OB and OD units respectively, but these tables should not be considered comprehensive. Table IV C-3 and Section IV C-1h provide the waste composition information.

TABLE IVC-1
Examples of Items that May be Treated in the OB Facility

Nomenclature	National Stock Number
CHG PROP 155MM M119E4	1320007679441
CHG PROP 8 IN WB M188A1	1320010704486
CHG PROP 8 IN WB M2	1320000284378
CHG PROP FIVE INCR BUNDLE F/M36A1 CHG	1315003517911
CHG PROP HALF INCREM	1315003517910
CHG PROP INCREM A M90A1 F/81 MORTAR	121500.703548
CHG PROP M6	1315000285009
CHG PROP SINGLE INCREM	1315003517912
FUSE BLASTING TIME M700 4000 FT	1375000285246
IGN TIME BLASTING M60	1375006911671

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TABLE IVC-2
Examples of Items that May be Treated in the OD Facility

Nomenclature	National Stock Number
5.56 MM BLANK	1305003599253
ARMING DEVICE TORPEDO	1356006072692
BLAST SIMULATOR ASSY	1370011902301
CAP BLASTING ELECT M6	1375011929174
CAP BLASTING NON ELECT M7	1375007561864
CAP BLASTING SPEC NON-ELECT M7	1375000285226
CARTRIDGE 22 CAL	1305008196016
CARTRIDGE 82MM	133000097528A
CARTRIDGE, IMPULSE	1377LLN770108
CATAPULT ACRFT EFECTION SEAT	1377011697797
CHG DEMO BLOCK TNT 1 LB	1375000285142
CHG DEMO BLOCK TNT ½ LB	1375000285140
CHG DEMO M112	1375007247040
CHG DEMOLITION BLOCK TNT 1LB	1375000285142
COMP A5	1376001598595
CORD DETONATING 3,000 FT	1375001809356
CORD DETONATING MD79 3000 FT	1377010466820
CTG & LAUNCHER 84MM AT-4	1315012454950
CTG 105MM HE M1 W/O FUZE	1315000284830
CTG 30MM HEI PGU-13/B (AEROJET)	1305010575335
CTG 30MM TP M788	1305010795386
CTG 40MM HEDP M433	1310009920451
CTG 40MM TP M385 LNKD	1310011593184
CTG 40MM TP M781	1310010507967
CTG 5.56 TR M196	1305009144719
CTG 5.56MM BALL M193	4305000058006
CTG 5.56MM BALL M855 LINKD	1305012588692
CTG 5.56MM BLANK M200 LNKD	1305013540739
CTG 5.56MM BLK M200	1305001823217
CTG 60MM HE M49A4	1310009349130
CTG 60MM TP M50A2	1310000284939
CTG 7.62MM BLANK F AK47 SNGL RD	1305001923126
CTG 7.62MM BLK M82	1305009905594
CTG 7.62MM NATO BALL M80	1305008924152
CTG 7.62MM TR M62	1305008288907
CTG 7.62MM X 39MM BALL	1305001823126
CTG 81MM HE M374 W/ FUZE RD M524A5	1315007825547
CTG 81MM HE M374 W/ PD FUZE	1315009356002

TABLE IVC-2
Examples of Items that May be Treated in the OD Facility (Continued)

Nomenclature	National Stock Number
CTG 81MM HE M374A2 W/ PD FUZE	1315001348984
CTG 90MM HEAT M371A1	1315008924307
CTG 90MM HEAT-T M431	1315008924113 CT
CTG 9MM BALL M882	1305011729558
CTG CAL .30 BLANK M3 CTN PACK	1305005298244
CTG CAL .38 SPEC BALL W/TR	1305003011692
CTG CAL .45 BALL M1911	1305003011685
CTG CAL .50 AP M2	1305000286295
CTG CAL .50 BALL M33 LNKD	1305005554056
CTG IGN M2	1315003833923
DYNAMITE	1375000963095
EXPL WATER GEL	1375011805779
FIRING DEVICE DELAY M1	1375000285195
FIRING DEVICE DEMO M1A1	1375000285178
FIRING DEVICE DEMO PULL TYPE M1	1375000285182
FIRING DEVICE PRESSURE RELEASE M5	1375000075563
FIZE MINE COMB M10A1	1345000285121
FLARE SURF M49 TRIP	1370007528060
FRAG HAND GRENADE	133000970701A
FUSE TIME BLASTING M700 4000 FT	1375000285246
FUX PROX MK73 W/BOOSTER	1390000108783
FUZE GP	1330010524928
FUZE MINE M10	1345005544658
FUZE MT MK50	1390002000182
GM DRAGON W/ LAUNCHER	1437001638960
GM PRAC MTM-51V SHILLELAGH	1410001508940
GM SHILLELAGH SUR ATT MGM-51C	1410001508932
GREN HAND FRAG M67	1330001338244
GREN HAND RIOT CS M743	1330009650802
GREN HAND RIOT CS-1 M23A2	1330006456211
GREN HAND SMK TED M18	3130002896852
HIGH EXPL MATL (COMP B)	1376000055115
IGN TIME BLASTING M60	1375002839452
IGNITER TIME BLASTING FISE M2	1375006911671
INITIATOR PROPELLENT	1377004033482
MINE APERS M18A1 W/ ACCESSORIES	1345007106946
MINE AT HEAVE M15	1345000285118
PRIMER PERC M28B2	1390008251370
PROJ 155MM HE APERS M483A1	1320012608720

TABLE IVC-2
Examples of Items that May be Treated in the OD Facility (Continued)

Nomenclature	National Stock Number
PROP PWDR (PROP IMR 4064)	1376007721370
RCKT HE 2.74IN W/WHD M229 & FUZE M429	1340001438446
RCKT MTR 2.75IN MK66 MOD1	1340011088854
RIOT CNTRL AGENT CN	1365003833909
RKT HE 66MM AT M72A1	1340000214478
RKT MOTOR 2.75IN MK66 MOD1	1340011088854
RKT MOTOR 2.75IN MK66 MOD2	1340011541679
ROCKET MOTOR	1337013948353
SAFETY & ARMING DEVICE	1336010508869
SIGNL SMK &ILLUM MARINE MK13 MOD0	1370003095028
SIMULATOR FLASH ARTY M21	1370010341397
SIMULATOR HAND GREN M116A1	1370007528124
SIMULATOR LAUNCHING (TOW)	1370001982566
SIMULATOR PROJGRND BURST M115A2	1370007528126
SQUIB FIRE EXT	1377009309390
WHD SEC GM MK26 MOD 1	1336010508873
WHD SECTION GM HE M205 (TOW)	1336012042532
WHD SECTION GM HE M207 (TOW)	1336010508873
WHD SECTION GM HE M207E1	1336011472040
WHD SECTION GM HELLFIRE	1336012272173

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TABLE IVC-3
General Chemical Compositions of WMM

Name	Chemical Formula	Hazardous Waste Identification Number
Propellants		
Nitrocellulose	$C_{12}H_{14}(ONO_2)_6O_4$	D003
Nitroglycerin	$C_3H_5(ONO_2)_3$	D003
Nitroguanidine	$H_2NC(NH)NHNO_2$	D003
These three primary constituents can be used singularly or in various combinations along with metals, metallic salts, and organic polymer binders		
Primary Explosives		
Lead Azide	$Pb(N_3)2$ (71% Pb)	D003, D008
Mercury Fulminate	$HgC_2N_2O_2$ (7.055 Hg)	D003, D009
Diazodinitrophenol (DDNP)	$HOC_6H_3(NO_2)_2N(:N)$	D003
Lead Styphnate	$C_6H(NO_2)_3(O_2Pb)$ (44.2% Pb)	D003, D008
Tetracene	$C_{18}H_{12}$	D003
Potassium Dinitrobenzofuroxane (KDNBF)	$C_6H_2N_4O_6K$	D003
Lead Mononitroresorcinate (LMNR)	$C_6H_3NO_2Pb$ (57.5% Pb)	D003, D008
Primary Compositions – Mixture of Primary Explosives, Fuels, Oxidizers, and Binders		
Fuels – Lead Thiocyanate	$Pb(SCN)_2$ (64% Pb)	D008
Antimony Sulfide	Sb_2S_5	D003
Calcium Silicide	$CaSi_2$	D003, D001
Oxidizers – Potassium Chlorate	$KClO_3$	D003
Ammonium Perchlorate	NH_4ClO_4	D003
Barium Nitrate	$Ba(NO_3)_2$	D003, D005
Aliphatic Nitrate Esters		
1,2,4-Butanetriol Trinitrate (BTN)	$C_4H_7N_3O_9$	D003
Diethyleneglycol Dinitrate (DEGN)	$C_4H_8O_3(NO_2)_2$	D003
Nitroglycerine (NG)	$C_3H_5(ONO_2)_3$	D003
Nitrostarch (NS)	$C_{12}H_{12}(NO_2)_8O_{10}$	D003
Pentaerythyritol Tetranitrate (PETN)	$C(CH_2NO_3)_4$	D003
Triethylene Glycoldinitrate (TEGN)	$C_6H_{12}O_4\ 2NO_2$	D003
1,1,1-Trimethylolethane Trinitrate (TMETN)	$C_5H_9O_9N_3$	D003
Nitrocellulose (NC)	$C_{12}H_{14}(ONO_2)_6O_4)$	D003
Nitramines		
Cyclotetramethylene-tetranitramine (HMX)	$C_4H_8N_8O_2$	D003
Cyclotrimethylene-trinitramine (RDX)	$C_3H_6N_6O_6$	D003
Ethylenediamine Dinitrate (EDDN Haleite)	$C_2H_6N_4O_4$	D003
Nitroguanidine (NQ)	$H_2NC(NH)NHNO_2$	D003
2,4,6-Trinitrophenyl-methylnitramine (Tetryl)	$(NO_2)_3C_6H_2N(NO_2)CH_3$	D003
Nitroaromatics		
Ammonium Picrate (Explosive D)	$NH_4C_6H_2N_3O_7$	D003

TABLE IVC-3
General Chemical Compositions of WMM

Name	Chemical Formula	Hazardous Waste Identification Number
1,3-Diamino-2,4,6-Trinitrobenzene (DATB)	$C_6H_4N_6O_6$	D003
2,2'4,4'6,6'-Hexanitroazobenzene (HNAB)	$C_{12}N_8O_{12}$	D003
Hexnitrostilbene (HNS)	$C_{14}H_2N_6O_{12}$	D003
1,3,5-Triamino-2,4,6-Trinitrobenzene (TATB)	$C_6H_6N_6O_6$	D003
2,4,6-Trinitrotoluene (TNT)	$(NO_2)_3C_6H_2CH_3$	D003
Ammonium Nitrate	NH_4NO_3	D003
Compositions:		
Mixtures of the above		
Plastic Bonded Explosive (PBX)		
Explosives (see above) and polymer binder, plasticizer, and fuel (aluminum or iron)		
Combination of:		
Oxidizer – oxygen or fluorine		
Fuel – powdered aluminum or magnesium		
Binding Agents – resins, waxes, plastics, oils, retardants, waterproofing, color intensifier		

IV C-1b Containerized Wastes

ANAD stores waste in containers. Storage of waste in containers is addressed in the permit renewal and subsequent permit modification requests and is not addressed herein. ADEM issued Hazardous Waste Facility Permit EPA ID/Permit Number AL3 210 020 027 for the storage of waste in containers. Permitted storage is not conducted within either the OB or OD units, though treatment residues collected post-treatment may be accumulated in containers prior to being further managed and disposed. Treatment residues include waste ash generated from the OB unit and metal fragments generated from the OD unit. Waste ash is temporarily stored at an appropriate hazardous waste storage location on ANAD prior to disposal offsite. Metal fragments are collected, visually inspected, certified as "free of explosive hazard", and sent to the DRMO or suitable scrap vendor for further management and recycling. Additional information pertaining to treatment residue management is provided in Sections IV D-1j, IV D-3d, and Section IV F-6 for the OB and OD units, respectively.

IV C-1c Wastes in Tanks

ANAD stores waste in tanks. Storage of waste in tanks is addressed in the permit renewal and subsequent permit modification requests and is not addressed herein. ADEM issued Hazardous Waste Facility Permit EPA ID/Permit Number AL3 210 020 027 for the storage of waste in tanks. No tank storage is used at or within the bounds of the OB and OD units. Tank storage at ANCDF is discussed in Section III.

IV C-1d Waste in Piles

Not applicable.

IV C-1e Landfilled Wastes

Not applicable.

IV C-1f Wastes Incinerated and Wastes Used in Performance Tests

Treated wastes are addressed in Section IV D.

IV C-1g Wastes to be Land-Treated

Treated wastes are addressed in Section IV D.

IV C-1h Wastes in Miscellaneous Units ADEM Admin. Code R.335-148-.02(14)

ANAD treats WMM in miscellaneous units by OB and OD. Military munitions are defined in ADEM Admin. Code R.335-14-1-.02 as follows:

> *All ammunition products and components produced or used by or for DoD or the U.S. Armed Services for national defense and security, including military munitions under the control of DoD, the U.S. Coast Guard, U.S. Department of Energy (DOE), and National Guard personnel. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries used by DoD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.*

Munitions are hazardous materials because of their reactive fillers and other hazardous components. Unused (non-expended) munitions become a RCRA solid (and therefore a hazardous) waste when they are:

- Abandoned by being disposed of, burned, incinerated, or treated prior to disposal
- Removed from storage in a military magazine or other storage area for the purpose of being disposed of, burned, incinerated, or treated prior to disposal
- Deteriorated or damaged to the point that it cannot be put into serviceable condition, and cannot reasonably be recycled or used for other purposes
- Declared a solid waste by a DoD Designated Disposition Authority (DDA)

At the Demil Enterprise level the DDA determines when specific munitions items can no longer be used for their intended purpose and funds disposition in accordance with available R3 or disposal options. These munitions are deemed a waste when removed from the storage igloo for the purpose of being disposed of, burned, or incinerated, or treated prior to disposal (ADEM Admin. Code R.335-14-7.-.13(3)(b)2).

ANAD is a depot-level facility that receives military munitions from offsite for R3 or for further technical evaluation and may receive WMM for treatment at its OB and OD units.

All WMM that are treated by OB and OD possess the RCRA hazardous characteristic of reactivity (D003) defined in ADEM Admin. Code R.335-14-2.03(3) as follows:

- (1) It is normally unstable and readily undergoes violent change without detonating.
- (3) It forms potentially explosive mixtures with water.
- (6) It is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.51, a Class A explosive as defined in 49 CFR 173.53, or a Class B explosive as defined in 49 CFR 173.88.

In addition to the reactivity characteristic (D003), wastes treated by OB and OD may also be classified as hazardous due to the hazardous characteristics of ignitability (D001), corrosivity (D002), and/or certain toxicity (D004, D005, D006, D007, D008, D009, D011, D030, D039) codes. The wastes treated by OB and OD do not contain pesticides, herbicides, dioxins, or polychlorinated biphenyls (PCBs).

The majority of WMM treated by OB and OD at ANAD require disposal because the military munitions item has exceeded its shelf life and the DDA has determined that it cannot otherwise be reused or recycled. These military munitions become WMM when removed from the various conventional munitions storage igloos at ANAD.

Military munitions and components consist of energetics and non-energetics. The non-energetic portions (casings and component parts) generally are made from metals. Following complete treatment of munitions by OD, large metal fragments may be observable on the soil. The OD area is inspected and metal fragments removed in accordance with the procedures described in Section IV F-6. Metal fragments that are collected and removed are visually inspected for evidence that the energetic component of the item has been treated as described in Section IV D-3d.

Military munitions and explosives possess the reactivity characteristic because of the presence of energetics. OB and OD treatment of these reactive wastes results in the destruction of the energetics and the deactivation of the reactivity characteristic.

All the WMM accepted for thermal treatment at ANAD are hazardous because of their explosive or reactive nature. Hazardous characteristic analyses are not performed prior to OB and OD. Munition Items Disposition Action System (MIDAS) provides technical information to ensure proper waste characterization. Ammunition Munitions Center (ANMC) Production Management Division (PMD) staff prepare a Work Order authorizing treatment. The responsible staff verify that the munitions to be treated are characterized within the Munitions Items Disposition Action System (MIDAS). MIDAS is a database that identifies the constituents contained within conventional munitions in the demilitarization stockpile. The staff additionally possesses the training and knowledge to determine the appropriate treatment for the waste type. The Work Order authorizes the waste munitions for treatment and identifies the shot configuration. On the day of operation, the waste is visually inspected against the

Work Order prior to treatment to ensure that only appropriate wastes are subjected to thermal treatment.

The following sections describe the chemistry of energetic materials, physical properties of the principal energetic materials, and various types of materials treated by OB and OD at ANAD.

IV C-1h(1) Chemical Composition of Energetic Constituents for Military Munitions and Components

Energetic materials are either chemical compounds or mixtures of chemical compounds. They are divided into three classes according to use: 1) propellants, 2) explosives, and 3) pyrotechnics. The total weight of energetic materials contained within a military munitions item or munitions component is expressed as net explosive weight, or NEW. Explosives and propellants, when initiated, evolve large quantities of gas in a short time. The difference between explosives and propellants is the rate at which the reaction proceeds. For explosives, a fast reaction produces a very high pressure in the surrounding medium; this pressure is capable of significant destruction. In propellants, a slower reaction produces lower pressure over a longer period of time. This lower sustained pressure is used to propel objects. Pyrotechnics evolve large amounts of heat but much less gas than propellants or explosives.

Propellants cannot be distinguished from explosives by chemical composition alone or by chemical reaction rate; although, propellants characteristically react (burn) at a rate that is much lower than the detonation rate of explosives. Propellants are characterized by the ability to be made to burn at reproducible, controllable, and predetermined rates. When confined to the breech and barrel of a gun, the evolved gases produce high pressures, which provide propulsion for the projectile. Under certain conditions, however, propellants can be made to detonate, and conversely, explosives that characteristically detonate may simply burn if the proper conditions of confinement, dimensions, degree of consolidation, and other factors are chosen.

The previously presented Table IV C-3 provides information on the general chemical composition of typical energetics (propellants and explosives) that are present in WMM. Tables IV C-4 and IV C-5 further identify the compositions for the propellants and WMM treated at the OB unit. Table IV C-6 lists the RCRA codes, characteristics, and contaminants for munitions/explosives treated.

Propellants

Propellants can be grouped into five classes:

- Single-base propellant compositions are used in cannons, small arms, and grenades. These compositions contain the propellant nitrocellulose as their chief ingredient. In addition to containing a stabilizer, they may also contain inorganic nitrates, nitro-compounds, and non-explosive materials such as metallic salts, metals, carbohydrates, and dyes.

- Double-base propellant compositions are used in cannons, small arms, mortars, rockets, and jet propulsion units. This term applies to compositions containing both nitrocellulose and nitroglycerine. Also, they can be defined as a propellant containing nitrocellulose and a liquid organic nitrate that will gelatinize nitrocellulose. The presence of an active gelatinizer makes double-base propellants more energetic than single-base propellants. The

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ballistic potential is increased correspondingly. The flame temperature and resulting barrel erosion is also increased. Additives are used frequently in addition to a stabilizer. Ballistite is a double-based propellant that is used in various forms as the propellant in rocket motors and some guided missile boosters and sustainers. It is procured in the form of sheets, carpet-rolls, and grains.

- Triple-base propellant compositions are used in cannon units. This term is applied to propellants containing three explosive ingredients, with nitroguanidine as the major ingredient and the other two usually nitroglycerine and nitrocellulose.

- Mixed nitrate esters are a propellant composition developed to replace the triple-base composition during times of nitroguanidine shortages. As an example, the XM35 composition contains TMETN (1,1,1-trimethylolethane trinitrate), TEGDN (triethylene glycol dinitrate), and DEGN (diethylene glycol dinitrate). As another example, the XM34 composition contains nitrocellulose, BTTN (1,2,4-butanetriol trinitrate), TMETN, and TEGDN.

- Composite propellants contain neither nitrocellulose nor an organic nitrate. They are usually a physical mixture of a fuel such as metallic aluminum, a binder (which is normally a synthetic rubber that is also a fuel), and an inorganic oxidizing agent, such as ammonium perchlorate. Composite propellants are used primarily in rocket assemblies and jet propellant propulsion units.

TABLE IVC-4
Composition of Propellants Treated in the OB Unit

Propellant Model Designation Component	M1	M2	M5	M6	M7	M8	M9	M10	M12	M13	M14	M15	M17
Nitrocellulose	85.0	77.45	81.95	87.0	54.6	52.15	57.75	98.00	97.70	57.30	90.00	20.0	22.0
Nitroglycerin		19.50	15.00		35.5	43.00	40.00			40.00		19.0	21.5
Nitroguanidine												54.7	54.7
Dinitrotoluene	10.0			10.0					Coating		8.00		
Dibutylphthalate	5.0			3.0							2.00		
Diethylphthalate						3.00							
Diphenylamine	1.0[a]			1.0[a]			1.00	1.0	0.80	1.00	1.00[a]		
Ethyl Centralite		0.60	0.60		0.9	0.60	0.75			1.00		6.0	1.5
Barium Nitrate		1.40	1.40										
Potassium Nitrate		0.75	0.75			1.25	1.50						
Potassium Perchlorate					7.8								
Lead Carbonate	1.0[b]												
Potassium Sulfate	1.0[b]			1.0[a]				1.0	0.75	1.50			
Tin									0.75				
Carbon Black					1.2		0.02[a]			0.05[a]			
Graphite	0.30	0.30	0.30; Glaze 0.10		0.30			Glaze 0.1					Glaze 0.1
Cryolite												0.3	0.3
Nitrocellulose	67.25	68.70	28.00	28.00	20.00	57.50	80.00	100.00	27.00	20.00			
Nitroglycerine	25.00	25.00	22.50	22.50	19.00	30.00	10.00		22.50	19.00			
Nitroguanidine			41.70	47.00	54.70				46.25	54.00			
Dinitrotoluene						2.50		8.00					
Dibutylphthalate					4.50		9.00			4.5			
Ethyl Centralite	6.00	6.00	1.50	1.50		8.00			1.5				
Barium Nitrate	0.75												
Potassium Nitrate	0.70								2.75				
Lead Stearate						0.50							
2-Dinitrodiphenyldiamine					1.50								
Potassium Sulfate				1.00		1.50		1.00[a]		1.5			

[a] Added basis
[b] When specified, added basis

The information contained in this chart is an approximation only. Specific information regarding percentages and tolerances of components should be obtained from appropriate specifications and standards.
In addition, these sources may provide information about perforation and web thickness applicable to a particular weapon or round of ammunition.
Numbers within chart are percentages by weight.

TABLE IV C-5
Compositions of WMM Treated in the OD Unit

Propellant Type		Chemical Make-Up	
1.	Black Powder	Potassium Nitrate:	74.0%
		Charcoal:	15.6%
		Sulfur:	10.4%
2.	TNT	Trinitrotoluene	
3.	Composition B	60/40 Cyclotol	
		RDX:	60%
		TNT:	39%
		WAX:	17%
4.	PETN	Pentaerythrite Tetranitrate	
		Chemical Formula:	
		Carbon:	19.0%
		Hydrogen:	2.5%
		Nitrogen:	17.7%
		Oxygen:	60.8%
5.	Photoflash	Laminac:	96.8%
		Lupersol, DDM:	3.0%
		Iron Oxide:	0.2%
6.	Composition C4	RDX:	91.0%
		Polysobutylene:	2.1%
		Motor Oil:	1.6%
		Di-(2-Ethylhexyl) Sebacate:	5.3%
7.	RDX	(Cyclonite) (Cyclotrimethylene-Trinitramine)	
		Chemical Formula:	
		Carbon:	16.3%
		Hydrogen:	2.7%
		Nitrogen:	37.8%
		Oxygen:	43.2%
8.	Tetryl	Trinitro-Phenylmethyl-Nitramine	
		Chemical Formula:	
		Carbon:	29.3%
		Hydrogen:	1.7%
		Nitrogen:	24.4%
		Oxygen:	44.6%
9.	TPA Incendiary	Triethylaluminum	
10.	HMX	(Homecyclonite) (Cycloteramamethylene Tetranitramine)	
		Chemical Formula:	
		Carbon:	16.2%
		Hydrogen:	2.7%
		Nitrogen:	37.9%

TABLE IV C-5
Compositions of WMM Treated in the OD Unit

Propellant Type	Chemical Make-Up	
	Oxygen:	43.2%
11. Lead Azide	Chemical Formula:	
	Nitrogen:	28.8%
	Lead:	71.2%
12. Lead Styphnate	Chemical Formula:	
	Carbon:	15.4%
	Hydrogen:	0.65%
	Nitrogen:	9.0%
	Oxygen:	30.8%
	Lead:	44.2%
13. Amatol	Ammonium Nitrate TNT	
14. Ammonium Nitrate	Chemical Formula:	
	Nitrogen:	35%
	Hydrogen:	5%
	Oxygen:	60%
15. Composition A3	RDX:	91%
	WAX:	9%
16. Explosive A4	RDX:	97%
	WAX:	3%
17. Explosive D	Ammonium Picrate	
	Chemical Formula:	
	Carbon:	29.3%
	Hydrogen:	2.4%
	Nitrogen:	22.7%
	Oxygen:	45.6%
18. Haleite	(EDNA) (Ethylene-Dinitramine)	
	Chemical Formula:	
	Carbon:	16.0%
	Hydrogen:	4.0%
	Nitrogen:	37.3%
	Oxygen:	42.7%
19. HBX-1, 3 & 6	RDX:	39.6%
	TNT:	37.8%
	Aluminum:	17.1%
	Densitizer (Comp D2):	5.0%
	CACL:	0.5%
20. Octol	HMX:	75%
	TNT:	25%
21. PBX	RDX:	

TABLE IV C-5
Compositions of WMM Treated in the OD Unit

Propellant Type	Chemical Make-Up	
	Polystyrene	
	Diocylphthalate	
22. Pentolite 50/50	PETN:	50%
	TNT:	50%
23. Pentolite 10/90	PETN:	10%
	TNT:	90%
24. Picratol	Explosive D:	52%
	TNT:	48%
25. Tetrytol	Tetryl	
	TNT	
26. Torpex	RDX:	42%
	TNT:	40%
	Aluminum:	18%
27. Tritonal	Aluminum	
	TNT	
28. Nitroglycerin	**Chemical Formula:**	
	Carbon:	15.9%
	Hydrogen:	2.2%
	Nitrogen:	18.5%
	Oxygen:	63.4%
29. Nitroguanidine (Picrate)	Picrate	
	Chemical Formula:	
	Carbon:	11.5%
	Hydrogen:	3.9%
	Nitrogen:	53.8%
	Oxygen:	30.8%
30. Military Dynamite – Medium	RDX:	75%
Velocity	TNT:	15%
	Starch:	5%
	SAE No. 10 Oil:	4%
	Polsobutylene:	1%
31. Military Dynamite – Low	RDX/DYE[a]:	17.5%
Velocity	TNT:	67.8%
	Tripentaery-Thritol:	8.6%
	Binder[b]:	4.1%
	Cellulose Acetate:	2.0%

[a] The dye is 96% pure 1 – Methylamino – Anthraquinone (1-MA) used in the amount of 0.5% of the RDX mixture.
[b] The binder is vistac No. 1 consisting of polybutene and diotyseabacate.

TABLE IV C-6
RCRA Codes for Hazardous Waste Treated by OB and OD at ANAD

RCRA Code	Characteristic	Contaminant
D003	Reactivity	Energetics
D004	Toxicity Characteristic	Arsenic
D005	Toxicity Characteristic	Barium
D006	Toxicity Characteristic	Cadmium
D007	Toxicity Characteristic	Chromium
D008	Toxicity Characteristic	Lead
D009	Toxicity Characteristic	Mercury
D011	Toxicity Characteristic	Silver
D030	Toxicity Characteristic	2,4-Dinitrotoluene
D039	Toxicity Characteristic	Tetrachloroethylene

Explosives

Explosives are substances or mixtures that, via chemical reaction, are capable of producing gas at high temperature and pressure; and thereby, causing damage to its surroundings. Explosives can include high explosives, low explosives, propellants, igniters, primers, initiating, and pyrotechnic compositions. Fuel-air explosives, together with liquid fuels and oxidants, are included in this definition even though the individual substances may not be explosives.

Primary Explosives

Primary explosives are often used in ordnance items in small quantities to initiate an explosive reaction. Primary explosives are very sensitive and relatively easy to detonate by heat, impact, or friction. In large quantities, these materials are extremely hazardous because of their great sensitivity. Primary explosives can be used in combination with fuels and oxidizers in ordnance. The other ingredients are used to increase the sensitivity of the mixture to the desired property such as percussion or heat. These primary explosives are Lead azide, Mercury fulminate, DDNP (5, 7-dinitro-1,2,3-benzoxadiazole), Lead styphnate, Tetracene, KDNBF (potassium dinitrobenzofuroxane), and LMNR (lead mononitroresorcinate).

Primary Compositions

Primary compositions are mixtures of primary explosives, fuels, oxidizers, and other ingredients. They are used to initiate detonation in high explosive charges or to ignite propellants and pyrotechnics. Fuels commonly used in primary compositions are lead thiocyanate, antimony sulfide, and calcium silicide. Oxidizing agents include potassium chlorate and barium nitrate. Several other ingredients may include primary explosives and binders.

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Secondary Explosives

The second element in the explosive train is the booster, which contains a larger quantity of less sensitive, but more powerful, material called a secondary high explosive. The booster is used either as an intermedial stage to detonate material that is too insensitive to be detonated by the relatively weak initiator or to ensure complete detonation of the main charge. The main charge is also a secondary explosive. It is the least sensitive material but comprises the bulk of the explosive charge. Secondary explosives can be divided into several classes that are less sensitive than primary explosives. These consist of aliphatic nitrate esters, nitramines, nitroaromatics, ammonium nitrate, binary mixtures, ternary mixtures, quaternary mixtures, plastic-bonded explosives, black powders, fuel-air explosives, pyrotechnics, and non-energetic constituents, which are discussed in the following sections.

Aliphatic Nitrate Esters. This category includes several common compounds. These compounds are prepared by attaching an oxygen atom to the compounds being nitrated.

- 1,2,4-butanetriol trinitrate is a good gelatinizer for nitrocellulose and can be used as a substitute for nitroglycerin in double-base propellants.
- Diethyleneglycol dinitrate can be used as an explosive and can be used in propellants as a colloiding agent for nitrocellulose.
- Nitrocellulose is a mixture of nitrates obtained by nitrating cellulose. The five recognized and used grades of nitrocellulose include pyroxylin, pyrocellulose, guncotton, high nitrogen nitrocellulose, and blended nitrocellulose.
- Nitroglycerin is a clear, colorless, odorless, and oily liquid with a sweet, burning taste and a molecular weight of 227.1. Nitroglycerin is used extensively in propellant compositions as a gelatinizing agent for nitrocellulose, as well as in dynamites and for the shooting of oil wells.
- Nitrostarch is a mixture of nitrates obtained by nitrating starch. The structure of starch is the same as for nitrocellulose, with the exception that the polymer chains are spiral rather than straight. Nitrostarch has a wide variety of gelatinizing agents and is used in place of nitrocellulose in explosive compositions chiefly as a substitute for nitroglycerin.
- Pentaerythritol tetranitrate (PETN) is a white solid with a molecular weight of 316.2. PETN is used in the explosive core of industrial detonating fuses, in the charge of commercial blasting caps, and as the entire explosive charge in exploding bridge wire detonators. PETN is also used in certain plastic-bound explosives and in a mixture with TNT called pentolite.
- Triethylene glycoldinitrate (TEGN) is a light yellow, oily liquid with a molecular weight of 240.20. TEGN is used as a component in a liquid explosive, a plasticizer in the fabrication of flexible explosive sheets, and as a plasticizer in pyrotechnic flares.
- 1,1,1-Trimethylolethane trinitrate is a slightly turbid, viscous oil with a molecular weight of 255.15.

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Nitramines. Compounds in this class include:

- Cyclotetramethylenetetranitramine (HMX)
- Cyclotrimethylenetrinitramine (RDX)
- Ethylenediamine dinitrate (EDDN)
- Ethylenedinitramine (Halite)
- Nitroguanidine (NQ)
- 2,4,6-trinitrophenolmethlynitramine (Tetryl)

Nitroaromatic. Compounds in this class include:

- Ammonium picrate
- 1,3-diamino-2,4,6-trinitrobenzene (DATB)
- 2,2′,4,4′,6,6′-hexanitroazobenzene (HNAB)
- Hexanitrostilbene (HNS)
- 1,3,5-triamino-2,4,6-trinitrobenzene (TATB), and2,4,6-trinitrotoluene (TNT)

Ammonium Nitrate. Ammonium nitrate is in a crystal form with a molecular weight of 80.05.

Compositions. Compositions are explosives in which two or more explosive compounds are mixed to produce an explosive with suitable characteristics for a particular application. Normally the characteristics of the compositions are an intermediate between the characteristics of the individual explosive ingredients. Compositions can include binary mixtures, ternary mixtures, and quaternary mixtures.

- Binary Mixtures:
  - Amatols are mixtures of ammonium nitrate and TNT. Composition A consists of a series of formulations of RDX and desensitizer. Composition B consists of mixtures of RDX and TNT. Composition C contains about 88.3 percent RDX and 11.7 percent of a nonexplosive oily plasticizer. Composition CH-6 is an explosive mixture containing RDX, calcium stearate, graphite, and polyisobutylene. Composition CH-6 is primarily used for boosters and leads. Ednatols are mixtures of haleite and TNT. Ednatols are used for the satisfactory bursting of charges in ammunition.
  - Octols are mixtures of HMX and TNT. Octols are used as an oil well formation agent and in fragmentation and shaped charges.
  - Pentolites are unstable explosive mixtures containing PETN and TNT.
  - Picratol is a mixture of ammonium picrate and TNT.
  - Tetrytols are mixtures of TNT and Tetryl and are cast into munitions. The United States no longer uses tetrytols.
  - Tritonal is a mixture of TNT and flaked aluminum. Tritonal is used as a filler in bombs and shells.

- Ternary Mixtures:
  - Amatex 20 consists of RDX and ammonium nitrate and is used as filler in ammunition items.
  - Ammonals are mixtures containing, as principal ingredients, ammonium nitrate and powdered aluminum incorporated with high explosives such as TNT, dinitrotoluene (DNT), and RDX. The major use of this composition is as a projectile filler.
  - High blast explosives have three compositions: HBX-1, HBX-3, and H-6. HBX-1 and HBX-3 consist of RDX, TNT, aluminum, wax, and lecithin. The formulation of H-6 is the same except for the deletion of TNT.
  - HMX, TNT, and aluminum mixture 3 (HTA-3) are cast as munitions.
  - Minol-2 consists of TNT, ammonium nitrate, and aluminum and is used in four types of ordnance: underwater depth bombs, block buster bombs, concrete fragmentation bombs, and general-purpose bombs.
  - Torpex consists of RDX, TNT, and aluminum powder and is cast into munitions.
- Quaternary Mixtures:
  - The depth bomb explosive (DBX) is the only explosive covered under this category and consists of TNT, RDX, ammonium nitrate, and aluminum. DBX is a binary explosive. It is an unstable mixture consisting of 40 percent TNT, 21 percent RDX, 21 percent ammonium nitrate, and 18 percent powdered aluminum. It is normally cast at a density between 1.61 and 1.69 and is used as a bursting charge in depth charges.

Plastic-Bonded Explosives. Plastic-bonded explosives are explosive materials, such as RDX or ammonium perchlorate (AP), that are held together by various plastic bonding agents, including polystyrene, viton, rubber epoxies, and polyurethane. Explosives coated with plastic materials are also referred to as plastic-bonded explosives.

Black Powders. Black powders are explosive materials composed of a mixture of potassium nitrate or sodium nitrate and charcoal, and sulfur. DoD uses black powder in the form of grains or granules of varying sizes and degrees of fineness depending on its specific purpose or function. There are two primary types of black powder: potassium nitrate-based black powder and sodium nitrate-based black powder.

Fuel-Air Explosives. Fuel-air explosives (FAE) are liquids or slurries that exhibit explosive properties when mixed with air. The individual substances may not be explosives. By the nature of the role they are required to perform, fuel-air mixtures are sensitive to a range of thermal and electrical stimuli. Currently, two divisions of FAE are employed: ethylene oxide or propylene oxide.

Pyrotechnics. Pyrotechnic compositions are substances or mixtures of substances that, when ignited, undergo an energetic chemical reaction at a controlled rate intended to produce, on demand and in various combinations, specific time delays or quantities of heat, noise, smoke, gas, light, or infrared to perform. Many pyrotechnic compositions are insensitive.

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However, some pyrotechnic compositions are relatively sensitive and can give rise to a rapid deflagration, which appears to be an explosion similar to that produced by a high explosive.

Pyrotechnics adapted to military purposes are divided into signaling, simulators, smoke screening, incendiary, and illuminating types. These classes are further subdivided into surface and aircraft pyrotechnics, although some items are common to both subdivisions.

Non-Energetic Constituents. Energetic materials contained in munitions and explosives may contain both energetic and non-energetic compounds. The energetic compounds consist of propellants, explosives, and pyrotechnics, such as those described above. The non-energetic compounds in energetic materials typically serve as binders and stabilizers. Examples of these additives are ethyl cellulose, graphite, carbon black, calcium carbonate, cellulose acetate, and charcoal.

IV C-1-h(2) Physical Properties of Energetics and Treatment Emission Constituents

Energetic constituents are generally solids and have a low vapor pressure. The thermochemical characteristics of typical military explosive compositions are listed in Table IV C-7. Table IV C-8 summarizes of the physical properties of typical energetics, including physical properties relevant to mobility in the environment. Additional information is contained in Section IV D, which contains the detailed health and ecological risk assessments. These risk assessments were completed in accordance with the guidance documents listed in Section IVD-1a.

Constituents of the energetic materials and treatment emissions were used to develop a list of constituents of potential concern (COPCs) for consideration in the risk assessment. These guidance documents for risk assessments at hazardous waste combustion facilities contain information on the physical properties of COPCs, which are relevant to risk assessments. This information includes molecular weight, vapor pressure, water solubility, octanol/water partition coefficients, bioaccumulation factors, etc. Attachment 1 of Section IV contains information for COPCs that are not listed in the EPA guidance documents.

IV C-1h(3) Classifications of Military Munitions and Components

The U.S. Army Defense Ammunition Center (DAC) developed a classification system for military munitions and components. These classifications are known as the Munitions Items Disposition Action System (MIDAS) families. Families of military munitions items and components treated by OB and OD at ANAD may be treated either with the full energetic filler still present (loaded) or after it is fired (expended). Expended military munitions and components require treatment because they are classified as reactive hazardous wastes due to the potential presence of residual energetics. Table IV C-9 lists the MIDAS families, whether items in the family are treated in loaded and/or expended conditions, and whether items in the family are prohibited from treatment by OB and OD at ANAD.

The OB or OD of loaded munitions/components items containing colored smokes, white phosphorous, red phosphorous, hexachlorethane, or riot control agents is prohibited by ANAD. These types of munitions/components may be treated by OB only after they have been expended, except in emergency conditions. If an inspection by surveillance reveals that

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TABLE IV C-7
Thermochemical Characteristics of Explosives

Material	Heat of Combustion, Calories per gram at Constant Pressure	Heat of Formation, Kilogram Calories per Mole	Heat, Calories per gram (H_2O) Gas	Gas (millimeters per gram)
Products of Explosion				
Primary Explosives:				
Lead azide	—	-112 to –126.3	367	308
Mercury fulminate	938	-221 to –226	427	315
Diazodinitrophenol	—	956	820	
Lead styphnate	1,251	92.3	460	440
Tetracene	—	270	658	1,190
Aliphatic nitrate esters				
BTN	2,167	368	1,458	—
DEGN	2,792	-99.4	1,161	—
Nitrocellulose:				
Pyroxlyn (12% N)	—	-216	1,020	—
Guncotton (13.55% N)	2,313	-200	1,020	883.2
High nitrogen (14.14% N)	—	-191	1,810	—
Nitroglycerin	1,603	-90.8	1,486	715
PETN	1,957	-128.7	1,510	790
TEGN	3,428	-603.7	750	—
TMETN	2,642	-422	—	—
Nitramines:				
HMX	2,231 to 2,253	11.3 to 17.93	1,480	—
RDX	2,259 to 2,284	14.71	1,480	908
EDDN	2,013	156.1	128 to 159	—
Haleite	2,477	20.11	1,276	908
Nitroguanidine	2,021	20.29	880	1,077
Tetryl	2,914	4.67 to 7.6	1,450	760
Nitroaromatics:				
Ammonium picrate	2,745	95.82	800	—
DATB	—	-97.1 to –119	910	—
HNAB	—	-58 to –67.9	1,420	—
HNS	3,451	-13.9 to 1.87	1,360	—
TATB	2,850	-33.46 to –36.85	1,018	—
TNT	3,563 to 3,598	-10 to –19.99	1,290	730
Ammonium nitrate	—	88.6	381	980

TABLE IV C-8
Physical Properties Relevant to Environmental Mobility for Energetic Constituents and Emission Products

Chemical	CAS Number	Molecular Weight[a]	Density[a] (g/mL)	Vapor Pressure[d] (mm Hg) (25°C)	Water Solubility[d] (mg/L) (25°C)	log K_{ow}[d] Octanol/Water Partition Coefficient	K_{oc} (mL/g) Organic Carbon Partition Coefficient	Henry's Law Constant[d] (atm-m^3/mole)	Bioaccumu-lation Factor[b] (L/kg)	Half-life[k] Soil (hours)	Half-life[k] Groundwater (hours)	Aquatic Photolysis Half-life[k] (hours)	Aqueous Biodegradation[k] (hours) Aerobic (A) or Anaerobic (AN)	
Explosives														
Ammonium Nitrate	6484-52-2	80.04	1.725	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonium Perchlorate	7790-98-9	117.49	1.95[e]	NA	2×10^5	-5.84	NA	NA	NA	NA	NA	NA	NA	NA
Antimony Sulfide	1315-04-4	807.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium Nitrate	10022-31-8	261.34	3.23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium Peroxide	1304-29-6	169.33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Butanetriol Trinitrate (BTN)	6659-60-5	241.11	1.52[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diazodinitrophenol (DDNP)	87-31-0	210.1[e]	1.63[e]	NA	NA	0.53	NA	NA	NA	NA	NA	NA	NA	NA
Diethyleneglycol Dinitrate (DEGN)	693-21-0	196.12	1.38[e]	4.8×10^{-3}[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylenediamine Dinitrate (EDDN)	NA	186.1[e]	1.58[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylenedinitramine (Haleite)	505-70-5	150.09	1.71[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium Resinate	9007-13-0	642.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium Silicide	12013-55-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclotetramethylene Tetranitramine (HMX)	2691-41-0	296.16	1.86[e,f]	NA	NA	0.54[b]	3.80[b]	NA	NA	NA	NA	NA	NA	NA
Lead Azide	13424-46-9	291.24	4.8[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead Styphnate	15245-44-0	450.29	3.0[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead Thiocynate	592-87-0	323.36	NA	NA	5,000	0.63	NA	NA	NA	NA	NA	NA	NA	NA
Nitrocellulose (NC)	9004-70-0	252.14	1.67[e]	NA	NA	NA	NA	NA	1.7	NA	NA	NA	NA	NA
Nitroglycerine (NG)	55-63-0	227.09	1.59[e]	0.04	1,380	1.62	NA	9.87×10^{-8}	NA	48–168	96–336	928–2,784	192–672	AN
Nitroguanidine (NQ)	556-88-7	104.07	1.71[e]	1×10^{-9}	4,400	-0.89	0.1334[b]	4.49×10^{-12}	0.12	NA	NA	NA	NA	NA
Nitrostarch (NS)	NA	NA	1.6[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentolite	8066-33-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium Chlorate	3811-04-9	122.54	2.32	NA	7×10^4	-4.22	NA	NA	NA	NA	NA	NA	NA	NA
Potassium Perchlorate	7778-74-7	138.54	2.52	2.07×10^{-16}	1.5×10^4	-7.18	NA	NA	NA	NA	NA	NA	NA	NA
Pentaerythritol Tetranitrate (PETN)	78-11-5	316.14	1.76[e]	NA	<1 g/100 mL @22°C[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclotrimethylene Trinitramine (RDX)	121-82-4	222.12	1.82[e]	4.1×10^{-9}	59.7	0.87	7.17[b]	6.32×10^{-8}	190	NA	NA	NA	NA	NA
Strontium Nitrate	10042-76-9	211.63	2.99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium Peroxide	1314-18-7	119.62	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetracene	92-24-0	228.29	NA	2.49×10^{-9}	0.00151	5.76	NA	4.95^{-7}	NA	NA	NA	NA	NA	NA
Triethylene Glycol Dinitrate (TEGDN)	111-22-8	241.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrophenyl-methylnitramine (Tetryl)	479-45-8	287.15	1.73[e]	NA	0.02 g/100 mL[a]	2[b]	92.53[b]	NA	19	NA	NA	NA	NA	NA
1,1,1-Trimethylolethane Trinitrate (TMETN)	3032-55-1	255.14	1.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Diamino-2,4,6-trinitrobenzene (DATB)	28930-29-2	243.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonium Picrate (Explosive D)	131-74-8	246.14	1.72[e]	NA	1 g/100 mL[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2',4,4',6,6'-Hexanitroazobenzene (HNAB)	19159-68-3	452.21	1.6[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexanitrostilbene (HNS)	20062-22-0	450.23	1.74[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Triamino-2,4,6-trinitrobenzene (TATB)	3058-38-6	258.15	1.93[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene (TNT)	118-96-7	227.13	1.65	8.2×10^{-6}	130	1.6	1.0[b]	4.57×10^{-7}	33	672–4,320	672–8,640	3.7–11.3	672–4,320	A, AN
1,3,3-Trinitroazetidine (TNAZ)	NA	192.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE IV C-8
Physical Properties Relevant to Environmental Mobility for Energetic Constituents and Emission Products

Chemical	CAS Number	Molecular Weight[a]	Density[a] (g/mL)	Vapor Pressure[d] (mm Hg) (25°C)	Water Solubility[d] (mg/L) (25°C)	log K_{ow}[d] Octanol/Water Partition Coefficient	K_{oc} (mL/g) Organic Carbon Partition Coefficient	Henry's Law Constant[d] (atm-m^3/mole)	Bioaccumu-lation Factor [b] (L/kg)	Half-life[k] Soil (hours)	Half-life[k] Groundwater (hours)	Aquatic Photolysis Half-life[k] (hours)	Aqueous Biodegradation[k] (hours) Aerobic (A) or Anaerobic (AN)	
FEFO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexanitroisowurtzitane (CL-20)	NA	438.19[m]	2.04[m]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatiles, Semivolatiles and Inorganics														
1,2,4-Trimethylbenzene	95-63-6	120.19	0.876	2.1	57	3.63	472[l]	6.16×10^{-3}	439 (estimated)[l]	168–672	336–1,344	NA	672–2,688	AN
1,3-Butadiene	106-99-0	54.09	NA	2.11×10^{3}	735	1.99	120[g]	7.36×10^{-2}	19	168–672	336–1,344	380	672–2,688	AN
1,3,5-Trimethylbenzene	108-67-8	120.19	0.865	2.48	48.2	3.42	NA	8.77×10^{-3}	NA	NA	NA	NA	NA	NA
1,3,5-Trinitrobenzene	99-35-4	213.11	1.76[h]	6.422×10^{-6}	278	1.18	14.5[b]	3.31×10^{-10}	4.8	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	99-65-0	168.11	1.37	9.0×10^{-3}	533	1.49	150[g]	4.9×10^{-8}	9.7	672–4,320	554–720	554–720	672–4,320	A
2,4-Dinitrotoluene	121-14-2	182.14	1.52	1.47×10^{-4} @ 22°C	270 @ 22°C	1.98	45[g]	5.4×10^{-8}	19	672–4,320	48–8,640	23–72	672–4,320	A
2-Methylnaphthalene	91-57-6	142.20	1	5.5×10^{-2}	24.6	3.86	224[b]	5.18×10^{-4}	540	NA	NA	NA	NA	NA
3,4-Methylphenol (m- & -p-cresol)	1319-77-3	324.42	1.04	1.7×10^{-1}	9,066	1.95	500[g]	6.19×10^{-7}	9[j]	1–696	2–1176	NA	240–1,176	AN
Acenaphthylene	208-96-8	152.20	0.899	9.12×10^{-4}	16.1	3.94	2,500[g]	1.14×10^{-4}	38	1,020–1,440	2,040–2,880	NA	4,080–5,760	AN
Acetophenone	98-86-2	120.15	1.03	3.97×10^{-1}	6,130	1.58	23.36[b]	1.04×10^{-5}	120	NA	NA	NA	NA	NA
Anthracene	120-12-7	178.23	1.28	2.67×10^{-6}	0.0434	4.45	14,000[g]	5.56×10^{-5}	1,300	120–11,040	2,400–22,080	0.58–1.7	4,800–44,160	AN
Benzo(a)anthracene	56-55-3	228.29	NA	1.9×10^{-6}	0.0094	5.76	1,380,000[g]	1.2×10^{-5}	13,000	2,448–16,320	4,896–32,640	1–3	9,792–65,280	AN
Benzene	71-43-2	78.11	0.879	9.48×10^{1}	1,790	2.13	83[g]	5.55×10^{-3}	23	120–384	240–17,280	2,808–16,152	2,688–17,280	AN
Benzo(a)pyrene	50-32-8	252.31	1.35	5.49×10^{-9}	0.00162	6.13	5,500,000[g]	4.57×10^{-7}	25,000	1,368–12,720	2,736–25,440	0.37–1.1	5,472–50,880	AN
Benzo(b)fluoranthene	205-99-2	252.31	NA	5×10^{-7}	0.0015	5.78	550,000[g]	6.57×10^{-7}	25,000	8,640–14,640	172,780–29,280	8.7–720	34,560–58,560	AN
Benzo(g,h,i)perylene	191-24-2	276.34	NA	1×10^{-10}	0.00026	6.63	1,600,000[g]	3.31×10^{-7}	61,000	14,160–15,600	28,320–31,200	NA	56,640–62,400	AN
Benzo(k)fluoranthene	207-08-9	252.31	NA	9.65×10^{-10}	0.0008	6.11	550,000[g]	5.84×10^{-7}	87,000	21,840–51,360	42,680–102,720	3.8–499	87,360–205,440	AN
Benzyl alcohol	100-51-6	108.14	1.05	9.4×10^{-2}	42,900	1.1	44.44[b]	3.37×10^{-7}	4	NA	NA	NA	NA	NA
Biphenyl	92-52-4	154.21	0.992	8.93×10^{-3}	6.94	3.98	15,632[b]	3.08×10^{-4}	770	36–168	72–336	NA	144–672	AN
bis (2-Ethylhexyl) phthalate	117-81-7	390.56	0.973	1.42×10^{-7}	0.27	7.6	111,000[i]	2.70×10^{-7}	3,100	120–550	240–9,336	3,500–4,800	980–9,336	AN
Butylbenzyl phthalate	85-68-7	312.36	1.1	8.25×10^{-6}	2.69	4.73	13,700[i]	1.26×10^{-6}	3,100	24–168	48–4,320	100 years	672–4,320	AN
Carbon Dioxide	124-38-9	44.01	NA	4.83×10^{3}	1,475	0.83	NA	1.52×10^{-2}	NA	NA	NA	NA	NA	NA
Carbon Monoxide	630-08-0	28.01	NA	1.55×10^{8}	0.004 g/100 mL @ 20°C[a]	1.78	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	56-23-5	153.82	1.59	1.15×10^{2}	793	2.83	110[g]	2.76×10^{-2}	79	4,320–8,640	168–8,640	NA	4,032–8,640	A
Di-n-butyl phthalate	84-74-2	278.35	1.04	1×10^{-5}[g]	0.0013 g/100 mL[a]	5.60[g]	170,000[g]	2.82×10^{-7}[g]	3,100	48–552	48–552	3,466	48–552	AN
Di-n-octyl phthalate	117-84-0	390.56	0.978	1×10^{-7}	0.02	8.1	83,200,000[i]	2.57×10^{-6}	5,800,000	168–672	336–8,760	NA	4,320–8,760	AN
Dibenzofuran	132-64-9	168.19	NA	2.48×10^{-3}	3.1	4.12	NA	2.13×10^{-4}	NA	168–672	205–835	NA	672–2,688	AN
Dichloromethane	75-09-2	84.94	1.33	4.35×10^{2}	13,000	1.25	11.74[b]	3.25×10^{-3}	5.7	168–672	336–1,344	NA	672–2,688	AN
Diethyl phthalate	84-66-2	222.24	1.12	2.1×10^{-3}	1,080	2.42	142[g]	6.10×10^{-7}	47	72–1344	144–2,688	NA	672–5,376	AN
Dimethyl phthalate	131-11-3	194.19	1.19	3.08×10^{-3}	4,000	1.6	82.2[i]	1.97×10^{-7}	9.7	24–168	48–336	NA	96–672	AN
Ethylbenzene	100-41-4	106.17	0.867	9.6	169	3.15	1,100[g]	7.88×10^{-3}	130	72–240	72–240	NA	4,224–5,472	AN
Fluoranthene	206-44-0	202.26	NA	9.22×10^{-6}	0.26	5.16	38,000[g]	8.86×10^{-6}	3,100	3,360–10,560	6,720–21,120	63–21	13,440–42,240	AN

TABLE IV C-8
Physical Properties Relevant to Environmental Mobility for Energetic Constituents and Emission Products

Chemical	CAS Number	Molecular Weight[a]	Density[a] (g/mL)	Vapor Pressure[d] (mm Hg) (25°C)	Water Solubility[d] (mg/L) (25°C)	log K_{ow}[d] Octanol/Water Partition Coefficient	K_{oc} (mL/g) Organic Carbon Partition Coefficient	Henry's Law Constant[d] (atm-m^3/mole)	Bioaccumu-lation Factor[b] (L/kg)	Half-life[k] Soil (hours)	Half-life[k] Groundwater (hours)	Aquatic Photolysis Half-life[k] (hours)	Aqueous Biodegradation[k] (hours) Aerobic (A) or Anaerobic (AN)	
Fluorene	86-73-7	166.22	1.2	8.42×10^{-3}	1.89	4.18	7,300[g]	9.62×10^{-5}	1,300	768–1,440	1,536–2,880	NA	3,072–5,760	AN
Freon 11	75-69-4	137.37	1.49	803×10^{2}	1,100	2.53	159[g]	9.7×10^{-2}	47	4,230–8,640	8,640–17,280	NA	16,128–34,560	AN
Freon 113	76-13-1	187.38	1.58	3.63×10^{3}	170	3.16	389[b]	5.3×10^{-1}	56	4,320–8,460	1,440–17,280	NA	17,280–34,560	AN
Freon 12	75-71-8	120.91	1.33	4.85×10^{2}	280	2.16	58[g]	3.43×10^{-1}	28	672–4,320	1,344–8,640	NA	2,688–4,032	AN
Hydrogen Chloride	7647-01-0	36.46	0.909	NA	62 g/100 mL[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrogen Fluoride	7664-39-3	20.01	0.993	9.17×10^{2}	922	0.23	NA	NA	NA	NA	NA	NA	NA	NA
Indeno (1,2,3-cd) pyrene	193-39-5	276.34	NA	1.25×10^{-10}	0.00019	6.7	1,600,000[g]	3.48×10^{-7}	61,000	14,400–17,520	28,800–35,040	3,000–6,000	57,600–70,080	AN
m- & p-Xylene[c]	1330-20-7	318.50	0.862	7.99	106	3.16	240[g]	6.63×10^{-3}	190	168–672	336–8,640	NA	4320–8,640	AN
Methane	74-82-8	16.04	0.466	4.658×10^{5}	22	1.09	NA	6.576×10^{-1}	NA	NA	NA	NA	NA	NA
Methyl chloride	74-87-3	50.49	0.991	4.3×10^{3}	5,320	0.91	35[g]	8.82×10^{-3}	5.7	168–672	336–1,344	NA	672–2,688	AN
n-Nitrosodiphenylamine	86-30-6	198.22	1.23	0.1	35	3.13	1,290[b]	1.21×10^{-6}	130	240–816	480–1,632	NA	960–3,264	AN
Naphthalene	91-20-3	128.17	0.997	8.5×10^{-2}	31	3.3	119[i]	4.4×10^{-4}	19	398–1,152	24–6,192	1,704–13,200	600–6,192	AN
Nitrogen Dioxide (peroxide)	10102-44-0	46.01	NA	9.0×10^{2}	170,900	-0.58	NA	2.45×10^{-2}	NA	NA	NA	NA	NA	NA
Nitrogen Oxide	10024-97-2	44.01	NA	4.289×10^{4}	8,738	0.36	NA	1.56×10^{-9}	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	106.17	0.897	6.61	178	3.12	241[i]	5.18×10^{-3}	160	168–672	336–8,640	NA	4,320–8,640	AN
p-Ethyltoluene	622-96-8	120.19	0.861	3	94.9	3.63	NA	5.01×10^{-3}	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	178.23	1.06	1.2×10^{-4}	1.15	4.46	14,000[g]	4.23×10^{-5}	1,800	384–4,800	768–9,600	3–25	1,536–19,200	AN
Phenol	108-95-2	94.11	1.07	3.5×10^{-1}	104	1.46	14.2[g]	3.33×10^{-7}	8.1	24-240	12–168	46–173	192–672	AN
Pyrene	129-00-0	202.26	1.27	4.5×10^{-6}	0.135	4.88	38,000[g]	1.9×10^{-5}	3,100	5,040–45,600	10,080–91,200	0.68–2.04	20,160–182,400	AN
Styrene	100-42-5	104.15	0.905	6.4	310	2.95	776[b]	2.75×10^{-3}	94	336–672	672–5,040	NA	1,344–2,688	AN
Tetrachloroethylene	127-18-4	165.85	1.62	1.85×10^{1}	200	3.4	155[b]	1.77×10^{-2}	56	4,320–8,460	8,640–17,280	NA	2,352–39,672	AN
Toluene	108-88-3	92.13	0.867	2.84×10^{1}	5.26	2.73	182[b]	6.64×10^{-3}	66	96–528	168–672	NA	1,344–5,040	AN

Notes:
[a] http://chemfinder.camsoft.com/results.asp (Chemfinder Database and Internet Searching, Homepage)
[b] http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_9801 (Risk Assessment Information System, Chemical-Specific Factors page)
[c] No data available, data for mixed xylenes presented.
[d] http://esc.syrres.com/interkow/physdemo.htm (Interactive PhysProp Database Demo page)
[e] Rudolph Meyer, Explosives: Third, revised and extended edition, 1987.
[f] The value presented for HMX is based on the alpha modification of the compound.
[g] EPA, Superfund Public Health Evaluation Manual (OSWER Directive 9285.4-1)
[h] Appendix IX to 40 CFR 264, Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Physical Properties, September 1992.
[i] EPA, Soil Screening Guidance: Technical Background Document, May 1996.
[j] EPA, Health Effects Assessment for Cresols, September 1984.
[k] Howard et al., Environmental Degradation Rates, 1991. Values presented are given as a range from low to high half-life values.
[l] http:/www.epa.gov/opptintr/chemfact (EPA Chemicals in the Environment: OPPT Chemical Facts Sheets page)
[m] Holston Defense Corporation - Development information sheet on CL-20.
NA = Not available in the references reviewed.

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TABLE IV C-9
Classes of Military Munitions and Components Treated by OB and OD at ANAD

Major Family	Loaded	Expended	Definitions
CD	Prohibited	Yes	Munitions containing dyes as a primary disposal requirement. Also bulk dye materials.
CH	Prohibited	Yes	Munitions containing hexachloroethane (HC) as the primary fill. Also bulk HC.
CP	Prohibited	Yes	Includes a variety of ammunition types that contain white phosphorus, or elasticized white phosphorus as primary fillers. Items may also contain a high explosive, bursting charge, and/or propellant charge as well.
CR	Prohibited	Yes	Usually referred to as riot control agents or munitions. Includes a variety of items that contain lacrimatory or irritating agents. Common fillers are tear gas, mace, or pepper gas. Common abbreviations for irritating agents are typically shown in the item nomenclature as CS, CN, or CR.
CS	Prohibited	Yes	Munitions whose primary purpose is to produce smoke. This family does not include smoke-producing munitions that use white or red phosphorus, which are assigned to family CP, and those munitions containing HC, which are in family CH. This family also does not include munitions of a primarily pyrotechnic nature, such as those used for illumination or smoke and illumination, or signal kits, flares, and most simulators, which are included in family FP.
DU	Prohibited	Prohibited	Includes all ammunition items using depleted uranium as the primary material for the projectiles/penetrators. These items are typically kinetic energy projectile penetrators, which may also have incendiary or tracer devices associated.
FI	Yes	Yes	Incendiary ammunition or devices that produce intense heat for destroying equipment or documents. Primary fillers are thermite, thermate, triethylaluminum, potassium perchlorate, or TPA.
FP	Yes	Yes	Pyrotechnics/Illumination/Non-Frag/Tracers. Includes a variety of ammunition types used for illumination, marking, spotting, signaling, simulating, or tracing. Typical items are ground, aircraft, or marine illumination signal stars, photoflash cartridges, personnel distress kits, and air/ground burst simulators. Does not include items whose primary purpose is to screen, which are assigned to family CS. Does not include tracer and incendiary rounds from 20mm through 40mm, which are assigned to families PDLA, PDLB, or PDLC.
HA	Yes	Yes	High Explosive components/devices. Includes all high explosive detonators, boosters, or bursting charges that are not configured within an ammunition item. Typically hazard class/division 1.1 or 1.2 components or munitions that do not fit any other family.
HB	Yes	Yes	High Explosive Bombs. Includes high explosive filled bombs. Items are typically air dropped, and fillers are usually tritonal, TNT, HBX, or H-6 explosives.

TABLE IV C-9
Classes of Military Munitions and Components Treated by OB and OD at ANAD

Major Family	Loaded	Expended	Definitions
HC	Yes	Yes	High Explosive Cartridges. Includes complete artillery or navy gun ammunition with a high explosive projectile and a propelling charge. Examples are 90mm, 105mm, 3"/50 Cal, 81mm, 30mm fuzed or unfuzed cartridges and fuzed 20mm cartridges.
HE	Yes	Yes	Bulk High Explosives. Includes all bulk high explosives such as TNT, Composition A, Composition B, Composition C-4, PBX, and RDX.
HG	Yes	Yes	High Explosive Grenades. Includes hand or rifle grenades that contain high explosive fillers. Does not include 40mm grenades in family HCCSH.
HH	Yes	Yes	High Explosive Depth Charges and Underwater Munitions. Includes all high explosive filled marine depth charges and underwater mines and also the separate warheads for these depth charges and underwater mines.
HI	Yes	Yes	High Explosive Improved Conventional Munition/Inter-Continental Missiles/Cluster Bomb Units and Submunitions. Includes a variety of improved and conventional munition types containing submunitions. Items may be air dropped cluster bomb units, projectiles, or warheads containing submunitions such as anti-tank mines, anti-personnel/material grenades, or bomb loaded units.
HM	Yes	Yes	High Explosive Rockets.
HP	Yes	Yes	High Explosive Projectiles and Warheads. Includes all projectiles, warheads, mortars, or similar items that do not have a cartridge case, propellant, or rocket motor associated, and that contain a high explosive filler.
HR	Yes	Yes	High Explosive Rockets. Includes complete rounds of rocket ammunition containing warhead, fuze, and rocket motor. Note that a live rocket motor with an inert warhead would be considered a member of family PDR. This family does not include rockets with practice warheads designed to provide a flash and smoke signature. These types of rockets are in family FPR.
HT	Yes	Yes	Torpedoes, complete.
HX	Yes	Yes	Demolition Materials. Includes all demolition materials such as cratering charges, shaped charges, flexible sheet explosives, and miscellaneous standard or nonstandard items, which could be used as donor material for OD of other munitions items. It also includes demolition initiation items, such as blasting caps, time fuze, det cord, etc. Typically, the initiation items will not be used for their intended purposes because they are in the demilitarization account due to defects.
HZ	Yes	Yes	High Explosive Land Mines. Includes all high explosive filled land mines emplaced by hand or dispersing devices, and includes the dispersing devices when the mines and the devices constitute end items. The family also includes scatterable mines when they are packed separately from the dispersing unit (e.g., a dispenser, projectile body, or other system).

TABLE IV C-9
Classes of Military Munitions and Components Treated by OB and OD at ANAD

Major Family	Loaded	Expended	Definitions
I	Yes	Yes	Inert. Includes all ammunition without any explosive or reactive material or fillers. Items in this family are typically classified as "dummy" or "blind loaded" ammunition used primarily for training. In general, all munitions items that are inert but that require demilitarization before being placed in the hands of the public (e.g., sold through the Defense Reutilization and Marketing Service) are placed in this family.
LR	No	Yes	Large Rocket Motor. Includes solid propellant Inter-Continental Ballistic Missile, Silo-Launched Ballistic Missile, or space launch booster motors. Does not include those motors that are associated with tactical rocket or missile systems. Does not include anti-ballistic missile systems designed to defend against theater ballistic missiles. E202 include strategic anti-ballistic missile systems (such as Safeguard).
N	Yes	Yes	No Family. Includes a variety of ammunition and components that cannot be identified as to filler or characteristics because of incomplete supply data.
PB	Yes	Yes	Bulk Propellants. Includes all propellants in bulk form that are not assembled or configured to an ammunition item. Material is normally packaged in drums or metal lined wooden containers. Does not include black powder, which is assigned to family HE.
PC	Yes	Yes	Propellant Charges and Increments. Includes packaged propelling charges and propellant increments.
PD	Yes	Yes	Propellant Munitions/Components. Includes a variety of ammunition types such as rocket motors, some ejection seat components such as catapults or canopy thrusters, ammunition of 20mm or larger with inert (except may include tracers or incendiary mixes) or flechette projectiles, etc. (Flechette projectiles containing dyes are in family CD.) Typically hazard class/division 1.3 and 1.4 items.
SA	Yes	Yes	Small Caliber Ammunition. Includes small caliber ammunition through .5 caliber.
SC	Yes	Yes	Miscellaneous and Incinerable Munitions and Components. Includes munitions and components typically assigned to hazard class/division 1.3 and 1.4 and that do not fit into any other families. Physical dimensions and weights of items in this family vary widely. Many of the items are relatively small and may be demilitarized in deactivation furnaces or other incineration methods. Typical items include small egress system components such as det cord assemblies, initiators, actuators, etc. Also included are impulse cartridges, squibs, and delay elements. At the other end of the scale, there are many items of large physical dimensions and weights. Typical items include assemblies containing small quantities of energetic materials, components that are primarily electronic but that contain small squibs or intiators, guidance kits, engine starter cartridges, etc.
SF	Yes	Yes	Fuzes. Includes all types of fuzes related to munitions. Examples include artillery ammunition/Navy gun fuzes, rocket fuzes, or grenade fuzes packaged separately from the munitions.

items are in an unsafe condition for further storage, they will initiate an emergency demilitarization request. Under those conditions, ANAD can destroy items that are normally prohibited. The OB or OD of any item containing depleted uranium, whether loaded or expended, is prohibited by ANAD.

Military munitions and components are also classified by hazard class. DoD uses the international system of classification devised by the United Nations Organization (UNO). The UNO classification system consists of nine hazard classes, two of which (Classes 1 and 6) are applicable to ammunition and explosives.

ANAD treats Class 1 materials at the OB and OD units. Within Class 1 are two hazard divisions, as follows:

- Munitions items that will detonate almost instantly when only a single item is subjected to fire or initiation.
- Munitions items that will not mass detonate when a single item or package in a stack is initiated. The items will progressively burn or explode a few items at a time, with blast effects limited to the immediate vicinity. The major hazard to exposed sites would be ejected fragments. Within this hazard division there are four subdivisions based on potential distances to which shrapnel might travel.
  - Items that burn vigorously with explosions limited to the rupture of containers with no shock waves.
  - Items with fire hazard but no blast hazard.
  - Items that are very insensitive explosives.
  - Items that are extremely insensitive ammunition.

Energetic By-Products

Energetic by-products may be generated as a result of ANAD's military munitions recycling and testing operations. These waste streams are derived directly from conventional WMM. For example, ANAD's missile recycling facility is currently working with commercial manufacturers of explosives to re-formulate military propellant for use in commercial explosives activities (e.g., mining). During the re-formulation process, ANAD may generate waste that is not WMM, but is derived directly from WMM. Additionally, should the re-formulated end product not meet the quality standards established by the commercial industry, the material failing test standards would need to be disposed. Energetic by-products comprise an insignificant fraction of the ANAD OB and OD waste stream and the chemical compositions of such products are generally consistent with those of the WMM from which they were derived.

Compositions of Energetic-Contaminated Solids

Energetic-contaminated solids are solid wastes that have become contaminated with energetic materials. Energetic-contaminated solids generally consist of paper products, tissue wipes, packaging material, chemical protective gloves, disposable coveralls, and cotton swabs that have been contaminated with energetics. These solids do not contain

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sufficient energetics to be deemed "reactive", but are disposed on-site at the OB/OD units to ensure public safety and eliminate the potential for ignition in the solid waste stream. These wastes are treated by OB/OD but may be temporarily stored as a non-hazardous waste at the point of generation in an area under control of the operator. Energetic-Contaminated Solids may be generated at multiple locations within the facility. Typically the material is generated at a rate of 3-6 25 gallon drums per year in the Munitions Recycling Center (MRC) (Building 381) but may also be generated during the handling of propellant and open explosives during the following operations at Buildings 58, 168, 600, 652, and 670:

- Buildings 168, 600, 652, 670, 726, and 738: Unpack and reconfiguration of conventional ammunition and missiles, renovation of conventional ammunition and missiles, preservation and packaging of convention ammunition and missiles, disassembly/reassembly of conventional ammunition and missiles.
- Building 58: Periodic inspections of conventional ammunition and missiles (e.g., propellant charges and/or incremental charges).

IV C-1h(4) Waste Qualification and Acceptance Process

Historical data, military specifications, ordnance published data, and quality assurance (QA) records can be used to determine the appropriateness of thermal treatment for the material. The primary source of information on the composition of munitions and components is MIDAS. The MIDAS program is part of the Demilitarization Technology Directorate at the U.S. Army DAC. MIDAS provides a central source of information on military munitions/explosives. The MIDAS program includes information on energetic components of munitions items and their composition.

The MIDAS program is accessible on the Internet. Registration is required to obtain a user identification and password. The MIDAS Internet site is www.dac.army.mil.

Waste munitions received from off-site would be processed to Standard Depot System, the same system used for receipt of non-WMM.

ANAD is authorized to accept WMM from offsite DoD activities; although to date, this has not occurred. In the event that ANAD should receive off-site waste, a Memorandum will be prepared and attached to the Waste Manifest or DoD shipping documents (for wastes shipped under the Military Munitions Rule Conditional Exemption) to document that the WMM was inspected and qualifies for disposal at ANAD. The Memorandum and accompanying Manifest and/or shipping documents will be retained at DRK.

ANAD thermally treats via OB and OD only those WMM that are included in MIDAS and the ANMC Munitions Analytical Compliance System (MACS). Additionally, ANAD only treats those munitions families listed in Table IV C-9. The determination that waste is acceptable for treatment is recorded on the pre-treatment checklists described in Section IV-F. The waste acceptance information is verified by signature on the inspections logs and the verification is included as part of the inspection sheet found in Section IV F.

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IV C-1i Wastes at Facilities with Process Vents ADEM Admin. Code R.335-14-8.-02(15)

Not applicable.

IV C-1j Wastes Used in Performance Tests

Treated wastes are addressed in Section III of the permit renewal application and subsequent permit modification request.

IV C-2 Waste Analysis Plan ADEM Admin. Code R.335-14-8-.02(5)(b)2&3

IV C-2a Introduction

Tables IV C-3, IV C-4, and IV C-5 list WMM formulations that are or may be thermally treated at this facility. All WMM received for treatment at the OB and OD facilities are hazardous by virtue of reactivity. A detailed waste analysis is not necessary to ensure successful treatment by OB and OD because the constituents of the WMM, as well as its ballistic properties, are well known prior to treatment. Chemical and physical data for the WMM being subjected to OB and OD are on file at ANAD and contained within the MACS and MIDAS systems. ANMC only treats WMM that are listed in the MIDAS. If the WMM is not in MIDAS, then the item is not eligible for disposal at ANAD. A request is submitted to DAC and arrangements are made for treatment. The determination that waste is acceptable for treatment is recorded on the pre-treatment checklists described in Section IV-F. The waste acceptance information is verified by signature on the inspections logs and the verification is included as part of the inspection sheet found in Section IV F.

Each treatment event is recorded electronically in the MACs system by DODIC and nomenclature. The system correlates each waste item with its composition. The system can be queried at any time to provide specific waste composition data, including metals content.

Energetic contaminated solid waste will be tracked from generation to disposal. These items, as discussed in Section IV C-1h(3), may be generated from various locations and processes and may be disposed of via OD. The volume or weight, composition of waste, and date of disposal will be recorded.

In regard to treatment residue generated as a result of OB, Waste Profile (refer to Figure IV C-2) are in the ANAD Hazardous Materials Management System (HMMS) for a variety of waste streams, cataloged by DODIC and/or National Stock Number (NSN). In the event that a new DODIC or NSN is scheduled for which no Waste Profile exists, a waste stream characterization is requested and completed before treatment is scheduled. Table IV C-8 contains physical properties of typical explosive compositions contained in the WMM treated at ANAD.

Records of test results and waste analysis will be maintained at ANAD in accordance with ADEM Admin. Code R.335-14-.04(c) and (d).

After treatment, treatment residues in the form of ash are collected and placed in DOT-approved containers. If the waste stream has changed and no current Waste Profile exists,

then the ash residue is sampled and analyzed. Otherwise, the appropriate waste profile is applied. The treatment residue is transported to one of three permitted hazardous waste storage facilities at ANAD (Building 466, 512, or 527) prior to shipment offsite.

Pans are covered when not in use and OB is prohibited during precipitation events so that precipitation does not accumulate in pans. In the event that precipitation should enter the pans during post-burn cool down period before pan covers are placed, the precipitation is allowed to evaporate prior to removing the ash for disposal.

IV C-2b Analyses and Rationale for Selection

IV C-2b(1) WMM Treated

All waste munitions treated are standard military end items with well-defined physical and chemical characteristics. ANAD uses process knowledge to obtain the necessary chemical and physical information to properly treat WMM by OB and OD. Section IVC-1 describes the waste qualification and acceptance process, including sources of process knowledge used to characterize the physical and chemical properties of the wastes. In addition, due to the nature of the waste stream, direct representative analysis of military munitions and energetic wastes is not proposed as a part of this WAP. Rather, post-treatment inspection and analysis will be used to ensure the treatment residues removed from the units are properly managed and disposed of.

IV C-2b(2) OB Treatment Residues

OB at ANAD results in the generation of treatment residue. Treatment residue is generated as the result of the combustion of an energetic. The physical form of treatment residue is distinctly different from an unburned propellant/explosive. Treatment residue is a fine powdery or feathery material. Treatment residues are collected and placed into a DOT-approved container. The treatment residues are analyzed the first time that a particular waste stream is treated. Figure IV C-1 shows a typical chain of custody (COC) and analytical request form for OB treatment residue. Thereafter, the treatment residue for that waste stream is not reanalyzed unless changes in the waste stream could result in changes in the waste characteristics. Rather, the existing waste profile is applied. Figure IV C-2 shows an example waste profile sheet for OB treatment residue at ANAD. The choice of analyses is based on the known composition of the WMM treated. Analyses are conducted to determine whether the treatment residues meet the Land Disposal Restrictions (LDRs) contained in ADEM Admin. Code R.335-14-9. Table IV C-10 lists the possible parameters that could be analyzed and the rationale for the analysis.

The RCRA characteristic of reactivity is not specifically tested. Visual observations are conducted to determine that only treatment residue is present. Propellants/explosives have a physical form of granules, plugs, or blocks. Therefore, visual observations of the burn residue are adequate to ensure that the reactivity characteristic is treated. A record of this visual determination is noted on the Post-treatment Inspection Log.

In the rare event that precipitation should fall between the time of a burn and replacement of pan lids in sufficient quantities to result in liquid accumulation in the pan, the precipitation is allowed to evaporate before removing the residue. More typically, the moist residue is removed and managed in the same manner as dry residue. After a burn, the pan

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lids are replaced and residue is removed as soon as possible to minimize the potential for exposure to moisture. Burn pans are fitted with a drainage device for draining liquids but there has been no occasion to employ these devices to date.

1

TABLE IV C-10
Rationales and Test Methods for Parameters Analyzed
Treatment Residues (OB)

Wastes	CAS Numbers	Parameters[a]	Rationale	Test Method[b]
OB treatment residue	N/A	Toxicity characteristic leaching procedure (TCLP)	Generate leachate for toxicity characterization	SW-846 Method 1311
OB treatment residue leachate	7429-90-5	Aluminum	Determine whether leachate meets LDR treatment standards for aluminum	SW-846 Method 6010B
OB treatment residue leachate	7440-36-0	Antimony	Determine whether leachate meets LDR treatment standards for antimony	SW-846 Method 6010B
OB treatment residue leachate	7440-38-2	Arsenic	Determine whether leachate meets LDR treatment standards for arsenic	SW-846 Method 6010B
OB treatment residue leachate	7440-39-3	Barium	Determine whether leachate meets LDR treatment standards for barium	SW-846 Method 6010B
OB treatment residue leachate	7440-41-7	Beryllium	Determine whether leachate meets LDR treatment standards for beryllium	SW-846 Method 6010B
OB treatment residue leachate	7440-43-9	Cadmium	Determine whether leachate meets LDR treatment standards for cadmium	SW-846 Method 6010B
OB treatment residue leachate	7440-47-3	Chromium	Determine whether leachate meets LDR treatment standards for chromium	SW-846 Method 6010B
OB treatment residue leachate	7440-48-4	Cobalt	Determine whether leachate meets LDR treatment standards for cobalt	SW-846 Method 6010B
OB treatment residue leachate	7440-50-8	Copper	Determine whether leachate meets LDR treatment standards for copper	SW-846 Method 6010B
OB treatment residue leachate	7439-95-4	Magnesium	Determine whether leachate meets LDR treatment standards for magnesium	SW-846 Method 6010B
OB treatment residue leachate	7439-96-5	Manganese	Determine whether leachate meets LDR treatment standards for manganese	SW-846 Method 6010B
OB treatment residue leachate	7439-97-6	Mercury	Determine whether leachate meets LDR treatment standards for mercury	SW-846 Method 7470A
OB treatment residue leachate	7440-02-3	Nickel	Determine whether leachate meets LDR treatment standards for nickel	SW-846 Method 6010B
OB treatment residue leachate	7782-49-2	Selenium	Determine whether leachate meets LDR treatment standards for selenium	SW-846 Method 6010B

TABLE IV C-10
Rationales and Test Methods for Parameters Analyzed
Treatment Residues (OB)

Wastes	CAS Numbers	Parameters[a]	Rationale	Test Method[b]
OB treatment residue leachate	7440-22-4	Silver	Determine whether leachate meets LDR treatment standards for silver	SW-846 Method 6010B
OB treatment residue leachate	7440-28-0	Thallium	Determine whether leachate meets LDR treatment standards for thallium	SW-846 Method 6010B
OB treatment residue leachate	7440-31-5	Tin	Determine whether leachate meets LDR treatment standards for tin	SW-846 Method 6010B
OB treatment residue leachate	7440-62-2	Vanadium	Determine whether leachate meets LDR treatment standards for vanadium	SW-846 Method 6010B
OB treatment residue leachate	7440-66-6	Zinc	Determine whether leachate meets LDR treatment standards for zinc	SW-846 Method 6010B
OB treatment residue leachate	121-14-2	2,4-dinitrotoluene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue leachate	118-74-1	Hexachlorobenzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue	67-64-1	Acetone	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	75-05-8	Acetonitrile	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate	71-43-2	Benzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	106-94-5	1-Bromopropane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	75-15-0	Carbon disulfide	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate	56-23-5	Carbon tetrachloride	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B

TABLE IV C-10
Rationales and Test Methods for Parameters Analyzed
Treatment Residues (OB)

Wastes	CAS Numbers	Parameters[a]	Rationale	Test Method[b]
OB treatment residue leachate	108-90-7	Chlorobenzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		Chloroform	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate	(o)95-48-7 (m)108-39-4 (p)106-44-5	o-, m-, and p-Cresol	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue ash leachate	108-94-1	Cyclohexanone	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		1,4-dichlorobenzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		1,2-dichloroethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		1,1-dichloroethylene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		1,4-dinitrotoluene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	141-78-6	Ethyl acetate	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	100-41-4	Ethyl benzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		Hexachlorobenzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		Hexachlorobutadiene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B

TABLE IV C-10
Rationales and Test Methods for Parameters Analyzed
Treatment Residues (OB)

Wastes	CAS Numbers	Parameters[a]	Rationale	Test Method[b]
OB treatment residue leachate		Hexachloroethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	67-56-1	Methanol	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8015B
OB treatment residue	75-09-02	Methylene chloride	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	78-93-3	Methyl ethyl ketone	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	108-10-1	Methyl isobutyl ketone	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	98-95-3	Nitrobenzene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue	79-46-9	2-Nitropropane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue leachate		Pentachlorophenol	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	110-86-1	Pyridine	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate	127-18-4	Tetrachloroethylene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	109-99-9	Tetrahydrofuran	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8270C
OB treatment residue	108-88-3	Toluene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B

TABLE IV C-10
Rationales and Test Methods for Parameters Analyzed
Treatment Residues (OB)

Wastes	CAS Numbers	Parameters[a]	Rationale	Test Method[b]
OB treatment residue	71-55-6	1,1,1-Trichloroethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	79-00-5	1,1,2-Trichloroethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate	79-01-6	Trichloroethylene	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	75-69-4	Trichlorofluoromethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	76-13-1	1,1,2-Trichloro-1,2,2-trifluoromethane	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		2,4,5-trichlorophenol	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB ash residue leachate		2,4,6-trichlorophenol	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue leachate		Vinylchloride	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B
OB treatment residue	1330-20-7	Xylenes	Determine whether treatment residue meets LDR treatment standards for underlying hazardous constituents	SW-846 Method 8260B

[a] Parameters analyzed only if present in the wastes treated
[b] SW-846 Test Method or most recent version will be used
NA = Not Applicable
DRO = Diesel Range Organics

ANNISTON ARMY DEPOT
CHEMICAL & ENVIRONMENTAL LABORATORIES – BLDG. 528
7 FRANKFORD AVENUE; PHONE: (256)235-6224 DSN: 571-6224
ANNISTON, AL 36201

SAMPLE NAME	CUSTOMER NAME & PHONE	
Waste Profiles	ANAD: Attn. Steven R. Guthrie DRK – Bldg 1 PHONE: 256-235-7207 ANAD; Anniston, AL 36201	REQUESTED ANALYSIS
NAME OF SAMPLER		

Sample ID/Location	Date	Time	Grab or Composite	Number of Containers		TCLP RCRA METALS EPA 1311		TCLP ADITIONAL METALS		TCLP RCRA VOA AND SVOA		TOTAL VOA/EPA 8260 and SVOA EPA 8270A		Flash Point		pH
Profile 030058 ADAS662-01			Grab		X		X		X		X					
OB/OD TREATMENT RESIDUE/SAND OR DIRT FROM BURNING PANS 1-5																

Released by: Date/Time	Received By: Date/Time	Released by: Date/Time	Received By: Date/Time

Remarks/SPECIAL Notes:

Sample to be taken from drum 10654 – fill date 6 May 2003

FIGURE IV C-1
Chain of Custody Form

Profile Sheet

Waste Profile Number : 0030058 Ref: 46268 NSN: 535000

Generator Name: ANNISTON ARMY DEPOT			US EPA ID:	AL3210020027
7 FRANKFORD AVE			STATE ID:	Z0001
ANNISTON, AL 36201-4199				
Technical Contact: ANTHONY PHILLIPS		Title: ENVIRONMENTAL COORDINATOR Phone: 256-235-6350		
Name of Waste: OB TREATMENT RESIDUE/SAND OR DIRTFROM BURNING PANS 1-5 (DAILY SWEEP UP)				
Start Date: 07-OCT-2003		End Date: 08-OCT-2004		
Process Generating Waste: PEP-OTHER			Description : OTHER	
Projected Annual Volume: Units:				
Mode of Collection: DRUM				
Is this waste a dioxin listed waste as defined in 40 CFR 261.31? NO				
Is this waste restricted from land disposal (40 CFR 268)? YES				
Does the waste meet applicable treatment standards? NO				
Has exemption been granted? NO				
Waste Type: HW		Process type: FP	Equip. Number: N/A	
Waste Stream Number: 17		State Waste Code:		
RCRA CHARACTERISTICS				
Physical State: SOLID		Treatment Group:	Non-Wastewater	
Ignitable: NO		Corrosive: NO		Reactive: NO
Flash Point(P): N/A		pH: N/A		Water Reactive: NO
High TOC (> 10%): N		Corrodes Steel: NO		Cyanide Reactive: NO
Low TOC (< 10%): Y		Toxicity Characteristics: YES		Sulfide Reactive: NO
RCRA Requirement:				
Additional RCRA Requirement:				
MATERIAL CHARACTERIZATION				
Color:		Density:	BTU/LB:	Ash Cont.:
Total Solids:	Single Phase: YES		Bi Layered: NO	Multi Layered: NO
CHEMICAL COMPOSITION				
Copper:		Nickel:		
Zinc:		Chromium-Hex:		
Phenolics:		Total Halogen:		
Volatile Organics:		Pesticide/PCBs:		
Other:				
SHIPPING INFORMATION				
DOT Hazardous Material? YES				
Proper Shipping Name: HAZARDOUS WASTE SOLID, N.O.S				
Hazard Class: 9	U.N. or N.A. Number: UN 3077		Emergency Response Guide Page: 171	
Additional Description: (LEAD, 2,4-DINITROTOLUENE)				
Package Group: III				
Method of Shipment: DRUM				

FIGURE IV C-2
Waste Profile Sheet for OB Treatment Residue at ANAD

Profile Sheet

Waste Profile Number : 0030058 Ref: 46268 NSN: 535000

CERCLA Reportable Quantity (RQ):				DEMIL Code: A
DOT Publication 5800.4 Page:		Edition Year:		
Special Handling Information: USE PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT				
DEFAULT CONTRACTS AND CLINS				
Contract Number	CLINs			
SP440000D0015	940400			
DEFAULT HANDLING COSTS				
Handling Cost Codes	Description			
EPA CODES				
EPA Codes	Description		Range	Unit
D008	Lead			
D030	2,4-Dinitrotoluene			
STATE WASTE CODES				
Codes	Description			Restricted
MATERIAL COMPOSITION				
Constituent	**Component**		**Concentration**	**Range**
121142	2,4-Dinitrotoluene		<0.01 MG/L	.000001
	ASH/SAND/DIRT		99–100%	99.9808572
7440473	CHROMIUM		<0.50 MG/L	.00005
	DI-N-BUTYLPHTHALATE		162.0 MG/KG	.0162
7439921	LEAD		25–100 MG/L	.00254
7440439	CADMIUM		<0.10 MG/L	.00001
86748	9H-CARBAZOLE		1.37 MG/KG	.000137
67641	Acetone		0.196 MG/KG	.000196
71432	BENZENE		0.0496 MG/KG	.00000496
75150	CARBON DISULFIDE		0.0159	.00000159
91203	NAPHTHALENE		0.0184 MG/KG	.00000184
108883	Toluene		.0041 MG/KG	.00000041
Total				100%
BIENNIAL INFORMATION				
Origin Code: 1	System type Code:		Source Code: A74	Form Code: B304
Point of Measurement: 1				
Is this waste mixed with nuclear source, special nuclear, or by-product material?				
AUTHORIZED WASTE COLLECTION SITES				
Collection Site		Description		
ADAS662.01		OB/OD BURN PANS ASH/SAND		

FIGURE IV C-2 (CONTINUED)
Waste Profile Sheet for OB Treatment Residue at ANAD

Profile Sheet

Waste Profile Number: 0030058 Ref: 46268 NSN: 535000

GENERATOR CERTIFICATION				
Sample Collect Date: 06-MAY-2003 Collector: JOHN P Basis for Information: CHEMICAL ANALYSIS				
I, _____, hereby certify that all information submitted in this and all				
attached documents is, to the best of my knowledge, an accurate representation of the waste turned in to the				
DRMO. All known or suspected hazards have been disclosed.				
Generator's Representative:			Date:	
Revision Date: 21-OCT-2004				

FIGURE IV C-2 (CONTINUED)
Waste Profile Sheet for OB Treatment Residue at ANAD

IV C-2b(3) OD Treatment Residues

Metal fragments are the only treatment residue potentially generated from OD. Housekeeping procedures associated with metal fragments are identified in Section IV D-3d and IV F-6. If metal fragments are observed or suspected to contain unreacted energetics, these are retreated in accordance with the procedures outlined in Section IV D-3f(11).

IV C-2c Test Methods

Methods Used to Test the Parameters
ADEM Admin. Code R.335-14-5-.02(4)(b)2

The methods used to test the parameters for the WMM treated and treatment residues are described below.

IV C-2c(1) WMM Treated

ANAD uses process knowledge to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes by OB and OD. All WMM are profiled by process knowledge and checked against MACS prior to treatment. Reactive hazardous wastes are not tested prior to treatment. Section IVC-1 describes the waste qualification and acceptance process, including sources of process knowledge used to characterize the physical and chemical properties of the wastes.

IV C-2c(2) Treatment Residues

Table IV C-11 lists the test methods for OB treatment residues.

Metal fragments may also be generated from OD operations. Metal fragments are visually inspected to verify that the reactivity has been successfully treated. Metal fragments are not tested.

TABLE IV C-11
Rationales and Test Methods for Parameters Analyzed
OB Treatment Residues

Parameters[a]	CAS Numbers	Rationale	Test Method[b]
Barium	7440-39-3	Solid waste containing leachable metals	Toxicity Characteristic Leaching Procedure (TCLP); SW-846
Cadmium	7440-43-9	Solid waste containing leachable metals	TCLP; SW-846
Chromium	7440-47-3	Solid waste containing leachable metals	TCLP; SW-846
Lead	7439-92-1	Solid waste containing leachable metals	TCLP; SW-846
Selenium	7782-49-2	Solid waste containing leachable metals	TCLP; SW-846

[a]Parameters analyzed only if present in the wastes treated.
[b]SW-846 Test Method or most recent version will be used.

IV C-2d Sampling Methods

Methods Used to Obtain Representative Samples of the Waste Being Analyzed ADEM Admin. Codes R.335-14-5-.02(4)(b)3 and R.335-14-2-Appendix I

The methods used to obtain a representative sample of the WMM treated and treatment residues are described below.

IV C-2d(1) WMM Treated

Section IV C-1 describes the method used by ANAD to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes by OB and OD.

IV C-2d(2) OB Treatment Residues

The methods and equipment used for sampling containerized residual materials vary with the form and consistency of the waste. The following American Society of Testing and Materials (ASTM) D 2234-76, Standard Practice for Collection of a Gross Sample of Coal and EPA SW-846 test methods are used for sampling treatment residues from the burn pans.

Fly Ash-Like Material – ASTM D 2234-76, Standard Practice for Collection of a Gross Sample of Coal—This method is used for sampling drums containing burn pan treatment residue.

Containerized Liquid Wastes – "COLIWASA" described in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods"—This method is used for sampling drums containing containerized precipitation collected from burn pans.

IV C-2d(3) OD Treatment Residues

Metal fragment is the only treatment residue potentially generated from OD. M etal fragments are inspected to verify that the reactivity has been successfully treated. Metal fragments are not tested.

IV C-2e Frequency of Analyses

Frequency of Revisions or Repetition of Analysis ADEM Admin. Code R.335-14-5-.02(4)(b)4

The frequency of revising or repeating analysis for the WMM treated and treatment residues is described below.

IV C-2e(1) WMM Treated

Section IV C-1 describes the method used by ANAD to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes by OB and OD.

IV C-2e(2) OB Treatment Residues

Treatment residues resulting from OB of a particular waste type is tested the first time that it is generated and a Waste Profile for the waste stream is generated.

IV C-2e(3) OD Treatment Residues

Metal fragments are the only potential treatment residue generated from OD. Metal fragments collected and removed from the OD unit are inspected to verify that the reactivity has been successfully treated. Metal fragments are not tested.

IV C-2f Additional Requirements for Waste Generated Offsite

Facilities Managing Wastes Generated Offsite
ADEM Admin. Code R.335-14-5-.02(4)(c)

The vast majority of wastes treated by OB and OD are generated on the Depot itself. ANAD may, however, accept waste from offsite DoD facilities. Only conventional WMM that are permitted for treatment at ANAD are accepted. WMM shipments to ANAD are coordinated well in advance with ANMC Transportation Officer. WMM shipments to ANAD are characterized by the generating unit and are accompanied by an EPA shipping manifest or appropriate DoD shipping controls as defined by the Military Munitions Rule. Ammunition handlers from the generating activity provide all necessary information, including National Stock Number (NSN) and DoD Identification Code. No unknown wastes or unidentified wastes are accepted.

WMM shipments arrive at ANAD in proper DoD shipping containers with appropriate markings and labeling. In addition, ANMC personnel are specifically trained to recognize munitions items based on their appearance (shape, size, color, configuration, etc.). WMM shipments are directed to one of three conventional munitions storage igloos for temporary storage prior to treatment or may be taken directly to the OB or OD unit as described in Section IV B-1j(2). ANMC surveillance personnel inspect each WMM shipment as it arrives onsite.

IV C-2g Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

Additional Waste Analysis for Demonstrating Compliance With Requirement of Ignitable, Reactive, or Incompatible Waste Management (Safe Handling) Methods
ADEM Admin. Codes R.335-14-5-.02(4)(b)6 and R.355-14-8-.02(5)(b)g

All WMM treated at the ANAD OB and OD units are reactive (D003), as defined by ADEM AAC 335-14-2-.03(4) and include small arms ammunition (hazard class 1.4). Some of the wastes may be ignitable (D001) as well. These characteristics are the primary RCRA characteristics of concern. Therefore, the waste characterization procedures were developed considering the reactivity, ignitability, and potential incompatibilities of munitions/explosives. There are no additional waste characterization requirements to be addressed.

IV C-2h Additional Waste Analysis for Land Disposal Restrictions
ADEM Admin. Code R.335-14-9-.01(7)

ANAD treats reactive hazardous wastes onsite to deactivate the reactivity characteristic. OB treatment residuals are managed in offsite facilities. The WAP (Section IVC-2) is designed to provide all information required to comply with the land disposal requirements in the event that tests of the OB treatment residues show the residues possess the RCRA toxicity characteristic.

Treatment residue from the OB unit is analyzed to determine whether it is a hazardous waste due to exceeding a toxicity characteristic constituent limit. These analyses are also used to determine whether federal LDR treatment standards are met. An extract of the treatment residue is analyzed by TCLP to determine whether the treatment standard for

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toxicity characteristic metals and toxicity characteristic organic waste are exceeded. Additional analyses of the residues for reactivity are not required because all reactive material is destroyed in treatment.

If the treatment residue does not meet the LDR treatment standards for toxicity characteristic metals or organics, with each shipment of waste, ANAD will notify, in writing, the facility receiving the waste of the appropriate treatment standards. Such information includes:

- EPA Hazardous Waste Number
- Corresponding treatment standard
- Manifest number associated with the shipment of waste

If the treatment residue meets LDR treatment standards, this means that the waste no longer exhibits the characteristic of hazardous waste (reactivity or toxicity) and will be disposed of as nonhazardous waste. Required notifications and certifications will be submitted to ADEM. The notification will include the following information:

- Description of the waste as initially generated, including applicable EPA Hazardous Waste Number
- Treatment standards applicable to the waste at the initial point of generation

The certification will be signed by an authorized representative of ANAD and will state the following:

> *"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR 268, Subpart D, and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."*

IV C-3 Analysis of Outgoing Waste for Compliance with Land Disposal Restrictions
ADEM Admin. Code R. 335-14-8-.02(5)(b)2

IV C-3a Introduction

Generators of wastes prohibited from land disposal under Alabama Administrative Code (AAC) 335-14-9-.03 must determine whether the applicable treatment standards specified in AAC 335-14-9-.04 have been met for their wastes and treatment residues prior to ultimate land disposal. The generator may make the determination by analytical testing or by using knowledge of the waste. This section describes procedures to comply with the land disposal restrictions (LDR) and promulgated treatment standards.

IV C-3a(1) Treatment Residues Generated

Treatment residue from OB/OD is limited to waste ash generated from OB and metal fragments generated from OD.

IV C-3a(2) California-List Wastes

In order to comply with LDR, total metals and organics will be evaluated where applicable.

IV C-3a(3) Waste Characteristics: First-Third Wastes With Treatment Standards

In order to comply with LDR, total metals and organics will be evaluated where applicable.

IV C-3a(4) Waste Characteristics: Second-Third Wastes With Treatment Standards

In order to comply with LDR, total metals and organics will be evaluated where applicable.

IV C-3a(5) Waste Characteristics: Third-Third Wastes With Treatment Standards

In order to comply with LDR, total metals and organics will be evaluated where applicable.

IIV C-3b Notification and Certification Requirements

IV C-3b(1) Retention of Generator Notices And Certifications

Notification and certification records will be retained in accordance with AAC 335-14-9-.01(7) and as detailed in Section II C-3b(1).

IV C-3b(2) Notification and Certification for Wastes to Be Further Managed

Notification and certification records will be maintained in accordance with AAC 335-14-9-.01(7) and as detailed in Section II C-3b(2).

IVC-3b(3) Additional Notification and Certification Requirements for Disposal Facilities

Notification and certification records will be retained in accordance with AAC 335-14-9-.01(7) and as detailed in Section II C-3b(3).

IV C-3b(4) Notification And Certification Requirements Pertaining to Landfill and Surface Impoundment Disposal Restrictions

Not applicable.

IV C-3c Additional Requirements Pertaining to Storage of Restricted Waste

Restricted wastes will not be placed in a land disposal unit without further treatment, unless the LDR requirements for these waste streams are met.

IV C-3c(1) Restricted Waste Stored In Containers

ANAD does not store restricted waste except to accumulate quantities to facilitate proper treatment or disposal.

IV C-3c(2) Restricted Waste Stored In Tanks

Not applicable.

IV C-3c(3) Storage of Liquid PCB Wastes

Not applicable.

IV C-3d Additional Requirements for Treatment Facilities

Typical wastes to be treated at the OB/OD units are summarized in Table IV C-1 and 2. The treatment standards applicable to these wastes are listed in AAC 335-14-9-.04.

IV C-3d(1) Additional Notification and Certification Requirements for Treatment Facilities

The facility will comply with the provisions of AAC 335-14-9-.01(7).

IV C-3d(2) Wastes with Treatment Standards Expressed as Concentrations in the Waste

The applicable LDRs are expressed as concentrations in AAC 225-14-9-.04. The methods for analyzing the residues from treatment of these wastes for the purposes of characterization and disposal are presented in Table IV C-10.

IV C-3d(3) Wastes with Treatment Standards Expressed as Concentrations in the Waste Extract

Because of the solid matrix of the waste residues generated by the OB/OD processes, these are the standards applicable to the treatment residues generated. Analytical methods used to characterize the treatment residue are presented in Table IV C-10. Information on the treatment method can be found in section IV D-1a.

IV C-3d(4) California-List Wastes Not Subject to Treatment Standards

Not applicable.

IV C-3e Additional Requirements for Land Disposal Facilities

Not applicable.

IV C-3f Exemptions from and Extensions to the Land Disposal Restrictions

Not applicable.

IV C-3g Requirements for Land Disposal Facilities with an Approved Exemption or Extension

Not applicable.

IV C-4 Waste Transportation and Offsite Treatment, Storage, and Disposal

All waste disposed off-site will be transported offsite to an appropriate Treatment, Storage, and Disposal facility. Information concerning transportation procedures for hazardous waste can be found in Section II B-5.

IV D Process Information ADEM Admin. Codes R.335-14-5-.24(1) and R.335-14-8.02(14)

ANAD treats hazardous waste military munitions (WMM) containing energetics by open burn (OB) and open detonation (OD). This section describes the OB and OD treatment processes. Each process is described separately. However, in cases where requirements are common to each treatment type, they are discussed together. Waste characterization information is found in Section IV C, along with information on waste generation activities. No wastes are stored at the OB and OD units. The maximum quantity of waste that may be present is the quantity that can be treated onsite during the operating day.

IV D-1 Open Burning in Containment Devices ADEM Admin. Codes R.335-14-8-.02(14) and R.335-14-8-.03(3)

ANAD conducts OB of WMM in burn pans, which serve as containment devices. As discussed below, these burn pans are elevated above the soil on two steel I-beams. This section describes processes employed by ANAD for OB in containment devices.

IV D-1a Appropriateness of Treatment Methods

ANAD hosts the Anniston Munitions Center (ANMC), a component of the Joint Munitions Command (JMC). JMC is responsible for the production, storage, issue, and demilitarization of conventional ammunition for all U.S. military services. JMC headquarters is located at Rock Island, Illinois, and the command operates a nationwide network of ammunition plants and maintains a global presence wherever U.S. combat units are stationed. ANAD operates as a Tier I installation for missiles and Tier II installation for other conventional munitions. Tier I facilities store ammunition for training and the first 30 days of War Reserve ammunition, while Tier II facilities store War Reserve ammunition to be used after the first 30 days. JMC is additionally the field operating agency for the DoD Single Manager for Conventional Ammunition (SMCA). The SMCA is responsible for managing DoD's demilitarization stockpile (the nation's stockpile of excess and unusable munitions). This is accomplished through munitions sales to foreign services, inter-service munitions transfers, resource, recovery and recycling (R3) of unusable munitions where possible, and disposal of unusable munitions where necessary. The OB and OD units at ANAD are used to support the JMC's demilitarization mission by providing necessary disposal capability.

The capability to treat WMM items by OB and OD is critical for Anniston Munitions Center (ANMC) to fulfill its demilitarization mission. Without OB and OD treatment capacity, WMM would accumulate. This would result in significant personnel safety hazards and environmental hazards due to potential fires and explosions. In the absence of OB and OD treatment capacity for WMM, ANMC would be unable to fulfill its mission.

The particular treatment method (OB and OD) for a particular waste item is based on its potential to detonate. The potential to detonate is based on the types of energetics present and the physical characteristics of the WMM. The physical form and energetic content of

each WMM item is evaluated to determine whether the item has the potential to detonate. Any WMM item that has the potential to detonate is treated by OD. Propellants are characterized by the ability to be made to burn at reproducible, controllable, and predetermined rates. When confined to the breech and barrel of a gun, the evolved gases produce high pressures, which provide the propulsion for the projectile. Under certain conditions, however, propellants can be made to detonate, and, conversely, explosives that characteristically detonate may simply burn if the proper conditions of confinement, dimensions, degree of consolidation, and other factors are chosen. For example, explosives will burn if not confined (in a bulk form) and the depth of the explosives is less than 3 or 4 inches (depending on the explosive). The physical form and energetic content of each waste item is evaluated to determine whether the item has the potential to detonate. Another factor considered is the DoD hazard class (1.1, 1.2, 1.3, etc.).

A risk assessment has been conducted to assess the potential effects on human and ecological receptors through direct and indirect pathways to OB and OD emissions (CH2M HILL, 2007). The risk assessment contains the air quality assessment. Results of the air quality assessment were used to conduct a human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA). The risk assessment also describes the potential pathways of exposure and potential exposure magnitude, including the results of the HHRA and SLERA. Both risk assessments were conducted in accordance with EPA guidance for conducting risk assessments at combustion facilities and are included in Attachment 1 to Section IV. Specifically, the HHRA and SLERA were completed in accordance with the following guidance documents:

- HHRA Protocol for Hazardous Waste Combustion Facilities (EPA, 2005b)
- EPA Guidelines for Ecological Risk Assessments (ERA), 1998
- EPA Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, 1997

EPA Region IV Ecological Risk Assessment Bulletins – Supplement to Risk Assessment Guidance for Superfund (RAGS), 2001.The results of the risk assessments show that OB in pans at ANAD is conducted in a manner that is protective of public health and environmental receptors.

Implementation of groundwater, surface water, and soil monitoring plans during the operational life of the OB unit, as a permitted facility, will ensure that OB is protective of environmental media.

Section IV E describes the groundwater monitoring plan for the OB unit. The groundwater monitoring plan describes the baseline monitoring program, which is designed to determine whether or not the operation of the OB unit has resulted in statistically significant increases in concentrations of hazardous constituents in groundwater above preliminary screening values (PSVs) and/or background concentrations. If the results of detection monitoring suggest that groundwater contamination has occurred, ANAD will institute an assessment monitoring program to determine the nature, extent, and rate of the groundwater contamination. The assessment monitoring program will continue as required by ADEM in the facility operating permit or corrective action program until the OB and OD unit (the unit

at which contamination is present) undergoes final closure. If no contamination has occurred, ANAD will continue detection monitoring. An assessment monitoring program will be implemented if a comparison of PSVs and background to detection monitoring results shows a statistically significant increase for any indicator parameters in downgradient wells.

OB operations are conducted in a manner that is safe for the waste handler. OB operations are conducted in accordance with operating procedures defined by and approved by the Department of the Army (DA). Procedures to prevent hazards during OB operations have been developed and are included in Section IV F. An OB and OD Unit Contingency Plan has been developed (see Attachment 4 of the Integrated Contingency Plan[1]) that describes procedures for dealing with emergencies resulting from OB operations. All workers responsible for conducting OB operations are trained to conduct their job function (see Section IV H).

IV D-1b Containment Device Description

IV D-1b(1) Physical Characteristics, Construction Materials, and Dimensions

OB is conducted in 1 of 10 burn pans (see Figure IV.B-4) located within the bounds of the OB unit. The OB unit consists of approximately 17 acres. Building 727, Pit Office is the closest building to the OB unit that serves as an administration and break area for Anniston Munitions Center (ANMC) personnel, storage for safety equipment and emergency response materials, telephone access, showers, water, etc., adjacent to the OB and OD units.

Figure IV B-3 shows the layout of the OB unit and the arrangement of the burn pans. Additional photographs of the OB unit are presented in Section IV B. All 10 burn pans are constructed of the same material. Each burn pan is self-contained with a lid to keep rain out of the pan.

As-built drawings of the burn pans are presented in Section IV B. These drawings contain information on the materials of construction and dimensions of the pans and lids. Each pan and lid was constructed to the same specification. Burn pans are constructed of 3/8-inch steel and measure 16 feet 2 inches long by 4 feet 1 inch wide and 1 foot 1 inch high. Pans are covered with steel lids. Sand is used to line the interior of the burn pans.

IV D-1c Leak Detection Provisions

The placement of the burn pans on top of steel I-beams that rest on the soil surface allows for visual inspections to determine whether the burn pans have maintained their integrity. Prior to placement of WMM into a burn pan, the sides and bottom of the burn pan are visually inspected to ascertain that the pan has maintained its integrity. If the pan has not retained its integrity, it is taken out of service and not used until it has been repaired or replaced. After each burn, the area surrounding the pans is inspected for the presence of ejected treatment residue. If any ejected treatment residue is found, it is swept up and placed in residual drums for disposal. Section IV F contains the inspection schedule, which includes inspections for spills and for the integrity of the pans.

[1] The Integrated Contingency Plan (ICP) is incorporated by reference into the Part B permit modification application and as a result, ICP updates will require a minor modification to the RCRA permit.

IV D-1d Precipitation Cover

Section IV D-1b(1) includes a discussion of the lids that are placed over the burn pans to prevent accumulation of precipitation in the burn pans. The lid is placed over the burn pans after each OB event as soon as the burn pan has cooled sufficiently to safely approach and to prevent heat damage to the lid. Burn pans lid segments overlap to prevent precipitation infiltration. The lid is kept on the burn pans during non-operational periods. The lids are only removed as necessary to remove treatment residues, conduct visual inspections of the pan integrity, or add wastes and conduct treatments. Typically, it takes 1 hour for the pans to cool sufficiently to place the lids.

IV D-1e Control of Treatment Residues

Treatment residues resulting from OB in the burn pans are controlled through several measures. Prior to placement of WMM into the burn pans, visual inspections are conducted to verify that the burn pans have maintained their integrity (e.g., no cracks or gaps that could result in the release of wastes or treatment residues). After each treatment, the treatment residues are visually evaluated to verify that no reactive material remains and then they are removed from the burn pans prior to initiation of the next burn. The collected residues are analyzed in accordance with the Waste Analysis Plan (WAP) (see Section IV C-2). During non-operational periods, lids are placed on the pans. These lids are periodically inspected as described in Section IV F-2.

IV D-1f Methods to Control Deterioration of Fabricated Devices

Deterioration of the burn pans and lids is controlled through several measures. Lids are used to prevent accumulation of precipitation in the burn pans. The lids, which are constructed of steel, are not placed on the burn pans until the pans have cooled sufficiently so that residual heat remaining in the pans does not result in deterioration of the lids. The burn pans are elevated above the soil surface to allow for visual inspection under the pan.

IV D-1g Handling of Accumulated Precipitation

OB pans remain closed at all times when not in use. Burn pan lids effectively mitigate precipitation from entering the pans. OB is not authorized during a precipitation event or when there is a forecast of high probability (50 percent or more during the schedule time of operation). Burn pan lids are replaced as soon as possible after the conduct of the burn as determined by the Supervisor.

The possibility of precipitation accumulation is limited to the brief period following a burn and before lid replacement. In such an event, the moist treatment residue is removed from the pan or in the rare event that liquid is present, that liquid is allowed to evaporate prior to removing the treatment residue. The burn pans are inspected regularly to ensure their integrity and the small amounts of liquid precipitation do not leak. Burn pans are fitted with a drainage device in the event that accumulated precipitation would need to be drained from the pans. This has never occurred during the life of the unit.

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IV D-1h Controls to Prevent Wind Dispersal of Treatment Residues

Wind dispersal of treatment residue is prevented through several measures. During high-wind conditions (greater than 20 miles/hour), OB does not take place. Treatment residue are removed after each burn and placed into covered DOT-approved containers. During non-operational periods, including periods when treatment residue is present, lids are placed on the burn pans.

IV D-1i Inspection, Monitoring, and Maintenance Plan

The inspection schedule, including conditions being inspected, is included in Section IV F-2 Monitoring of groundwater, surface water, and soil is discussed in Section IV D-7 and IV D-8. Maintenance of OB pans is conducted whenever inspections show the need for maintenance. Any pans or lids that require repairs are removed from service until repaired.

IV D-1j Treatment Residue Management

OB of WMM in burn pans results in the generation of treatment residue. The burn pans at ANAD are lined with sand as required by Department of the Army Pamphlet 385-64, Ammunition and Explosives Safety Standards, Paragraph 17-5. The sand dissipates the heat of the burn to mitigate warping of the pans. Waste munitions (i.e., propellant) are placed over the sand and ignited. This is the treatment process. The pan lids remain in place at all times when the pans are not in use. The lid segments are removed from the pans and the burn completed. After all flames are out, a cool down period of approximately 1 hour is required before treatment residue can be removed. The pan lids are replaced as soon as possible after the burn as determined by the Supervisor to mitigate the potential for precipitation entering the pan.

After each burn, treatment residue (shrapnel and a small layer of sand) is removed from burn pans with non-spark shovels and placed into DOT-approved containers with lids and closure rings. This is performed following the cool down period after the treatment residue is cool to the touch (as judged by the operator), and visual inspections show that all the reactive material has been treated.

During the burn, some treatment residue may be ejected just outside of the pan. When the cool down period has past, the operators inspect the pans and vicinity. Any treatment residue ejected from the pans is swept up and placed into the collection container along with the treatment residue removed from the pan.

Additional sand may be added as part of routine maintenance when too much is removed along with the treatment residue. When the layer of sand becomes visibly contaminated as judged by the Supervisor, the sand is completely removed from the pan and replaced. *(Note: the sand replacement schedule is dependent on usage and during infrequent use of the OB, due to increased recycling of propellant, it may take several years to reach the point of sand replacement.)*

All treatment residue is placed into DOT-approved containers with lids and closure rings. Treatment residue from different pans may be combined if the waste treated is the same. If different wastes have been treated, then they are not commingled. The drums are labeled with hazardous waste labels that are pre-printed with the appropriate RCRA code. If the waste stream changes, then a Hold for Test Label will be placed on the drum.

OB residue may be temporarily accumulated within the OB unit. Collected treatment residue is then removed from the units and transported to the ANAD permitted storage areas (Buildings 466, 512, and 527). Samples are collected as described in the WAP (see Section IV C-2). The waste containers are then managed based on the results of the analysis.

IV D-1k Standard Operating Procedures

IV D-1k(1)General Safety Requirements

The following are the general procedures for OB and OD operations conducted at ANAD.

All operations are conducted under the direct supervision of an experienced and trained site supervisor. The lead operator is charged with the custody of ignition devices. Prior to the actual OB or OD, all personnel, including the lead operator, evacuate to a safe distance or protective structure affording adequate protection but allowing monitoring of the OB or OD operation until it is completed. Operators do not directly observe the OD treatment. TV cameras are used to observe the OD treatments. The site supervisor reports injuries and accidents to the Safety Office and, in the event of fire or explosion, activates the necessary fire extinguishing equipment and alarms.

Personnel employed in the OB and OD treatment area are properly and thoroughly trained. Section II H describes the training program. The training program includes training in procedures for OB and OD. Personal protective equipment (PPE) is worn, including, but not limited to, steel-toed shoes, leather or leather-palmed gloves when handling wooden boxes or in the vicinity of steel banding operations, and face shields and safety glasses when in the proximity of steel banding operations. The number of personnel is kept to a minimum, but no less than two at any given time.

Proper lifting, carrying, and safe hand-tool and sharp-tool handling techniques are implemented. All personnel use proper material-handling procedures. This includes, but is not limited to, proper handling of blasting caps and electronically initiated igniter or squibs.

Operators of any materials handling equipment (MHE) or vehicles have a valid operator's permit and commercial driver's license (for truck drivers only). Vehicles display appropriate fire and chemical hazard symbols describing their cargo. At no time is the load rating of any MHE or lifting device exceeded.

All explosives or ammunitions to be treated are handled carefully and not subjected to any shocks or roughness. Prior to, during, and after treatment, entry to the OB and OD units is restricted until the area is declared safe. OB and OD operations are suspended in the event of a thunderstorm or electrical storm. Operations are not initiated if there is a forecasted probability greater than 50 percent of precipitation, thunderstorms, or lighting storms. All treatment events are recorded in a demolition logbook.

OB of items containing colored smokes, white phosphorous, red phosphorous, or hexachloroethane is permitted only if the item has been expended based on ANAD policy.

The area surrounding the burn pans is inspected and cleaned up if necessary. The burn pans are covered when not in use. Treatment residue waste is placed in DOT-approved containers and properly marked with hazardous waste labels. Each label is filled out completely. Containers are moved to storage as per Section IV C-3.

The OB unit is kept clean of dry grass, leaves, or anything that might pose a fire hazard. The grounds are kept free of large stone or deep cracks where explosives ejected during treatment could lodge.

Any unusual conditions are reported immediately to the site supervisor or designated representative.

IV D-1k(2) Environmental Requirements

The listed meteorological restrictions are applicable to both OB and OD treatment operations:

- Less than a 50 percent chance of precipitation (thunderstorms or electrical storms)
- Average wind speed between 3 and 20 miles/hour
- Cloud cover less than 80 percent and ceilings greater than 2,000 feet
- Operations limited to between 0800 and 1600 Monday through Saturday
- Wind direction will not carry emissions over any publicly accessible area within 1 mile (i.e., west of the installation boundary)

Meteorological conditions are verified by ANMC and documented on a Weather Data Statistics Log maintained at the Pit Office. Specific weather data are obtained by ANMC using on-line information provided by the National Oceanic and Atmospheric Administration (NOAA) in accordance with ANMC SOPs.

In the event of a spill, the procedures contained in the Contingency Plan are implemented.

IV D-1k(3) Transportation of Material for Treatment

The following requirements for transportation of WMM are applicable to both OB and OD treatment operations.

Loading of material on a vehicle for the purpose of transporting to the OB and OD units is performed outside and away from magazine doors. Vehicle engines are not running and the parking brake is applied. All explosives and munitions are containerized and braced before transporting. When transporting by truck, a predetermined route is selected to avoid traffic congestion. Vehicles transporting material are inspected monthly and contain a non-sparking bed and fire extinguishers.

WMM is transported by the most direct route from the storage igloo to the OB and/or OD units. WMM may be temporarily held in MilVans located just southwest of the Pit Office and northeast of the OB area while the OD unit is being prepared or if a weather delay is indicated. The WMM shipment is accompanied by a DA Form 4508 (Figure IV B-11). WMM are transported by way of either Elwood Road or Lance Road to the OB and/or OD units and off-loaded from the trailer and moved to the WMM storage igloo or to the treatment unit by forklift.

WMM received from offsite are transported via enclosed tractor-trailer by the most direct route from Gate A-1 to one of three designated conventional WMM storage igloos (I-103, F-704A, or F-405) or may be transported directly to the OB and/or OD units by way of the Former Lance Fueling Area.

IV D-1k(4) Unloading/Unpacking of Material

Unloading of material from vehicles is conducted with the engine turned off, wheels chocked, and the parking brake applied. When unloaded, WMM and demolition materials are separated by at least 10 feet.

IV D-1k(5) Explosive Limits for Treatment by Open Burning

The OB unit has a restriction of 2,000 lb net explosive weight (NEW) per pan and 20,000 lb NEW per day. The OD unit has a restriction of 15 lb NEW above ground and 1,000 lb NEW belowground.

IV D-1k(6) Preparation of Ignition Charges/Firing System

The method for initiating OB is the non-electric firing system. This system consists of:

- Fuse igniters are connected to safety fuses (must be of sufficient length to allow personnel time to reach a designated safety area, generally at least 8 feet in length.
- The safety fuse is never less than 3 feet in length with a minimum burn time of 30 to 45 seconds per foot [sec/ft]).Time fuse ends are split and inserted into small bags of smokeless powder (approximately 1 oz.) when available or any small grain propellant.
- The length of time the fuse is set to allow the operator sufficient time to retreat to bunker.

IV D-1k(7) Safety Checks at Treatment Site

After a reasonable amount of time after a treatment event, a visual and manual inspection of the treatment area is conducted. If any unreacted WMM is found, it is collected for retreatment during the next treatment event.

IV D-2 Open Burning on the Ground Surface Where Unit Incorporates the Soil as Part of the Unit ADEM Admin. Codes R.335-14-8-.02(14) and R.335-14-8-.03(3)

ANAD does not conduct routine OB treatment directly on the ground surface. OB on the ground occurs only under the purview of an approved Emergency Permit issued by ADEM. ADEM defines the conditions under which such an event may occur in the Emergency Permit; therefore, this section is not applicable.

IV D-3 Open Detonation ADEM Admin. Codes R.335-14-8-.02(14) and R.335-14-8-.03(3)

IV D-3a Appropriateness of Treatment Methods

Section IV D-1a includes discussion of ANAD's need for OB and OD capabilities for WMM and the factors determining whether OB and OD is the appropriate treatment method.

See Section IV D-1a for a description of the appropriateness of the treatment methods.

IV D-3b Description of OD Unit

OD is conducted in up to 10 (but generally 4 to 6) pits. These pits are individually dug to a depth of 1 to 14 feet whenever OD operations are conducted. Figures IV B-5 and IV B-6 are

photographs of the OD unit. The maximum quantity of materials that may be detonated in each pit is 15 lb NEW above ground and 1,000 lb NEW below ground, including the demolition material. Additional photographs of the OD unit are presented in Section IV B-1j(2).

IV D-3c Inspection, Monitoring, and Maintenance Plan

The inspection items, conditions to be evaluated, and schedule are included in Section IV F-2 and IV F-6. Monitoring of groundwater, and surface water and soil is discussed in Sections IV D-7 and IV D-8.

IV D-3d Residue Management

Metal fragment is the only treatment residue potentially generated from OD.Metal fragments are visually inspected for evidence that the energetic component of the item has been successfully treated. After inspection, the metal fragments are certified as "free of explosive hazard", managed as described in Section IV C-1b, and either sold as scrap metal through the servicing Defense Reutilization and Marketing Office (DRMO) or to a suitable scrap vendor.

IV D-3e Run-on and Run-off Management

OD is not carried out during precipitation events or if the probability of precipitation is greater than 50 percent. OD takes place in pits. The pits are only dug on the day on which the OD will take place. They are filled in after OD if no additional treatment events are scheduled. After each OD event, the pits are filled in with dirt. Interceptor ditches bound the OD unit. These ditches direct surface water run-on and run-off away from the detonation area.

An earthen sediment retention basin is located within the OD unit to control sediment within the bounds of the permitted unit. Because of the nature of the OD operation, soil stabilization is not an effective measure to control soil erosion. Soil particles become air-borne at detonation and coat groundcover, stressing and preventing the growth of vegetation. The OD operation is also performed at the low point of a bowl shaped area with high slopes surrounding and sloping into the operable area of the unit. The earthen sediment basin is designed to contain and control sediment at the site from these slopes which are susceptible to erosion due to the site's fine soil types. During high intensity rainfall events, soils may erode down slopes where they are captured in the sediment basin and will be retained for reuse within the permitted unit. The sediment basin is located on the northwestern end of the permitted unit, which is the less elevated portion of the unit. The sediment basin location is shown on Figure IV D-6.

The earthen basin has an approximate area of 32,500 square feet with approximately 9,100 of those square feet containing rip-rap material at the water inlet to slow water velocity as stormwater enters the basin. The basin's primary spillway is designed for a 10 year, 24 hour rainfall event and contains appropriate piping to release water at a controlled rate back into the intermittent stream. The basin's emergency spillway is designed for a 25 year, 24 hour rainfall event. Design schematics are shown on Figures IV D-7 and IV D-8.

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The sediment basin will be cleared of sediment build up on a yearly basis or as needed when indicated through diminished performance. Metal fragments will be separated from the sediment and the soils will remain within the permitted OD unit to be reused as fill or as cover for future detonations/operations. If at any time sediment is to be disposed of, sediment will be sampled for proper waste characterization. Metal fragments recovered from the basin area will be managed along with those recovered during routine inspection of the OD unit.

IV D-3f Standard Operating Procedures

IV D-3f(1) General Safety Requirements

General safety requirements are included in Section IV D-1k(1). The following are the additional general procedures for OD operations conducted at ANAD.

Operations are conducted under the direct supervision of an experienced and trained site supervisor or his designee. Operating personnel, including the site supervisor, receive the same training (see Section IV H). The site supervisor is charged with the custody of ignition devices.

Items containing PCP, beryllium, colored smokes, white phosphorous, red phosphorous, or hexachloroethane are prohibited from treatment except under emergency conditions. If an inspection by ammunition surveillance personnel reveals that items are in an unsafe condition for further storage, they will initiate an emergency demilitarization request. The request is generated by the Surveillance office in the form of a letter attached to the work order. Copies of the letter are provided to DRK who retains a copy. In the event of such an emergency, ANAD can destroy items that are normally prohibited.

The OD unit and the surrounding area is inspected for the presence of unexploded ordnance (UXO) (i.e., whole munitions items ejected from the OD pit and not detonated and/or munitions fragments or remnants that still contain energetic material as a result of incomplete or low order detonation) by ANMC personnel in accordance with Section IV F-6. Any UXO remaining after a detonation event is assumed to be unstable and unsafe to move and the standard procedures identified in Section IV D-3f(11) are implemented.

The OD unit is kept clean of dry grass, leaves, or anything that might pose a fire hazard. The grounds are kept free of large stones or deep cracks where explosives ejected during treatment could lodge.

Any unusual conditions are reported immediately to the supervisor or designated personnel.

IV D-3f(2) Environmental Requirements

Environmental requirements are included in Section IV D-1k(2).

IV D-3f(3) Transportation of Material for Treatment

Transportation of material of treatment requirements are included in Section IV D-1k(3).

IV D-3f(4) Unloading/Unpacking of Material

Unloading/unpacking requirements are included in Section IV D-1k(4).

IV D-3f(5) Explosive Limits for Treatment by OD

The maximum quantity that may be treated in each of the OD pit is 15 lb NEW, including donor material, above ground and 1,000 lb NEW, including donor material, below ground.

IV D-3f(6) Preparation of OD Area

OD treatments take place in pits that are 1 to 14 feet in depth. The pits are dug before WMM is taken to the OD area for treatment. The pits are generally prepared immediately before treatment is scheduled. The site is used for surface detonations of up to 6.8 kg (15 lb) NEW of conventional WMM per shot at each of up to ten detonation stations (pits), as well as for buried detonation of up to 450 kg (1,000 lb) NEW of conventional WMM per shot at depths of up to 4.3 meters (14 feet). Generally ANAD accomplishes two OD shots per day; though, additional shots can be accommodated as long as there are no more than 16 individual detonations. . Each shot is comprised of an average of 4 to 6 pits; though, the site can accommodate 8 to 10. Typically, OD is accomplished below ground with only a small fraction of surface detonations.

IV D-3f(7) Preparation of High-Explosive Filled Materials

High explosive munitions contain an explosive-bursting charge, and high-explosive fragmentation and fire precautions must be taken. Munitions-specific procedures developed by ANAD in accordance with Army requirements are followed during detonation operations.

IV D-3f(8) Noise Consideration

The Army Environmental Noise Management Plan (ENMP) provides a method for evaluating the effect of noise and the hazards associated with certain operations that stem from activities at military installations. The purpose of the program is to identify land areas that are exposed to generally unacceptable noise levels. This information is then used to recommend uses for the land lying within these areas that are compatible with the needs of the civilian community and the Army. By determining the locations of noise zones and applying federal noise guidelines to these zones, present and future land uses can be evaluated as to acceptability for various types of activities. The largest noise producing activities at ANAD are OD activities and large caliber gun test firing (USACHPPM, 2003). Noise and ground vibration impacts from OB and OD unit operations are primarily associated with high-energy, low-impulsion sounds from detonations (e.g., OD operations). There are no noise issues associated with OB.

IV D-3f(9) Preparation of Ignition Charges, Firing System, and Detonation of Charge

The primary method for initiating OD is the non-electric firing system. This system consists of a fuse igniter, a length of time fuse, and non-electric blasting caps. This system is used for initiating OD if the electrical firing system is not available. The operator initiates the time fuse and retreats to the bunker. The fuse is set to allow the operator sufficient time to retreat to bunker.

IV D-3f(10)Safety Check of Surrounding Area after Detonation

Following a reasonable amount of time, typically 3 to 5 minutes after an OD treatment event, a visual and manual inspection of the treatment area is conducted by ANMC personnel. If any UXO is found in the pit or area surrounding the OD pits, the procedures identified in Section IV D-3f(11) are followed. The OD area is inspected and metal fragments

removed in accordance with the procedures described in Section IV F-6. Metal fragments removed from the OD unit are managed as described in Section IV D-3d.

IV D-3f(11) Procedures for UXO (Incomplete/Low Order Detonations)

A. Items will be examined as follows:

1. All personnel will wear the minimum of the following safety equipment to examine an above or below ground low order detonation: flak helmet, vest and groin protectors, with safety glasses/goggles.

2. Upon occurrence of a low order detonation, no personnel will proceed down range for 24 hours after all indications of burning material disappear from the view of the camera. Security will be notified of the possible hazard. No entry will be allowed for security personnel during the waiting period.

3. Demil certified supervisor and a designated employee will proceed to the detonation area to examine the cause of the low order. A stand-by employee will monitor the progress and be prepared to communicate to the required personnel if any problems are encountered by the entry team. **A patient transport vehicle (PTV) with driver will remain a minimum of 150 feet from detonation pit protected from low angle fragments.** The location of any rounds outside the pit will be marked and not moved unless determined safe, or are required to be moved to allow entry into the pit. Rounds will only be moved when determined safe to be moved by the demil certified supervisor. Any unfuzed donor material found will be collected and placed on a subsequent pit for detonation.

4. If required, the remaining earth cover will be removed to the extent possible utilizing hand shovels. Care will be exercised to prevent disturbing any rounds or remaining donor material. Note that if a shaped charge is to be used, the remaining earth cover may not have to be removed.

B. Appropriate charges as determined by the **supervisor** will be placed on top of the earth at the center of the stack of rounds. The center will be determined by landmarks, previous marking/flags of the demolition area, or visual observance after excavation. The shaped charge will be appropriately fuzed, and the demolition will proceed with **step D** below.

C. As an alternative to use of the shaped charge, the rounds will be reprimed as follows:

1. New detonating cord and initiating blocks of explosive will be used to detonate the old donor material, additional donor material may be utilized depending on the situation observed.

2. If the donor material has been partially or completely consumed, new donor material may be utilized to assure at least the original amount of donor material present.

3. Donor material will be distributed as closely as possible to the setup depicted on the approved layout drawing for the material being demiled. The pit may be recovered utilizing the bulldozer, only if all donor and demil material is accounted for. Shovel will be utilized if material cannot be accounted for.

D. Any fuzed material on the surface of the ground will be primed with appropriate donor material and det cord. Det cord will be tied into the main line to detonate all shots simultaneously.

E. All personnel will retire to the safe bunker, per local SOP. No other pits will be set up on the demilitarization ground until the low order pit is successfully detonated.

F. The charges or the reprimed pit will be detonated per local SOP, and the grounds will be examined after the prescribed wait, per local SOP.

IV D-4

Reserved.

IV D-5 Quantity and Physical and Chemical Characteristics of the Waste and Products of Combustion ADEM Admin. Codes R.335-14-5-.24(2)(a)1, R.335-14-5-.24(2)(b)1, and R.335-14-8-.02(14)

Information specified in this section is contained in other sections of the Part B Permit Application. References to the location of the required information are provided.

IV D-5a EPA Waste Code ADEM Admin. Code R.335-14-8-.02(14)(e)

Table IV C-6 lists the RCRA codes of the wastes managed at the ANAD OB and OD units.

IV D-5b Amount Burned at the Unit ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

Amount of waste treated in the OB and OD are described in Section IV C-1a and in Section IV D-3f(5).

IV D-5c Waste Composition Data ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

Section IV C-1a contains information on the composition of the wastes treated by OB and OD.

IV D-5d Solubility in Water ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

Attachment 1 contains the detailed health and ecological risk assessments. The guidance documents for risk assessments at hazardous waste combustion facilities (see IVD-1a) contain information on the solubility in water of constituents of potential concern (COPCs). Attachment 1 contains water solubility information for COPCs that are not listed in the guidance documents.

IV D-5e Mobility in Soil
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information on the mobility of COPCs in soils. Attachment 1 contains information on mobility in soils for COPCs that are not listed in the guidance documents.

IV D-5f Physical State and Molecular Properties
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information on the physical state and molecular properties of COPCs. Attachment 1 includes information on the physical state and molecular properties for COPCs that are not listed in the EPA guidance documents.

IV D-5g Mobility in Groundwater
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information on mobility in groundwater of COPCs. Attachment 1 includes information on mobility in groundwater for COPCs that are not listed in the guidance documents.

IV D-5h Sorption Properties of Waste Material Relative to Environmental Media
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information on the sorption properties of COPCs. Attachment 1 contains information on sorption properties for COPCs that are not listed in the EPA guidance documents.

IV D-5i Biodegradability, Bioconcentration, and Biotransformation Relative to Environmental Media
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information on biodegradability, bioconcentration, and biotransformation properties of COPCs relative to environmental media. Attachment 1 contains information on biodegradability, bioconcentration, and biotransformation properties of COPCs relative to environmental media for COPCs, which are not listed in the guidance documents.

IV D-5j Photodegradation Rates of Waste
ADEM Admin. Codes R.335-14-5-.24(2)(a)1 and R.335-14-8-.02(14)

The guidance documents for risk assessments at hazardous waste combustion facilities contain information relative to photo degradation rates of COPCs. Attachment 1 contains information relative to photo degradation rates for COPCs that are not listed in the EPA guidance documents.

IV D-6 Hydrogeological Characteristics of the Site ADEM Admin. Code R.335-14-8.02(5)

IV D-6a Depth to Water Beneath the Unit

As stated in Section IV E, the depth to water beneath the OB and OD units is approximately 1 ½ to 23 feet.

IV D-6b Estimate of Net Recharge Rate

The net recharge rate is calculated from the risk models used for Attachment 1 to evaluate the potential for migration of contaminants associated with OB and OD. The average annual surface runoff from pervious areas was estimated to be 50.8 cm/yr based upon Geraghty et al., *Water Atlas of the United States*, Port Washington, New York: Water Information Center, 1973. EPA's HHRAP states that "This reference provides maps with isolines of annual average surface water runoff, which is defined as all flow contributions to surface water bodies, including direct runoff, shallow interflow, and ground water recharge. Because these values are total contributions and not only surface runoff, EPA (1994) recommends that the volumes be reduced by 50 percent to estimate surface runoff." Therefore, after subtracting 50 percent for surface water runoff, the groundwater recharge rate is estimated to be approximately 25.4 cm/yr (10 inches/yr).

IV D-6c Description of Uppermost Aquifer

The description of the uppermost aquifer for the OB and OD units is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV and Section IV E.

IV D-6d Description of Soil Types and Depth Range of Each Soil Site-specific soil data for the OB and OD units is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

IV D-6e Topography of the Unit Area

The topography of the OB and OD unit areas is provided in Section IV B.

IV D-7 Protection of Ground Water and Subsurface Environment ADEM Admin. Codes R.335-14-5-.24(2)(a) and R.335-14-8-.02(14)(b) and (c)

IV D-7a Potential for Migration through Soil, Liners, and Containing Structures ADEM Admin. Code R.335-14-5-.24(2)(a)1

Ten burn pans are dedicated to the thermal destruction (OB) of propellants, explosives, and energetic-contaminated wastes. Thirteen are available, but the three located along the western boundary of the unit are not in use. The OB and OD units, a Subpart X activity, occupy approximately 17 and 52 acres, respectively. Soil deposition of WMM/WMM residue before, during, or after OB and OD operation is not a significant exposure pathway. The nature of WMM lends itself to simple and effective cleanup of any spills.

All the burn pans at the ANAD OB unit are similarly constructed. The burn pans are above the ground and supported on two I-beams, allowing no direct contact with the soil. Preburn inspections are completed on the pans for integrity before the placement of waste into the

pans. Also, postburn inspections of the surrounding areas are completed for presence of ejected treatment residue. No treatment occurs during precipitation events. The potential for ejected residue is controlled both in operational controls, such as limiting the amount of propellant placed in a pan, and by inspections of the OB and OD units to recover any residue from the operation. The OD area is inspected and metal fragments removed in accordance with the procedures described in Section IV F-6. Finally, removal of treatment residues from the pans and use of pan covers eliminate any significant opportunity for residue to migrate to the soil between operational cycles.

IV D-7b Groundwater Quality and All Possible Sources of Contamination ADEM Admin. Code R.335-14-5-.24(2)(a)3

See Section VI for information regarding the various solid waste managements units (SWMUs) and their possible contamination contributions, as well as Section IV E for site-specific groundwater quality data.

IV D-7c Groundwater Flow and Rate ADEM Admin. Codes R.335-14-5-.24(2)(a)4 and R.335-14-5-.24(2)(a)5

Site-specific groundwater flow and rate data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

IV D-7d Proximity to and Withdrawal Rates of Current and Potential Groundwater Users ADEM Admin. Code R.335-14-5-.24(2)(a)5

Coldwater Spring is located about 1.5 miles south of the ANAD boundary. The spring is the primary source of drinking water for about 72,000 people in Calhoun County with a withdrawal rate of 13,000,000 gal./day. There are no other known withdrawal wells in the vicinity of the OB and OD units.

IV D-7e Potential for Damaging Unsaturated Zone ADEM Admin. Code R.335-14-5-.24(2)(b)8

See Attachment 2, Section IV.

As stated in Section IV B-3a, the design of the OB and OD units helps prevent damage to the unsaturated zone. Numerous features, such as the raised pads and lack of operations during precipitation, help prevent impacts on the unsaturated zone.

IV D-7f Land Use Patterns in the Area ADEM Admin. Codes R.335-14-5-.24(2)(a)6 and R.335-14-5-.24(2)(b)9

Seventy percent of the land within a 100-km radium of ANAD is forested. Pasture and cropland account for 23 percent of the land use. The two major rivers, Coosa and Tallapoosa, and residential or industrial development cover the remaining 7 percent.

Industry in the region is highly diversified and includes the manufacture of textiles, chemicals, steel, paper, and electronic products. The principal source of agricultural income is poultry; other important sources are dairy products, cattle, hogs, and cotton.

IV D-7g Potential for Deposition or Migration of Waste Constituents into Subsurface Physical Structures and into Root Zone of Food Chain Crops and Other Vegetation ADEM Admin. Code R.335-14-5-.24(2)(a)7

Site-specific information concerning subsurface soils data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

IV D-7h Effects of Explosion on Geologic Units and Ground Water Flow Under the Unit ADEM Admin. Codes R.335-14-8-.02(14)(e), R.335-14-5-.24(2)(a)1, and R.335-14-5-.24(2)(b)2

In general, surface explosions may induce fracturing of rock or cohesive soils, such as clays, which might alter the hydrogeologic characteristics of the site. However, no studies were found demonstrating that significant fracturing of soil structures had occurred from OD treatment.

IV D-7i Potential Impacts on Human Health ADEM Admin. Codes R.335-14-5-.24(2)(a)8 and R.335-14-5-.24(2)(b)10

See OB/OD Risk Assessment in Attachment 1.

IV D-7j Potential for Damage to Flora, Fauna, and Physical Structures Due to Exposure ADEM Admin. Codes R.335-14-5-.24(2)(a)9 and R.335-14-5-.24(2)(b)11

See OB/OD Risk Assessment in Attachment 1. .

IV D-7k Previous Subsurface Soil Investigations at the OB and OD Units (if applicable)

Site-specific information concerning subsurface soils data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

IV D-7k(1) OB Unit

Site-specific OB unit data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV and in Section IV E.

IV D-7k(2) OD Unit

Site-specific OD unit data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV and in Section IV E.

IV D-7l Subsurface Soil Monitoring Program

IV D-7l(1) Subsurface Soil Sampling and Analysis

Site-specific soil data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

ID-7l(2) Decontamination of Field Sampling Equipment

See Attachment 2, Section IV.

IV D-7l(3) Sample Identification System

See Attachment 2, Section IV.

IV D-7l(4) Sample Preservation and Handling

See Attachment 2, Section IV.

IV D-7l(5) Chain-of-Custody/Field Documentation

See Attachment 2, Section IV.

IV D-7l(6) Analyses/Detection Limits

See Attachment 2, Section IV.

IV D-7l(7) Investigation-Derived Waste Management

See Attachment 2, Section IV.

IV D-7l(8) Quality Assurance/Quality Control Samples

See Attachment 2, Section IV.

IV D-7l(9) Data Evaluation and Reporting

See Attachment 2, Section IV.

IV D-8 Protection of Surface Water, Wetlands, and Soil Surface

ADEM Admin. Codes R.335-14-5-.24(2)(b) and R.335-14-8-.02(14)(b) and (c)

Surface water at ANAD flows into three major streams: Cane Creek to the north, Blue Eye Creek to the west, and Choccolocco Creek to the south. All of the streams draining ANAD eventually flow into the Coosa River, which lies west of the depot. Natural drainage patterns are predominantly dendritic in the valley areas with radial feeder streams flowing down the ridge hillsides. Straightened drainage channels are apparent in areas of the depot where there has been construction of roadways and buildings.

In Calhoun County, 147 springs have been located and documented (Moser and DeJarnette 1992, Science Applications International Corporation [SAIC] 1998a). As is typical of the fold and thrust belt of the Valley and Ridge province, many of the spring locations are fault-related. Discharge rates vary from approximately 1 to 17,000 gallons per minute (gpm) (Moser and DeJarnette 1992). The major spring in the area is Coldwater Spring, producing 32 million gallons per day (mgd). Other major springs in the area with discharge rates of more than 1,000 gpm include Boiling Springs, Oxford Spring, Golden Springs, McCullars Spring, Training Lake Spring (in the northwestern corner of the Fort McClellan Military Reservation), Seven Springs, Oxford Lake Spring, and the State Fish Hatchery Springs. Although karst features have been identified near ANAD no features have been located within 1 mile of the OB/OD.

Figure IV D-1 illustrates surface water drainage patterns and drainage divides on ANAD. As shown, a pronounced drainage divide bisects the depot from the eastern-central boundary to the southwestern boundary. To the north of the divide, the drainage flows into Cane Creek, whereas the southern drainage flows into the Eastaboga Creek system. North of the divide, a series of small drainage ways exit the depot along the western-central boundary and continue westward to the Coosa River. The remainder of the drainage flows north into the Pelham Range, which is a part of the Fort McClellan Military Reservation. All drainage leaving the depot south of the divide flows onto private land.

The average flow of streams in the area varies throughout the year. Daily flow rates respond not only to precipitation events but also to base flow contributions. Approximately one-third of the annual precipitation contributes to evaporation and transpiration processes. The

remaining two-thirds are available for surface water runoff and groundwater infiltration. Lakes and ponds in the immediate vicinity of ANAD occur south of the Eastaboga Creek divide. Two artificial lakes, Cone Lake and 5-Acre Lake, lie within the ANAD boundary and are used for recreational purposes. There are 24 smaller ponds (of approximately 1 acre) located throughout ANAD; these are used for fire protection.

Additional site-specific surface water and soils data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV. There are no wetlands immediately adjacent to or in the immediate vicinity of the OB and OD units.

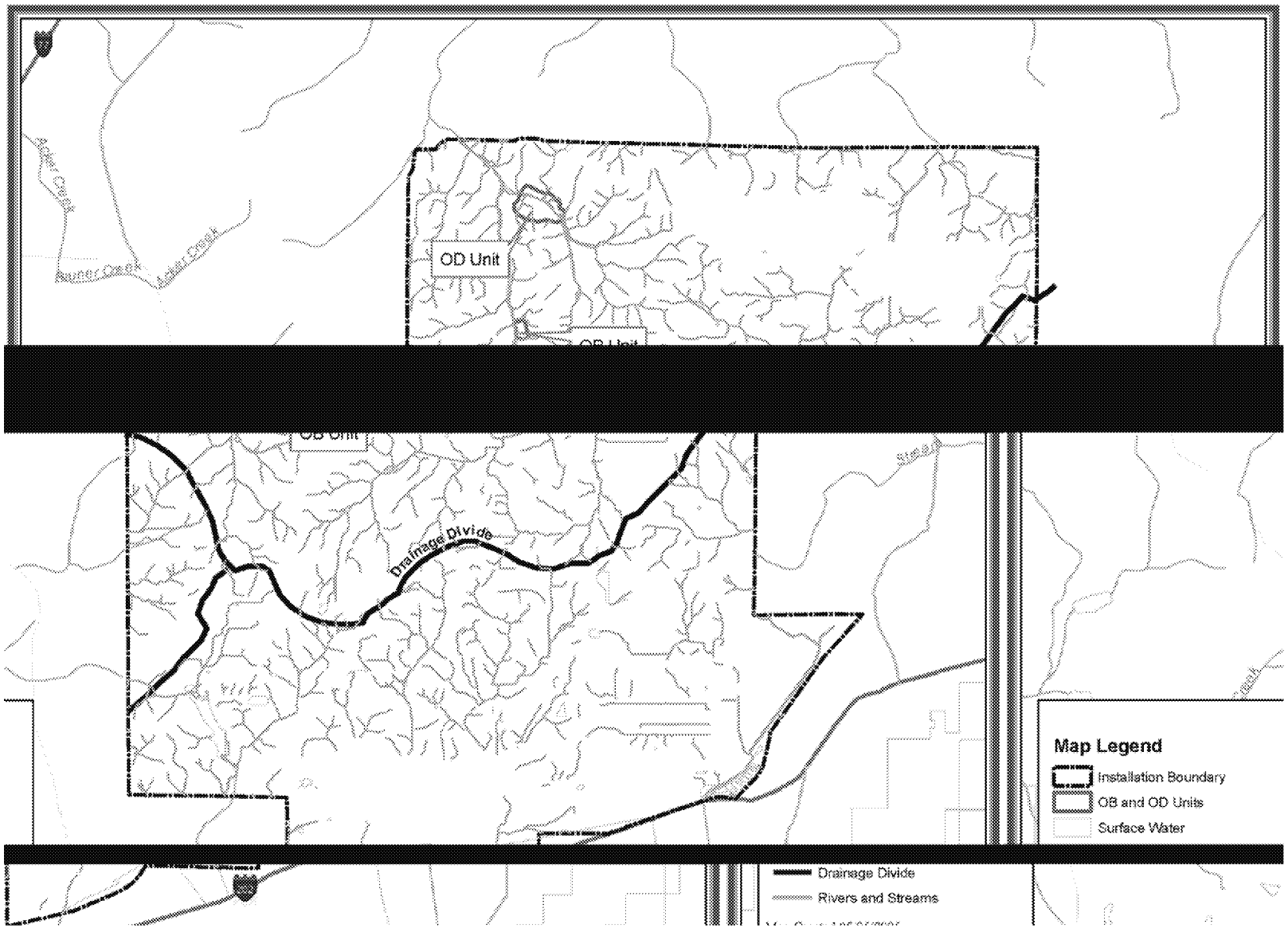

FIGURE IV D-1
Drainage Divide and Surface Water Features

IV D-8a Effectiveness and Reliability of Containing, Confining, and Collecting Systems and Structures in Preventing Migration ADEM Admin. Code R.335-14-5-.24(2)(b)2

There are three potential mechanisms for WMM/WMM residues to reach surface waters: soil migration to groundwater and then to surface water; entrainment in run-off water and then to surface water; and entrainment in air with eventual deposition to surface water.

- Groundwater is monitored in accordance with the monitoring program identified in Section IV-E.
- Run-on to the OB and OD units is channeled away from the treatment area via interceptor ditches
- Stormwater run-off from the units is monitored in accordance with the installation's NPDES Stormwater Permit and mitigated via a sediment retention basin as described in IV D-3e.
- An air assessment and downwind deposition is addressed in Attachment 1.

Additional site-specific surface water and sediment data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2.

IV D-8b Precipitation Patterns in the Area ADEM Admin. Code R.335-14-5-.24(2)(b)6

ANAD receives approximately 53.4 inches average annual precipitation. Precipitation is scattered throughout the year with the average monthly precipitation totals highest in winter (15.5 inches) and the lowest in the fall (9.5 inches). Figure IV D-2 shows the daily precipitation for Anniston, Alabama from 1948 through 1998. Figure IV D-3 shows the average annual precipitation for Alabama. Figure IV D-4 shows daily means for precipitation and temperature.

IV D-8c Proximity of the Units to Surface Waters ADEM Admin. Code R.335-14-5-.24(2)(b)6

Locations of surface waters in the vicinity of the OB and OD units are shown in Attachment 2. ANAD has one lake, Cone Lake, covering 14.2 hectares (35.6 acres), that is used for recreational and fire protection purposes. This lake is approximately 3,900 meters (12,800 feet) from the OB unit and 5,500 meters (18,000 feet) from the OD unit. Twenty-four 0.25-acre (approximate) ponds are located throughout ANAD's fenced Restricted Access Area. These ponds, constructed specifically to be used for fire protection and watering cattle and wildlife, are necessary because there are few streams on ANAD and these ponds are the animals' primary sources of water. None of the ponds are within a 300-meter (1,000-foot) radius of the OB and OD units.

IV D-8d Water and Surface Soil Quality Standards, Quality Data, and Uses ADEM Admin. Codes R.335-14-5-.24(2)(b)7 and R.335-14-5-.24(2)(b)8

Water and soil quality standards can be found in Attachment 2, Section IV.

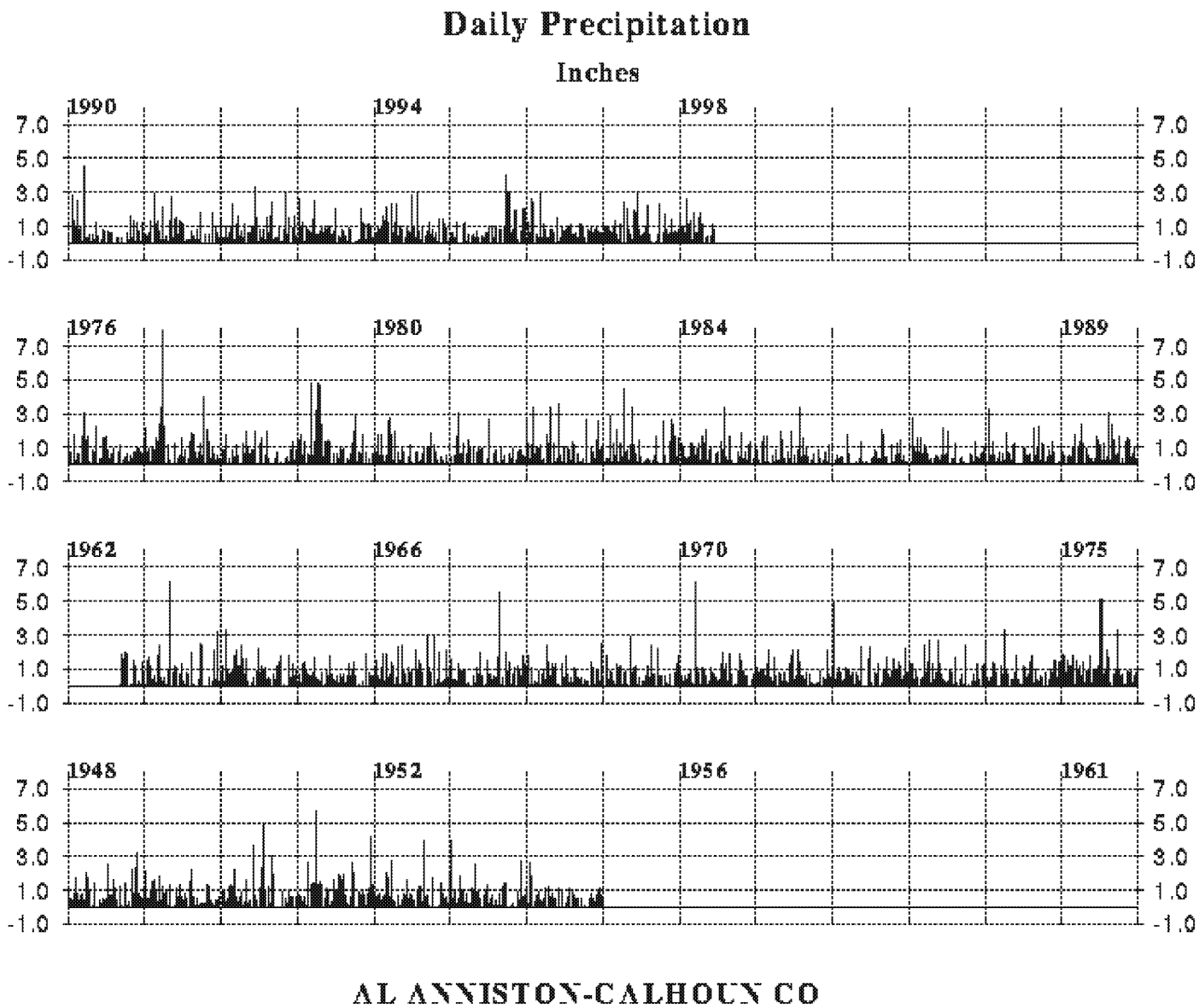

FIGURE IV D-2
Daily Precipitation

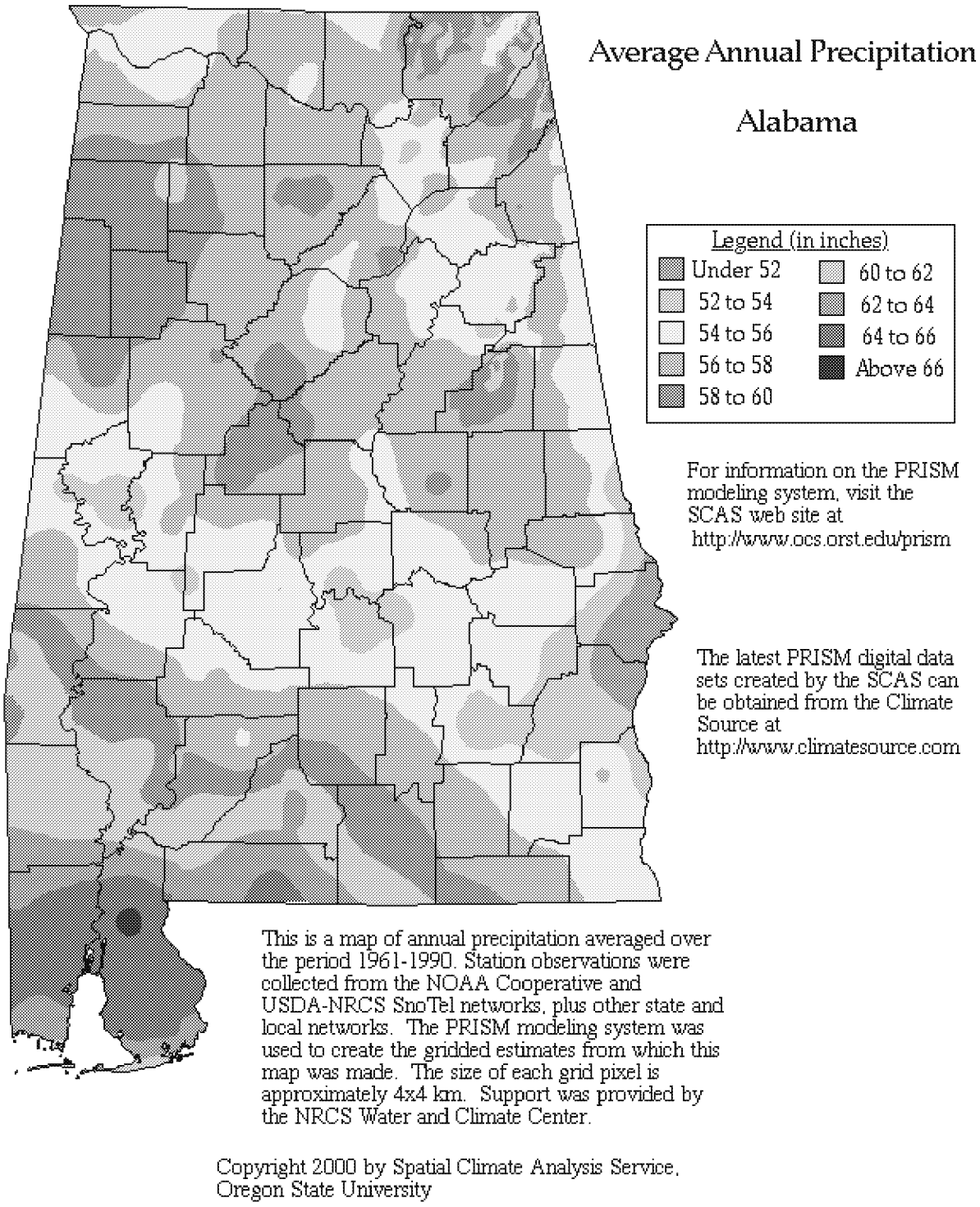

FIGURE IV D-3
Annual Precipitation

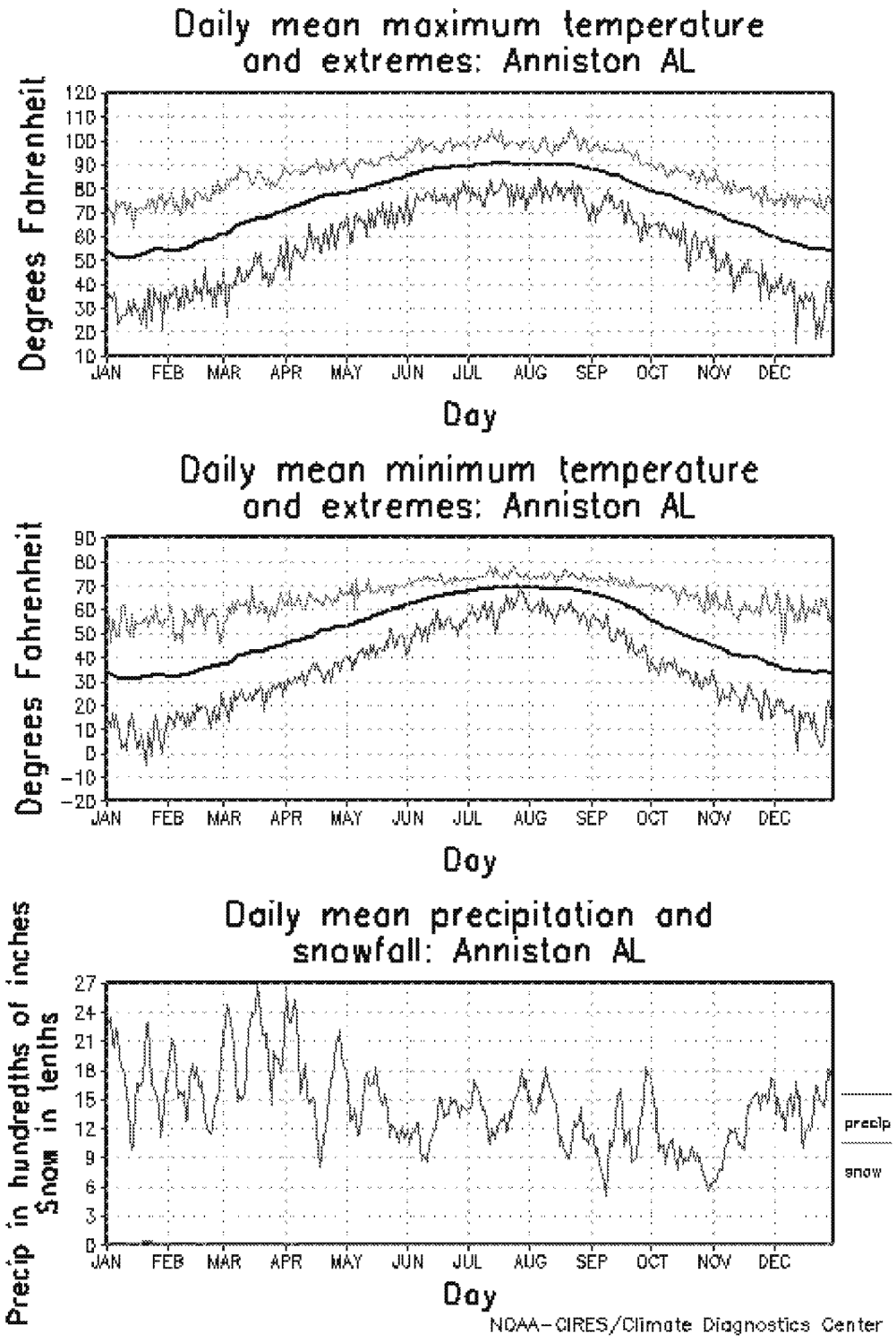

FIGURE IV D-4
Daily Mean Precipitation for Anniston

IV D-8e Previous Surface Soil Investigations at the OB and OD Units

Previous soil sampling information is provided in Attachment 2, Section IV.

IV D-8f Surface Soil Monitoring Program

IV D-8f(1) Surface Soil Sample Locations

Site-specific soil sample locations are provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV.

IV D-8f(2) Sample Preservation and Handling

Site-specific soil sample preservation and handling is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2 of Section IV. Preservation and handling are discussed in Attachment 2, Section IV.

IV D-9 Air Quality Assessments ADEM Admin. Codes R.335-14-8-.02(14)(b) and (d) and R.335-14-5-.24(2)(c)1–7

Air Quality Assessments are discussed in IVD-1b and Volume II.

IV D-10 Potential Pathways of Exposure and Potential Exposure Magnitude

Potential pathways of exposure and potential exposure magnitude are discussed in Section IVD-1b and Volume II.

IV D-11 Effectiveness of Treatment ADEM Admin. Code R.335-14-8-.02(14)(d)

OB and OD are effective treatments for the waste material treated at the ANAD OB and OD units. The military energetics contained in the items result in the classification of these items as reactive (D003) due to their potential to explode. Energetics are designed to explode or burn vigorously and react completely when exposed to an initiating source. These explosions, or vigorous reactions, occur whether they are used as designed in warfare or treated by OB and OD.

The ANAD OB and OD treatment processes are designed to ensure that complete reaction occurs. In the case of OD, the quantity and placement of donor explosive material is designed to direct explosive forces toward the waste item to ensure that all the energetics contained in the waste materials are destroyed. In the case of OB, placement into pans helps to ensure that the maximum quantity of oxygen is available to ensure complete combustion.

Two lines of evidence demonstrate that OB and OD is an effective treatment method for D003 wastes. These are (1) physical transformations of the D003 waste material as shown by visual observation and (2) test data of OB and OD emissions and treatment residues.

Physical Transformations of D003 Waste Material: D003 waste items treated by OD generally consist of the energetics and components that are enclosed in a metallic case. Energetics have a discrete physical form (block, plug, granule, etc.). Following complete

detonation, the only potential residue is metal fragment. The OD area is inspected and metal fragments removed in accordance with the procedures described in Section IV F-6. Metal fragments that are collected and removed are visually inspected for evidence that the energetic component of the item has been treated as described in Section IV D-3d. The presence of shrapnel that is free of energetics is evidence that the energetics have been effectively destroyed by the detonation.

OB results in the generation of treatment residue. Treatment residue can only be generated as the result of combustion. The physical form of treatment residue is distinctly different from unburned energetics. Treatment residue is a fine powdery or feathery material, while energetics have a distinct physical form. Therefore, the presence of treatment residue, which is free of energetics, is evidence that the energetics have been effectively destroyed by the burning. For additional information, see Section IV D-1k.

IV D-12 Additional Information - Noise Considerations ADEM Admin. Codes R.335-14-5-.24(2) and R.335-14-8-.02(14)(e)

Noise considerations are described below.

IV D-12a Distance of the OB and OD Units, or Area, from Off-Plant Inhabited Buildings

OD activity takes place in the northwest section of ANAD at the OD unit, approximately 3,000 feet from the nearest ANAD boundary. ANAD's noise contours for demolition activity and weapons firing are contained within ANAD except where they intrude upon Pelham Range along the northern boundary. There are no incompatible land uses within the blast noise contours (USACHPPM, 2003).

IV D-12b Airblast ADEM Admin. Codes R.335-14-5-.24(2) and R.335-14-8-.02(14)(e)

The Army ENMP provides a method for evaluating the effect of noise and hazards associated with certain operations that stem from activities at military installations. The purpose of the program is to identify land areas that are exposed to generally unacceptable noise levels. This information is then used to recommend uses for the land lying within these areas that are compatible with the needs of the civilian community and the Army.

Potential air blast impacts were evaluated using C-weighted (for impulsive noise) Day-Night Average Sound Level (CDNL) time-weighted criteria. The BNOISE2 model was used by USACHPPM to determine daily and annual CDNL land-use planning zones (U.S. Army, 1998). BNOISE2 accounts for the effects of meteorology, topography, and propagation over water, including the land-water interface. Army installation commanders establish and maintain active programs to achieve the maximum feasible compatibility between the noise environment and noise-sensitive land uses, both off and on the installation. They consider the land areas, with noise-sensitive land uses, that are exposed to generally unacceptable noise levels and aircraft accident potential.

There are three noise zones, Noise Zones III (NZ III), II (NZ II) and I (NZ I), and a Land Use Planning Zone (LUPZ) that are used to determine what activities can take place. NZ III consists of the area around the source of the noise in which the day-night sound level (DNL) is greater than 70 dB, C-weighted (dBC) for impulsive noise. The noise level within NZ III is

considered so severe that noise-sensitive land uses should not be considered therein. NZ II consists of an area where the DNL is between 62 and 70 dBC. Exposure to noise within this area is considered significant and land use within NZ II should normally be limited to activities such as industrial, manufacturing, transportation, and resource production. If land in NZ II areas were to be used for residential purposes, noise level reduction (NLR) management would be warranted. NZ I includes all areas around a noise source in which the DNL is less than 62 dBC. This area is usually suitable for all types of land use activities.

The DNL noise contours represent an annual average that separates the normally incompatible NZ II from the compatible NZ I. Taking all operations that occur at ANAD over the year and averaging the noise dose generates the contours. The noise environment at the installation varies daily and seasonally because operations are not consistent for all days of the year. In order to provide a planning tool that could be used to account for days of higher than average operations, the LUPZ contour is included on the noise contour maps. The LUPZ can offer a better prediction of noise impacts when levels of operation are above average. For example, if operations are approximately 3 times more numerous than the normal daily firing, average noise levels increase approximately 5 dB. By setting the extent of the LUPZ contours at 57 CDNL, the variability in the ANAD noise environment can be accounted for. The LUPZ can provide the installation with a buffer for land use planning, and can reduce conflicts between the installation noise producing activities and the civilian community. It encompasses areas where, during periods of increased operations, community annoyance levels can reach those levels associated with NZ II. The LUPZ gives the installation a more comprehensive view of areas where complaints may occur and can meet the public demand for a better description of what will exist during a period of increased operations.

Federal standards at 30 CFR 816.67(b) for airblasts (developed for the mining industry) are applied here to assess the impacts to offsite receptors. This standard establishes a criteria of a maximum level of 129 dB for 6 Hz. Based on Figure III F-1, from the *Anniston Army Depot Installation Environmental Noise Management Plan* (USACHPPM, 2003), the criterion set forth in 30 CFR 816.67(b) is not met due to the NZ II and LUPZ extending offsite. However, this does not adversely impact current land use. The only location where the noise contours extend beyond ANAD is along the northern boundary, approximately 3,000 feet from the OD unit into the adjacent Pelham Range, while the nearest potentially impacted population would be along the western boundary, approximately 5,500 feet from the OD unit. Residents living outside of the contours might still occasionally hear activity taking place at ANAD.

In the absence of definitive data, the Committee on Hearing Bioacoustics and Biomedicine of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans. In general, the appropriate levels would be those corresponding to adverse health effects. For threatened and endangered species, which require a higher degree of protection, the appropriate levels would be those corresponding to annoyance.

IV D-12b(1) Map Showing Monitoring Receptors

Predictive noise modeling indicates that noise generated by OD operations is not negatively impacting nearby receptors. Therefore, no ongoing noise monitoring is needed or proposed.

IV D-12b(2) Range of Sizes of Explosive Charges in the Monitoring Data

For mitigation, there are limits on the charge weights that can be used at ANAD. The maximum allowable is 1,000 lb for buried charges and 15 lb for charges that are detonated on the surface. Weather conditions would influence noise levels. Studies have found that variation of temperature and wind velocity with altitude can cause a noise event to be inaudible at one time and highly annoying at another time. This phenomenon is referred to as atmospheric refraction. Atmospheric refraction is the bending of sound rays caused by the variation with altitude of the speed of sound. This variation is a function of temperature and wind velocity. This bending of the sound rays can concentrate acoustic energy, causing sound levels to be significantly greater. Conversely, the sound rays can also be bent upward so that the acoustic energy of the event is dissipated by the atmosphere, resulting in a lower sound level on the ground.

A simplified technique has been developed by the Explosives Research Group (ERG) (University of Utah, 1958) to predict atmospheric refraction conditions. The ERG technique summarizes the results of this research into a series of "good" and "bad" firing times in Table IV D-1. These results are shown in Figure IV D-5. This technique provides a good first approximation of the effects of the existing weather conditions on noise propagation.

TABLE IV D-1
Allowable Weather Conditions

Good Conditions	Bad Conditions
Clear skies with billowy cloud formations, especially during warm periods of the year.	Days of steady winds of 5 to10 mph with gusts of greater velocities (above 20 mph) in the direction of residences close by.
A rising barometer immediately following a storm.	Clear days on which "layering" of smoke or fog are observed.
	Cold hazy or foggy mornings.
	Days following a day when large extremes of temperature (about 36ºF) between day and night are noted.
	Generally high barometer readings with low temperatures.

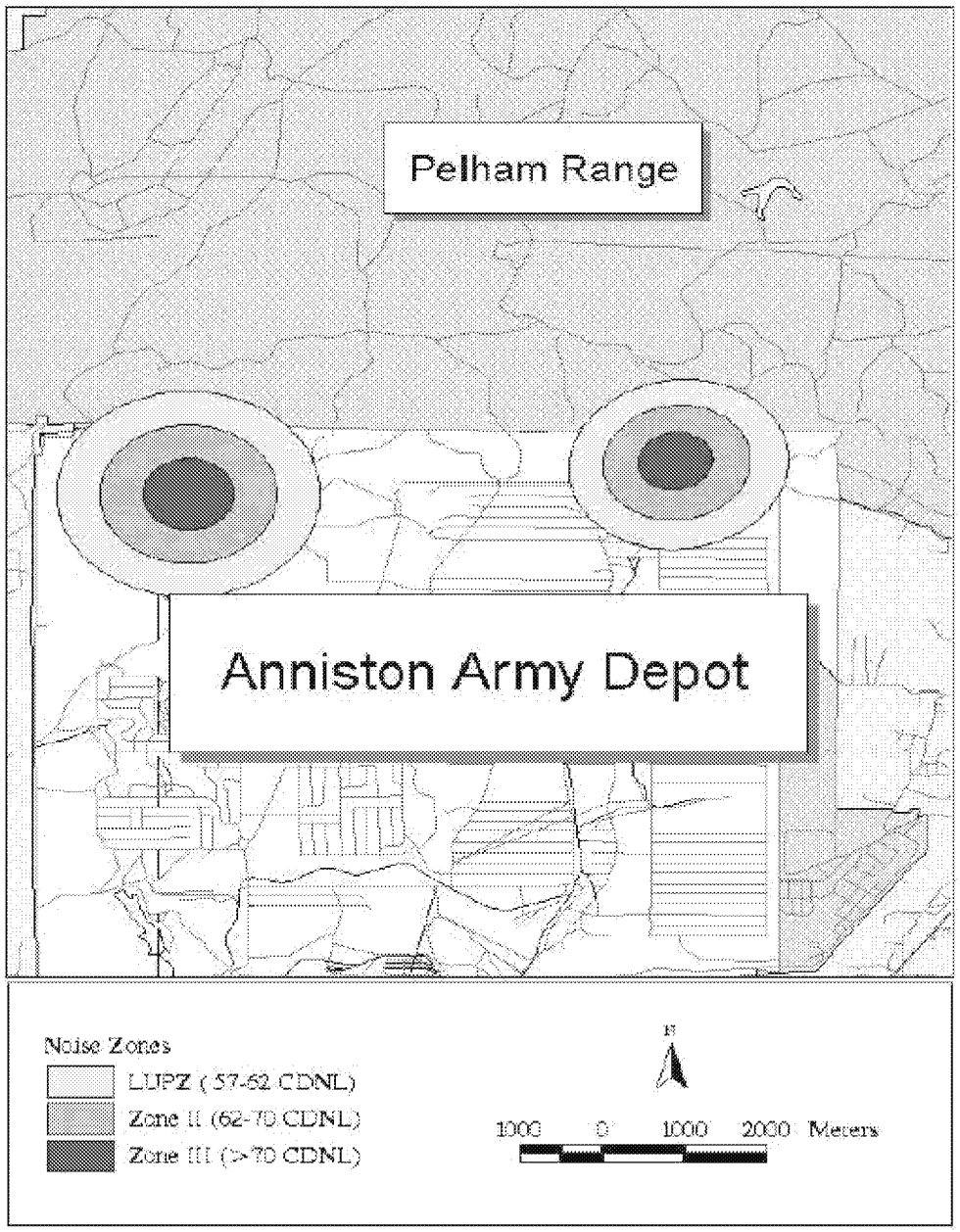

FIGURE IV D-5
ANAD Noise Zone Contour Map

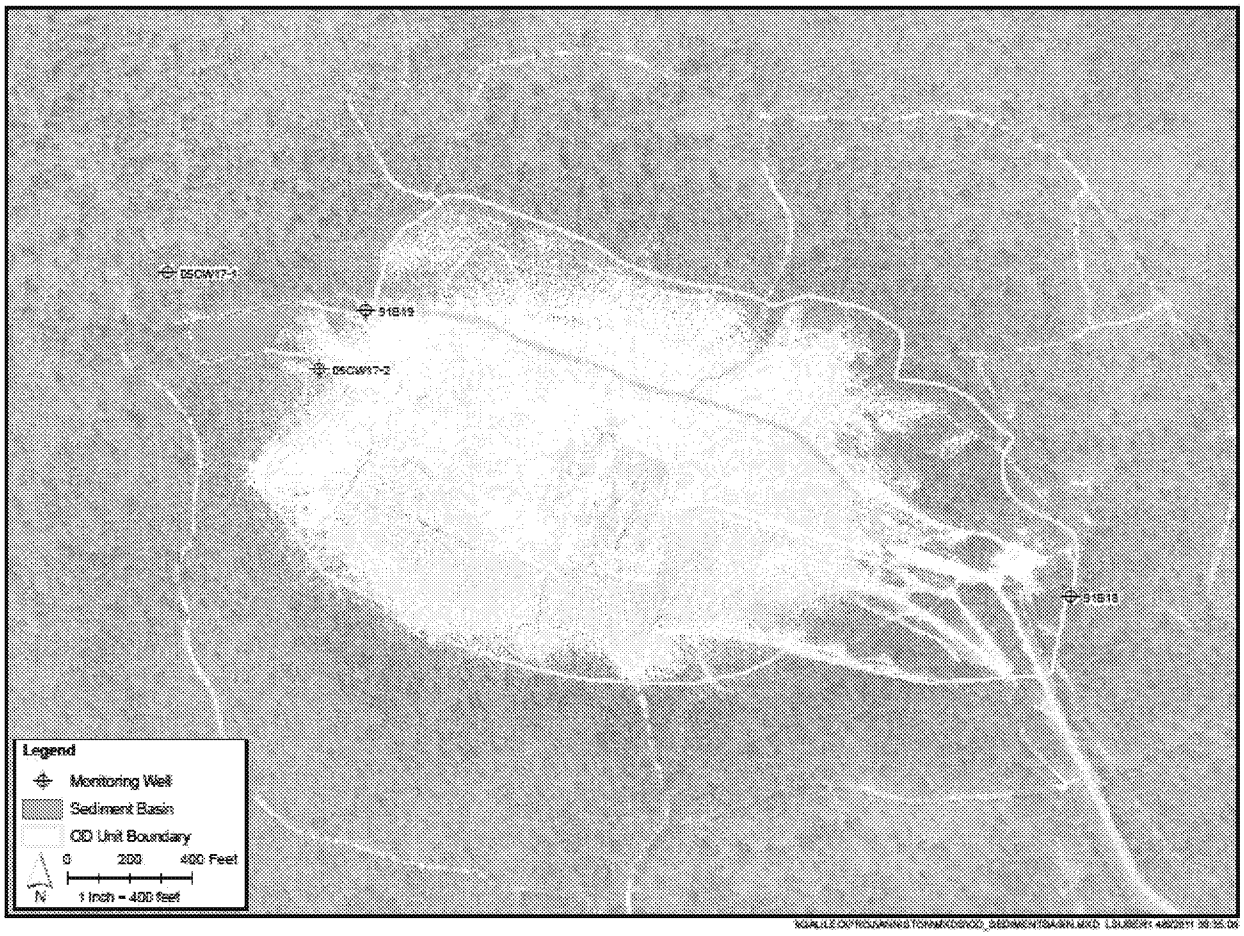

FIGURE IV D-6
Sediment Basin Location

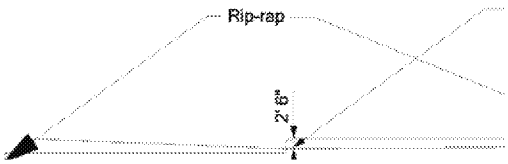

FIGURE IV D-7
Sediment Basin Design

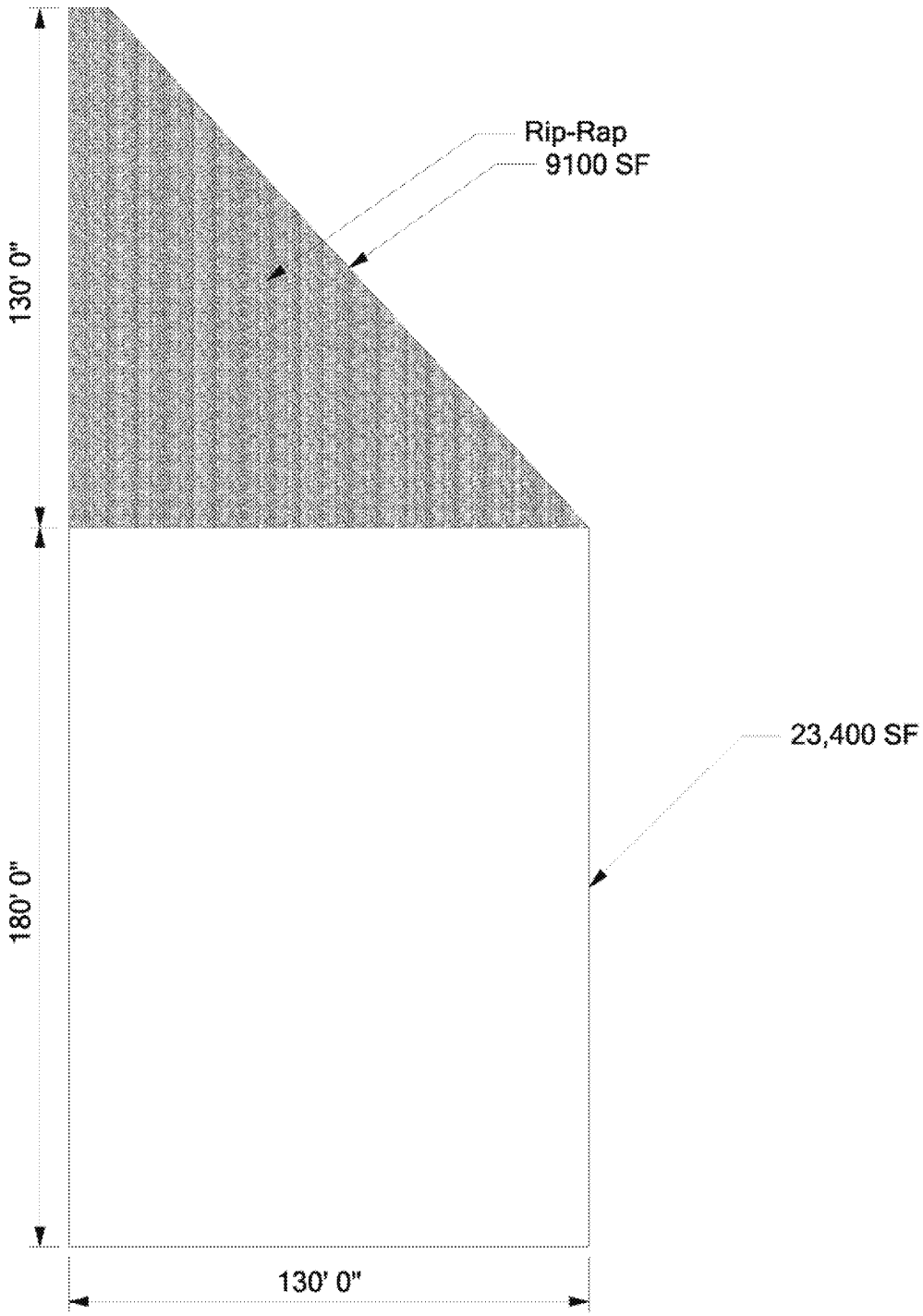

FIGURE IV D-8
Sediment Basin Dimensions

The simplified technique above is an example of noise mitigation. At ANAD, a more detailed analysis of weather conditions is made before operations take place. The Range Safety Office assesses current weather conditions in accordance with ANAD SOPs. Table IV D-2 shows ANAD's operating restrictions described in the SOP. The meteorological conditions evaluated include wind speed, cloud cover, and temperature gradient conditions. If conditions are such that high noise levels would be expected, operations are postponed. The only time that activity takes place at ANAD under unfavorable conditions is when there is a change in weather after the detonation has been set, wired, and buried. Under these circumstances, it would be unsafe to leave the explosives in place without detonating.

TABLE IV D-2
Operation Restrictions Due to Meteorological Conditions

Meteorological Conditions	Operation Restrictions
Wind speed	Operations are restricted to periods when surface average wind speed is more than 3 mph but less than 20 mph.
Wind direction	Operations are not conducted if wind directions would carry emission products over publicly accessible areas within 1 mile of the OB and OD units.
Cloud cover/ceiling	Operations are not conducted when the cloud cover is greater than 80% and the cloud ceiling is less than 2,000 ft.
Precipitation/storms	Operations are not conducted during electrical storms or thunderstorms, or during periods of precipitation or forecasted high probabilities (50% or more) of precipitation during the scheduled OB and OD operation period.

Table IV D-3 gives predicted noise levels for the maximum allowable charges at ANAD. The base levels listed in Table III D-3would be expected levels without the influence of weather propagation, focus would be worst-case, and negative would occur when the wind was blowing away from the area of concern. Because of the SOPs ANAD uses relative to weather, expected levels for treatment would fall at the lower ends of the ranges. These levels show that ANAD does not exceed limits set forth in 30 CFR 816.67(b).

TABLE IV D-3
ANAD Predicted Noise Levels

Distance (ft)	Peak Noise Level (dBP)		
	Base	Focus	Negative
1,000 lb (buried 14 ft)			
5,000	123	127	115
7,500	118	123	110
10,000	116	121	107
15,000	111	117	102
15 lb (surface charge)			
5,000	127	132	120
7,500	123	128	115
10,000	120	125	111
15,000	116	121	106
Note: OD unit is approximately 3,000 feet from nearest installation boundary (northern boundary at Pelham Range). The nearest potential receptor is assumed to be at the western boundary, approximately 5,500 feet from the OD unit.			

IV D-12c Ground Vibration ADEM Admin. Codes R.335-14-5-.24(2) and R.335-14-8-.02(14)(e)

The impulsive sound pressure from firing large weapon systems and detonating explosive charges can cause structures to vibrate. This vibration is perceived by the occupants as the rattling of loose windows and objects on shelves. Operations at ANAD involve operations that generate low-frequency noise and vibration. *Anniston Army Depot Installation Environmental Noise Management Plan* (USACHPPM, 2003) contains information on studies that have been done measuring vibration levels. Studies of vibration caused by coalmine detonations (Northwestern University, 1981) indicate that the ground-borne vibration dominates house vibration at scaled distances of less than 50 (0 to 300 feet). At scaled distances greater than 50, the airborne vibration dominates. That is, for a 100-lb charge, the ground-borne vibration is the dominant cause of house vibration if the house is located less than 500 feet from the detonation point. The studies concluded that vibration levels could be determined by measuring the noise level. Also, the study results show why the source of structural vibration in areas adjacent to ANAD is related to airborne vibration not ground-borne vibration. A summary of typical vibration levels is listed in Table IV D-4.

Airborne vibration is the dominant cause of vibration of structures off the installation. Most of the studies of airborne vibration and the damage guidelines derived from these studies used sonic booms as the source. The vibration from artillery and tank main gun firing is similar to the vibration from sonic booms. OD does not cause these levels of vibrations.

TABLE IV D-4
Typical Vibration Levels

Response	Ground Vibration (inches/second)
Human:	
Perceptible	0.08
Noticeable	0.2
Unpleasant	0.38
Disturbing	0.8
Objectionable	1.3
Structure:	
Minor Damage (fine cracks in plaster)	5.4
Major Damage	7.6

IV D-12c(1) Specific Maximum Ground Vibration

The maximum ground-borne vibration level recommended by the U.S. Bureau of Mines (Bureau of Mines, 1980) to prevent threshold damage is 0.5 inches/second. The threshold level at which minor structural damage may begin to occur in 0.01 percent of structures is set at 2.0 inches/second.

IV D-12c(2) Method of Determination of Ground Vibration

Potential ground vibration impacts from detonations are primarily associated with structural vibration. Pursuant to 30 CFR 816.67(d)(3), the allowable charge weight can be calculated as follows:

$$W = \left(\frac{D}{D_s}\right)^2$$

where:

W = allowable charge weight, lb NEW
D = receptor distance, feet
D_s = scaled distance factor (50 for distances of 0 to 300 feet; 55 for 301 to 5,001 feet; and 65 for 5,001 feet and beyond)

Based on this equation and the 15 lb NEW maximum allowable charge per aboveground detonation, ground vibration impacts would be minimal/acceptable at distances beyond 190 feet. Therefore, receptor locations beyond the ANAD boundary would not be impacted from detonations at the OD unit.

IV D-12d Manner of Placing the Waste in the Unit

When treating propellant, propellant is moved to the OB unit by enclosed tractor-trailer. The packed propellant is unloaded by forklift and placed adjacent to each pan. Covers are

removed from the pans and the allowable amount of bulk propellant or bagged propellant placed in the pans. An ignition train is laid to the end of the prepared propellant.

WMM is delivered to the OD unit by an enclosed tractor-trailer and placed at each demolition site. Initiating explosives are then delivered by the carrier and placed at each site, at least 7.5 meters (approximately 25 feet) from the carrier truck and at least 3 meters (approximately 10 feet) from the demolition site. Packing material from unpacking explosives is then loaded on the carrier truck, and after the carrier has moved at least two sites away, the initiating explosive is opened and placed on the item to be destroyed. Detonating cords are then prepared and the blasting caps wired into the firing wire circuits and connected to the detonating cords.

IV D-12d(1) Use of Supplemental Fuels, Type, Amount, and Manner of Placing Them in the Waste

Supplemental fuels are not used.

IV D-12e Minimum Protective Distances ADEM Admin. Codes R.355-14-6-.16(13) and R.335-14-8-.02(14)(e)

The minimum protection distances (based on explosive safety hazards) for the ANAD OB and OD units are commensurate with 40 CFR 265.382. Table IV D-5 presents federally specified minimum safety distances, based on explosion hazards, to inhabited buildings and public traffic routes from potential explosive sites.

TABLE IV D-5
Minimum Safety Distances for OB and OD Operations

Quantity of Waste Explosives	Minimum Distance from OB or OD to Property of Others
0 to 100 lb	670 ft
101 to 1,000 lb	1,250 ft
1,001 to 10,000 lb	1,730 ft
10,001 to 30,000 lb	2,260 ft

As noted in previous sections, the following maximum allowable treatment quantities are applicable to the ANAD OB and OD units:

- OB: 2,000 lb NEW per pan/20,000 lb NEW/day
- OD: 15 lb NEW above ground/1,000 lb NEW below ground/detonation station, 16,000 lb NEW/day

The closest installation boundaries to the OB and OD units are approximately 4,800 feet and 3,000 feet, respectively.

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IV E Protection of Groundwater

IV E-1 Unit is a Regulated Unit ADEM Admin. Code R.335-14-8-.02

ADEM Admin. Code R.335-14-8.02 requires that specific information be provided by owners or operators of hazardous waste facilities containing a *regulated unit*. A *regulated unit* is defined in ADEM Admin. Code R.335-14-5.06 as a surface impoundment, waste pile, and land treatment unit or landfill that receives hazardous waste. Therefore, the additional information listed in 270.14(c) is not specifically required for the ANAD open burn (OB) and open detonation (OD) units, which are defined under RCRA as miscellaneous units. The information contained in this section is provided in support of the Environmental Performance Standards for groundwater protection as required by AAC R.335-14-5-.24(2)(a).

IV E-2 Existing Groundwater Monitoring Data ADEM Admin. Codes R.335-14-8-.02(5)(c)1 and R.335-14-8-.02(14)

Groundwater monitoring data for the OB and OD units has been collected during quarterly monitoring events between July 2005 and December 2008. Quarterly reports are submitted to ADEM for review. The Point of Compliance (POC) monitoring well network for the OB and OD units are shown in Figures IV E-1 and IV E-2, respectively. Groundwater samples collected from each monitoring well were submitted for analysis of:

- Explosives (EPA Method 8330B)
- Total and dissolved metals (EPA Method 6010B)
- Total and dissolved mercury (EPA Method 7470A)
- Volatile organic compounds (VOCs) (EPA Method 8260B)
- Semivolatile organic compounds (SVOCs) (EPA Method 8270C)
- Nitrate/nitrite as N (EPA Method 353.2 or EPA Standard Method 4500-NO3 F)
- Cyanide (EPA Method 335.4)
- Perchlorate analysis was performed using EPA Method 314.0 until February 2007 and then by EPA Method 6850 to reduce the possibility of matrix interference
- N-Nitrosodimethylamine analysis was performed using EPA Method 8270C until October 2006, and then EPA Method 607/1625-modified or MSABN 3291A-modified was used to achieve lower detection limits.

A complete list of analytes is provided in Table IV E-21.

During some scheduled sampling events, wells have been dry or there has been insufficient well recharge to fill bottles for all analyses. Quarterly reports provide the details for each sampling event.

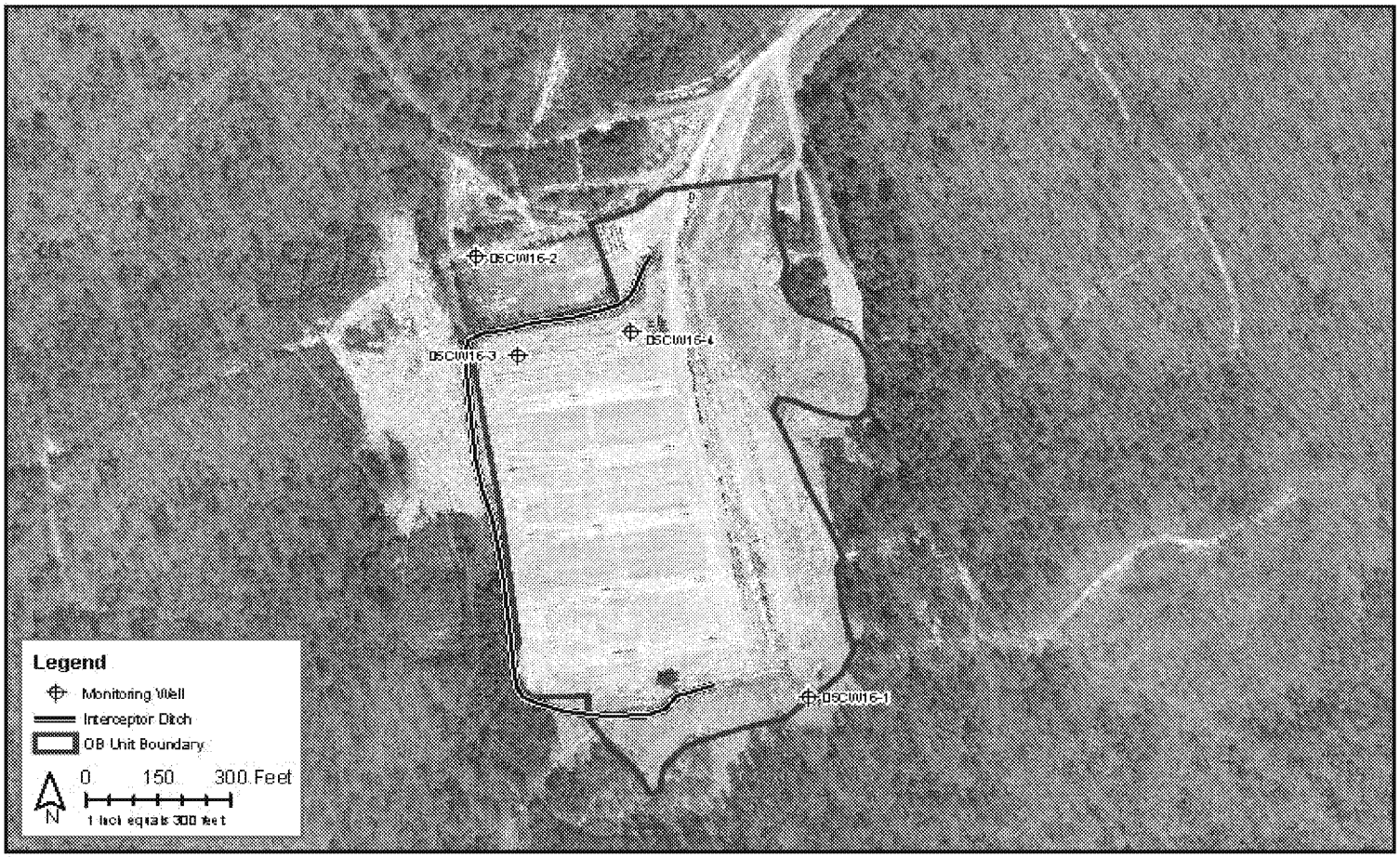

FIGURE IV E-1
Monitoring Well Locations for the OB Unit

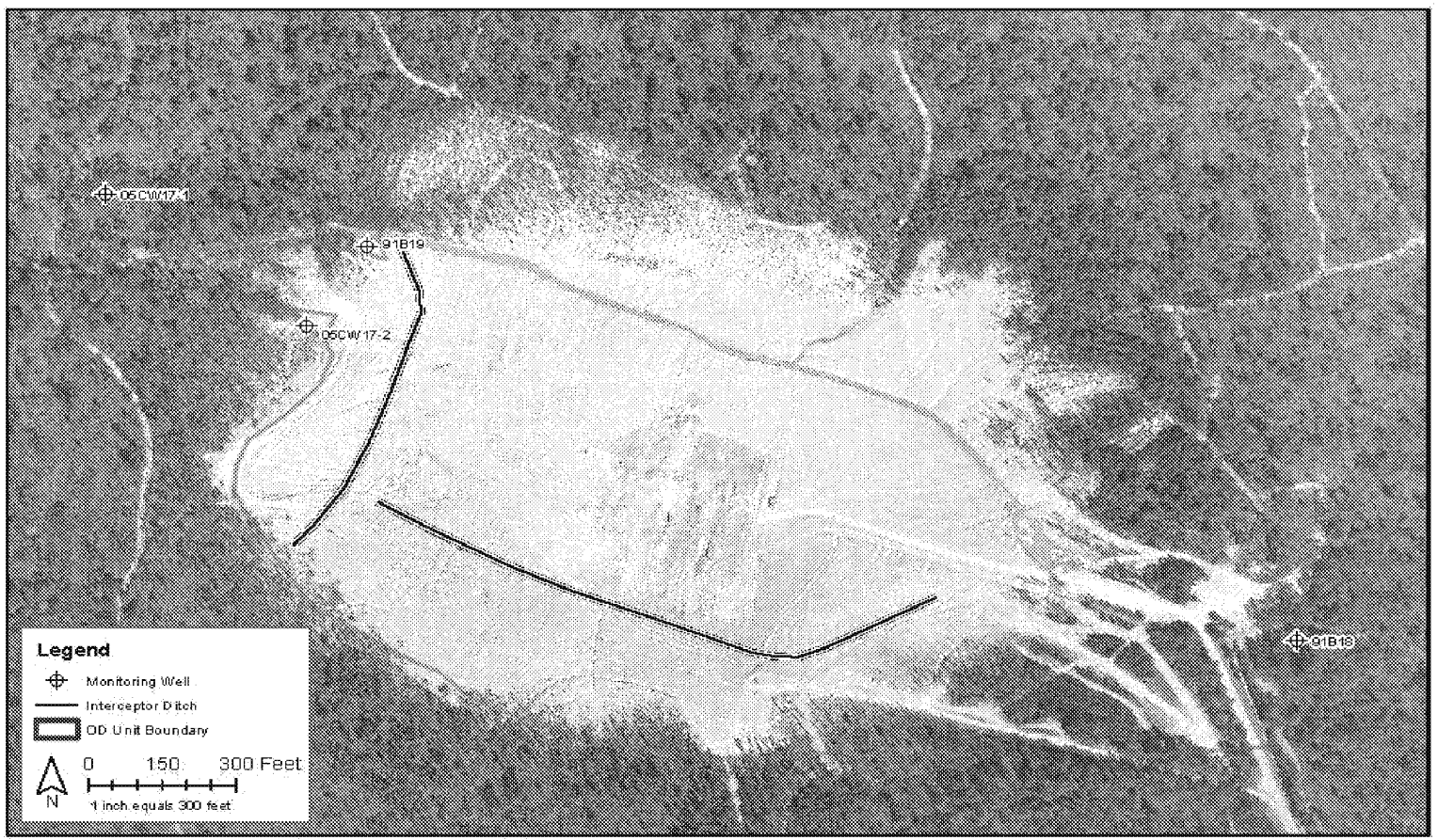

FIGURE IV E-2
Monitoring Well Locations for the OD Unit

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The results from groundwater monitoring at the OB and OD units are presented below through comparison of detected compounds to their respective preliminary screening values (PSV). These screening values were developed from Table 2-2 in the Alabama Risk-Based Guidance Manual (ARBCA, ADEM, 2008). For constituents where there are no ARBCA PSVs, the screening criteria are consistent with the EPA regional screening levels (RSL) as of September 12, 2008 (EPA, 2008). Compounds which were detected but have no corresponding PSV include calcium, magnesium, potassium, and sodium. These compounds are not discussed with the analytical results in this section, but are included in the statistical evaluation presented in Section IV E-6l.

The PSVs are conservative health-based concentrations of constituents determined to be indicators for the protection of human health or the environment. The detection of a contaminant(s) at a concentration greater than a PSV does not necessarily trigger a requirement to perform remediation. Conversely, the absence of chemical concentrations greater than PSVs does not necessarily mean that no further investigative or remedial action is warranted. PSVs are generally used to provide a measure of the overall risk to human health and the environment associated with a contaminated site.

OB Unit

The analytical results from the monitoring program at the OB units are summarized in Table IV E-1 through Table IV E-4. The tables list those constituents that were present above their respective detection limits for which preliminary screening values (PSVs) have been promulgated. For metals, both total and dissolved results are included for comparison purposes. Detected constituents in each well are shaded gray and constituents whose concentration exceeded the PSV at least once are presented in bold font.

Comparison to Preliminary Screening Values

The results from groundwater monitoring at the OB and OD units are presented below through comparison of detected compounds to their respective PSV. A complete list of analytes is provided in Table IV E-21. Compounds detected with no PSVs include: calcium, magnesium, potassium, and sodium as indicated by "NP" in Table IV E-21. These compounds are not discussed with analytical results, but are included in the statistical evaluation discussion in Section IV E-6l.

At the OB unit, metals detected at least once in any well above their respective PSV include aluminum, arsenic, iron, lead and manganese. Two volatile organic compounds (VOCs), Trichloroethene and cis-12,dichloroethene (cis-1,2-DCE), and one explosive constituent, 3-nitrotoluene, have each been detected during one sampling event at concentrations below their respective PSVs. Perchlorate has been detected twice above the PSV . Additional discussion is provided below.

Metals

In up-gradient monitoring well 05CW16-1, Aluminum (total), has been detected in the majority of samples, with concentrations always below the PSV. Aluminum (total) has frequently been detected in the down-gradient wells but concentrations were above the PSV once each in wells 05CW16-2 and 05CW16-4 and never in well 05CW16-3. Aluminum

(dissolved) has not been detected in the up-gradient well and has only been detected once in down-gradient well 05CW16-4.

Arsenic (total) has been detected above its PSV once in samples from down-gradient wells 05CW16-2 and 05CW16-4, but has not been detected as a dissolved metal in samples from either well. Arsenic (total or dissolved) has not been detected in the other 2 wells to date.

Iron (total) has been detected in the majority of the up-gradient well samples, only once with concentration greater than the PSV. Iron (total) was also frequently detected in all of the down-gradient wells with concentrations often measured above the PSV in wells 05CW16-2 and 05CW16-4 but only once above the PSV in well 05CW16-3.

Iron (dissolved), not detected in the up-gradient well, has been frequently detected in the down-gradient wells. However, concentrations of iron (dissolved) have been measured above the PSV only in a single down-gradient well (05CW16-2) and only in one-fourth of the samples.

Manganese (total) has been detected in all of the up-gradient well samples, once above the PSV; above the PSV in all samples from wells 05CW16-2 and 05CW16-3; and detected in more than half of the samples from 05CW16-4, once above the PSV. Manganese (dissolved) has been detected in all of the samples collected to date at the up-gradient well 05CW16-1, and all concentrations were below the 24.5 µg/L PSV. Concentrations of manganese (dissolved) were above the PSV in most of the samples collected from down-gradient wells 05CW16-2 and 05CW16-3 but it has not been detected at all in well 05CW16-4.

Lead (total) has never been detected in up-gradient well 05CW16-1. Lead (total) has been detected once each in down-gradient wells 05CW16-3 and 05CW16-4, below the PSV in both cases. The concentration has exceeded the PSV in well 05CW16-2 once out of two detections. Lead has not been detected as a dissolved metal in any of the wells to date.

Vanadium (total) has been detected once in down-gradient well 05CW16-2 and concentration exceeded the PSV. Vanadium (total) has not been detected in any other well and has not been detected as a dissolved metal in any of the wells to date.

Table IV E-5 lists all of the metals results as well as turbidity and dissolved oxygen (DO) values. Generally, where turbidity is greater then 10 NTU and DO is greater than 2 mg/L, there are more detections of metals, and concentrations are higher in the total metals results. Under these conditions, there are fewer detections and at lower concentrations of the dissolved metals. This indicates that the metals are released during the acid digestion process from suspended solids in the unfiltered samples rather than dissolved in the water under natural conditions.

DO concentrations are generally less than 1 mg/L in wells 05CW16-2 and 05CW16-3 where both total and dissolved manganese concentrations are frequently above the PSV. This indicates that the manganese is dissolved in anaerobic groundwater rather than sorbed to suspended solids at these wells and manganese concentrations are greater than the ARBCA PSV because of natural processes causing the reductive dissolution of manganese solids from the soil matrix.

1

TABLE IV E-1

Summary of Analytes with PSVs Detected in OB Unit Upgradient Groundwater Monitoring Well 05CW16-1

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	9	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	8	0	0.018[a]	0				0.005
Aluminum	mg/L	9	7	3.6[a]	0	0.161	0.5677	1.6	0.118
Aluminum, dissolved	mg/L	8	0	3.6[a]	0				0.1
Arsenic	mg/L	9	0	0.01[a]	0				0.01
Arsenic, dissolved	mg/L	8	0	0.01[a]	0				0.01
Barium	mg/L	9	8	2[a]	0	0.0116	0.01427	0.017	0.01
Barium, dissolved	mg/L	8	8	2[a]	0	0.0104	0.01325	0.0158	
Cadmium	mg/L	9	0	0.005[a]	0				0.001
Cadmium, dissolved	mg/L	8	0	0.005[a]	0				0.001
Chromium, total	mg/L	9	0	0.1[a]	0				0.005
Chromium, total dissoved	mg/L	8	0	0.1[a]	0				0.005
Copper	mg/L	9	0	1.3[a]	0				0.01
Copper, dissolved	mg/L	8	0	1.3[a]	0				0.01
Iron	**mg/L**	**9**	**8**	**1.1[a]**	**1**	**0.0813**	**0.5958**	**2.45**	**0.05**
Iron, dissolved	mg/L	8	0	1.1[a]	0				0.05
Mercury	mg/L	9	0	0.002[a]	0				0.0002
Mercury, dissolved	mg/L	8	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**9**	**9**	**0.088[a]**	**1**	**0.0279**	**0.04622**	**0.102**	
Manganese, dissolved	mg/L	8	8	0.088[a]	0	0.0274	0.03286	0.0425	
Nickel	mg/L	9	0	0.1[a]	0				0.01
Nickel, dissolved	mg/L	8	0	0.1[a]	0				0.01
Lead	mg/L	9	0	0.015[a]	0				0.005
Lead, dissolved	mg/L	8	0	0.015[a]	0				0.005
Vanadium	mg/L	9	0	0.0036[a]	0				0.02
Vanadium, dissolved	mg/L	8	0	0.0036[a]	0				0.02
Zinc	mg/L	9	0	1.1[a]	0				0.05
Zinc, dissolved	mg/L	8	0	1.1[a]	0				0.05
cyanide	mg/L	9	0	0.2[a]	0				0.005
cis-1,2-Dichloroethene	mg/L	11	1	0.07[a]	0	0.00188	0.00188	0.00188	0.001
Nitrogen, nitrate-nitrite	mg/L	9	0	10[a]	0				0.1
3-nitrotoluene	mg/L	10	0	0.73[b]	0				0.0005
Perchlorate	mg/L	10	8	0.0245[a]	0	0.00097	0.00481	0.015	0.004
Trichloroethene (TCE)	mg/L	11	1	0.005[a]	0	0.00214	0.00214	0.00214	0.001

Notes:
a = ARBCA Screening Values
b = EPA Regional Screening Levels
Constituents whose concentration exceeded the PSV are in bold font
Detected Constituents shaded in gray
PSV = preliminary screening value
mg/L = milligrams per liter

2
3

1

TABLE IV E-2
Summary of Analytes with PSVs Detected in OB Unit Downgradient Groundwater Monitoring Well 05CW16-2

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	8	0	0.01	0				0.005
Silver, dissolved	mg/L	8	0	0.01	0				0.005
Aluminum	**mg/L**	**8**	**3**	**3.6[a]**	**1**	**0.378**	**2.168**	**5.23**	**0.1**
Aluminum, dissolved	mg/L	8	0	3.6[a]	0				0.1
Arsenic	**mg/L**	**8**	**1**	**0.01**	**1**	**0.0198**	**0.020**	**0.0198**	**0.01**
Arsenic, dissolved	mg/L	8	0	0.01	0				0.01
Barium	mg/L	8	8	2[a]	0	0.0753	0.105	0.154	
Barium, dissolved	mg/L	8	8	2[a]	0	0.0608	0.088	0.121	
Cadmium	mg/L	8	1	0.00	0	0.0018	0.0018	0.0018	0.001
Cadmium, dissolved	mg/L	8	1	0.00	0	0.0019	0.0019	0.0019	0.001
Chromium, total	mg/L	8	1	0.1[a]	0	0.0113	0.0113	0.0113	0.005
Chromium, total dissoved	mg/L	8	0	0.1[a]	0				0.005
Copper	mg/L	8	1	1.3[a]	0	0.0329	0.0329	0.0329	0.01
Copper, dissolved	mg/L	8	0	1.3[a]	0				0.01
Iron	**mg/L**	**8**	**8**	**1.1[a]**	**8**	**1.21**	**5.662**	**18.2**	
Iron, dissolved	**mg/L**	**8**	**4**	**1.1[a]**	**2**	**0.13**	**0.8265**	**1.75**	**0.05**
Mercury	mg/L	8	0	0.00	0				0.0002
Mercury, dissolved	mg/L	8	0	0.00	0				0.0002
Manganese	**mg/L**	**8**	**8**	**0.08**	**8**	**1.15**	**2.248**	**3.11**	
Manganese, dissolved	**mg/L**	**8**	**8**	**0.08**	**7**	**0.05**	**1.735**	**2.79**	
Nickel	mg/L	8	1	0.1[a]	0	0.0117	0.0117	0.0117	0.01
Nickel, dissolved	mg/L	8	1	0.1[a]	0	0.0104	0.0104	0.0104	0.01
Lead	**mg/L**	**8**	**2**	**0.01**	**1**	**0.00878**	**0.03639**	**0.064**	**0.005**
Lead, dissolved	mg/L	8	0	0.01	0				0.005
Vanadium	**mg/L**	**8**	**1**	**0.00**	**1**	**0.0225**	**0.0225**	**0.0225**	**0.02**
Vanadium, dissolved	mg/L	8	0	0.00	0				0.02
Zinc	mg/L	8	2	1.1[a]	0	0.113	0.159	0.205	0.05
Zinc, dissolved	mg/L	8	1	1.1[a]	0	0.08	0.08	0.08	0.05
cyanide	mg/L	9	1	0.2[a]	0	0.0106	0.0106	0.0106	0.005
cis-1,2-Dichloroethene	mg/L	9	0	0.07	0				0.001
Nitrogen, nitrate-nitrite	mg/L	8	0	10[a]	0				0.1
3-nitrotoluene	mg/L	8	0	0.73	0				0.0005
Perchlorate	mg/L	9	0	0.02	0				0.01
Trichloroethene (TCE)	mg/L	9	0	0.00	0				0.001

Notes:
a = ARBCA Screening Values
b = EPA Regional Screening Levels
Constituents whose concentration exceeded the PSV are in bold font
Detected Constituents shaded in gray
PSV = preliminary screening value
mg/L = milligrams per liter

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TABLE IV E-3
Summary of Analytes with PSVs Detected in OB Unit Downgradient Groundwater Monitoring Well 05CW16-3

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	7	1	0.018[a]	0	0.0056	0.0056	0.0056	0.005
Silver, dissolved	mg/L	6	0	0.018[a]	0				0.005
Aluminum	mg/L	7	2	3.6[a]	0	0.114	1.167	2.22	0.218
Aluminum, dissolved	mg/L	6	0	3.6[a]	0				0.1
Arsenic	mg/L	7	0	0.01[a]	0				0.01
Arsenic, dissolved	mg/L	6	0	0.01[a]	0				0.01
Barium	mg/L	7	7	2[a]	0	0.0617	0.122	0.161	
Barium, dissolved	mg/L	6	6	2[a]	0	0.0982	0.123	0.162	
Cadmium	mg/L	7	2	0.005[a]	0	0.0011	0.001	0.0012	0.001
Cadmium, dissolved	mg/L	6	0	0.005[a]	0				0.001
Chromium, total	mg/L	7	1	0.1[a]	0	0.006	0.006	0.006	0.005
Chromium, total	mg/L	6	0	0.1[a]	0				0.005
Copper	mg/L	7	0	1.3[a]	0				0.01
Copper, dissolved	mg/L	6	0	1.3[a]	0				0.01
Iron	**mg/L**	**7**	**7**	**1.1[a]**	**1**	**0.113**	**1.320**	**6.21**	
Iron, dissolved	mg/L	6	4	1.1[a]	0	0.109	0.205	0.296	0.05
Mercury	mg/L	7	0	0.002[a]	0				0.0002
Mercury, dissolved	mg/L	6	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**7**	**7**	**0.088[a]**	**7**	**0.952**	**4.580**	**7.82**	
Manganese, dissolved	**mg/L**	**6**	**6**	**0.088[a]**	**6**	**2.29**	**4.532**	**6.62**	
Nickel	mg/L	7	1	0.1[a]	0	0.0102	0.010	0.0102	0.01
Nickel, dissolved	mg/L	6	1	0.1[a]	0	0.0116	0.012	0.0116	0.01
Lead	mg/L	7	1	0.015[a]	0	0.0085	0.009	0.0085	0.005
Lead, dissolved	mg/L	6	0	0.015[a]	0				0.005
Vanadium	mg/L	7	0	0.0036[a]	0				0.02
Vanadium, dissolved	mg/L	6	0	0.0036[a]	0				0.02
Zinc	mg/L	7	1	1.1[a]	0	0.132	0.132	0.132	0.05
Zinc, dissolved	mg/L	6	0	1.1[a]	0				0.05
cyanide	mg/L	7	0	0.2[a]	0				0.005
cis-1,2-Dichloroethene	mg/L	7	0	0.07[a]	0				0.001
Nitrogen, nitrate-nitrite	mg/L	7	1	10[a]	0	0.6	0.600	0.6	0.1
3-nitrotoluene	mg/L	7	1	0.73[b]	0	0.0005	0.0005	0.0005	0.0005
Perchlorate	mg/L	7	2	0.0245[a]	0	0.00031	0.007	0.014	0.01
Trichloroethene (TCE)	mg/L	7	1	0.005[a]	0	0.00105	0.001	0.00105	0.001

Notes: Constituents whose concentration exceeded the PSV are in bold font
a = ARBCA Screening Values Detected Constituents shaded in gray PSV = preliminary screening value
b = EPA Regional Screening Levels mg/L = milligrams per liter

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TABLE IV E-4

Summary of Analytes with PSVs Detected in OB Unit Downgradient Groundwater Monitoring Well 05CW16-4

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	8	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	7	0	0.018[a]	0				0.005
Aluminum	**mg/L**	**8**	**7**	**3.6[a]**	**1**	**0.256**	**1.46**	**4.9**	**0.1**
Aluminum, dissolved	mg/L	7	1	3.6[a]	0	0.158	0.158	0.158	0.1
Arsenic	**mg/L**	**8**	**1**	**0.01[a]**	**1**	**0.0117**	**0.012**	**0.0117**	**0.01**
Arsenic, dissolved	mg/L	7	0	0.01[a]	0				0.01
Barium	mg/L	8	8	2[a]	0	0.0107	0.01453	0.0204	
Barium, dissolved	mg/L	7	2	2[a]	0	0.0104	0.0115	0.0126	0.01
Cadmium	mg/L	8	0	0.005[a]	0				0.001
Cadmium, dissolved	mg/L	7	0	0.005[a]	0				0.001
Chromium, total	mg/L	8	1	0.1[a]	0	0.005	0.005	0.005	0.005
Chromium, total	mg/L	7	0	0.1[a]	0				0.005
Copper	mg/L	8	0	1.3[a]	0				0.01
Copper, dissolved	mg/L	7	0	1.3[a]	0				0.01
Iron	**mg/L**	**8**	**8**	**1.1[a]**	**5**	**0.068**	**2.593**	**10.6**	
Iron, dissolved	mg/L	7	6	1.1[a]	0	0.0563	0.08537	0.111	0.05
Mercury	mg/L	8	1	0.002[a]	0	0.00025	0.00025	0.000248	0.0002
Mercury, dissolved	mg/L	7	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**8**	**5**	**0.088[a]**	**1**	**0.0188**	**0.0441**	**0.112**	**0.015**
Manganese, dissolved	mg/L	7	0	0.088[a]	0				0.015
Nickel	mg/L	8	0	0.1[a]	0				0.01
Nickel, dissolved	mg/L	7	0	0.1[a]	0				0.01
Lead	mg/L	8	1	0.015[a]	0	0.00687	0.00687	0.00687	0.005
Lead, dissolved	mg/L	7	0	0.015[a]	0				0.005
Vanadium	mg/L	8	0	0.0036[a]	0				0.02
Vanadium, dissolved	mg/L	7	0	0.0036[a]	0				0.02
Zinc	mg/L	8	0	1.1[a]	0				0.05
Zinc, dissolved	mg/L	7	0	1.1[a]	0				0.05
cyanide	mg/L	8	0	0.2[a]	0				0.005
cis-1,2-Dichloroethene	mg/L	8	0	0.07[a]	0				0.001
Nitrogen, nitrate-nitrite	mg/L	8	8	10[a]	0	0.495	0.8064	1.01	
3-nitrotoluene	mg/L	8	0	0.73[b]	0				0.0005

TABLE IV E-4
Summary of Analytes with PSVs Detected in OB Unit Downgradient Groundwater Monitoring Well 05CW16-4

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Perchlorate	**mg/L**	**9**	**7**	**0.0245[a]**	**2**	**0.0073**	**0.02134**	**0.04**	**0.01**
Trichloroethene (TCE)	mg/L	8	0	0.005[a]	0				0.001

Notes:
a = ARBCA Screening Values
b = EPA Regional Screening Levels
PSV = preliminary screening value
Constituents whose concentration exceeded the PSV are in bold font
Detected Constituents shaded in gray
mg/L = milligrams per liter

TABLE IV E-5
Total and Dissolved Metals above the PSV, Turbidity, and Dissolved Oxygen Results for OB Unit Monitoring Wells

StationID	Parameter Name	Unit	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
05CW16-1	Aluminum	mg/L	0.39 J	0.1 U	0.118 U	NS	0.352 =	0.161 =	NS	NS	0.465 =	0.176 =	0.83 =	1.6 =
05CW16-1	Aluminum, dissolved	mg/L	NS	0.1 U	0.1 U	NS	0.1 U	0.1 U	NS	NS	0.1 U	0.1 U	0.1 U	0.1 U
05CW16-1	Arsenic	mg/L	0.01 U	0.01 U	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U	0.01 U	0.01 U
05CW16-1	Arsenic, dissolved	mg/L	NS	0.01 U	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U	0.01 U	0.01 U
05CW16-1	Iron	mg/L	0.584 =	0.05 U	0.0813	NS	0.206 =	0.214 =	NS	NS	0.441 =	0.333 =	0.457	**2.45 =**
05CW16-1	Iron, dissolved	mg/L	NS	0.05 U	0.05 U	NS	0.05 U	0.05 U	NS	NS	0.05 U	0.05 U	0.05 U	0.05 U
05CW16-1	Lead	mg/L	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	NS	NS	0.005 U	0.005 U	0.005	0.005
05CW16-1	Lead, dissolved	mg/L	NS	0.005 U	0.005 U	NS	0.005 U	0.005 U	NS	NS	0.005 U	0.005 U	0.005	0.005
05CW16-1	Manganese	mg/L	0.0437	0.0282	**0.102 =**	NS	0.0279	0.0312	NS	NS	0.0333	0.0329 =	0.0422	0.0746
05CW16-1	Manganese, dissolved	mg/L	NS	0.0316	0.0425	NS	0.0274	0.03 =	NS	NS	0.0294	0.0278 =	0.0343	0.0399
05CW16-1	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	NS	0.02 U	0.02 U	NS	NS	0.02 U	0.02 U	0.02 U	0.02 U
05CW16-1	Vanadium, dissolved	mg/L	0.02 U	0.02 U	0.02 U	NS	0.02 U	0.02 U	NS	NS	0.02 U	0.02 U	0.02 U	0.02 U
05CW16-1	Oxygen, dissolved	ppm	NM	4.48	2.25	NM	6.47	5.19	NM	NM	6.36	4.1	NM	5.68
05CW16-1	Turbidity	NTU	NM	8.47	8.4	NM	6.67	11	NM	NM	24.3	13.6	29.3	9.81
05CW16-2	Aluminum	mg/L	**5.23 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NS	NS	NS	0.896 =	0.378	NS
05CW16-2	Aluminum, dissolved	mg/L	NS	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NS	NS	0.1 U	0.1 U	0.1 U	NS
05CW16-2	Arsenic	mg/L	**0.0198**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS
05CW16-2	Arsenic, dissolved	mg/L	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U	0.01 U	NS
05CW16-2	Iron	mg/L	**18.2 =**	**3.67 =**	**3.7 =**	**4.34 =**	**5.31 =**	**5.55 =**	NS	NS	NS	**3.32 =**	**1.21 =**	NS
05CW16-2	Iron, dissolved	mg/L	NS	**1.27 =**	0.05 U	**1.75 =**	0.05 U	0.13 =	NS	NS	0.05 U	0.156 =	0.05 U	NS
05CW16-2	Lead	mg/L	**0.064 =**	0.005 U	0.005 U	0.005	0.005 U	0.005 U	NS	NS	NS	0.00878 =	0.005	NS
05CW16-2	Lead, dissolved	mg/L	NS	0.005 U	0.005 U	0.005	0.005 U	0.005 U	NS	NS	0.005 U	0.005 U	0.005	NS
05CW16-2	Manganese	mg/L	**3.11 =**	**2.17 =**	**2.2 =**	**2.76 =**	**2.62 =**	**2.57 =**	NS	NS	NS	**1.15 =**	**1.4 =**	NS
05CW16-2	Manganese, dissolved	mg/L	NS	**2.22 =**	**2.12 =**	**2.79 =**	**2.6 =**	**2.62 =**	NS	NS	0.05 =	**0.943 =**	**0.534**	NS
05CW16-2	Vanadium	mg/L	**0.0225**	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	0.02 U	0.02 U	0.02 U	NS
05CW16-2	Vanadium, dissolved	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	0.02 U	0.02 U	0.02 U	NS
05CW16-2	Oxygen, dissolved	ppm	NM	0	0	0	0.11	0	0	NM	0.96	0.94	1.12	NM
05CW16-2	Turbidity	NTU	NM	2.13	1.46	2.23	2.59	4.2	26.1	NM	61.7	40.6	172	NM
05CW16-3	Aluminum	mg/L	2.22 J	0.1 U	0.1 U	0.1 U	0.114 =	0.1 U	NS	NS	NS	0.218 U	NS	NS
05CW16-3	Aluminum, dissolved	mg/L	NS	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NS	NS	NS	0.1 U	NS	NS
05CW16-3	Arsenic	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS	NS
05CW16-3	Arsenic, dissolved	mg/L	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS	NS
05CW16-3	Iron	mg/L	**6.21 =**	0.329 =	0.499 =	0.658	0.361 =	0.113 =	NS	NS	NS	1.07 =	NS	NS
05CW16-3	Iron, dissolved	mg/L	NS	0.296 =	0.196 =	0.217	0.05 U	0.05 U	NS	NS	NS	0.109 =	NS	NS

TABLE IV E-5
Total and Dissolved Metals above the PSV, Turbidity, and Dissolved Oxygen Results for OB Unit Monitoring Wells

StationID	Parameter Name	Unit	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
05CW16-3	Lead	mg/L	0.0085	0.005 U	0.005 U	0.005	0.005 U	0.005 U	NS	NS	NS	0.005 U	NS	NS
05CW16-3	Lead, dissolved	mg/L	NS	0.005 U	0.005 U	0.005	0.005 U	0.005 U	NS	NS	NS	0.005 U	NS	NS
05CW16-3	Manganese	mg/L	**7.82 =**	**5.21 =**	**5.44 =**	**6.72 =**	**2.13 =**	**0.952 J**	NS	NS	NS	**3.79 =**	NS	NS
05CW16-3	Manganese, dissolved	mg/L	NS	**5.37 =**	**5.43 =**	**6.62 =**	**2.29 =**	**3.27 J**	NS	NS	NS	**4.21 =**	NS	NS
05CW16-3	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	NS	0.02 U	NS	NS
05CW16-3	Vanadium, dissolved	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	NS	0.02 U	NS	NS
05CW16-3	Oxygen, dissolved	ppm	NM	0.07	0	0.09	0.59	0	NM	NM	NM	0.27	NM	NM
05CW16-3	Turbidity	NTU	NM	0.94	0.33	1.04	4.21	1.74	NM	NM	NM	16.5	NM	NM
05CW16-4	Aluminum	mg/L	1.54 J	0.1 U	1.03 =	0.835	**4.9 =**	0.256 =	0.794 =	NS	NS	0.868 =	NS	NS
05CW16-4	Aluminum, dissolved	mg/L	NS	0.1 U	0.1 U	0.1 U	0.158 =	0.1 U	0.1 U	NS	NS	0.1 U	NS	NS
05CW16-4	Arsenic	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	**0.0117**	0.01 U	0.01 U	NS	NS	0.01 U	NS	NS
05CW16-4	Arsenic, dissolved	mg/L	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	0.01 U	NS	NS
05CW16-4	Iron	mg/L	**3.09 =**	0.068 =	**2.15 =**	**1.95 =**	**10.6 =**	0.604 =	0.781 =	NS	NS	**1.5 =**	NS	NS
05CW16-4	Iron, dissolved	mg/L	NS	0.0766	0.111 =	0.0691	0.0972	0.0563	0.05 U	NS	NS	0.102 =	NS	NS
05CW16-4	Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005	0.00687	0.005 U	0.005	NS	NS	0.005 U	NS	NS
05CW16-4	Lead, dissolved	mg/L	NS	0.005 U	0.005 U	0.005	0.005 U	0.005 U	0.005	NS	NS	0.005 U	NS	NS
05CW16-4	Manganese	mg/L	0.0426	0.015 U	0.0209	0.0262	**0.112 =**	0.015 U	0.015	NS	NS	0.0188 =	NS	NS
05CW16-4	Manganese, dissolved	mg/L	NS	0.015 U	0.015 U	0.015	0.015 U	0.015 U	0.015	NS	NS	0.015 U	NS	NS
05CW16-4	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	0.02 U	NS	NS
05CW16-4	Vanadium, dissolved	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	NS	0.02 U	NS	NS
05CW16-4	Oxygen, dissolved	ppm	NM	5.2	3.87	3.02	2.66	5.33	5.33	NM	NM	8.45	NM	NM
05CW16-4	Turbidity	NTU	NM	4.94	41	10.9	126	25.4	56.2	NM	NM	61.6	NM	NM

Notes:

NS=Not Sampled
NM=Not Monitored
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
J = Concentration is estimated

Constituents whose concentration exceeded the PSV are in bold font.
mg/L = milligrams per liter
ppm = parts per million
NTU = Nephelometric Turbidity Units

VOCs

Tables IV E-6 and IV E-7 list the trichloroethene and cis-1,2-DCE results for the OB unit wells. Trichloroethene was detected in the up-gradient monitoring well 05CW16-1 at 2.14 µg/L and in down-gradient monitoring well 05CW16-3 at 1.05 µg/L in October 2006 samples. Cis-1,2-dichloroethene was detected in the up-gradient monitoring well 05CS16-1 at 1.88 µg/L in October 2006.

Explosives

Table IV E-8 lists the 3-nitrotoluene results for the OB unit wells. 3-nitrotoluene was detected once in down-gradient monitoring well 05CW16-3 at 0.5 µg/L in April 2007 samples.

Perchlorate

Table IV E-9 lists all of the perchlorate results from samples collected at the OB unit. Perchlorate has been detected in up-gradient well 05CW16-1 in 8 of 10 samples with the concentration below the PSV in all events. It has never been detected in down-gradient well 05CW16-2 and has only been detected twice in well 05CW16-3, below the PSV. It has been detected in seven of nine samples from 05CW16-4 (two samples were analyzed by method SW6850 in 1Q07) and the concentration exceeded the PSV in two cases.

OD Unit

The analytical results from the monitoring program at the OD unit are summarized in Table IV E-10 through Table IV E-13 by monitoring well. The tables list the constituents that have promulgated PSVs and were present above detection limits in any of the four wells in the unit in any sampling event. The constituents detected in a given well are shaded gray and the constituents whose concentration exceeded the PSV at least once are in bold font.

At the OD unit, metals detected at least once in any well above their respective PSV include aluminum, arsenic, cobalt, iron, lead, manganese, and vanadium. Perchlorate has been detected, but the concentrations were all below the 24.5 µg/L PSV. The explosives hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetracocine (HMX) have been detected, but only RDX had concentrations above its 0.61 µg/L PSV. Cyanide was detected once in the up-gradient well and once in one down-gradient well at concentrations below the PSV in both cases.

Phenol was detected in the October 2008 sample collected from well 91B19 for the first time in that well or any well at the OD unit. The concentration was 1,130 µg/L and slightly exceeded the PSV of 1,100 µg/L. Because of this anomalous occurrence, well 91B19 was sampled again in December 2008 and phenol was not detected in this sample at a detection limit of 9.52 µg/L.

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TABLE IV E-6
Trichloroethene Results (µg/L) for OB Unit Wells

Well	Q106	Q206	Q306	Q406	Q107	Q207	Q307	Q407	Q108	Q208	Q308	Q408
05CW16-1	1U	1U	1U	2.14=	1U	1U	1U	NS	1U	1U	1U	1U
05CW16-2	1U	1U	1U	1U	1U	1U	NS	NS	1U	1U	1U	NS
05CW16-3	1U	1U	1U	1.05=	1U	1U	NS	NS	NS	1U	NS	NS
05CW16-4	1U	1U	1U	1U	1U	1U	1U	NS	NS	1U	NS	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
Detections are shaded in gray

2

TABLE IV E-7
Cis-1,2-Dichloroethene Results (µg/L) for OB Unit Wells

Well	Q106	Q206	Q306	Q406	Q107	Q207	Q307	Q407	Q108	Q208	Q308	Q408
05CW16-1	1U	1U	1U	1.88=	1U	1U	1U	NS	1U	1U	1U	1U
05CW16-2	1U	1U	1U	1U	1U	1U	NS	NS	1U	1U	1U	NS
05CW16-3	1U	1U	1U	1U	1U	1U	NS	NS	NS	1U	NS	NS
05CW16-4	1U	1U	1U	1U	1U	1U	1U	NS	NS	1U	NS	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
Detections are shaded in gray

3

TABLE IV E-8
3-Nitrotoluene Results (µg/L) for OB Unit Wells

Well	Q106	Q206	Q306	Q406	Q107	Q207	Q307	Q407	Q108	Q208	Q308	Q408
05CW16-1	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	NS	NS	0.5U	0.5U	0.5U
05CW16-2	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	NS	NS	NS	0.5U	0.5U	NS
05CW16-3	0.5U	0.5U	0.5U	0.5U	0.5U	0.5=	NS	NS	NS	0.5U	NS	NS
05CW16-4	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	NS	NS	0.5U	NS	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
Detections are shaded in gray

4

1

TABLE IV E-9
Perchlorate Results (µg/L) for OB Unit Wells

Well	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	Q108	Q208	Q308	Q408
05CW16-1	1.11 U	4 U	NS	15 =	0.968 =	1.4 =	2.53 =	NS	14.1	1.16 =	1.7 U	1.6 =
05CW16-2	1.11 U	4 U	10 U	1 U	0.0612 U	0.0612 U	NS	NS	0.2 U	0.2 U	0.2 U	NS
05CW16-3	1.11 U	4 U	10 U	14 =	0.0612 U	0.0612 U	NS	NS	NS	0.314 =	NS	NS
05CW16-4	1.11 U	7.3 =	10 U	**40 =**	22 J[a] 13.3=	14 =	21.6 =	NS	NS	**31.2**	NS	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
J = Concentration is estimated

Detections shaded in gray
Concentrations that exceeded the PSV are in **bold** font
a: perchlorate samples were collected on 6 February 2007 and 28 February 2007 and both were analyzed using EPA method SW6850. The 6 February 2007 sample was analyzed beyond the hold time and the result was qualified as estimated during validation.

2

Metals

Aluminum (total) has commonly been detected in samples from well 91B18, never above the PSV. Aluminum (total) was commonly detected in down-gradient wells but concentrations were greater than the ARBCA PSV only in February 2006 in wells 05CW17-1 and 05CW17-2. Aluminum (dissolved) has been detected one time in the up-gradient well and has not been detected in the down-gradient wells.

Arsenic (total) has rarely been detected in samples collected in the up-gradient well but has not been detected in the dissolved form in any samples from any of the wells. Arsenic (total) has been detected above its PSV once in samples from well 05CW17-2.

Cobalt (total and dissolved) has been detected twice in up-gradient well 91B18 at concentrations below the PSV. Cobalt (total and dissolved) has frequently been detected in down-gradient well 91B19, twice above the PSV. Cobalt was detected once in well 05CW17-2 and the concentration was above the PSV. Cobalt has never been detected in downgradient well 05CW17-1

Iron (total) concentrations were frequently above the PSV in samples from up-gradient well 91B18 and in all samples from down-gradient well 91B19. Iron (total) was frequently detected in down-gradient wells 05CW17-1 and 05CW17-2, but concentrations were below the PSV in the majority of samples from these wells. Concentrations were consistently above the PSV only in well 91B19. The iron (total) concentrations were above the PSV once in well 05CW17-1 and twice in 05CW17-2. Iron (dissolved) was frequently detected in the up-gradient well above the PSV and was infrequently detected above the PSV in the down-gradient wells, except for 91B19.

Manganese (total and dissolved) was detected in all of the samples collected at the up-gradient well and all concentrations were above the PSV. Concentrations were above the PSV in the majority of samples collected from wells 91B19 and 05CW17-2 and concentrations were above the ARBCA PSV in approximately one-half of the samples from 05CW17-1 (Figure IV E-2).

Lead (total) has been detected at least once in each of the down-gradient wells with the concentration above the PSV twice in well 91B19 and once in well 05CW17-2.

Vanadium has been detected once in down-gradient well 05CW17-2 and the concentration was above the PSV. Vanadium has never been detected in any other well.

Table IV E-14 lists all of the metals results from the OD wells and includes turbidity and DO values. Generally, where turbidity is greater then 10 NTU and DO is greater than 2 mg/L as in well 91B19, there are more detections of metals at higher concentrations in the total metals results. Where turbidity and DO are high, there are fewer detections, and at lower concentrations, of the dissolved metals. This indicates that the high total metals results are released from suspended solids during the acid digestion process rather than dissolved in the water under natural conditions.

DO concentrations are typically low in all of the other wells and total and dissolved manganese concentrations are frequently above the new PSV. This indicates that the manganese is dissolved in anaerobic groundwater rather than sorbed to suspended solids at

TABLE IV E-10
Summary of Analytes with PSVs Detected in OD Unit Upgradient Groundwater Monitoring Well 91B18

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	10	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	9	0	0.018[a]	0				0.005
Aluminum	mg/L	10	6	3.6[a]	0	0.105	0.155	0.2	0.1
Aluminum, dissolved	mg/L	9	2	3.6[a]	0	0.104	0.123	0.142	0.1
Arsenic	**mg/L**	**10**	**2**	**0.01[a]**	**2**	**0.0125**	**0.0167**	**0.0209**	**0.01**
Arsenic, dissolved	mg/L	9	0	0.01[a]	0				0.01
Barium	mg/L	10	10	2[a]	0	0.0839	0.1439	0.231	
Barium, dissolved	mg/L	9	9	2[a]	0	0.0854	0.1451	0.233	
Cadmium	mg/L	10	3	0.005[a]	0	0.001	0.00123	0.0014	0.001
Cadmium, dissolved	mg/L	9	2	0.005[a]	0	0.0012	0.00125	0.0013	0.001
Cobalt	mg/L	10	2	0.073[a]	0	0.0262	0.02735	0.0285	0.02
Cobalt, dissolved	mg/L	9	2	0.073[a]	0	0.0268	0.02725	0.0277	0.02
Chromium, total	mg/L	10	0	0.1[a]	0				0.005
Chromium, total dissolved	mg/L	9	0	0.1[a]	0				0.005
Copper	mg/L	10	0	1.3[a]	0				0.01
Copper, dissolved	mg/L	9	0	1.3[a]	0				0.01
Iron	**mg/L**	**10**	**10**	**1.1[a]**	**7**	**0.142**	**4.917**	**14.9**	
Iron, dissolved	**mg/L**	**9**	**6**	**1.1[a]**	**5**	**0.172**	**4.872**	**11.9**	**0.05**
Mercury	mg/L	10	0	0.002[a]	0				0.0002
Mercury, dissolved	mg/L	9	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**10**	**10**	**0.088[a]**	**10**	**0.28**	**0.595**	**0.819**	
Manganese, dissolved	**mg/L**	**9**	**9**	**0.088[a]**	**9**	**0.299**	**0.6307**	**0.902**	
Nickel	mg/L	10	4	0.1[a]	0	0.0138	0.01755	0.0224	0.01
Nickel, dissolved	mg/L	9	4	0.1[a]	0	0.0122	0.0176	0.0222	0.01
Lead	mg/L	10	0	0.015[a]	0				0.005
Lead, dissolved	mg/L	9	0	0.015[a]	0				0.005
Vanadium	mg/L	10	0	0.003	0				0.02
Vanadium, dissolved	mg/L	9	0	0.003	0				0.02
Zinc	mg/L	10	7	1.1[a]	0	0.054	0.07394	0.0973	0.05
Zinc, dissolved	mg/L	9	6	1.1[a]	0	0.0516	0.06918	0.0974	0.05
cyanide	mg/L	10	1	0.2[a]	0	0.0097	0.0097	0.0097	0.005
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	mg/L	10	0	0.18[a]	0				0.0005
Nitrogen, nitrate-nitrite	mg/L	10	2	10[a]	0	0.123	0.2905	0.458	0.1

TABLE IV E-10
Summary of Analytes with PSVs Detected in OD Unit Upgradient Groundwater Monitoring Well 91B18

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Perchlorate	mg/L	10	5	0.024	0	0.000205	0.00629	0.02	0.004
Hexahydro-1,3,5-trinitro-1,3,5-triazine	**mg/L**	**10**	**1**	**0.000**	**1**	**0.00209**	**0.00209**	**0.00209**	**0.0005**

Notes:
a = ARBCA Screening Values
b = EPA Regional Screening Levels
PSV = preliminary screening value
mg/L = milligrams per liter
Detected Constituents shaded in gray
Constituents whose concentration exceeded the PSV are in bold font

TABLE IV E-11
Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 91B19

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	12	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	11	1	0.018[a]	0	0.0059	0.0059	0.0059	0.005
Aluminum	mg/L	12	9	3.6[a]	0	0.179	0.74	1.99	0.1
Aluminum, dissolved	mg/L	11	0	3.6[a]	0				0.1
Arsenic	mg/L	12	0	0.01[a]	0				0.01
Arsenic, dissolved	mg/L	11	0	0.01[a]	0				0.01
Barium	mg/L	12	12	2[a]	0	0.203	0.3624	0.713	
Barium, dissolved	mg/L	11	11	2[a]	0	0.23	0.3825	0.698	
Cadmium	mg/L	12	10	0.005[a]	0	0.0016	0.00238	0.0041	0.0023
Cadmium, dissolved	mg/L	11	9	0.005[a]	0	0.0015	0.00214	0.0032	0.0021
Cobalt	**mg/L**	**12**	**12**	**0.073[a]**	**2**	**0.0319**	**0.05147**	**0.105**	
Cobalt, dissolved	**mg/L**	**11**	**11**	**0.073[a]**	**1**	**0.0318**	**0.05485**	**0.104**	
Chromium, total	mg/L	12	3	0.1[a]	0	0.0057	0.0089	0.0115	0.005
Chromium, total dissoved	mg/L	11	0	0.1[a]	0				0.005
Copper	mg/L	12	9	1.3[a]	0	0.0135	0.03768	0.0865	0.01
Copper, dissolved	mg/L	11	1	1.3[a]	0	0.012	0.012	0.012	0.01
Iron	**mg/L**	**12**	**12**	**1.1[a]**	**12**	**2.05**	**7.683**	**22.8**	
Iron, dissolved	**mg/L**	**11**	**8**	**1.1[a]**	**3**	**0.0704**	**1.195**	**3.68**	**0.05**
Mercury	mg/L	12	1	0.002[a]	0	0.00024	0.00024	0.000244	0.0002
Mercury, dissolved	mg/L	11	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**12**	**12**	**0.088[a]**	**12**	**1.62**	**3.343**	**7.08**	
Manganese, dissolved	**mg/L**	**11**	**11**	**0.088[a]**	**11**	**1.96**	**3.747**	**7.42**	
Nickel	mg/L	12	12	0.1[a]	0	0.0167	0.03112	0.0648	
Nickel, dissolved	mg/L	11	11	0.1[a]	0	0.0189	0.03107	0.0596	
Lead	**mg/L**	**12**	**3**	**0.015[a]**	**2**	**0.0123**	**0.02367**	**0.0434**	**0.005**
Lead, dissolved	mg/L	11	0	0.015[a]	0				0.005
Vanadium	mg/L	12	0	0.0036[a]	0				0.02
Vanadium, dissolved	mg/L	11	0	0.0036[a]	0				0.02
Zinc	mg/L	12	12	1.1[a]	0	0.0623	0.1179	0.277	
Zinc, dissolved	mg/L	11	8	1.1[a]	0	0.06	0.08099	0.14	0.05
cyanide	mg/L	12	1	0.2[a]	0	0.0126	0.0126	0.0126	0.005
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	mg/L	12	0	0.18[a]	0				0.00322
Nitrogen, nitrate-nitrite	mg/L	12	0	10[a]	0				0.1

TABLE IV E-11

Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 91B19

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Perchlorate	mg/L	12	5	0.0245[a]	0	0.00021	0.00045	0.000727	0.01
Hexahydro-1,3,5-trinitro-1,3,5-triazine	mg/L	12	0	0.00061[a]	0				0.0005

Notes:

a = ARBCA Screening Values

b = EPA Regional Screening Levels

PSV = preliminary screening value

mg/L = milligrams per liter

Detected Constituents shaded in gray

Constituents whose concentration exceeded the PSV are in bold font

TABLE IV E-12
Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 05CW17-1

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	12	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	11	0	0.018[a]	0				0.005
Aluminum	**mg/L**	**12**	**4**	**3.6[a]**	**1**	**0.116**	**1.423**	**5.02**	**0.1**
Aluminum, dissolved	mg/L	11	0	3.6[a]	0				0.1
Arsenic	mg/L	12	0	0.01[a]	0				0.01
Arsenic, dissolved	mg/L	11	0	0.01[a]	0				0.01
Barium	mg/L	12	12	2[a]	0	0.0157	0.0336	0.0555	
Barium, dissolved	mg/L	11	11	2[a]	0	0.0146	0.0313	0.0518	
Cadmium	mg/L	12	1	0.005[a]	0	0.0012	0.0012	0.0012	0.001
Cadmium, dissolved	mg/L	11	0	0.005[a]	0				0.001
Cobalt	mg/L	12	0	0.073[a]	0				0.02
Cobalt, dissolved	mg/L	11	0	0.073[a]	0				0.02
Chromium, total	mg/L	12	1	0.1[a]	0	0.0069	0.0069	0.0069	0.005
Chromium, total dissoved	mg/L	11	0	0.1[a]	0				0.005
Copper	mg/L	12	0	1.3[a]	0				0.01
Copper, dissolved	mg/L	11	0	1.3[a]	0				0.01
Iron	**mg/L**	**12**	**10**	**1.1[a]**	**1**	**0.0575**	**1.425**	**12.8**	**0.05**
Iron, dissolved	mg/L	11	4	1.1[a]	0	0.098	0.1175	0.146	0.05
Mercury	mg/L	12	0	0.002[a]	0				0.0002
Mercury, dissolved	mg/L	11	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**12**	**11**	**0.088[a]**	**6**	**0.0196**	**0.2446**	**0.814**	**0.015**
Manganese, dissolved	**mg/L**	**11**	**8**	**0.088[a]**	**4**	**0.018**	**0.2307**	**0.913**	**0.015**
Nickel	mg/L	12	1	0.1[a]	0	0.0299	0.0299	0.0299	0.01
Nickel, dissolved	mg/L	11	0	0.1[a]	0				0.01
Lead	mg/L	12	1	0.015[a]	0	0.0099	0.0099	0.0099	0.005
Lead, dissolved	mg/L	11	0	0.015[a]	0				0.005
Vanadium	mg/L	12	0	0.0036[a]	0				0.02
Vanadium, dissolved	mg/L	11	0	0.0036[a]	0				0.02
Zinc	mg/L	12	1	1.1[a]	0	0.119	0.119	0.119	0.05
Zinc, dissolved	mg/L	11	0	1.1[a]	0				0.05
cyanide	mg/L	12	0	0.2[a]	0				0.005
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	mg/L	12	0	0.18[a]	0				0.0005
Nitrogen, nitrate-nitrite	mg/L	12	2	10[a]	0	0.224	0.797	1.37	0.1

TABLE IV E-12

Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 05CW17-1

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Perchlorate	mg/L	12	8	0.0245[a]	0	0.00014	0.0025	0.016	0.01
Hexahydro-1,3,5-trinitro-1,3,5-triazine	mg/L	12	0	0.00061	0				0.0005

Notes:

a = ARBCA Screening Values

b = EPA Regional Screening Levels

PSV = preliminary screening value

mg/L = milligrams per liter

Detected Constituents shaded in gray

Constituents whose concentration exceeded the PSV are in bold font

TABLE IV E-13
Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 05CW17-2

Parameter Name	Unit	Number Results	Number Detects	PSV	Number Exceedances	Minimum Detect	Average Detect	Maximum Detect	Maximum Non-Detect
Silver	mg/L	10	0	0.018[a]	0				0.005
Silver, dissolved	mg/L	9	0	0.018[a]	0				0.005
Aluminum	**mg/L**	**10**	**3**	**3.6[a]**	**1**	**0.156**	**3.506**	**10.2**	**0.1**
Aluminum, dissolved	mg/L	9	0	3.6[a]	0				0.1
Arsenic	**mg/L**	**10**	**1**	**0.01[a]**	**1**	**0.0158**	**0.0158**	**0.0158**	**0.01**
Arsenic, dissolved	mg/L	9	0	0.01[a]	0				0.01
Barium	mg/L	10	10	2[a]	0	0.0166	0.07891	0.206	
Barium, dissolved	mg/L	9	9	2[a]	0	0.0317	0.0612	0.11	
Cadmium	mg/L	10	3	0.005[a]	0	0.0011	0.00123	0.0014	0.001
Cadmium, dissolved	mg/L	9	3	0.005[a]	0	0.001	0.00107	0.0011	0.001
Cobalt	**mg/L**	**10**	**1**	**0.073[a]**	**1**	**0.0795**	**0.0795**	**0.0795**	**0.02**
Cobalt, dissolved	mg/L	9	0	0.073[a]	0				0.02
Chromium, total	mg/L	10	1	0.1[a]	0	0.0361	0.0361	0.0361	0.005
Chromium, total dissoved	mg/L	9	0	0.1[a]	0				0.005
Copper	mg/L	10	2	1.3[a]	0	0.0127	0.1118	0.211	0.01
Copper, dissolved	mg/L	9	1	1.3[a]	0	0.0102	0.0102	0.0102	0.01
Iron	**mg/L**	**10**	**8**	**1.1[a]**	**2**	**0.0501**	**4.592**	**34.2**	**0.05**
Iron, dissolved	mg/L	9	1	1.1[a]	0	0.0913	0.0913	0.0913	0.05
Mercury	mg/L	10	0	0.002[a]	0				0.0002
Mercury, dissolved	mg/L	9	0	0.002[a]	0				0.0002
Manganese	**mg/L**	**10**	**10**	**0.088[a]**	**9**	**0.0178**	**1.44**	**3.59**	
Manganese, dissolved	**mg/L**	**9**	**9**	**0.088[a]**	**9**	**0.104**	**1.038**	**2.77**	
Nickel	mg/L	10	4	0.1[a]	0	0.0102	0.01688	0.0324	0.01
Nickel, dissolved	mg/L	9	4	0.1[a]	0	0.01	0.01153	0.0148	0.01
Lead	**mg/L**	**10**	**1**	**0.015[a]**	**1**	**0.0602**	**0.0602**	**0.0602**	**0.005**
Lead, dissolved	mg/L	9	0	0.015[a]	0				0.005
Vanadium	**mg/L**	**10**	**1**	**0.0036[a]**	**1**	**0.0475**	**0.0475**	**0.0475**	**0.02**
Vanadium, dissolved	mg/L	9	0	0.0036[a]	0				0.02
Zinc	mg/L	10	6	1.1[a]	0	0.051	0.1142	0.323	0.05
Zinc, dissolved	mg/L	9	5	1.1[a]	0	0.0538	0.09484	0.155	0.05
cyanide	mg/L	10	0	0.2[a]	0				0.005
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	mg/L	10	2	0.18[a]	0	0.00064	0.00106	0.00148	0.0005
Nitrogen, nitrate-nitrite	mg/L	10	7	10[a]	0	0.124	0.4051	0.904	0.1

TABLE IV E-13

Summary of Analytes with PSVs Detected in OD Unit Downgradient Groundwater Monitoring Well 05CW17-2

Perchlorate	mg/L	10	9	0.0245[a]	0	0.00016	0.00492	0.019	0.00111
Hexahydro-1,3,5-trinitro-1,3,5-triazine	**mg/L**	**10**	**3**	**0.00061[a]**	**3**	**0.00097**	**0.00164**	**0.00286**	**0.0005**

Notes:

a = ARBCA Screening Values

b = EPA Regional Screening Levels

PSV = preliminary screening value

mg/L = milligrams per liter

Detected Constituents shaded in gray

Constituents whose concentration exceeded the PSV are in bold font

1

TABLE IV E-14
Total and Dissolved Metals, Turbidity, and Dissolved Oxygen Results for OD Unit Monitoring Wells

StationID	Parameter Name	Unit	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
91B18	Aluminum	mg/L	0.151 =	0.1 U	0.105 =	0.1 U	0.158 =	0.1 U	0.128 =	NA	0.2 =	0.188 =	0.1 U	NA
91B18	Aluminum, dissolved	mg/L	NA	0.1 U	0.1 U	0.1 U	0.104 =	0.1 U	0.1 U	NA	0.142 =	0.1 U	0.1 U	NA
91B18	Arsenic	mg/L	0.01 U	0.01 U	**0.0125 =**	**0.0209 =**	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	NA
91B18	Arsenic, dissolved	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	0.01 U	NA
91B18	Iron	mg/L	**2.81 =**	**3.06 =**	**9.65 =**	**14.9 =**	0.261 =	**12.2 =**	**2.35 =**	NA	0.142 =	**3.42 =**	0.378 =	NA
91B18	Iron, dissolved	mg/L	NA	**1.44 =**	**4.02 =**	**11.9 =**	0.05 U	**10.1 =**	**1.6 =**	NA	0.05 U	0.172 =	0.05 U	NA
91B18	Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.005 U	0.005 U	0.005 U	NA
91B18	Cobalt	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	0.0262=	0.0285 =	0.02 U	NS
91B18	Cobalt, dissolved	mg/L	NS	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	0.0268=	0.0277 =	0.02 U	NS
91B18	Lead, dissolved	mg/L	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.005 U	0.005 U	0.005 U	NA
91B18	Manganese	mg/L	**0.442 =**	**0.28 J**	**0.547 =**	**0.78 =**	**0.324 =**	**0.728 =**	**0.506 =**	NA	**0.767 =**	**0.757 =**	**0.819 =**	NA
91B18	Manganese, dissolved	mg/L	NA	**0.299 J**	**0.538 =**	**0.798 =**	**0.325 =**	**0.798 =**	**0.494 =**	NA	**0.787 =**	**0.735 =**	**0.902 =**	NA
91B18	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	0.02 U	0.02 U	0.02 U	NA
91B18	Vanadium, dissolved	mg/L	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	0.02 U	0.02 U	0.02 U	NA
91B18	Oxygen, dissolved	ppm	NM	0	0	0	0.29	0	0	NM	6.36	1	0.09	NS
91B18	Turbidity	NTU	NM	3.5	9.62	2.37	5.82	1.91	2.59	NM	4.22	9	8.23	NS
91B19	Aluminum	mg/L	0.1 U	0.275 =	0.282 =	0.1 U	0.465 =	1.99 =	0.823 =	0.179 =	0.465 =	0.561 =	1.62 =	0.1 U
91B19	Aluminum, dissolved	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
91B19	Arsenic	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
91B19	Arsenic, dissolved	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
91B19	Cobalt	mg/L	0.0378 =	0.0319 =	0.0425 =	0.0385 =	0.0323 =	0.0561 =	0.0539 =	0.0349 J	0.0617=	**0.0755 =**	**0.105 =**	0.0476 =
91B19	Cobalt, dissolved	mg/L	NS	0.0455 =	0.0375 =	0.0396 =	0.0318 =	0.0501 =	0.0361 =	0.0642 J	0.0669=	**0.0711 =**	**0.104 =**	0.0565 =
91B19	Iron	mg/L	**4.36 =**	**4.54 =**	**4.22 =**	**2.05 =**	**4.72 =**	**22.8 =**	**8.57 =**	**4.7 =**	**6.65 =**	**9.66 =**	**17.6 =**	**2.32 =**
91B19	Iron, dissolved	mg/L	NA	0.287 =	0.05 U	0.243 =	0.05 U	0.05 U	0.0704 =	**3.68 =**	**1.66 =**	**1.1 =**	**1.54 =**	0.976 =
91B19	Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	**0.0153 =**	**0.0434 =**	0.005 U	0.005 U	0.005 U	0.0123 =	0.005 U
91B19	Lead, dissolved	mg/L	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
91B19	Manganese	mg/L	**2.25 =**	**1.62 J**	**2.18 =**	**2.21 =**	**2.23 =**	**4.33 =**	**3.05 =**	**2.35 J**	**4.06 =**	**5.68 =**	**7.08 =**	**3.08 =**
91B19	Manganese, dissolved	mg/L	NA	**2.02 J**	**1.96 =**	**2.18 =**	**2.28 =**	**4.43 =**	**2.49 =**	**4.66 J**	**4.64 =**	**5.5 =**	**7.42 =**	**3.64 =**
91B19	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
91B19	Vanadium, dissolved	mg/L	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
91B19	Oxygen, dissolved	ppm	NM	4.98	0.74	2.57	4.29	0	0.92	0.1	0.23	3.9	1.15	4.28
91B19	Turbidity	NTU	NM	59.4	17.1	65.9	258	462	7100	432	E3*	203	762	48.1
05CW17-1	Aluminum	mg/L	**5.02 J**	0.1 U	0.1 U	0.408 =	0.1 U	0.1 U	0.1 U	0.1 U	0.116 =	0.147 =	0.1 U	0.1 U
05CW17-1	Aluminum, dissolved	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
05CW17-1	Arsenic	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
05CW17-1	Arsenic, dissolved	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
05CW17	Cobalt	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
05CW17	Cobalt, dissolved	mg/L	NS	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
05CW17-1	Iron	mg/L	**12.8 =**	0.05 U	0.148 =	0.05 U	0.119 =	0.0886 =	0.141 =	0.172 =	0.217 =	0.431 =	0.0575 =	0.0777 =
05CW17-1	Iron, dissolved	mg/L	NA	0.12 =	0.05 U	0.106 =	0.05 U	0.05 U	0.05 U	0.146 =	0.05 U	0.098 =	0.05 U	0.05 U
05CW17-1	Lead	mg/L	0.0099 =	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
05CW17-1	Lead, dissolved	mg/L	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
05CW17-1	Manganese	mg/L	**0.403 =**	0.0196 =	**0.0935 =**	**0.814 =**	0.0373 =	0.0524 =	0.0396 =	**0.515 =**	0.015 U	0.0257 =	**0.41 =**	**0.28 =**
05CW17-1	Manganese, dissolved	mg/L	NA	0.015 U	0.0713 =	**0.913 =**	0.0212 =	0.015 U	0.0319 =	**0.112 =**	0.015 U	0.018 =	**0.406 =**	**0.272 =**
05CW17-1	Vanadium	mg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U

TABLE IV E-14
Total and Dissolved Metals, Turbidity, and Dissolved Oxygen Results for OD Unit Monitoring Wells

StationID	Parameter Name	Unit	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
05CW17-1	Vanadium, dissolved	mg/L	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
05CW17-1	Oxygen, dissolved	ppm	NM	1.55	0.87	0.38	0.28	0	0	0	1.11	0.57	0	0.39
05CW17-1	Turbidity	NTU	NM	3.34	2.76	1.36	8.47	14.2	1.94	7.11	9.58	20.5	13.4	6.63
05CW17-2	Aluminum	mg/L	**10.2 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.162 =	NA	0.1 U	0.156 =	NA
05CW17-2	Aluminum, dissolved	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	0.1 U	0.1 U	NA
05CW17-2	Arsenic	mg/L	**0.0158 =**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	NA
05CW17-2	Arsenic, dissolved	mg/L	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U	0.01 U	NA
05CW17-2	Cobalt	mg/L	**0.0795 =**	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	0.02 U	0.02 U	NS
05CW17-2	Cobalt, dissolved	mg/L	NS	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NS	0.02 U	0.02 U	NS
05CW17-2	Iron	mg/L	**34.2 =**	0.205 =	0.05 U	0.05 U	0.0501 =	0.191 =	0.113 =	**1.3 =**	NA	0.0964 =	0.579 =	NA
05CW17-2	Iron, dissolved	mg/L	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0913 =	NA	0.05 U	0.05 U	NA
05CW17-2	Lead	mg/L	**0.0602 =**	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.005 U	0.005 U	NA
05CW17-2	Lead, dissolved	mg/L	NA	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.005 U	0.005 U	NA
05CW17-2	Manganese	mg/L	**3.59 =**	0.0178 =	**0.126 =**	**0.175 =**	**0.862 =**	**3.26 =**	**1.1 =**	**1.95 =**	NA	**0.916 =**	**2.4 =**	NA
05CW17-2	Manganese, dissolved	mg/L	NA	**0.104 J**	**0.124 =**	**0.172 =**	**0.858 =**	**1.07 =**	**1.13 =**	**2.2 =**	NA	**0.913 =**	**2.77 =**	NA
05CW17-2	Vanadium	mg/L	**0.0475 =**	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	0.02 U	0.02 U	NA
05CW17-2	Vanadium, dissolved	mg/L	NA	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NA	0.02 U	0.02 U	NA
05CW17-2	Oxygen, dissolved	ppm	NM	4.23	2.52	2.04	0.41	0.1	0.64	0.35	NS	1.3	0.94	NS
05CW17-2	Turbidity	NTU	NM	5.81	8.01	3.74	7.45	4.26	32.8	74	NS	5.8	59	NS

Notes:
NS=Not Sampled
NM=Not Monitored
"=" Measured concentration was greater than or equal to the reporting limit.
U = Compound not detected
J = Concentration is estimated

E^3 = reading too high to register on instrument

Constituents whose concentration exceeded the PSV are in bold font.

these wells and manganese concentrations are greater than the PSV because of natural processes driving the dissolution of manganese solids in the soil matrix.

Explosives

Table IV E-15 lists all of the RDX results from the OD wells. RDX has been detected once in the up-gradient monitoring well 91B18 at 2.09 µg/L in October 2006 and in down-gradient monitoring well 05CW17-2 samples collected in February (2.86 µg/L), May (0.97 µg/L), and September (1.09 µg/L) of 2006. RDX has not been detected in any samples collected from any well in 2007 or 2008.

Table IV E-16 lists all of the HMX results from the OD wells. HMX has been detected in down-gradient monitoring well 05CW17-2 samples collected in February (1.48 µg/L) and May (0.64 µg/L) of 2006. HMX has not been detected in any samples collected from any well in 2007 or 2008.

Perchlorate

Table IV E-17 lists all of the perchlorate results from the OD wells. Perchlorate has frequently been detected in the monitoring wellsbut concentrations have always been below the 24.5 µg/L PSV.

IV E-3 Identification of Upper-Most Aquifer and Aquifers Hydraulically Interconnected Beneath the Facility Property ADEM Admin. Codes R.335-14-8-.02(5)(c)2 and R.335-14-8-.02(14)

Site-specific geology and hydrogeology data is available in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2.

The information contained herein currently is based on the *Anniston Army Depot Ammunition Storage Area Remedial Investigation Report* (SAIC 2001) and the *ANAD OB and OD Site Characterization Memorandum* (URS, October 2005), Attachment 2, Section IV.

The northwestern portion of ANAD overlies the Valley and Ridge Aquifer System. The horizontal extent of this aquifer system is shown in Figure IV E-3. The groundwater flow system in the ANAD area is complex and is the result of the interplay of several factors. The most important components of the regional hydrogeology affecting the ANAD, of which the OB and OD units are a part, are the thickness of the unconsolidated zone, the secondary porosity of the bedrock, and the existence of a nearby artesian groundwater regime of fault-controlled groundwater pathways (Fauss and Mata 1987, Osborne and Szabo 1984, Scott et al. 1987). The following section reviews the current conceptual elements of the hydrogeologic model. The primary elements for the model are derived from observations made during the drilling of shallow and deep environmental monitoring wells in the ANAD area.

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TABLE IV E-15
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX, ug/L) Results for OD Unit Wells

Well	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
91B18	0.5 U	0.5 U	0.5 U	**2.09 =**	0.5 U	0.5 U	0.5 U	NS	0.5 UJ	0.5 U	0.5 U	NS
91B19	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
05CW17-1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
05CW17-2	**2.86 =**	**0.97 =**	**1.09 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration greater than or equal to the reporting limit.
U = Compound not detected
Detections shaded in gray
Concentrations that exceeded the PSV are in **bold** font

TABLE IV E-16
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetracocine (HMX, µg/L) Results for OD Unit Wells

Well	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
91B18	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	0.5 U	NS
91B19	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
05CW17-1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
05CW17-2	0.5 U	1.48 =	0.64 =	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
"=" Measured concentration greater than or equal to the reporting limit.
U = Compound not detected
Detections shaded in gray

TABLE IV E-17
Perchlorate Results (µg/L) for OD Unit Wells

Well	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08
91B18	1.11 U	4 U	10 J	20 =	0.205 =	0.0612 U	0.2 U	NS	0.938 J	0.2 U	0.324 =	NS
91B19	1.11 U	4 U	10 U	1 U	0.214 =	0.333 =	0.464 =	0.2 U	0.2 U	0.727 =	0.2 U	0.505 =
05CW17-1	1.11 U	4 U	10 UJ	16 =	0.307 =	0.144 J	2.77 =	0.224 =	0.2 U	0.155 J	0.414 =	0.34 =
05CW17-2	1.11 U	8 =	6.6 =	19 =	1.55 =	2.25 =	0.164 J	2.78 =	NS	2.66 =	1.26 =	NS

Notes:
NS = Not Sampled
µg/L = micrograms per liter
U = Compound not detected
"=" Measured concentration greater than or equal to the reporting limit.
UJ = Compound not detected, detection limit is estimated
J = Concentration is estimated
Detections shaded in gray

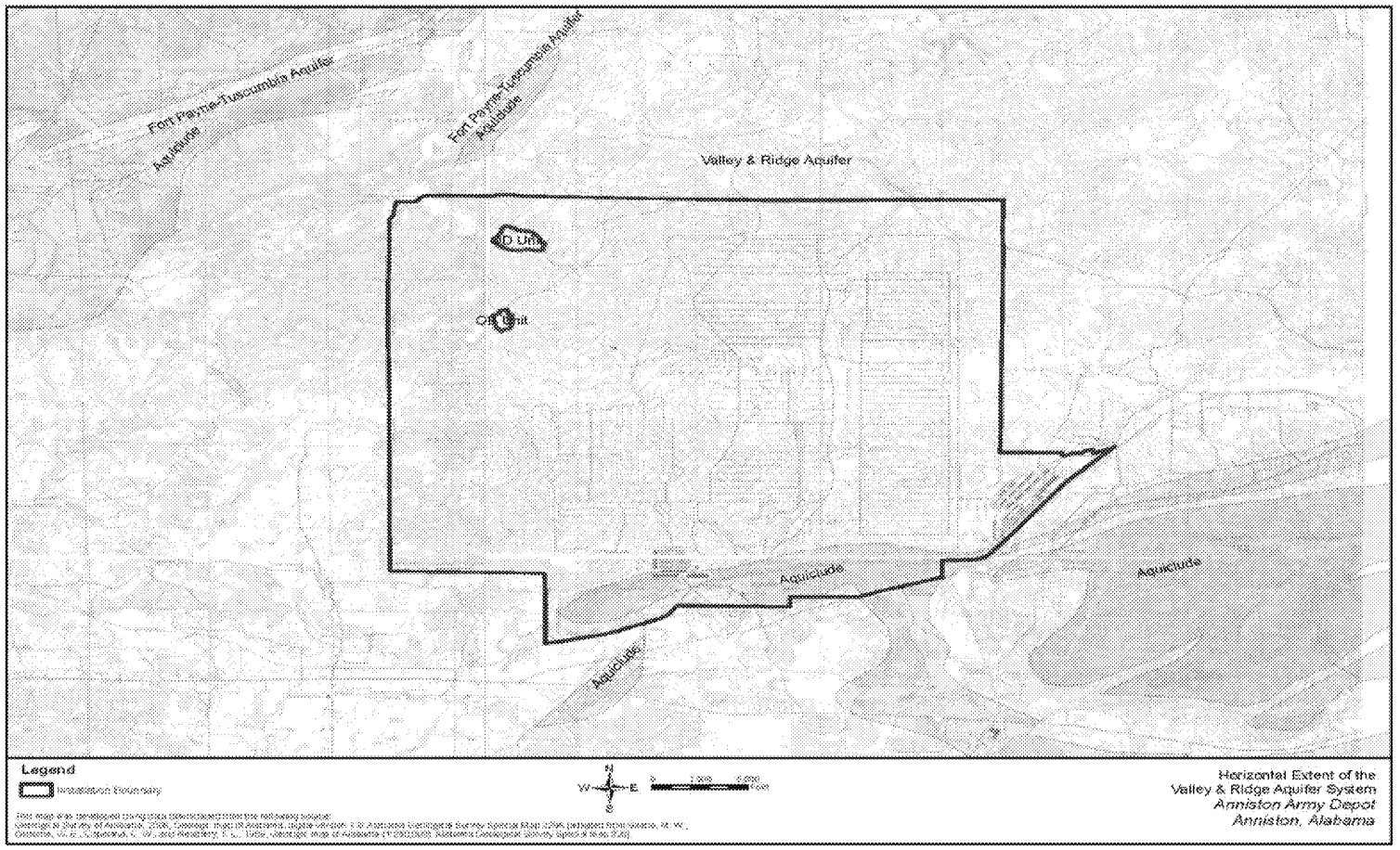


FIGURE IV E-3
Horizontal Extent

A conceptual cross-section illustrating relationship of these elements beneath SWMU 35 (located between and slightly east of the OB and OD units) is shown in Figure IV E-4.

Progressing from near surface to saturated within the groundwater system, the following elements are present:

- A shallow residuum zone of low-permeability, sandy to silty clay (including discontinuous perched groundwater),
- A regime consisting of low- to high-permeability clayey sand and gravel formed at the top of weathered bedrock (a transitional zone), and
- A bedrock zone characterized by a fracture flow system with relatively impermeable dolostone matrix blocks.

IV E-3a Residuum Interval

Site-specific geology and hydrogeology data is available in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2.

The aquifer at ANAD consists of unconsolidated residuum in full to partial hydraulic communication with the underlying bedrock zone. Migration of infiltrating surface water is near vertical through the soil horizons and underlying residuum to the bedrock aquifer. Interception of infiltrating groundwater by a perched water table may result in localized lateral movement reflecting the gradient of the perched interval.

The thick, cherty residuum blanketing the Paleozoic rocks of the region, especially the Knox formation at the ASA, is an important hydrogeologic control. Regionally, residuum thickness is estimated to be from 30 to 100 feet (Scott et al., 1987). The transition from residuum to bedrock is often not apparent during drilling operations because of the presence of large chert or limestone boulders "floating" in the clay residuum. Refusal of drill augers on such boulders may give a false impression of encountering top of bedrock. In addition, identification of the top of bedrock is complicated by the presence of a zone of weathered bedrock (transition zone) and an upper boundary of the bedrock surface that is often extremely uneven because of multiple fractures and solution-enhanced fractures.

Thick residuum stores recharge waters that otherwise would be lost to evaporation or runoff. The residuum also slowly releases the water to the underlying aquifers or discharges it to shallow streams. Together with a high annual rainfall and humid climate, this slow release of water maximizes aquifer recharge. The transmissivity of the residuum typically is greatest at the transitional zone at the unconsolidated/bedrock interface.

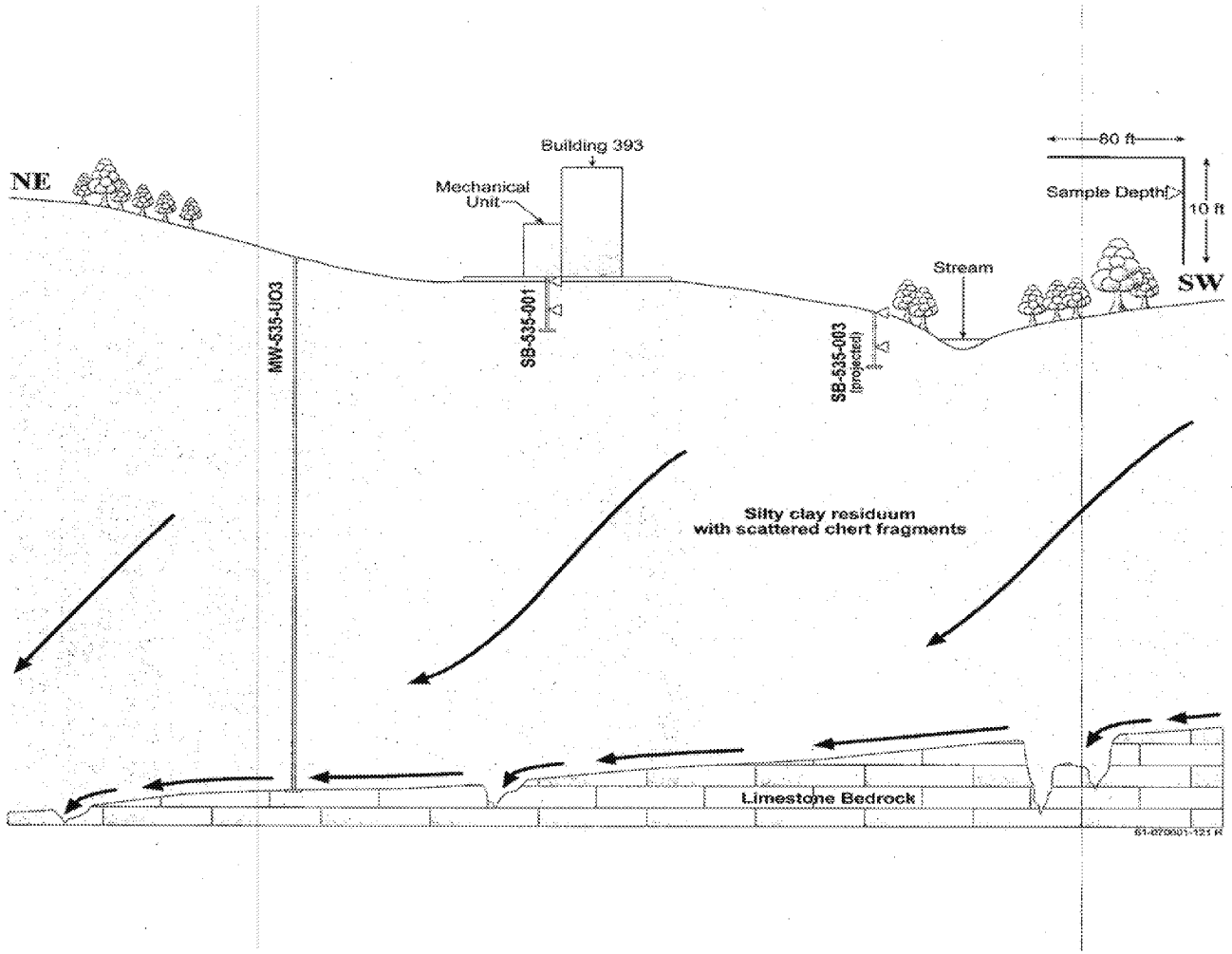


FIGURE IV E-4
Conceptual Cross-Section

The residuum is principally a low-yielding material [estimated hydraulic conductivities of 10-7 to 10-5 cm/sec (ESE, 1981)], its secondary porosity, resulting from weathering processes, results in a limited amount of groundwater leakage to the underlying shallow bedrock aquifer.

IV E-3b Bedrock Aquifer

Site-specific geology and hydrogeology data is available in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2. The Knox Group carbonates make up the principal bedrock aquifer (Pritchett, 1995; Osborne and Szabo, 1984). Low primary porosity and permeability characterize Paleozoic rocks of this region. Localized zones of secondary porosity and permeability are present in the bedrock and are important in storing and transmitting water. Fracturing and dissolution are the major causes of secondary permeability and dramatically augment transmissivity.

The Knox Group aquifer underlying ANAD extends from the Mississippian clastic rocks near Cane Creek in the north to where it meets the Rome Formation near Choccolocco Creek in the southeast. The less permeable Rome and Shady Formations block groundwater moving to the south in the Knox Group in the area of the Jacksonville Fault. Subsequently, groundwater probably moves along the Jacksonville Fault, joining groundwater from distant sources moving parallel to the fault at depth. If Knox-sourced groundwater encounters the Weisner Formation, the groundwater probably mixes with the Weisner's recharge water from Coldwater Mountain. The groundwater then is forced, under pressure, out of the edge of the Shady Dolomite cap at Coldwater Spring (Fauss and Mata, 1987).

In the ANAD Special Interest Area RI (SAIC 1998), water levels from bedrock and unconsolidated zone monitoring wells (with connection to the underlying bedrock aquifer) located in SWMUs 5, 8, 10, 11, 26, 27, and 35 were used in drawing the drawing of a potentiometric surface maps. There are no unconsolidated zone monitoring wells paired with bedrock wells in the vicinity of the OB or OD units suitable for assessing the magnitude or direction of vertical gradients between the two aquifers.

Regional groundwater flow occurs at a greater rate within the deep portion of the aquifer because of the more developed karst geomorphology. In the deep groundwater system, voids, fractures, and conduits are interconnected on a larger scale at depth and transport water in the deep system over greater distances and in less time than the shallow groundwater system.

IV E-4 Groundwater Flow, Direction, Rate, and Source of Information ADEM Admin. Codes R.335-14-8-.02(5)(c)2 and R.335-14-8-.02(14)

In general the groundwater flow direction in the vicinity of the OB unit is to the north/northwest. The recorded depth to groundwater during the two year groundwater monitoring period ranged between 4.3 feet below top of casing (btoc) to greater than 22.7 feet btoc.

The groundwater velocity beneath the OB unit was calculated using the water table elevation map presented in Figure IV E-5. The groundwater elevations established for the

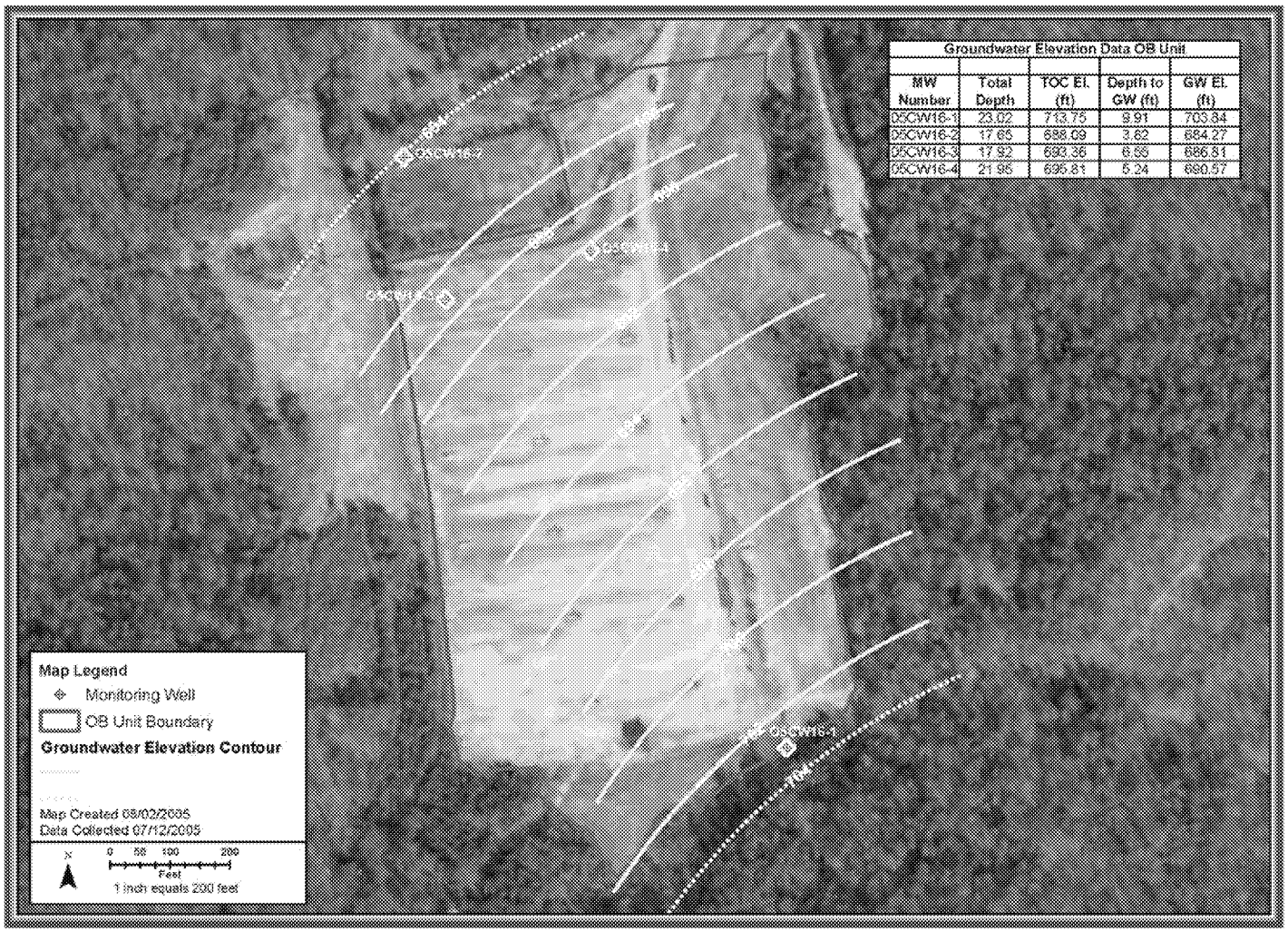
up-gradient well (05CW16-1) to the furthest down-gradient well (05CW16-2) were used to calculate the hydraulic gradient to measure groundwater flow velocity at the unit.

The Darcy equation V=KI/n was used to calculate the flow rates for this memorandum, where V is velocity of groundwater flow (flow rate), I is the hydraulic gradient, and n is the estimated porosity of the porous medium. A flow rate of 1.72×10^{-7} ft/sec was calculated using an average hydraulic conductivity value of 2.095×10^{-6} ft/sec determined from slug test data, an estimated porosity of 20%, and a hydraulic gradient of 0.0164 ft/ft.

The lithology of the soil encountered in the OD unit borings was similar to the OB unit with the addition of some brown silty clay and sandy clays encountered. Also present were sand and chert fragments layers.

In general the groundwater flow direction in the vicinity of the OD unit is to the west/northwest. The recorded depth to groundwater during the two year groundwater monitoring period ranged between 1.5 feet btoc to greater than 22.7 feet btoc.

The groundwater velocity beneath the OD unit was calculated using the water table elevation map presented in Figure IV E-6. The groundwater elevations established for the up-gradient well (91B18) to the furthest down-gradient well (05CW17-1) were used to calculate the hydraulic gradient to measure groundwater flow velocity at the unit. The Darcy equation V=KI/n was used to calculate the flow rates for this memorandum. A flow rate of 8.73 × 10-7 ft/sec was calculated using the average hydraulic conductivity value of 1.243 × 10-5 ft/sec determined from a slug test, an estimated porosity of 20%, and a hydraulic gradient of 0.0141 ft/ft.



Groundwater Elevation Data OB Unit

MW Number	Total Depth	TOC El. (ft)	Depth to GW (ft)	GW El. (ft)
05OW16-1	23.02	713.75	9.91	703.84
05OW16-2	17.65	688.09	3.82	684.27
05OW16-3	17.92	693.36	6.55	686.81
05OW16-4	21.95	695.81	5.24	690.57

FIGURE IV E-5
Potentiometric Surface Elevation of the Uppermost Aquifer at the OB Unit

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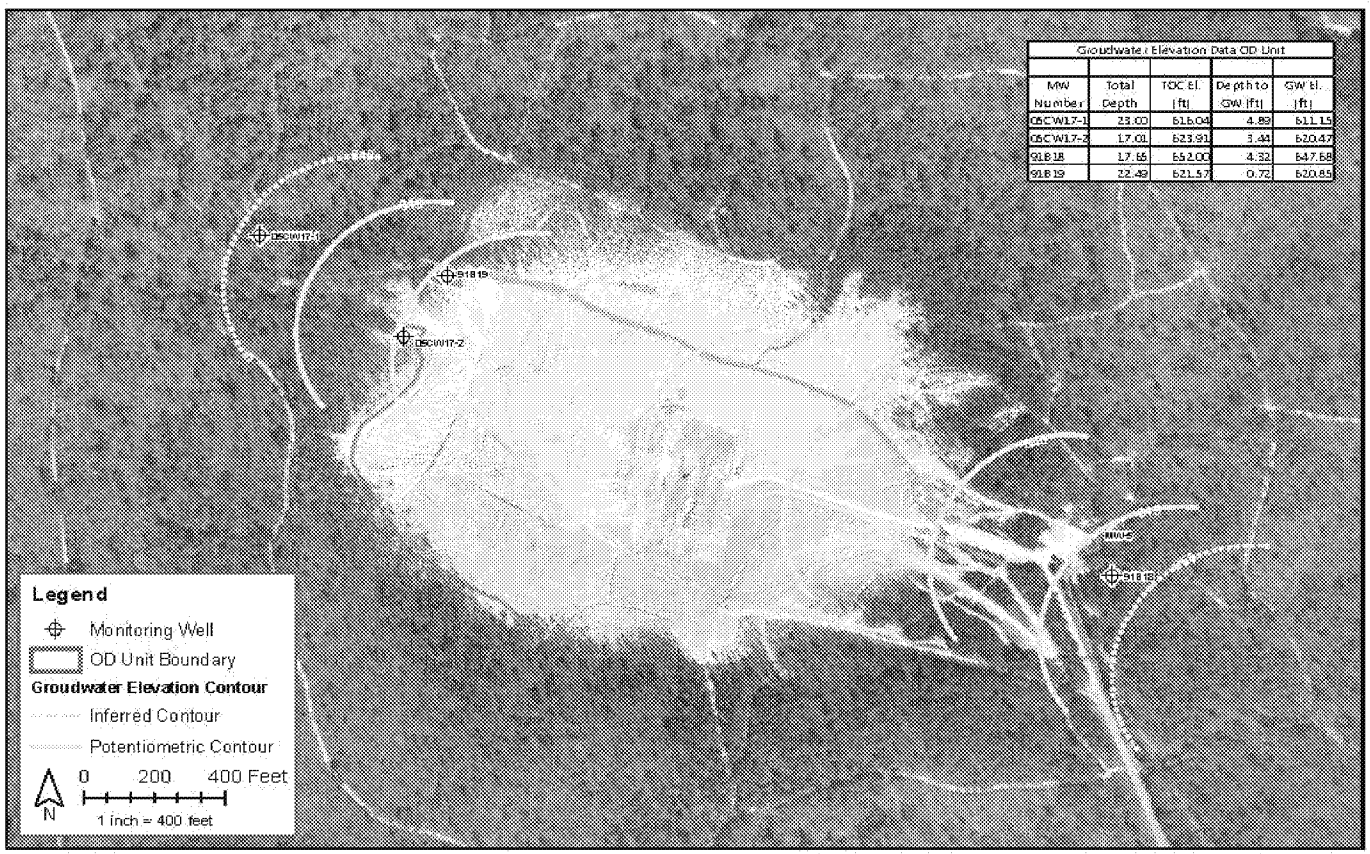

Groudwater Elevation Data OD Unit				
MW Number	Total Depth	TOC El. (ft)	Depth to GW (ft)	GW El. (ft)
05CW17-1	23.00	616.04	4.89	611.15
05CW17-2	17.01	623.91	3.44	620.47
91818	17.65	652.00	4.32	647.68
91819	22.49	621.57	0.72	620.85

FIGURE IVE-6
Potentiometric Surface Elevation of the Uppermost Aquifer at the OD Unit

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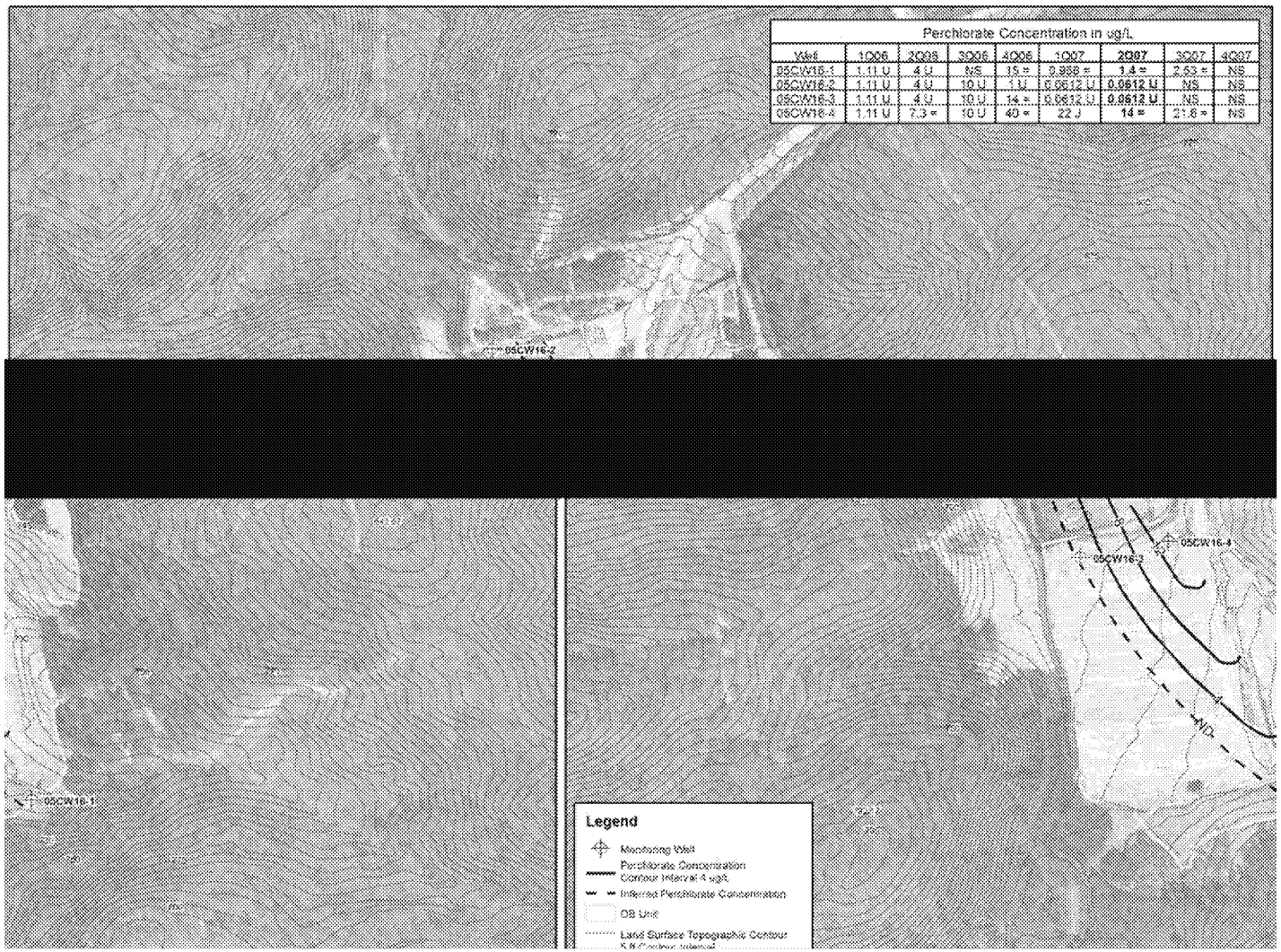
IV E-5 Description of Any Plume of Contamination that has Entered the Groundwater from a Regulated Unit ADEM Admin. Codes 335-14-8-.02(5)(c)4 and R.335-14-8-.02(14)

Section IV E-2 summarizes the results of the groundwater detection monitoring program conducted in 2006 and 2007.

The general trend of more detections of metals at higher concentrations in the total metals results as compared to the dissolved metals results indicates that turbidity of the sample appears to be a significant factor. Dissolved oxygen concentrations have been commonly less than 1 mg/L in wells in wells with manganese concentrations above the PSV. This indicates that the groundwater is anaerobic and manganese (total or dissolved) concentrations are greater than the PSV due to natural processes.

The trichloroethene, cis-1,2-dichloroethene, 3-nitrotoluene detections at the OB unit and the RDX and HMX detections at the OD unit have been rare and sporadic occurring mostly in the 2006 sampling events.

At the OB unit, perchlorate has been detected in groundwater unit at concentrations above the PSV of 24.5 µg/L only once in 2006 and once in 2008.



Perchlorate Concentration in ug/L								
Well	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07	4Q07
05CW16-1	1.11 U	4 U	NS	15 =	0.958 =	1.4 =	2.43 =	NS
05CW16-2	1.11 U	4 U	10 U	1 U	0.0612 U	0.0612 U	NS	NS
05CW16-3	1.11 U	4 U	10 U	14 =	0.0612 U	0.0612 U	NS	NS
05CW16-4	1.11 U	7.3 =	10 U	40 =	22 J	14 =	21.6 =	NS

FIGURE IV E-7
Iso-concentration Contour Map of Perchlorate Concentrations at the OB Unit

At the OD unit, perchlorate has never been detected in groundwater unit at concentrations above the ARBCA PSV of 24.5 µg/L. RDX was detected in samples collected in 2006 but has not been detected in samples collected in 2007.

The statistical evaluations discussed in Section IV E-6 indicate that the down-gradient concentration distributions have not been significantly different from the up-gradient concentration distributions for trichloroethene, cis-1,2-dichloroethene, 3-nitrotoluene, RDX, HMX, and perchlorate.

IV E-5a Indication of the Extent of the Plumes on the Topographic Map

The February 2007 sampling event is the most recent event where all of the wells were sampled at the OB and OD units and concentrations were greater in the down-gradient wells. The perchlorate plume map for this event at the OB unit is shown in Figure IV E-7 and the perchlorate plume at the OD unit is shown in Figure IV E-8.

IV E-5b Concentration of Pollutants in the Plume

A complete list of constituents monitored to date is provided in Table IV E-21. The list of constituents is based on the volume and physical and chemical characteristics of the waste treated in the units and reasonably expected to be in or derived from that waste, as required by the Environmental Performance Standards for miscellaneous units (AAC 335-14-5-.24(2)(a)).

The list of constituents has been derived from review of the bulk of resources available on the subject matter through the DoD, particularly the U.S. Army Corps of Engineers and associated research laboratories. The constituent list is consistent with those for similar units throughout the DoD. Due to the unique nature of the waste stream, the list of monitored constituents includes a number of contaminants that are not contained in Appendix IX of AAC 335-14-5, and excludes those Appendix IX constituents that are not associated with the waste stream and/or operation of the OB and OD units.

The maximum concentrations of the Appendix IX constituents detected above the PSVs in groundwater at the OB unit are provided in Tables IV E-1 through E-4 and in Tables IV E-10 through E-14 for the OD unit.

IV E-6 Proposed Groundwater Monitoring Program ADEM Admin. Codes R.335-14-8-.02(5)(c)5, R.335-14-5-.06(8), R.335-14-5-.24(1), and R.335-14-8-.02(14)

As stated in AAC R.335-14-5-.06(2)(a), the determination of whether a detection or compliance monitoring program is proposed is based upon statistically significant evidence of increased contamination at the compliance point.

Four wells at the OB Unit and four wells at the OD Unit have been sampled quarterly in 2006, 2007, and 2008, except when insufficient water was available due to the regional drought. Concentrations from three down-gradient wells and one up-gradient well have been evaluated from each unit. Nondetects have been replaced by a proxy of ½ the detection limit. This evaluation followed guidance in ADEM Administrative Code Chapter 335-14-5 (ADEM, 2007).

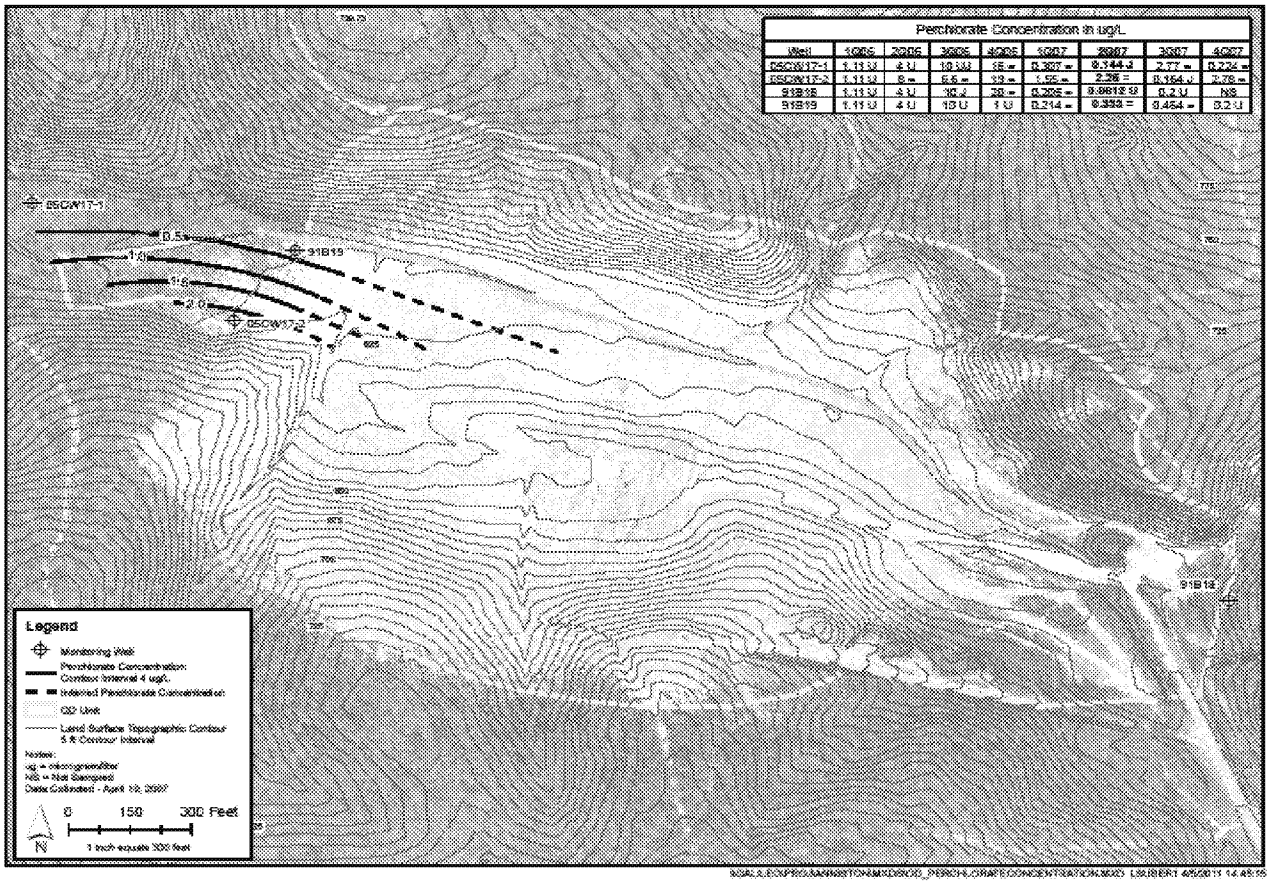


FIGURE IV E-8
Iso-concentration Contour Map of Perchlorate Concentrations at the OD Unit

The concentration data from the three down-gradient monitoring wells have been compared with the background data from the one background (up-gradient) well using analysis of variance (ANOVA) techniques. Because the percentage of non-detected values has been so high for most of the parameters, it was inappropriate to use a parametric ANOVA technique that requires an assumption that the residuals of the ANOVA model follow a given statistical distribution (that is, a normal one). For this reason, a nonparametric ANOVA method, the Kruskal-Wallis test, has been used (EPA, 1992). This approach is recommended in section 2(8)(h) 2 (p 14-5-51) from Chapter 335-14-5. The ANOVA approach promotes a test for average shifts above background in the down-gradient wells and is not overly sensitive to unusually elevated (or reduced) individual concentrations.

The calculated probabilities from the initial ANOVA step have been compared with a significance level of 0.05. When the probability is below this level, a significant difference between the central tendency of at least one of the wells and the other multiple well groups is suggested. Note that this comparison only indicates significant differences between wells, but does not indicate whether an exceedance of background has occurred.

For units and constituents with a significant difference, a post hoc test (multiple comparison test) is employed to determine which down-gradient wells, if any, exceed the background well. The results of these tests are shown for the OB unit in Table IV E-18 and for the OD unit in Table IV E-19. They indicate that a total of 31 well-constituent pairs have exceeded background. Bold font indicates constituents where the ANOVA comparison indicated a significant difference between the up-gradient well and the post-hoc test indicated down-gradient concentrations were greater.

At the OB unit these constituents include barium (total and dissolved), calcium (total and dissolved), iron, magnesium (dissolved), manganese (total and dissolved), nitrogen (nitrate-nitrite), potassium (total and dissolved), and sodium (total and dissolved). The statistical evaluations and comparison to PSVs indicate that only iron (total) and manganese (total and dissolved) have down-gradient concentration distributions significantly different from and greater than up-gradient concentration distributions and have been measured above their PSVs at the OB unit.

At the OD unit these constituents include barium (total), cadmium (total and dissolved), calcium (total and dissolved), cobalt (total and dissolved), copper (total), magnesium (total and dissolved), manganese (total and dissolved), nickel (total and dissolved), and sodium (total and dissolved). The statistical evaluations and comparison to PSVs indicate that only iron (total), manganese (total and dissolved), and cobalt (total and dissolved) have down-gradient concentration distributions significantly different from and greater than up-gradient concentration distributions and have been measured above their PSVs. Iron and manganese are naturally occurring metals and their concentrations in groundwater are strongly influenced by the turbidity of the sample and the anaerobic groundwater conditions. Cobalt is not a typical component of materials thermally treated at the OD unit. Cobalt can sorb to solid phase manganese oxides and oxyhydroxides under aerobic conditions. Conversely, it can be transferred to groundwater when the solid phase manganese dissolves. Figure IV E-9 is a graph of total and dissolved cobalt versus total and dissolved manganese with a linear trendline fit and R-squared value. An R-squared value is a number from 0 to 1 that indicates the quality of the fit between the trendline and the actual values. The fit is most reliable when its R-squared value is at or near 1. There is a greater

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TABLE IV E-18
Kruskal Wallis (Nonparametric) ANOVA Comparisons to Background at the OB Unit

Area	Constituent	Calculated Probability	Decision	Specific Wells Exceeding Background
OB Unit	3-nitrotoluene	0.981	No Significant Difference	
OB Unit	Aluminum	0.063	No Significant Difference	
OB Unit	Aluminum, dissolved	0.863	No Significant Difference	
OB Unit	Arsenic	0.818	No Significant Difference	
OB Unit	**Barium**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	**Barium, dissolved**	**0.000**	**Significant Difference**	**05CW16-3**
OB Unit	Cadmium	0.622	No Significant Difference	
OB Unit	Cadmium, dissolved	0.686	No Significant Difference	
OB Unit	**Calcium**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	**Calcium, dissolved**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	Chromium, total	0.972	No Significant Difference	
OB Unit	Cobalt	0.999	No Significant Difference	
OB Unit	Cobalt, dissolved	0.998	No Significant Difference	
OB Unit	Copper	0.498	No Significant Difference	
OB Unit	Copper, dissolved	0.817	No Significant Difference	
OB Unit	**Iron**	**0.001**	**Significant Difference**	**05CW16-2**
OB Unit	**Iron, dissolved**	**0.026**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	Lead	0.847	No Significant Difference	
OB Unit	**Magnesium**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	**Magnesium, dissolved**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	**Manganese**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-3**
OB Unit	**Manganese, dissolved**	**0.000**	**Significant Difference**	**05CW16-3**
OB Unit	Mercury	0.965	No Significant Difference	
OB Unit	Nickel	0.903	No Significant Difference	
OB Unit	Nickel, dissolved	0.881	No Significant Difference	
OB Unit	**Nitrogen, nitrate-nitrite**	**0.000**	**Significant Difference**	**05CW16-4**
OB Unit	Perchlorate	0.003	Significant Difference	
OB Unit	Phenol	0.893	No Significant Difference	
OB Unit	**Potassium**	**0.001**	**Significant Difference**	**05CW16-2**
OB Unit	**Potassium, dissolved**	**0.001**	**Significant Difference**	**05CW16-2**
OB Unit	Silver	0.777	No Significant Difference	
OB Unit	Silver, dissolved	0.941	No Significant Difference	
OB Unit	**Sodium**	**0.000**	**Significant Difference**	**05CW16-2,**

TABLE IV E-18
Kruskal Wallis (Nonparametric) ANOVA Comparisons to Background at the OB Unit

Area	Constituent	Calculated Probability	Decision	Specific Wells Exceeding Background
				05CW16-4
OB Unit	**Sodium, dissolved**	**0.000**	**Significant Difference**	**05CW16-2, 05CW16-4**
OB Unit	Trichloroethene (TCE)	0.764	No Significant Difference	
OB Unit	Vanadium	0.996	No Significant Difference	
OB Unit	Zinc	0.695	No Significant Difference	
OB Unit	Zinc, dissolved	0.967	No Significant Difference	
OB Unit	cyanide	0.954	No Significant Difference	
OB Unit	hexahydro-1,3,5-trinitro-1,3,5-triazine	0.944	No Significant Difference	
OB Unit	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	0.934	No Significant Difference	

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TABLE IV E-19
Kruskal Wallis (Nonparametric) ANOVA Comparisons to Background at the OD Unit

Area	Constituent	Calculated Probability	Decision	Specific Wells Exceeding Background
OD Unit	3-nitrotoluene	0.994	No Significant Difference	
OD Unit	Aluminum	0.071	No Significant Difference	
OD Unit	Aluminum, dissolved	0.783	No Significant Difference	
OD Unit	Arsenic	0.690	No Significant Difference	
OD Unit	**Barium**	**0.000**	**Significant Difference**	**91B19**
OD Unit	Barium, dissolved	0.000	Significant Difference	
OD Unit	**Cadmium**	**0.001**	**Significant Difference**	**91B19**
OD Unit	**Cadmium, dissolved**	**0.003**	**Significant Difference**	**91B19**
OD Unit	**Calcium**	**0.000**	**Significant Difference**	**05CW17-1**
OD Unit	**Calcium, dissolved**	**0.000**	**Significant Difference**	**05CW17-1**
OD Unit	Chromium, total	0.767	No Significant Difference	
OD Unit	**Cobalt**	**0.000**	**Significant Difference**	**91B19**
OD Unit	**Cobalt, dissolved**	**0.000**	**Significant Difference**	**91B19**
OD Unit	**Copper**	**0.000**	**Significant Difference**	**91B19**
OD Unit	Copper, dissolved	0.818	No Significant Difference	
OD Unit	Iron	0.000	Significant Difference	
OD Unit	Iron, dissolved	0.002	Significant Difference	
OD Unit	Lead	0.765	No Significant Difference	
OD Unit	**Magnesium**	**0.000**	**Significant Difference**	**05CW17-1**
OD Unit	**Magnesium, dissolved**	**0.000**	**Significant Difference**	**05CW17-1**
OD Unit	**Manganese**	**0.000**	**Significant Difference**	**91B19**
OD Unit	**Manganese, dissolved**	**0.000**	**Significant Difference**	**91B19**
OD Unit	Mercury	0.981	No Significant Difference	
OD Unit	**Nickel**	**0.000**	**Significant Difference**	**91B19**
OD Unit	**Nickel, dissolved**	**0.000**	**Significant Difference**	**91B19**
OD Unit	Nitrogen, nitrate-nitrite	0.046	Significant Difference	
OD Unit	Perchlorate	0.078	No Significant Difference	
OD Unit	Phenol	0.847	No Significant Difference	
OD Unit	Potassium	0.937	No Significant Difference	
OD Unit	Potassium, dissolved	0.905	No Significant Difference	
OD Unit	Silver	0.963	No Significant Difference	
OD Unit	Silver, dissolved	0.925	No Significant Difference	
OD Unit	**Sodium**	**0.042**	**Significant Difference**	**91B19**
OD Unit	**Sodium, dissolved**	**0.006**	**Significant Difference**	**91B19**
OD Unit	Trichloroethene (TCE)	0.943	No Significant Difference	
OD Unit	Vanadium	0.733	No Significant Difference	
OD Unit	Zinc	0.000	Significant Difference	

TABLE IV E-19
Kruskal Wallis (Nonparametric) ANOVA Comparisons to Background at the OD Unit

Area	Constituent	Calculated Probability	Decision	Specific Wells Exceeding Background
OD Unit	Zinc, dissolved	0.005	Significant Difference	
OD Unit	cyanide	0.917	No Significant Difference	
OD Unit	hexahydro-1,3,5-trinitro-1,3,5-triazine	0.223	No Significant Difference	
OD Unit	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	0.880	No Significant Difference	

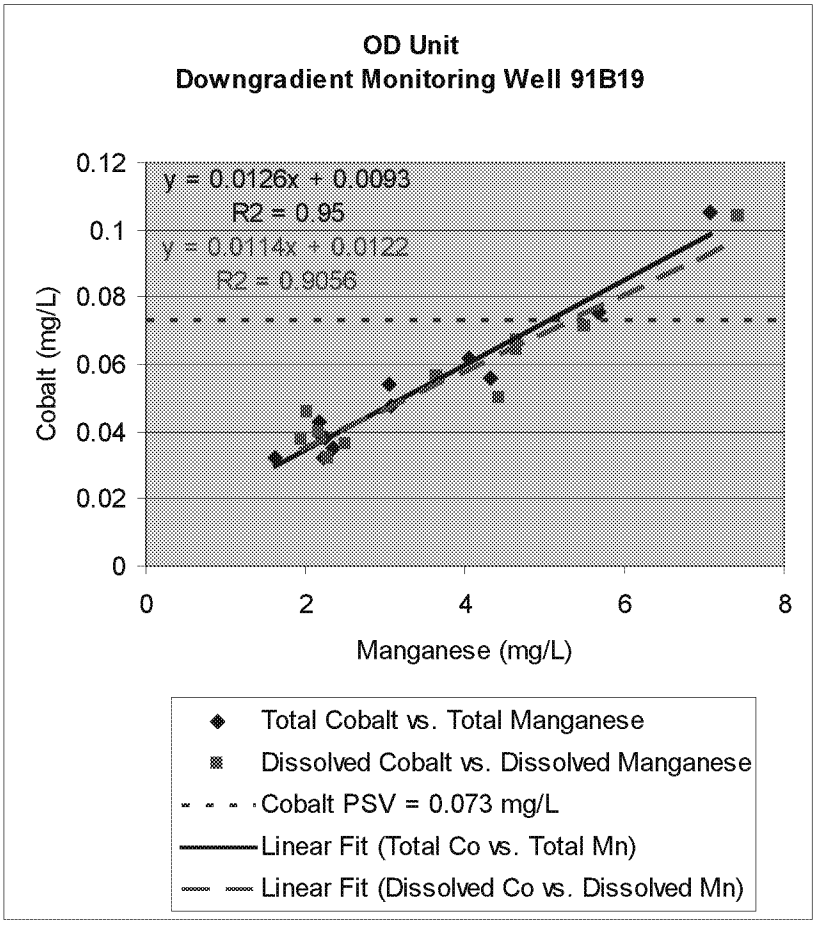


FIGURE IV E-9
Total and Dissolved Manganese and Cobalt Concentrations at OD Unit Monitoring Well 91B19

than 0.9 R-squared value between the cobalt and manganese concentrations and the linear trendline. This, in combination with natural and well studied sorption and dissolution processes, indicates that the cobalt is released when the manganese is released through dissimilatory reductive dissolution by anaerobic bacteria.

Therefore, continuation of the detection monitoring program is proposed based upon groundwater monitoring results to date.

IV E-6a Description of Well Design and Location ADEM Admin. Codes R.335-14-8-.02(5)(c)5, R.335-14-5-.06(8), R.335-14-5-.24(1), and R.335-14-8-.02(14)

See "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 2.

IV E-6a(1) Well Location

As part of the site characterization conducted during June/July 2005, point of compliance (POC) groundwater monitoring networks were established at the OB and OD units to evaluate the groundwater flow direction and groundwater quality. Each network consists of one upgradient and three downgradient monitoring wells that are screened into the first saturated zone.

Prior to the selection of the POC well locations at the OB unit, three piezometers were installed to evaluate the groundwater flow direction. The piezometers were installed using 5 foot slotted screens which were placed into the saturated zone. The tops of the casings were surveyed to determine relative groundwater elevations. After collecting groundwater elevation data for three consecutive days, groundwater potentiometric surface elevation maps were generated to establish the groundwater flow direction. Using this information, the locations for four permanent groundwater monitoring wells, one upgradient and three downgradient, were chosen.

The Open Burning (OB) unit is located in a valley surrounded by forested hills to the east and west of the unit. The valley slopes from the south to the north and a stream located along the western boundary of the unit flows northward. Two groundwater monitoring wells are located at the southern end of the unit and 3 are located at the northern end. Water level measurements at these wells indicate that groundwater beneath the OB unit generally flows toward the north-northwest with variation between west-northwest and north, depending on the groundwater conditions during individual measurement events.

No wells are located west of the OB unit and no groundwater elevation data in that area is currently available. However, the land surface elevation data and the locations of streams in and around the unit were used, in conjunction with hydrogeological concepts (Groundwater, Chapter 6, Freeze and Cherry, 1979), to estimate the configuration of the water table surface.

The hydrogeological principals with bearing on this project include:

- Highlands are recharge areas in hilly topography.
- Groundwater flows from the highlands toward the valleys.

- The water table is generally deeper below ground surface in high areas and shallower in valleys.
- The symmetry of the system creates vertical boundaries beneath the valleys and ridges.
- Water table elevations are generally smoothed out reflections of land surface topography.

A vertical two-dimensional groundwater flow net across the OB unit is shown in Figure IV E-10. The flow net was constructed from a topographic profile across the unit and application of the above hydrogeological concepts. It was assumed that the aquifer is homogeneous and isotropic and that groundwater flow is not influenced by geological structures, flow effects due to secondary porosity in the underlying bedrock, or any regional groundwater flow systems. It was also assumed that the water table elevation is slightly above the stream channel bottom and the base flow of the stream is maintained through groundwater discharge. The location of the cross section and land surface topography is shown in Figure IV E-11.

The flow net indicates that the vertical groundwater divides to the east and west coincide with surface water divides, and the vertical equipotential line beneath the stream indicates that flow from the OB unit toward the west would not be expected.

A plan view of the land surface topography, projected water table elevation contours, and potential temporary well and piezometer locations are shown in Figure IV E-11. This projection was developed with consideration of the groundwater flow net and typical measured water level elevations at the OB unit wells. The shape of the water table elevation contours is roughly symmetrical with the axis of the contour lines coincident with the centerline of the stream. Groundwater flow is from hills to the east and west toward the valley and then northward. In summary, the land surface topography in and around the OB unit indicates that the groundwater beneath the unit would not be expected to flow westward beyond the stream channel.

The locations of the POC monitoring wells in the OD unit were chosen based on reviewing the site topography, surface water flow, existing groundwater flow direction data and data from the two existing monitoring wells within the OD unit. The Department approved the placement of the monitoring wells at the OD unit in absence of installing piezometers.

The OB unit piezometers were abandoned in accordance with the Sampling and Analysis Plan (SAP) and ADEM regulations. The temporary casing and screen were removed and the borehole was grouted using a tremie pipe with a bentonite/Portland cement mixture at two of the piezometer locations. At the third piezometer location, the screen and casing materials were removed and the borehole was overdrilled to install a permanent POC monitoring well at the same location.

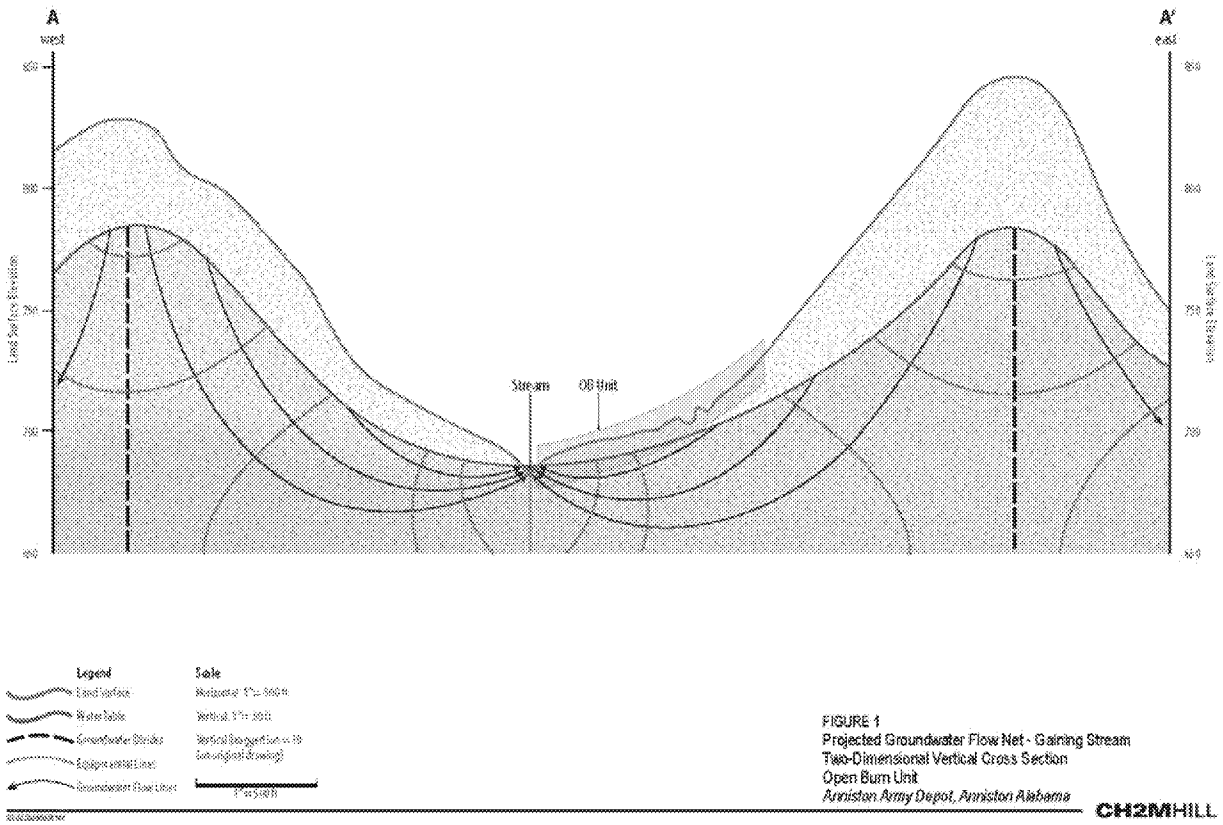


FIGURE IV E-10
Projected Groundwater Flow Net at the OB Unit Under Gaining Stream Conditions, Two-Dimensional Vertical Cross Section

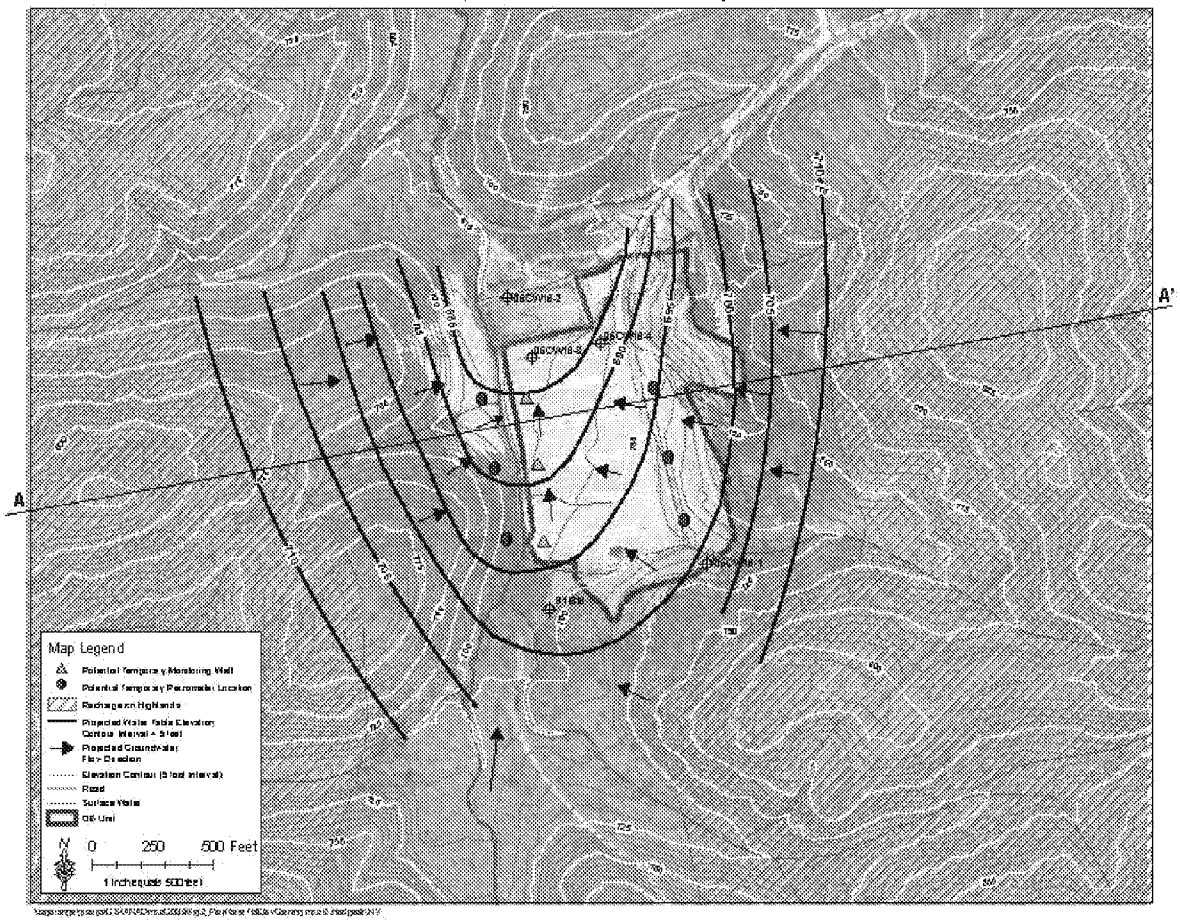


FIGURE IV E-11
Projected Water Table Elevations at the OB Unit Under Gaining Stream Conditions, Plan View

During the characterization field work, two preexisting wells in the OD unit were observed. It was learned that the existing monitoring wells were installed within the shallow aquifer (<25 ft), one located upgradient and the other located downgradient of the OD unit. It was concluded and verified with ADEM that the existing wells were acceptable for inclusion as POC monitoring wells after reviewing the boring logs and as-built plans. Two additional downgradient wells were then installed at the OD unit.

Figure IV E-12 shows the monitoring wells at the OB unit, while Figure IV E-13 shows the well locations for the OD unit.

IV E-6a(2) Well Design

Four groundwater monitoring wells (one upgradient and three downgradient) are located at the OB and OD units within the unconfined aquifer, for a total of eight wells.

Two preexisting wells (91B18 and 91B19, installed in 1992) at the OD unit were constructed with stainless steel screens and risers. In 2005, six additional wells were installed. These six wells were constructed with PVC screens and risers since the groundwater at the OB and OD units does not contain high levels of organics. If these conditions change, potential materials incompatibility will be evaluated with respect to the structural integrity of the PVC wells.

The wells installed in 2005 were designed and constructed using EPA *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EPA 2001) and USACE Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites* (USACE 1998). The surface completion consisted of above ground lockable steel protective casing set into a concrete protective pad, and four 4-in.-diameter steel protective pipes were set around the perimeter of the concrete pads. Monitoring well installation and completion diagram are shown in Figures IV E-14 through IV E-21.

IV E-6a(3) Well Installation

The monitoring wells installed in 2005 were constructed as follows:

- 8 ¼-in. outside diameter boreholes were drilled using continuous flight hollow-stem augers.
- New 2-in. diameter Schedule 40 PVC pipe with flush thread connections was used to construct the wells.
- 10 ft of 0.010-in. continuous, factory cut, slotted screens, solid PVC risers and end caps were used.
- Number 2 filter sand filter pack was extended a minimum of 2 ft above the top of the well screen.
- A 2-ft seal was constructed of hydrated 3/8-in bentonite pellets. After a minimum of 8 hours from installing the bentonite seal, cement/bentonite grout slurry was tremied from the seal to approximately ½ ft bgs where applicable.

FIGURE IV E-12
ANAD Groundwater Monitoring Well Locations for the OB Unit

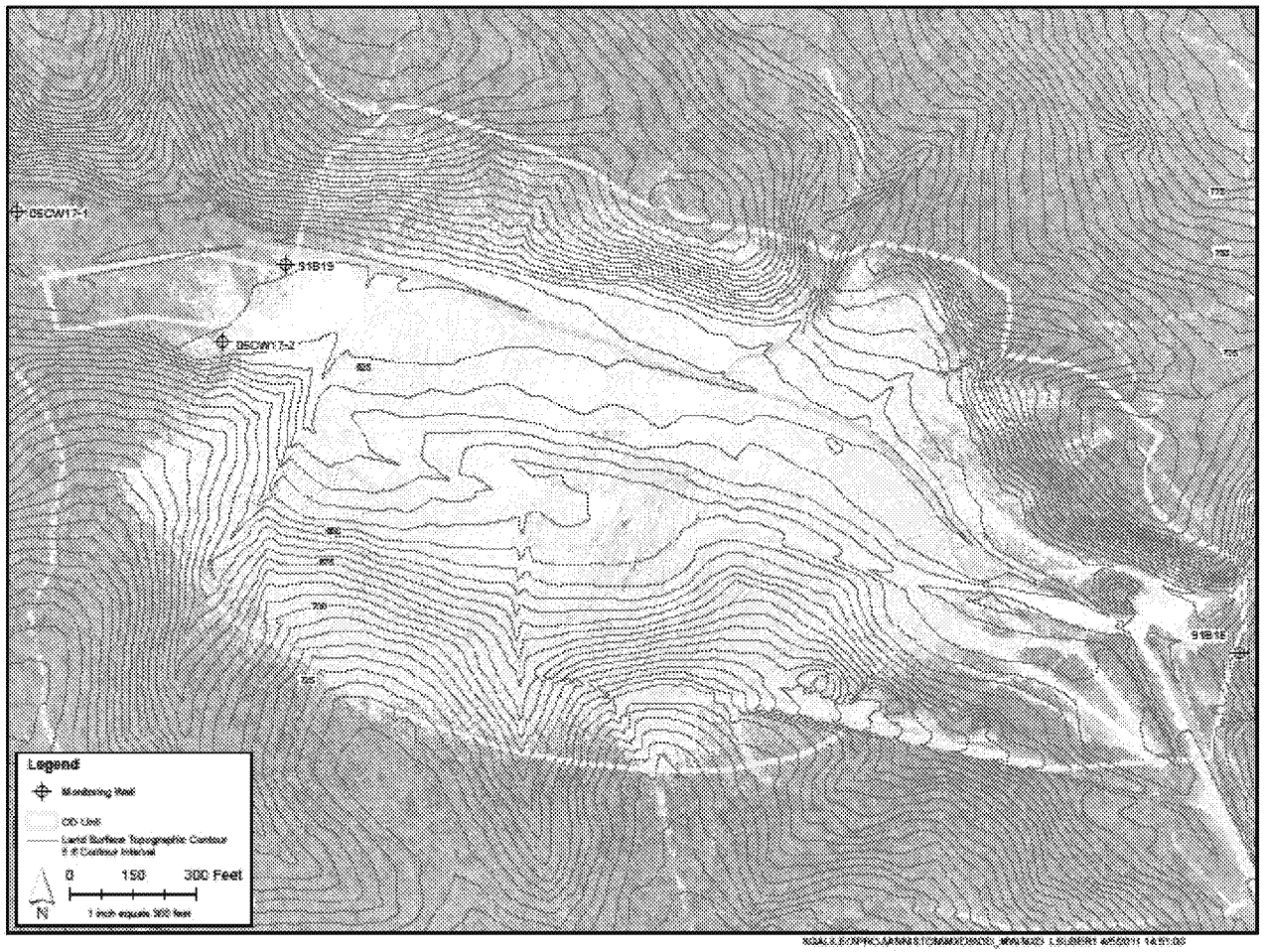


FIGURE IV E-13
ANAD Proposed Groundwater Monitoring Well Locations for the OD Unit

Log of Borehole 05CW16-1

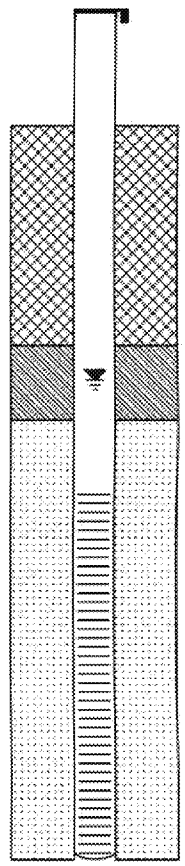
Page 1 of 1

Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 10, 2005
Elevation: 713.75
Northing: 1151659.576
Easting: 606433.159

Riser: 0.0-10.0' with 3' stick-up
Screen: 10.0-20.0'
Sand: 8.0-20.0'
Seal: 0.0-6.0'
Grout: 6.0-8.0'

DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)
		Ground Surface		
0		Light brown clayey silt, loose, dry, with some black specs.	3,4,3	0.0
2		Light tan, loose rock fragments, stiff with reddish clay @ 4'.	2,4,8	0.0
4		Rock @ 5'. More clay, mottled light brown and greenish gray, stiff, dry.	31,20,17	0.0
6		Same with more clay.	9,19,21	0.0
8		Same, slightly soft @ 9.0-9.5'.	14,13,20	0.0
10		Same with rock at bottom.	22,20,52	0.0
12		Dark brown, stiff, silty clay (CL) with fragments, slightly soft @13'.	38,44,20	0.0
14		Equipment refusal.		
16		Monitoring well installed based on piezometer PZ-1 installation data.		
18				
20		End of Borehole		
22				
24				
26				



WELL COMPLETION DETAILS

Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

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FIGURE IV E-14
Monitoring Well 05CW16-1 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-2

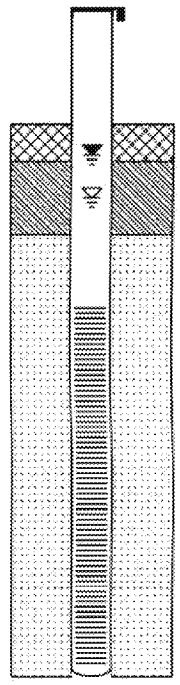
Page 1 of 1

Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-Stem Auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 12, 2005
Elevation: 688.09
Northing: 1152649.861
Easting: 605790.892

Riser: 0.0-5.0' with 3' stick-up
Screen: 5.0-15.0'
Sand: 3.0-15.0'
Seal: 1.0-3.0'
Grout: 0.0-1.0'

DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)	WELL COMPLETION DETAILS
-4, -2, 0		Ground Surface			
0–2		Dark brown, silty clay topsoil with organics, minor amount of gravel.			
2–4		Wet, soft, dark gray silty clay, low plasticity.			
4–6		Light gray, gravely silty clay, medium plasticity to 5'. 5-6' dry red and gray chert fragments with gray silty clay matrix, loose.			
6–8		Light gray gravel and silty clay, loose, with chert.			
8–10		Tight tan, reddish brown silty clay (CL).			
10–14		Same as above, 1' recovery.			
14–20		Same as above, 1' recovery.			
20		Monitoring well installed by overdrilling piezometer PZ-2. End of Borehole			
22, 24, 26					



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

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FIGURE IV E-15
Monitoring Well 05CW16-2 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-3

Page 1 of 1

Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 14, 2005
Elevation: 693.26
Northing: 1152411.278
Easting: 605861.004

Riser: 0.0-4.5'
Screen: 4.5-14.5'
Sand: 2.5-14.5'
Seal: 0.5-2.5'
Grout: 0.0-0.5'

DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)	WELL COMPLETION DETAILS
-4, -2, 0		Ground Surface			
0		Light brown silty clay, medium hard with black mottling. White silty rock layer @ 1'. Chert rock fragments throughout.		0.0	
2		2-3' same as above. 3-4' Brown clayey silt, loose, wet with rock fragments.		0.0	
4		4-5.5' same as above. 5.5-6.0' brown chert with sandy clay, dry.		0.0	
6		6.0-6.5' same as above. 6.5-7.5' brown clayey silt with sand and rock fragments, loose, wet. 7.5-8.0' brown clay with red-black mottling, med-tight, dry.		0.0	
8		Brown gravel chert layer, moist, with 6" weathered rock layer @ 10'.		0.0	
10		Brown silty clay with sand, dry, medium tight.		0.0	
12		Brown silty clay with sand and chert fragments, dry, medium.		0.0	
14				0.0	
		End of Borehole			
16, 18, 20, 22, 24, 26					

Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

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FIGURE IV E-16
Monitoring Well 05CW16-3 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-4

Page 1 of 1

Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 14, 2005
Elevation: 695.81
Northing: 1152492.558
Easting: 606103.870

Riser: 0.0-9.5' with 2' stick-up
Screen: 9.5-19.5'
Sand: 7.5-19.5'
Seal: 5.5-7.5'
Grout: 0.0-5.5

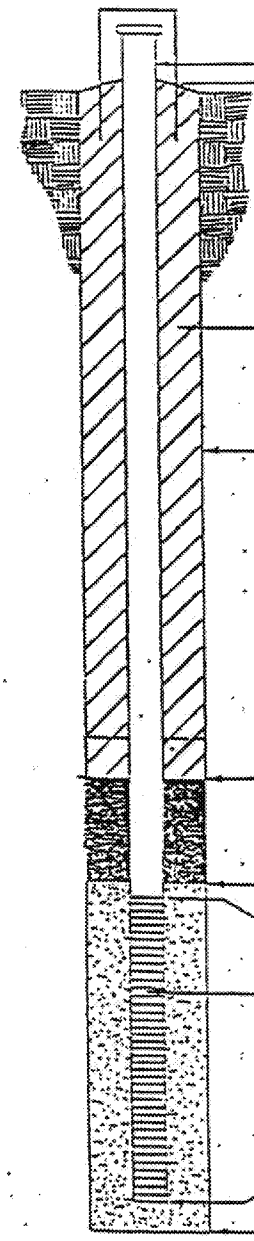
DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)	WELL COMPLETION DETAILS
-4					
-2					
0		Ground Surface			
		Light brown clayey silt with chert and sand fragments, loose, dry.	6,9,6	0.0	
2		Same as above, with quartz layer @ 4'.	10,21,23	0.0	
4		Same as above.	21,18,23	0.0	
		brown silty clay with chert and rock fragments, m dry from 7-8'. Slight moist with more sand @ 7'.	12,14,12	0.0	Light mediu
8		me as above. Chert rock layer with sand @ 8'. 9-10' rown clayey silt, medium, dry.	22,18,18	0.0	8-9 sa light b
10		as above with wet sand/gravel layer and silty clay @ 1.0'.	10,11,13	0.0	Same 10.5-1
12		covery.		0.0	No rec
14					
16		brown clayey silt with chert and sand loose, dry.	14,13,11	0.0	Light
18		covery.			No rec
20					
22		brown silty clay with chert/sand fragments, medium,	0,0,0	0.0	Light dry.
24		End of Borehole			

FIGURE IV E-17
Monitoring Well 05CW16-4 Well Completion Diagram and Borehole Log

Project Name ANAD ESI
Project Number 35G30600
Location SWMU #17 / Demolition Pit
Boring No. 91B18
Date 2-18-92

Driller ATEC
Drilling Method Hollow Stem Auger
Development Method

Well Materials Used
Feet of 2-foot Riser – 2'
Feet of 5-foot Riser 5'
Feet of 10-foot Riser 0'
Feet of Screen 10'
Caps 1 end, 1 Top
Bags of Sand 4.5
Bags of Bentonite Powder 1
Buckets of Pellets 1
Bags of Cement 2
Bags of Concrete Mix 15
le Covers

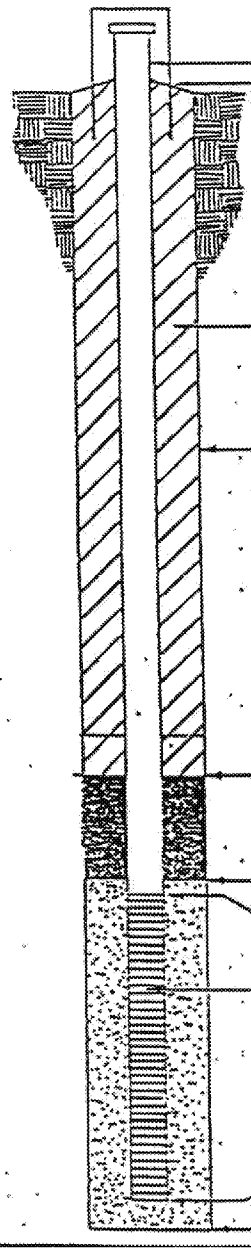


Stick-Up Riser Pipe: @ 2.5'
Type of Surface Seal: Concrete
Riser Pipe I.D.:
Type of Riser Pipe: Stainless Steel
Borehole Diameter: 10 1/4"
Type of Backfill: Cement/Bentonite mix 20:1. or 5% bentonite
Depth to Top of Seal: 2'
Type of Seal: Bentonite Pellets
Depth to Top of Sand Pack: 4'
Depth to Top of Screen: 5'
Screen I.D.: 2"
Type of Screen: Stainless Steel
Length of Screen: 10'
Depth to Bottom of Screen: 15'
Depth to Bottom of Hole: 18'

FIGURE IV E-18
Monitoring Well 91B18 Well Completion Diagram

Project Name ANAD TASK #6
Project Number 35G30600
Location ANAD Demolition Area, down gradient
Boring No. 91B19
Date 02/19/92

Driller ATEC; R. Scott
Drilling Method HSA
Development Method



Stick-Up Riser Pipe: 2.5 ft
Type of Surface Seal: Concrete

Well Materials Used

Feet of ~~8~~ 2-foot Riser 2 ft SS
Feet of 10-foot Riser 10 ft SS
Feet of Screen 10 ft SS
Caps bottom plug, top cap SS
Bags of Sand 3
Bags of Bentonite Powder 14 lb
Buckets of Pellets 1 1/2 (75 lb)
Bags of Cement 3
Bags of Concrete Mix
Hole Covers 5 ft protective steel casing
Lock

Riser Pipe I.D.: 2 inch
Type of Riser Pipe: SS

Borehole Diameter: 10 1/2 inch
Type of Backfill: Type II Cement grout
grout mix:
24 gal portable water
3 bags Type II cement @ 94#/bag
14 lb bentonite

Depth to Top of Seal: 3.4 ft
Type of Seal: bentonite pellets

Depth to Top of Sand Pack: 5.5 ft
Depth to Top of Screen: 10.0 ft

Screen I.D.: 2 inch
Type of Screen: SS
Length of Screen: 10.0 ft

Depth to Bottom of Screen: 20.0 ft
Depth to Bottom of Hole: 23.0 ft.

FIGURE IV E-19
Monitoring Well 91B19 Well Completion Diagram

Log of Borehole 05CW17-1

Page 1 of 1

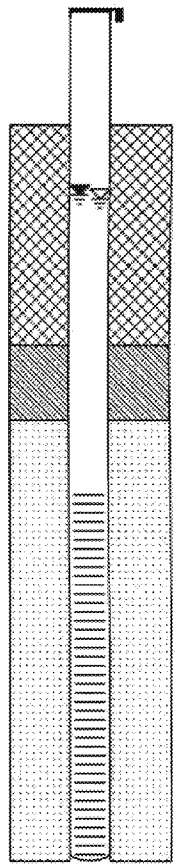
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 5, 2005
Elevation: 616.04
Northing: 1157887.321
Easting: 605577.771

Riser: 0.0-10.0' with 3' stick-up
Screen: 10.0-20.0'
Sand: 8.0-20.0'
Seal: 6.0-8.0'
Grout: 0.0-6.0'

DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)
		Ground Surface		
0		Brown with red mottles, soft, silty clay with gravel fragments.	2,3,1	0.0
2		Gray soft silty clay with sand, gravel fragments, wet.	5,6,10	0.0
4		Gray sand, gravel with red, gray silty clay, wet, loose.	7,16,14	0.0
6		Brown, reddish silty clay, moist, loose with gravel fragments.	4,3,10	0.0
8		Reddish brown with black mottling silty clay with sand/cherty fragments, medium plastic.	3,4,4	0.0
10		10-10.5' same as above. 10.5-11' brown sandy gravel with silty clay, loose, wet. 11-12' reddish brown clay medium plastic, with moist gray silty sand layer @12'.	2,4,9	0.0
12				
14		No recovery, void.		
16		Gray sandy silt with chert rock @17'.	8,22,12	0.0
18		17-18' Plastic reddish brown clay. 18-18.6' dry sandy silt gray. 18.6-19' tan brown clay stiff, layered.	5,5,12	0.0
20		Angular cherty gravel (6-12mm) in gray silty clay.	12,35+	0.0
		End of Borehole		
22				
24				
26				

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

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FIGURE IV E-20
Monitoring Well 05CW17-1 Well Completion Diagram and Borehole Log

Log of Borehole 05CW17-2

Page 1 of 1

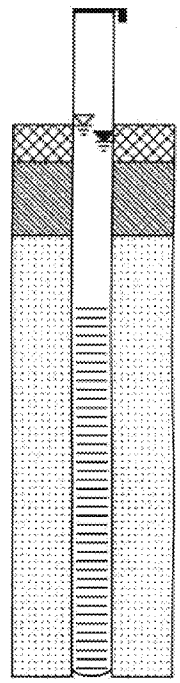
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

Site Location: Anniston, AL
Date: June 7, 2005
Elevation: 623.91
Northing: 1157629.508
Easting: 605998.206

Riser: 0.0-5.0' with 3' stick-up
Screen: 5.0-15.0'
Sand: 3.0-15.0'
Seal: 1.0-2.0'
Grout: 0.0-1.0'

DEPTH (ft bgs)	LITHOLOGY	DESCRIPTION	Blow Count	OVA (ppm)
		Ground Surface		
0		Light brown with medium-grained sandy silt with clay, wet.	0,0,1	0.0
2		Same as above.	0,0,3	0.0
4		Soft, wet, gray gravelly clay to red, dark brown, yellow gravel. Light medium cherty dolomite rock (GM)	14,52,64	0.0
6		Soft, wet gray sandy clay (GM), with cherty dolomite at bottom.	14,64,58	0.0
8		Same, less rock fragments, coarse silty sand and gravel (GC).	48,27,28	NA
10		Same, light brown gravelly sand with more clay, some reddish brown, loose black lignite? at 11.5.	12,12,17	NA
12		Same, light brown gravelly sand, becoming (SM).	21,22,19	NA
14		Same, becoming slightly stiff with yellowish brown clay at 16 (SM).	18,17,16	NA
16		End of Borehole		
18				
20				
22				
24				
26				

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples.
Mechanical tests were not performed unless otherwise stated.

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FIGURE IV E-21
Monitoring Well 05CW17-2 Well Completion Diagram and Borehole Log

- Monitoring wells were completed with secure, watertight caps and an above ground lockable steel protective casing set into a concrete protective pad with four 4-in.-diameter steel protective pipes set around the perimeter of the concrete pad.
- A brass USACE survey disk was placed in each concrete pad at each well. A metal plate with the well number was permanently attached to the well casing.
- The POC monitoring well network at each site was adequate to evaluate the potential impact of OB and OD operations on groundwater quality for each unit.

IV E-6a(4) Well Development

The monitoring wells were developed to remove any silt or materials remaining in the wells after their installation, to clear the filter pack of fine sediments and to bring the groundwater flow conditions back to the natural flow prior to the well installation activities.

Well development was performed after the surface pad and outer protective casing were installed and the cement had cured. The well development also included redeveloping the two existing wells in the OD unit. Each of the wells was developed using a surge block and then purged using a Typhoon 12-Volt stainless steel centrifugal pump to ensure that the development water was surged back and forth through the sand filter pack. The pump was used to induce the groundwater flow towards the well. Fine particulate material pulled into the well was discharged by the pump. Each well was pumped at a rate approximately equal to the recharge rate of the well. During the purging procedure, the pump was lowered and raised throughout the entire length of the well screen to ensure the entire filter pack was cleaned. The pump flow rate and purge volume was recorded during the process. Each well was purged until pH, specific conductance, temperature, and turbidity were stabilized. The well development water was discharged to the ground.

The data obtained from single well aquifer tests (slug test) were used to calculate the hydraulic conductivity of the shallow aquifer. The slug tests were conducted by introducing a decontaminated slug to the well and recording the change in water levels through time using a pressure transducer. The test data were recorded and saved using an In-Situ Inc., Mini Troll Professional Data Logger. The recorded data were reduced, and the hydraulic conductivity of the aquifer were calculated using the computer software AQTESOLV (Version 3.5 by Geraghty and Miller Modeling Group) that employs the Bouwer and Rice (1976) method.

IV E-6b Sample Collection
ADEM Admin. Codes R.335-14-5-.06(8)(d)1, R.335-14-5-.24(1), and R.335-14-8-.02(14)

ANAD will be sampling in accordance with a detection monitoring program established per the requirements of 40 CFR 264.98. The objective of this sampling is to determine whether the OB and OD unit activities have caused the release of hazardous substances into the underlying aquifer in quantities sufficient to cause significant change in groundwater quality.

The sample size will be as large as necessary to ensure with reasonable confidence that a contaminant release to groundwater from a facility will be detected. Samples from each well will be taken at least semi-annually. ANAD may propose an alternate sampling frequency

through discussions with ADEM. The baseline sampling program will be analyzing for Appendix IX constituents that are present in munitions or have been found in previous investigations (see Section IV E-5b). ANAD will monitor for indicator parameters, waste constituents, or reaction products that provide a reliable indication of the presence of hazardous constituents in groundwater.

IV E-6c Sample Preservation and Shipment
ADEM Admin. Codes R.335-14-5-.06(8)(d)2, R.335-14-5-.24(1), and R.335-14-8-.02(14)

Sample containers and preservation techniques for groundwater samples are summarized in Table IV E-20.

At the end of each sampling day, samples requiring shipment will be repackaged in shipping containers with a cooling material specified by the laboratory and analytical protocols. These samples will be packaged to prevent leakage and breakage during shipping. Each shipping container will be sealed with a custody seal and sent to the laboratory by an overnight delivery service.

TABLE IV E-20
Sample Container and Preservation Requirements for Groundwater

Analysis	Container[a]	Preservation	Holding Times
Explosives	Two 1-L amber glass[b]	Cool 4ºC	7 days until extraction 40 days until analysis
Metals (total)	500-mL plastic	Cool 4ºC, HNO_3 pH <2	28 days until analysis for mercury 180 days until analysis for other metals
Metals (dissolved)	500-mL plastic	Cool 4ºC, laboratory filtered	28 days until analysis for mercury 180 days until analysis for other metals
Perchlorates	500-mL plastic	Cool 4ºC	28 days until extraction
Cyanide	500-mL plastic	Cool 4ºC, NaOH	14 days
Nitrate/Nitrite	500-mL plastic	Cool 4ºC, H_2SO_4	2 days
N-Nitrosodimethylamine	Two 1-L amber glass[b]	Cool 4ºC	7 days until extraction 40 days until analysis
SVOCs	Two 1-L amber glass[b]	Cool 4ºC	7 days until extraction 40 days until analysis
VOCs	Three 40-mL glass[b]	Cool 4ºC, HCl_3 pH <2	14 days until extraction

[a]The subcontract laboratory will be consulted for the specific containers for this project. However, container materials and preservation requirements will not be altered.
[b]Teflon-lined cap required.

IV E-6d Sampling and Analysis Procedures
ADEM Admin. Codes R.335-14-5-.06(8)(d)3, R.335-14-5-.24(1), and R.335-14-8-.02(14)

As part of the detection monitoring program, groundwater samples will be collected from each monitoring well and submitted to an offsite laboratory. Groundwater samples will be analyzed for explosives, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), metals, cyanide, perchlorates, and nitrates/nitrites. Sampling and analysis will be conducted in accordance with EPA regulations and ADEM requirements.

After well evacuation as described in Section IV E-6h, samples will be collected using a peristaltic pump by discharging the water through the line into appropriately preserved sample bottles provided by the contract analytical laboratory. The samples will be immediately placed into laboratory-supplied coolers with ice and stored at 4°C or less. A chain of custody (COC) record will be prepared in the field at the time each sample is collected. Prior to shipment, the coolers will be repackaged with ice, sealed with strapping tape and custody seals, and sent via overnight delivery to the analytical laboratory.

The following methods, or the most current version of the method at the time of analysis, will be used for the analysis of groundwater:

- Explosives (EPA Method 8330)
- Metals (EPA Method 6010B), including mercury EPA (Method 7470)
- Perchlorates (EPA Method 6850)
- Nitrate/Nitrite (EPA Method 353.2)
- Cyanide (EPA Method 335.4)
- SVOCs (EPA Method 8270C
- Nitrosodimethylamine (EPA Method 607/1625-modified)
- VOCs (EPA Method 8260B)

These constituents may potentially be contained within WMM. Table IV E-21 shows the complete list of chemicals of potential concern (COPCs) and their associated PSVs. The PSVs for groundwater results are consistent with the Alabama Risk Based Corrective Action Guidance Table 2-2 and the EPA Master Screening Values list where ARBCA PSVs are not provided. The results for each sampling event will be compared to the most recent version of the above sources.

IV E-6e Determination of the Groundwater Surface Elevation Each Time Groundwater is Sampled
ADEM Admin. Code R.335-14-8-.02(14)(e)

The top of each well casing will be notched to identify a constant measuring point for determining groundwater elevations. The depth to the groundwater and total well depth will be measured from the surveyed reference point at the wellhead of each monitoring well. Water level measurements will be made with a decontaminated electronic water level meter and reported to the nearest 0.01 feet. Measurements will be taken repeatedly until two consecutive measurements are consistent within 0.01 feet.

TABLE IV E-21
Constituents of Potential Concern

Analyte	PSV Groundwater (µg/L)	Groundwater Reference
Metals (Method 6010B)		
Aluminum	3.60E+03	a
Antimony	6.00E+00	a
Arsenic	1.00E+01	a
Barium	2.00E+03	a
Beryllium	4.00E+00	a
Cadmium	5.00E+00	a
Calcium	NP	NA
Chromium	1.00E+02	a
Cobalt	7.30E+01	a
Copper	1.30E+03	a
Iron	1.10E+03	a
Lead	1.50E+01	a
Magnesium	NP	NA
Manganese	8.80E+01	a
Mercury (Method 7470A)	2.00E+00	a
Nickel	1.00E+02	a
Potassium	NP	NA
Selenium	5.00E+01	a
Silver	1.80E+01	a
Sodium	NP	NA
Thallium	2.00E+00	a
Vanadium	3.60E+00	a
Zinc	1.10E+03	a
Explosives (Method 8330B)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	6.10E-01	a
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.80E+02	a
1,3,5-Trinitrobenzene	1.10E+02	a
1,2-Dinitrobenzene	3.70E+00	b
1,3-Dinitrobenzene	3.70E+00	b
1,4-Dinitrobenzene	3.70E+00	b, c
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	3.60E+01	a
2-Amino-4,6-dinitrotoluene	7.30E+01	b
4-Amino-2,6-dinitrotoluene	7.30E+01	b
Nitrobenzene	3.40E-01	a
2,4,6-Trinitrotoluene	2.20E+00	a
2,4-Dinitrotoluene	7.30E+00	a
2,6-Dinitrotoluene	3.60E+00	a
2-Nitrotoluene	3.10E-01	b

TABLE IV E-21
Constituents of Potential Concern

Analyte	PSV Groundwater (µg/L)	Groundwater Reference
3-Nitrotoluene	7.30E+02	b
4-Nitrotoluene	4.20E+00	b
PETN	NP	NA, c
Nitroglycerin	3.70E+00	b,c
SVOCs (Method 8270C)		
1,2,4-Trichlorobenzene	7.00E+01	a
1,2-Dichlorobenzene	6.00E+02	a
1,3-Dichlorobenzene	1.80E+01	a
1,4-Dichlorobenzene	7.50E+01	a
2,4,5-Trichlorophenol	3.60E+02	a
2,4,6-Trichlorophenol	3.60E-01	a
2,4-Dimethylphenol	7.30E+01	a
2,4-Dichlorophenol	1.10E+01	a
2,4-Dinitrophenol	7.30E+00	a
2,4-Dinitrotoluene	7.30E+00	a
2,6-Dinitrotoluene	3.60E+00	a
2-Chloronaphthalene	4.90E+01	a
2-Chlorophenol	3.00E+00	a
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	3.70E+00	b
2-Methylnaphthalene	6.26E+00	a
2-Methylphenol (o-cresol)	1.80E+02	a
2-Nitroaniline	1.10E+01	a
2-Nitrophenol	NP	NA
3,3'-Dichlorobenzidine	1.50E-01	a
3-Methylphenol/4-Methylphenol(m&p-cresol)*	1.80E+01	a
3-Nitroaniline	3.20E+00	b
4-Bromophenyl phenyl ether	NP	NA
4-Chloro-3-methylphenol	1.41E+01	a
4-Chloroaniline	1.50E+01	a
4-Chlorophenylphenylether	NP	NA
4-Nitroaniline	3.20E+00	b
4-Nitrophenol	1.25E+01	a
Acenaphthene	3.70E+01	a
Anthracene	1.80E+02	a
Benzo(a)anthracene	9.20E-02	a
Benzo(a)pyrene	2.00E-01	a
Benzo(b)fluoranthene	9.20E-02	a
Benzo(g,h,i)perylene	4.69E+01	a
Benzo(k)fluoranthene	9.20E-01	a

TABLE IV E-21
Constituents of Potential Concern

Analyte	PSV Groundwater (µg/L)	Groundwater Reference
Benzoic acid	1.50E+05	b, c
Benzyl alcohol	1.10E+03	a
bis(2-Chloroethoxy)methane	1.10E+02	b
bis(2-Chloroethyl)ether	1.00E-02	a
bis(2-Chloroisopropyl)ether	2.70E-01	a
bis(2-Ethylhexyl)phthalate	6.00E+00	a
Butylbenzylphthalate	7.30E+02	a
Chrysene	9.20E+00	a
Dibenzo(a,h)anthracene	9.20E-03	a
Dibenzofuran	1.20E+00	a
Diethylphthalate	2.90E+03	a
Dimethylphthalate	3.60E+04	a
Di-n-butylphthalate	3.60E+02	a
Di-n-octylphthalate	1.50E+02	a
Fluoranthene	1.50E+02	a
Fluorene	2.40E+01	a
Hexachlorobenzene	1.00E+00	a
Hexachlorobutadiene	8.60E-01	a
Hexachlorocyclopentadiene	5.00E+01	a
Hexachloroethane	4.80E+00	a
Indeno(1,2,3-cd)pyrene	9.20E-02	a
Isophorone	7.10E+01	a
Naphthalene	6.20E-01	a
Nitrobenzene	3.40E-01	a
N-Nitrosodimethylamine (MSABN 3291A-modified)	1.30E-03	a
n-Nitroso-di-n-propylamine	9.60E-03	a
N-Nitrosodiphenylamine/Diphenylamine	1.40E+01	a
Pentachlorophenol	1.00E+00	a
Phenanthrene	4.69E+01	a
Phenol	1.10E+03	a
Pyrene	1.80E+01	a
VOCs (Method 8260B)		
Benzene	5.00E+00	a
Bromobenzene	2.00E+01	b
Bromochloromethane	NP	NA
Bromodichloromethane	8.00E+01	a
Bromoform	8.00E+01	a
Bromomethane	8.70E-01	a
n-Butylbenzene	NP	NA

TABLE IV E-21
Constituents of Potential Concern

Analyte	PSV Groundwater (µg/L)	Groundwater Reference
sec-Butylbenzene	2.40E+01	a
tert-Butylbenzene	2.40E+01	a
Carbon tetrachloride	5.00E+00	a
Chlorobenzene	1.00E+02	a
Chloroethane	4.60E+00	a
Chloroform	8.00E+01	a
Chloromethane	1.60E+00	a
2-Chlorotoluene	1.20E+01	a
4-Chlorotoluene	2.60E+03	b
Dibromochloromethane	8.00E+01	a
1,2-Dibromo-3-chloropropane	2.00E-01	a
1,2-Dibromoethane (EDB)	5.00E-02	a
1,2-Dichlorobenzene	6.00E+02	a
1,3-Dichlorobenzene	1.80E+01	a
1,4-Dichlorobenzene	7.50E+01	a
Dichlorodifluoromethane	3.90E+01	a
1,1-Dichloroethane	8.10E+01	a
1,2-Dichloroethane	5.00E+00	a
1,1-Dichloroethene	7.00E+00	a
cis-1,2-Dichloroethene	7.00E+01	a
trans-1,2-Dichloroethylene	1.00E+02	a
1,2-Dichloropropane	5.00E+00	a
1,3-Dichloropropane	7.30E+02	b
2,2-Dichloropropane	NP	NA
1,1-Dichloropropylene	NP	NA
cis-1,3-Dichloropropene	4.00E-01	a
trans-1,3-Dichloropropene	4.00E-01	a
Ethylbenzene	7.00E+02	a
Hexachlorobutadiene	8.60E-01	a
Isopropylbenzene	6.60E+02	a
p-Isopropyltoluene	NP	NA
Methylene chloride (Dichloromethane)	5.00E+00	a
Naphthalene	6.20E-01	a
n-Propylbenzene	NP	NA
Styrene	1.00E+02	a
1,1,1,2-Tetrachloroethane	4.30E-01	a
1,1,2,2-Tetrachloroethane	5.50E-02	a
Tetrachloroethene	5.00E+00	a
Toluene	1.00E+03	a

TABLE IV E-21
Constituents of Potential Concern

Analyte	PSV Groundwater (µg/L)	Groundwater Reference
1,2,3-Trichlorobenzene	NP	NA
1,2,4-Trichlorobenzene	7.00E+01	a
1,1,1-Trichloroethane	2.00E+02	a
1,1,2-Trichloroethane	5.00E+00	a
Trichloroethylene	5.00E+00	a
Trichlorofluoromethane	1.30E+02	a
1,2,3-Trichloropropane	5.60E-03	a
1,2,4-Trimethylbenzene	1.20E+00	a
1,3,5-Trimethylbenzene	1.20E+00	a
Vinyl chloride	2.00E+00	a
Total Xylenes	1.00E+04	a
Acetone	5.50E+02	a
2-Butanone (Methyl ethyl ketone)	7.00E+02	a
4-Methyl-2-pentanone (MIBK: methyl isobutlyl ketone)	2.00E+02	a
Carbon disulfide	1.00E+02	a
Other Analytes		
Cyanide (Method 335.4)	2.00E+02	a
Perchlorate (Method 6850)	2.45E+01	a
Nitrate/Nitrite as Nitrogen (Method 353.2)	1.00E+04	a

Notes:
a = ARBCA screening values (Alabama Risk-Based Corrective Action Guidance Manual, Revision 2, April 2008)

b = EPA Master Screening Values List (Regional Screening table, September 2008, developed by Oak Ridge National Laboratory under an Interagency Agreement with EPA)

c = Compound not included in past or current laboratory analytical services contract

NP = Not promulgated
NA = Not applicable
PSV = Preliminary screening value
µg/L = Micrograms per liter
SVOC = Semivolatile organic compound
VOC = Volatile organic compound
* This value is for 4-methylphenol with the lower PRG of the pair.

The measurements will be used to calculate the well volumes required for purging. Casing volumes will be determined using the formula:

$$\text{Volume (gal)} = \frac{\pi r^2 h \times 7.48 \text{ gal}}{1 \text{ ft}^3}$$

where:

r = radius of the well casing (feet),
h = height of the wetted column (feet).

The following steps will be taken when performing water level measurements:

1. Wear protective clothing and equipment as required by the project Site Safety and Health Plan (SSHP).
2. Check the well for proper identification and note in the well access logbook.
3. Unlock the well cover and remove the PVC cap.
4. Using a photoionization detector, monitor the air above the well opening and breathing zone to determine VOC emissions. Record the levels in the field logbook and proceed if the vapors in the breathing zone are below levels specified in the SSHP. If not, proceed as outlined in the SSHP.
5. Inspect well, noting any deterioration, damage, or apparent tampering. Note the height of stick-up of protective casing above ground level and the distance between protective casing top to the top of the inner casing.
6. Before each measurement, decontaminate the water level indicator.
7. Lower the electronic probe into the well until water is encountered and note the depth on the calibrated tape relative to the surveyed reference point.
8. Repeat the water level measurement until two consecutive measurements agree within 0.01 feet.
9. Sound the total depth of the well by lowering the probe to the bottom of the well. If a water level indicator is used to measure total depth of the well, adjust to account for the 0.3 feet extra length on the indicator tip past the sensor.
10. Record the depth to water and adjusted total well depth in the field logbook.
11. Decontaminate probe and the entire length of the water level indicator that entered the well.
12. Cap and lock the well if no more activities will occur.
13. Convert water level measurements to mean sea level elevations.

After all the monitoring wells have been installed and developed, at least one synoptic water level survey will be performed on all the wells installed during the site characterization investigation and on all other existing site wells. The requirements for the synoptic water level survey are:

- Survey will be completed in one 8-hour period free of recharge events.
- Water level meter calibration will be performed if more than one probe is being used.
- Procedures for performing water level measurements described above will be followed.

Water level meters will be calibrated by measuring the water level in a single well with all the probes. If the measurements vary, the difference will be documented in the field logbook, and adjustments will be made after the survey is completed.

IV E-6f Vadose Zone Monitoring
ADEM Admin. Codes R.335-14-8-.02(14)(e) and R.335-14-8-.03(3)(b)2

ANAD does not plan to perform vadose zone monitoring; therefore, this section does not apply.

IV E-6g Field Measurements
ADEM Admin. Code R.335-14-8-.02(14)(e)

The water quality screening instruments that may be used in the field are listed below:

- Specific conductance, dissolved oxygen, and temperature meter;
- pH meter and thermometer;
- Turbidity meter; and
- Electronic water level indicator.

These indicators where chosen because of their ability to reflect changes in the organic composition of groundwater.

Instruments will be calibrated, at a minimum, each day during field use. Field notes pertaining to the calibration will be maintained in the field.

IV E-6h Well Evacuation
ADEM Admin. Code R.335-14-8-.02(14)(e)

The wells will be evacuated using a low-flow method consistent with EPA technical guidance document EPA/540/S-95/504 entitled *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. The proposed low-flow procedure is described below:

- After the static water level in the well has been measured and recorded using an electronic water level indicator, the pump intake or tubing will be set in the middle or slightly above the middle of the screened.
- A low-flow (i.e., peristaltic pump) with new, disposable 1/4-inch polyethylene tubing will be used to purge/sample each well.
- Purge water will be collected into a calibrated bucket or other calibrated container to obtain and maintain the proper purge flow rate. The flow rate will be adjusted to

eliminate any significant drawdown of the well. A purge at a rate between 0.1 and 0.5 L/min (or between 0.03 and 0.1 gpm) will be maintained.

- Depth to water measurements will be made during purging to monitor water table drawdown. Drawdown should be less than one foot (ideally less than 0.5 feet). If the water table begins to drop more than one foot, the pump rate will be reduced.
- Water quality parameters including pH, specific conductance, temperature, turbidity, and dissolved oxygen (DO) will be monitored using appropriate water quality meters and recorded throughout purging.
- Purging and collecting water quality parameters (every five [or ten] minutes) will continue until the water quality parameters stabilize for three consecutive readings. A minimum subset of stability will include pH, conductivity, and turbidity or DO. The wells will be considered stable when three successive readings are within ± 0.1 for pH, ± 3 percent for conductivity, and ± 10 percent for turbidity or DO.

If the above parameters will not stabilize under the low flow purging method, the purge tubing or pump intake will be moved to the top of the water column and three to five well volumes will be purged in a manner consistent with the EPA Environmental Investigation Standard Operating Procedures. The proposed three to five well volume procedure is described below:

- Water quality parameters will be monitored throughout purging.
- A minimum of three times the volume of standing water in the well will be removed during purging.
- The well will be considered stable when pH, specific conductance, and temperature are within 10% for four or more successive readings taken at 2- to 4-minute intervals, and turbidity has either stabilized or is below 10 NTUs.
- If the chemical parameters have not stabilized in accordance with the above criteria after removing three well volumes, additional water may be removed.
- If the parameters have not stabilized within purging a maximum of five borehole volumes, it is at the discretion of the Field Task Leader whether to collect a sample or continue purging.

Prior to sample collection, the flow-through cell will be disconnected so that the sample is collected from the tubing section before the purge water contacts the flow through cell. If the recharge rate of the well is so low that the well goes dry despite a flow rate of 0.1 liter per minute (lpm), turn off the pump. Then, allow time for the well to recharge to a sufficient level to obtain the necessary volume and collect the sample.

As soon as stabilization is achieved, the well will be considered ready for sampling. If the well purges dry using either method, samples will be collected after sufficient recharge.

IV E-6i Sample Preparation
ADEM Admin. Code R.335-14-8-.02(14)(e)

Groundwater samples will be collected in appropriate sample containers, properly preserved, sealed, and labeled. Labels will be completed with black indelible ink and will include the following information:

- Unique sample number
- Sample site/location or appropriate identification
- Sampling date and time
- Sample preservation used
- Sample type
- Analysis required

All samples will be recorded on a COC record. The remarks section will be used to note whether the sample has been preserved and, if so, which preservative was used. A sample collection log entry will be made at the time the sample is taken. The field data log sheet will include, but not be limited to, the following information:

- Unique field study or sampling activity name, project number, and sample number
- Volume of sample taken
- Name of collector and of others present
- Date and time of sample collection
- Sample depth or interval
- Location of sampling (well number)
- Designation of QC samples (for example, blank, splits, or duplicates)
- Observations during sampling (for example, odors and colors)
- COC control number and request for analysis number
- Preservatives used
- Field observations and measurements
- Water level measurement and how obtained
- Dissolved oxygen
- Purge volume and pumping rate and date and time of purge
- Equipment calibration information
- Weather conditions

IV E-6j Analytical Procedures
ADEM Admin. Code R.335-14-8-.02(14)(e)

Groundwater samples will be properly packed and shipped to a certified analytical laboratory. The analytical procedures to be used are listed in Section IV E-6d.

IV E-6k QA/QC Procedures
ADEM Admin. Code R.335-14-8-.02(14)(e)

QC procedures are operations employed during field sampling and chemical analysis in order to support and document the attainment of established QA objectives. The field team leader and the analytical laboratory are responsible for meeting the QA objectives by

maintaining precision, accuracy, representativeness, completeness, comparability (PARCC), and sensitivity requirements.

The following QA/QC samples will be collected when water samples are collected: 1 trip blank, 1 field blank (source water blanks), 1 field duplicate per laboratory analysis method, 1 equipment rinsate blank per laboratory analysis method, 1 matrix spike per laboratory analysis method, and 1 matrix spike duplicate per laboratory analysis method. The trip blank for each cooler will be provided by the laboratory and will be analyzed for volatile organic compounds only. The field duplicate groundwater sample will be collected during sample collection. This duplicate will be subjected to identical analytical procedures as its original. The equipment rinsate blanks will be performed by collecting laboratory grade, deionized water that has been rinsed over decontaminated groundwater sampling equipment. Temperature blanks will be prepared by the laboratory and accompany each cooler containing VOC samples. An adequate quantity, quality, and type of sample will be collected to meet the goals of the groundwater detection monitoring program. **Section IV E-6c** outlines the sample containers, preservatives, and holding time requirements for the groundwater samples collected.

IV E-6l Data Evaluation and Reporting Admin. Code R.335-14-8-.02(14)(e)

Groundwater data from the downgradient wells will be compared to preliminary screening values (PSVs) and/or data from the upgradient wells (as appropriate) as part of the detection monitoring program. This will be done to determine whether there is statistically significant evidence of contamination present at the OB and OD units.

In determining whether statistically significant evidence of contamination exists, ANAD will use the methods that follow the requirements of the permit under ADEM R.335-14-5-.06(8)(h).

Annually, the concentration data from the three down-gradient monitoring wells will be compared with the background data from the one background (up-gradient) well using analysis of variance (ANOVA) techniques. The calculated probabilities from the initial ANOVA step will be compared with a significance level of 0.05. When the probability is below this level, a significant difference between the central tendency of at least one of the wells and the other multiple well groups is suggested. Note that this comparison only indicates significant differences between wells, but does not indicate whether an exceedance of background has occurred. For all cases units and constituents with a significant difference, a post hoc test (multiple comparison test) is employed to determine which down-gradient wells, if any, exceed the background well.

Analytical data will be qualified during the validation process based on the EPA functional guidelines. The addition of data qualifiers to analytical results signifies the occurrence of QC noncompliances that have been noted during the course of data validation. Summaries of the analytical data and statistical analyses performed will be presented in annual reports and will include the following:

- Summary of concentrations of each constituent for which analysis was performed at each well for the most recent sampling event and the detection limit for each constituent.

- Summary of the most recent monitoring event statistical results including concentration of each chemical at each well for that event and identification of downgradient wells with concentrations higher than the background 95 percent upper threshold limits (UTLs). Those parameters found to be exceeding upgradient will be in boldface for clarity.

The reports will also include a rolling trend analysis of four events for each well showing concentrations of each chemical exceeding the PSV in that or the three preceding sampling events and will be evaluated qualitatively. ANAD will submit the reports to ADEM, at which time ADEM will determine the next step in the program. The next step may include, but may not be limited to, increased sampling frequency, locations, etc.

Records of groundwater monitoring at the OB and OD units will be maintained at ANAD. Records related to groundwater monitoring will be maintained at a central recordkeeping repository. Following is a description of the records that will be kept:

- **Field Notebooks.** Pertinent information regarding the site and sampling procedures will be documented in the field logbook. Information will be entered into the field notebook legibly with indelible ink. A new page will be used at the beginning of each day's activities. The following information will be recorded at a minimum:
  - Name and exact location of site of investigation
  - Date and time of arrival and departure
  - Name of person keeping log
  - Names of all persons onsite
  - Purpose of sampling
  - Location of sampling point (including justification, number of samples taken, volume of samples taken)
  - Preservation method
  - Method of sample collection and any factors that may affect sample quality
  - Date and time of sample collection and any factors that may affect sample quality
  - Name of collector
  - Sample identification numbers
  - Description of samples
  - Weather conditions on the day of sampling
  - Sketch of sample location in relation to a burn pan or more permanent points in the OB and OD units
  - Bound logbooks with numbered and water-resistant pages will be used for the maintenance of field records. Logbooks will be kept onsite at the Directorate of Risk

Management office. Logbooks are controlled documents and will be maintained as part of the project file. The documents will not be destroyed or thrown away, even if they are illegible or contain inaccuracies.

- COC receipts
- Sample log sheets
- Sample forms
- Task modification requests
- Field analytical data
- Water levels
- Calibration forms
- Boring logs
- Well construction sheets

Analytical records will include the following:

- Analytical data (hardcopy and electronic)
- Data validation letters

Statistical evaluation records will include summaries of the analytical data and statistical analyses.

ANAD will prepare groundwater monitoring reports after the baseline sampling events. This report will include the following information:

- Groundwater elevations to the nearest 0.01 feet for each monitoring well, for each sampling event
- Groundwater elevation contours for each aquifer monitored, for each unit, for each sampling event
- Summary of groundwater flow conditions for each unit, for each aquifer monitored at the unit
- Description and explanation of any changes or new interpretations regarding background groundwater quality for each unit, for each aquifer
- Evaluation, analysis, and graphical presentation of any potential contaminant migration
- Evaluation of the performance of monitoring devices, including detailed proposals of the actions that are needed to restore or establish monitoring effectiveness at a unit or at an individual monitoring point
- Maps showing the groundwater flow direction for the uppermost aquifer monitored, including interconnected aquifers

- Groundwater monitoring analytical data for monitoring points in a tabular form, including methods of analysis
- Summaries of the analytical data and statistical analyses performed

IV E-6m Chain-of-Custody Control ADEM Admin. Codes R.335-14-5-.06(8)(d)4, R.335-14-5-.24(1), and R.335-14-8-.02(14)

Custody of samples for the baseline monitoring program will be maintained and documented at all times. A chain of custody (COC) is initiated at the laboratory and remains with the sample at all times. The COC bears the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and appropriate handling of the bottles and samples. A sample is in custody if:

- It is in the field investigator's or the transferee's actual possession.
- It is in the field investigator's or the transferee's view, after being in his/her physical possession.
- It was in the field investigator's or the transferee's physical possession and then he/she secured it to prevent tampering.
- It is placed in a designated secure area.

A COC record form will be used to record the custody of samples collected and maintained by personnel under the detection monitoring program. It will also serve as a sample logging mechanism for the laboratory. The COC form will be completed and kept with the samples at all times inside the cooler in a plastic bag. The sampler will maintain custody from the time of sampling until the coolers are prepared for transport and shipped via overnight air freight to the laboratory or until the samples are delivered by the sampler to the laboratory. If the samples are not immediately transported to the analytical laboratory they will remain in the custody of the sampler or field investigator.

IV E-7 Detection Monitoring Program Information ADEM Admin. Codes R.335-14-8-.02(5)(c)6, R.335-14-5-.06(9), R.335-14-5-.24(1), and R.335-14-8-.02(14)

In accordance with 40 CFR 264.92, the groundwater monitoring program is based on whether hazardous constituents have been detected, defined as statistically significant evidence of contamination, at the POC. This determination is made by comparing data collected at the POCs to background data and using statistical methods that comply with the performance standards required in 40 CFR 264.97(i). Based on the groundwater monitoring data collected to date, no hazardous constituents have been detected in the groundwater. Therefore, ANAD will institute a detection monitoring program as described below.

IV E-7a Indicator Parameters

No indicator parameters other than water quality parameters (pH, temperature, and specific conductivity) will be measured or monitored.

IV E-7b Hazardous Constituents ADEM 335-14-5-.06(4)

Hazardous constituents are constituents identified in ADEM Admin. Code R.335-14-5-Appendix IX that have been detected in groundwater in the uppermost aquifer or that are otherwise likely to be derived from wastes treated at the facility or other materials that were used.

Existing groundwater monitoring data indicate the there is no statistically significant release of a hazardous constituent. Section IV E-6 discusses the results of the statistical analysis in detail. Briefly, the statistical evaluations and comparison to PSVs indicate that only iron (total) and manganese (total and dissolved) have been measured above their PSV and have down-gradient concentration distributions significantly different from and greater than up-gradient concentration distributions. The general trend of more detections of metals at higher concentrations in the total metals results as compared to the dissolved metals results indicates that turbidity of the sample appears to be a significant factor. Dissolved oxygen concentrations are commonly less than 1 mg/L in wells in wells with manganese concentrations above the PSV. This indicates that the groundwater is anaerobic and manganese (total or dissolved) concentrations are greater than the PSV due to natural processes.

The trichloroethene, cis-1,2-dichloroethene, 3-nitrotoluene detections at the OB unit and the RDX and HMX detections at the OD unit are rare and sporadic and occurred mostly in the 2006 sampling events.

At the OB unit, perchlorate has been detected in groundwater unit at concentrations below 24.5 µg/L ARBCA preliminary screening value since EPA method 6850 has been used for the perchlorate analysis.

At the OD unit, perchlorate has been detected in groundwater unit at concentrations below the ARBCA preliminary screening value of 24.5 µg/L. RDX was detected in samples collected in 2006 but was not detected in samples collected in 2007.

The statistical evaluations discussed in **Section IV E-6** indicate that the down-gradient concentration distributions are not significantly different from the up-gradient concentration distributions for trichloroethene, cis-1,2-dichloroethene, 3-nitrotoluene, RDX, HMX, and perchlorate.

The proposed hazardous constituents list for the groundwater monitoring program was based on:

- Knowledge of past treatment operations
- The types, quantities, and concentrations of constituents likely to be present in the wastes to be treated in the OB and OD units
- Constituents previously detected in groundwater
- Potential for adverse impacts to human health and the environment

Section IV E-6d contains the list of hazardous constituents.

IV E-7c Proposed Groundwater Monitoring System ADEM 335-14-5-.06(1)(a) and (b)(1) and (2)

The proposed groundwater monitoring system will be installed at the point of compliance for the OB and OD units and comply with ADEM Admin. Code R.335-14-5-.06. The point of compliance is defined as a vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated units.

IV E-7d Background Values for Each Proposed Monitoring Parameter or Constituent ADEM 335-14-5-.06(4)(a) and (b)(1)

The upgradient well at the each of the OB and OD units will be sampled and analyzed for the same parameters as the downgradient wells. This information will be used in the statistical evaluation of the monitoring data described in Section IV E-6l.

IV E-7e Description of Proposed Sampling, Analysis, and Statistical Comparison Procedures

The proposed procedures for sampling, analysis, and statistical comparison procedures are described in Sections IV E-6b through IV E-6m.

IV E-8 Recordkeeping of Groundwater Analytical Data ADEM Admin. Codes R.335-14-5-.06(9)(c) and R.335-14-5-.06(9)(g)

ANAD will maintain a hardcopy and electronic record of groundwater analytical data at the Directorate of Risk Management. Additionally, ANAD will maintain a record of calculations to determine the statistical significance of the data. Field logbooks and supporting sampling documentation will be maintained.

IV E-9 Compliance Monitoring Program ADEM Admin. Codes R.335-14-8-.02(5)(c)7 and R.335-14-5.06(5)

If statistically significant evidence of contamination is found during the baseline sampling monitoring program, in compliance with AAC 335-14-5-.06(10)(h)(2) and (3), the groundwater will be sampled in all monitoring wells to determine whether constituents in the list of Appendix IX of AAC 335-14-5-Appendix IX are present and, if so, at what concentration. For any Appendix IX compounds found, the analysis may be repeated in 1 month. If the analysis is repeated and the results of the second analysis confirm the initial results, then these constituents will form the basis of compliance monitoring. Alternatively, ANAD may elect to have the hazardous constituents found in the initial Appendix IX monitoring serve as the basis for compliance monitoring. Within 90 days after the discovery of statistically significant evidence of contamination, ANAD will submit to ADEM an application for a permit modification. The permit modification application will include the following information:

- Identification of the concentration of any Appendix IX constituent detected in the groundwater at each monitoring well at the compliance point [AAC 335-14-5-.06(10)(h)].

- Any proposed changes to the groundwater monitoring system at the OB and OD units necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].
- Any proposed corrective actions, additions or changes to the monitoring frequency, sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].

IV E-10 Corrective Action Program or Data Showing that the Existing Levels are not Harmful ADEM Admin. Code R.335-14-8-.02(5)(c)8

Currently, the groundwater monitoring program is being developed to obtain baseline data. After several sampling events, if hazardous constituents are measured in the groundwater that exceed the concentration limits established under AAC 335-14-5-Appendix IX, a corrective action program that meets the requirements of AAC 335-14-5-.06(11) will be established.

IV E-11 Detailed Plans and Engineering Report Describing the Corrective Action to be Implemented ADEM Admin. Code R.335-14-8-.02(5)(c)7(v)

Not applicable.

IV E-12 Description of Use of the Groundwater Monitoring Program to Demonstrate the Adequacy of the Corrective Action ADEM Admin. Code R.335-14-8-.02(5)(c)7(vi)

Not applicable. The OB and OD units are under a detection groundwater monitoring program.

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IV F Procedures to Prevent Hazards
ADEM Admin Code R. 335-14-8-.02(5)(b)8

This section contains information concerning procedures to prevent hazards in accordance with ADEM Admin. Code R.335-14-5-.02(5). These regulations require a description of the security procedures and equipment, inspection schedules, justification for a waiver of preparedness and prevention requirements, spill prevention containment and countermeasures plan, and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

IV F-1 Security
ADEM Admin. Code R.335-14-8-.02(5)(b)4 and R.335-14-5-.02(5)

IV F-1a Security Procedures and Equipment

Security is addressed in Section II F-1a. The open burn (OB) and open detonation (OD) units are located within the Restricted Access Area of ANAD. Access to this area requires passage through an additional fence/gate system (Gate C).

IV F-1a(1) 24-Hour Surveillance Systems

Surveillance systems are addressed in Section II F-1a.

IV F-1a(2) Barriers and Means to Control Entry

Barriers related to ANAD are addressed in Section II F-1a.

Passage through additional locked gates, located adjacent to the Pit Office, is required to enter the OB and OD units. Entry through the gates is controlled by ANMC personnel. When OB and/or OD operations are underway, these gates are secured to prohibit access to non-essential personnel.

IV F-1a(3) Warning Signs

Warning signs are addressed in Section II F-1a.

IV F-1b Waiver

Sections II F-1 and II F-1a identify procedures that will be taken to prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock onto the active portion of the facility. Sections II F-1b (1) and (2) will not apply, and therefore will not be addressed.

IV F-2 Inspection Schedule
ADEM Admin. Code R.335-14-8-.02(5)(b)5 and 355-14-5-.02(6)

ANAD conducts regular inspections of the OB and OD units for equipment malfunctions, structural deterioration, operator error, and discharges that could cause or lead to the release of hazardous waste constituents and adversely affect the environment or threaten human health.

Table IV F-1 presents the inspection schedule for the OB and OD units. The schedules list the items that are inspected, the types of problems inspected for, and the frequency of

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TABLE IV F-1
OB and OD Units Inspection Schedule

Item	Inspect	Decision Criteria
	Monthly Inspection Schedule for OB and OD Units	
Groundwater monitoring wells[a]	Concrete pad, steel casings/pipes, well covers, and locks	Locks present and functioning, no damage to concrete and/or steel casings/pipes. Well covers in place.
Warning signs[b]	Signs	Present, visible, and not damaged
OD unit access[b]	Access road	Access road is accessible and free of debris and obstructions
OB unit access[b]	Access Road	Access road is accessible and free of debris and obstructions.
Fire controls[c]	OB and OD units	Free of combustible materials within 200 ft
Entrance gates and flag pole[b]	Entrance gates to OB and OD units and flag poles	In place and operable. Flag in good condition. Lights on flag pole operable
Telephones/radios on Personnel[c]	Telephones and radios	Operative
Personnel protective equipment (PPE) worn on Personnel as required	Work gloves, boots, safety glasses, goggles, and ear protection	Available in sufficient quantity and in good condition
Fire extinguishers in vehicles[c]	Fire extinguishers	Not damaged and adequately charged, unit has been inspected for operability
Decontamination facilities (eye wash, showers) in Pit Office	Eye wash station, shower facilities	Water pressure, leaking, drainage, upkeep
Emergency equipment in Pit Office Storage Building	Overpack drum, brooms, shovels,	Available for use
First aid kit in Pit Office	First Aid Kit	Complete and available for use
	Pre-Operation Inspection Schedule for OB Unit	
Notifications[c]	Not applicable	Have Security, Safety, ANMC Surveillance Office, and Emergency Operation Center (EOC) been notified of pending operation (range is hot)
Waste Acceptance	Waste munitions in comparison to the Work Order	Verify that the WMM to be treated matches the information presented in the Work Order.
Area clear[c]	Personnel, equipment, wildlife	Is the area of operation (OB unit) free and clear of unauthorized personnel, equipment, and wildlife
Emergency services[c]	Personal transport vehicle	Is personnel transport vehicle (PTV) present, is first aid kit available and with proper equipment, is stretcher available
Access gates[b,c]	OB unit access gate	Access gate is closed when range is hot. Access gate is observed from Pit Office
Baker flags and warning lights[b]	Flags and lights	Present, visible, and not damaged. Flags flown and lights functioning when range is hot
Fire extinguishers)[c]	Charge of unit, inspection date	Present in all vehicles. Not damaged and adequately charged, unit has been inspected for operability
Telephones/radios[c]	Telephones and radios	Operative
PPE[c]	As needed	ANMC personnel operating in the area are wearing proper PPE
Burn pan[d]	Burn pan	Structural integrity of the pan and lid. Pan lid removed for operations.

TABLE IV F-1
OB and OD Units Inspection Schedule

Item	Inspect	Decision Criteria
Post-Operation Inspection Schedule for OB Unit		
Burn pan[d]	Burn pan	Integrity intact, no standing water. Lids back in place following treatment residue removal
Unburned materials [c]	Interior of unit	Presence of unburned materials
Treatment residue [d]	Interior of unit	Presence of treatment residue. Treatment residue is drummed and removed off-site for disposal
Pre-Operation Inspection Schedule for OD Unit		
Notifications[c]	Not applicable	Have Security, Safety, ANMC , Surveillance Office, and EOC been notified of pending operation (range is hot)
Area clear[c]	Personnel, equipment, wildlife	Is the area of operation (OD unit) free and clear of unauthorized personnel, equipment, and wildlife
Emergency services[c]	Personal transport vehicle	Is PTV present, is first aid kit available and with proper equipment, is stretcher available
Access gates[c,b]	OD unit access gate	Access gate is closed when range is hot
Baker flags and warning lights[b]	Flags and lights	Present, visible, and not damaged. Flags flown and lights functioning when range is hot
Fire extinguishers [c]	Charge of unit, inspection date	Present in all vehicles. Not damaged and adequately charged, unit has been inspected for operability
Telephones/radios[c]	Telephones and radios	Operative
PPE[c]	As needed	ANMC personnel operating in the area are wearing proper PPE
Detonation surface[d]	Soil surface	Detonation surface is free of debris and standing water
Post-Operation Inspection Schedule for OD Unit		
Craters[d]	Craters	Depth of crater to assess necessity to backfill/grade
Unexploded materials[c,d]	Ground surface within OD unit	Presence of unexploded materials
Metal fragments[d]	Ground surface within OD unit	Presence of observable metal fragments on the soil and measuring 4 inches or greater in any dimension

[a] Monitoring equipment.
[b] Security devices
[c] Safety and emergency equipment
[d] Operating and structural equipment

inspection. OD residue inspections will be conducted in accordance with Section IV F-6. Operating and structural equipment is inspected during use as a part of standard OB and OD operating procedure prior to and post treatment. Security and emergency equipment, signs, and environmental monitoring equipment are inspected monthly. Emergency response equipment is inspected in accordance with Appendix C of the ANAD Integrated Contingency Plan.

IVF-2a General Inspection Requirements

Also provided in Table IV F-1 is the frequency of inspection for each item related to the operation of the OB and OD units.

IV F-2a (1) Types of Problems

Table IV F-1 lists the types of problems to be checked. The items listed in Table IV F-1 are considered most important for inspection because of their role in preventing, detecting, or responding to environmental or human health hazards. Provided with each item is a list of problems normally encountered and those normally looked for during the inspection. The inspection schedule is kept in the office of the DRK, Building 1, where it is available to authorized personnel.

Results of each inspection are recorded on the inspection log sheets (or equivalent) shown in Figures IV F-1 through IV F-3. Information requested on the log sheets includes the inspector's name and title, data and time of inspection, item of inspection, problems encountered, status of the item, observations, and data and nature of repairs and remedial action. Included in the inspection schedule are typical problems encountered with each item of inspection. These are provided on the log sheet as guidance for the inspector. They do not cover the entire range of problems that may be encountered. The inspector is required to check the status of each item and indicate whether its condition is acceptable or unacceptable. Regardless of the status, observations are made as to the number of containers, aisle space, inventory quantities, etc. If the status of a particular item is unacceptable, appropriate and complete information is recorded, including date and nature of repairs and remedial action.

IV F-2a (2) Frequency of Inspections

Inspections of the OB and OD units are conducted either monthly, prior to, or after a treatment event, per the inspection schedule provided in Table IV F-1 and in accordance with Section IV F-6. Monthly inspections will be conducted during calendar months that include at least one operating day.

IVF-2b Specific Process Inspection Requirements

Process specific inspection requirements are included in Table IV F-1 and in accordance with Section IV F-6.

IV F-2b(1) Container Inspection

Not applicable.

IV F-2b(2) Tank Inspections

Not applicable.

Inspector's Name/Title _____ / _____
Date of Inspection _____ (month/day/year)
Time of Inspection _____ (military time)

Item	Types of Problems	Status ( )		Observations	Date and Nature of Repairs/Remedial Action
		Acceptable	Unacceptable		
Groundwater monitoring wells	Locks present and functioning, no damage to concrete and/or steel casings/pipes. Protective well covers in place.				
Warning signs	Present, visible, and not damaged				
OD unit access	Access road is accessible and free of debris and obstructions				
OB unit access	Access road is accessible and free of debris and obstructions.				
Fire controls	Free of combustible materials within 200 ft				
Entrance gates and flag pole	In place and operable. Flag in good condition. Lights on flag pole operable				
Telephones/radios on Personnel	Operative				
PPE worn on Personnel as Required	Available in sufficient quantity and in good condition				
Fire extinguishers) in Vehicles	Not damaged and adequately charged, unit has been inspected for operability				
Decontamination facilities (eye wash, showers) in Pit Office	Water pressure, leaking, drainage, upkeep				
Overpack Drum (1)	Available in sufficient quantity and in good condition				
Brooms (2), Shovels (2)	Available in sufficient quantity and in good condition				
Boundary Markers for the Active Area	In place and in good condition				
Metal Fragments at OD Unit	Metal fragments observable on the soil and measuring 4 inches in any dimension are collected and removed from the Validation Area within the OD Unit .				

FIGURE IV F-1
Monthly OB and OD Unit Inspection Log

Inspector's Name/Title _____ / _____Date of Inspection _____ Time of Inspection _____

Waste Acceptance: The waste stream treated during this treatment event has been verified against the Work Order and is authorized for treatment.

Signature: _____

Item	Types of Problems	Status ( )		Observations	Date and Nature of Repairs/Remedial Action
		Acceptable	Unacceptable		
Inspections Prior to OB Unit Treatment Event					
Notifications	Have Security, Safety, ANMC Surveillance Office, and EOC been notified of pending operation (range is hot)				
Area clear	Is the area of operation (OB unit) free and clear of unauthorized personnel, equipment, and wildlife				
Emergency services	Is PTV present, is first aid kit available and with proper equipment, is stretcher available				
Access gates	Access gate is closed when range is hot.				
Baker flags and warning lights	Present, visible, and not damaged. Flags flown and lights functioning when range is hot				
Fire extinguishers)	Present in all vehicles. Not damaged and adequately charged, unit has been inspected for operability				
Telephones/radios	Operative				
PPE	ANMC personnel operating in the area are wearing proper PPE				
Burn pan	Structural integrity of the pan and lid. Pan lid removed for operations.				
Inspections Following OB Unit Treatment Event					
Burn pan	Integrity intact, no standing water. Lids back in place following treatment residue removal				
Unburned materials	Presence of unburned materials				
Treatment Residue	Presence of treatment residue. Treatment residue is drummed and removed off-site for disposal				

FIGURE IV F-2
Operational OB Unit Inspection Log

Inspector's Name/Title _____ / _____Date of Inspection _____ Time of Inspection _____

Waste Acceptance: The waste stream treated during this treatment event has been verified against the Work Order and is authorized for treatment.

Signature: _____

Item	Types of Problems	Status ( )		Observations	Date and Nature of Repairs/Remedial Action
		Acceptable	Unacceptable		
Inspections Prior to OD Unit Treatment Event					
Notifications	Have Security, Safety, ANMC Surveillance Office, and EOC been notified of pending operation (range is hot)				
Area clear	Is the area of operation (OD unit) free and clear of unauthorized personnel, equipment, and wildlife				
Emergency services	Is PTV present, is first aid kit available and with proper equipment, is stretcher available				
Access gates	Access gate is closed when range is hot				
Baker flags and warning lights	Present, visible, and not damaged. Flags flown and lights functioning when range is hot				
Fire extinguishers)	Present in all vehicles. Not damaged and adequately charged, unit has been inspected for operability				
Telephones/radios on Personnel	Operative				
PPE on Personnel as Required	ANMC personnel operating in the area are wearing proper PPE				
Detonation surface	Detonation surface is free of debris and standing water				
Inspections Following OD Unit Treatment Event					
Craters	Depth of crater to assess necessity to backfill/grade				
Unexploded materials	Presence of unexploded materials in the Active Area				
Inspection At End Of Operating Day					
Unexploded materials	Presence of unexploded materials in the Active Area				
Metal fragments	Metal fragments observable on the soil and measuring 4 inches in any dimension are collected and removed from the Active Area (900' x 300') of the OD Unit				

FIGURE IV F-3
Operational OD Unit Inspection Log

IV F-2b(3) Waste Pile Inspections

Not applicable.

IV F-2b(4) Surface Impoundment Inspections

Not applicable.

IV F-2b(5) Incineration Inspection

Not applicable.

IV F-2b(6) Landfill Inspection

Not applicable.

IV F-2b(7) Land Treatment Inspection

Not applicable.

IV F-2b(8) Miscellaneous Unit Inspection

Process specific inspection requirements are included in Table IV F-1.

IV F-2b(9) Inspection for Process Vents

Not applicable.

IV F-2b(10) Inspection Procedures for Equipment Leaks, Applicability, and Waste Analysis

Process specific inspection requirements are included in Table IV F-1.

ANAD treats only solid WMM at the OB and OD units; therefore, leaks of hazardous WMM will not occur. Burn pans are completely covered with burn pan lids that effectively prevent precipitation from accumulating in the pans. Burn events are prohibited during periods of precipitations and pans are covered when not in use. A small amount of condensation may accumulate in the pans and a small amount of precipitation may fall into the pans before pan lids are replaced after the conduct of the burn. This precipitation is allowed to evaporate. Burn pans are filled with a drainage device, but these have never been required to drain the pains.

The integrity of burn pans is inspected monthly as well as prior to each burn event. Metal corrosion that could potentially lead to a pan leak is noted on the inspection checklist and repair or replacement is required. Any pan that is corroded or damaged to the extent that a potential for a leak exists will be taken out of commission immediately and will not be used until the repair or replacement is completed.

Results of a site characterization at the OB units which included both surface and subsurface sampling indicates that munitions constituents in the soils at the OB unit are not present at levels of concern. Results of the site characterization are described in Attachment 2.

IV F-2b(11) Test Methods and Procedures

Refer to Table II F-1.

IVF-2c Remedial Action

When inspections reveal that non-emergency maintenance is needed, the maintenance will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs. If a hazard is imminent or has already occurred during the course of an

inspection or any time between inspections, remedial action will be taken immediately. In case of an industrial emergency, ANAD personnel will notify the appropriate authorities identified in Attachment 4 to the Integrated Contingency Plan and initiate remedial actions. In the event of an emergency involving the release of industrial hazardous constituents to the environment, efforts will be directed toward containing the hazard, removing it, and subsequently decontaminating the affected area. The Integrated Contingency Plan contains details for everything except chemical munitions. Action to be taken during emergency situations involving chemical agent are described in ANAD's Chemical Accident/Incident Response and Assistance (CAIRA) Plan in the Integrated Contingency Plan.

IVF-2d Inspection Records and Recordkeeping

Inspection log sheets are described in Section IV F-2a(1).

IVF-3 Documentation of Preparedness and Prevention Requirements ADEM Admin. Code 335-14-8-.02(5)(b)6 and R.335-14-5-.03

The applicant does not wish to request a waiver of the preparedness and prevention requirements of ADEM 335-14-8-.02. Requirements of this section specific to the OB and OD units are primarily addressed in Sections IV B, IV F, and IV G.

IVF-3a Equipment Requirements

IV F-3a(1)/(2)/(3) Internal Communication/External Communication/Emergency Equipment

Internal communications, external communications, and emergency equipment are included in the Integrated Contingency Plan.

IV F-3a(2) External Communication

Internal communications, external communications, and emergency equipment are included in the Integrated Contingency Plan.

IV F-3a(3) Emergency Equipment

Internal communications, external communications, and emergency equipment are included in the Integrated Contingency Plan.

IV F-3a (4) Water and Fire Control

Hydrants at ANAD have an average water volume capacity ranging from a low of 620 gallons per minute (gpm) to a high of 1,186 gpm. ANAD has two water tenders, one of 1,000 gallons and a second which holds 2,700 gallons. This allows a dedicated water supply to be available for fire control at the OB and OD units at all times. This supply is deemed sufficient by ANAD's fire department for fire fighting needs of the OB and OD units.

IVF-3b Aisle Space Requirements
ADEM Admin. Code R.335-14-5-.03(6)

Figure IV F-4 shows the location of the OB and OD units with respect to the ANAD Fire and Emergency Services Division. The figure additionally shows the roadways that would be used by emergency vehicles to access the units. In the event of an emergency, the layout and road system of the OB and OD units allows the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any

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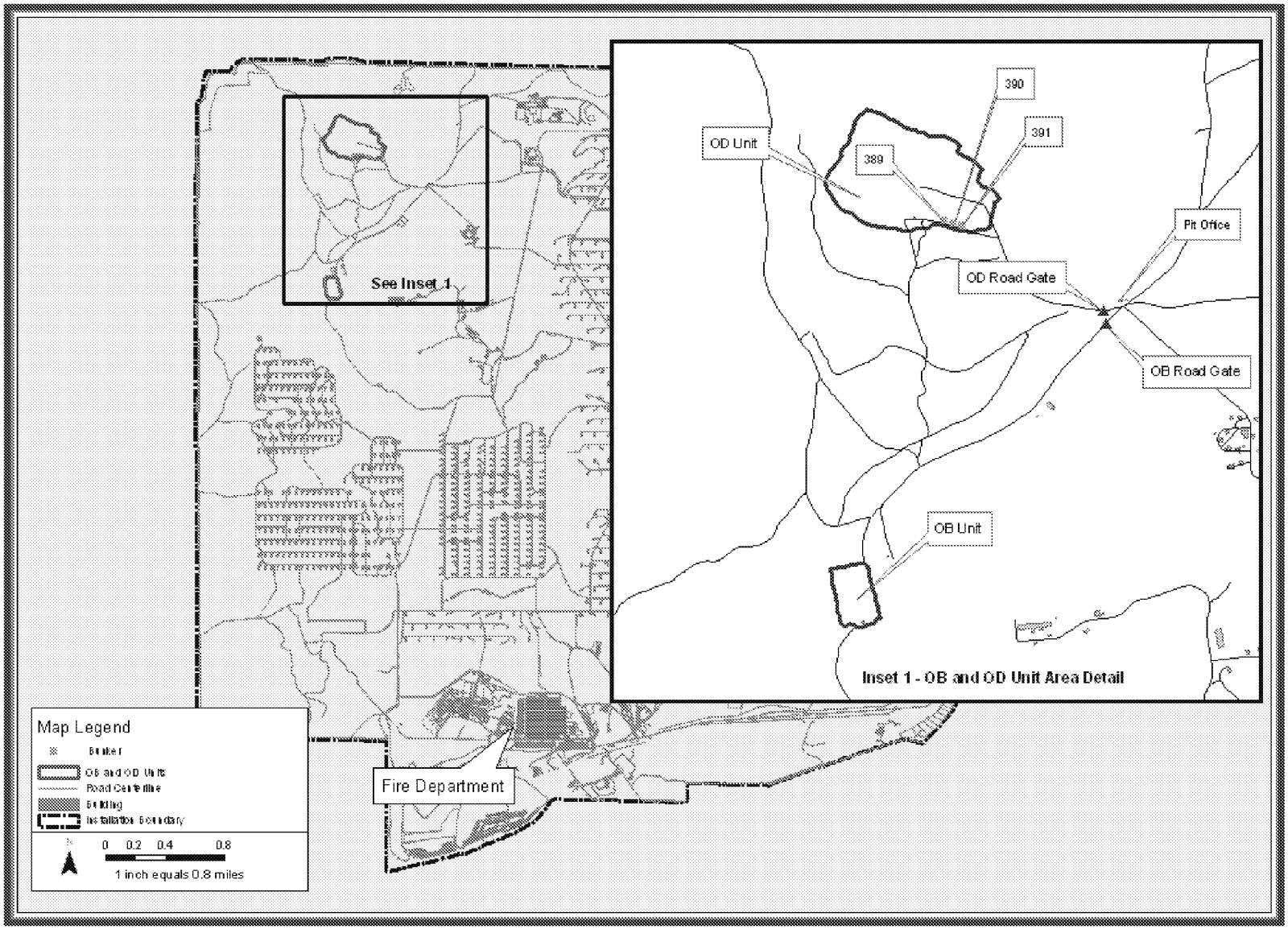

FIGURE IV F-4
ANAD OB and OD Units Location Map

location within the OB and OD units. The burn pans are 100 to 150 feet apart, and the OD unit is approximately 0.8 mile from the OB unit. The internal roads within from the OB to the OD unit are 16.5 feet wide.

IVF-4 Preventive Procedures, Structures, and Equipment ADEM Admin. Codes R.335-14-8-.02(5)(b)6 and R.335-14-5-.03

ANAD does not wish to request a waiver of the preparedness and prevention requirements under ADEM Admin. Code R.335-14-8-.02(5)(b)6 or 335-14-5.03. Requirements of this Subpart are primarily addressed in the Integrated Contingency Plan.

IVF-4a Unloading Operations

Hazardous WMM treated at the OB and OD units are classified as reactive (D003) waste. Anniston Munitions Center (ANMC) routinely loads, transports, and unloads explosive materials, and procedures have been established to address potential hazards as described below.

General procedures for loading waste military munitions (WMM):

- WMM must not be handled roughly or dropped or carried over other explosive materials.
- When empty carriers pick up WMM to be treated from the igloo storage area, the vehicle is shut off, the break set, and the tires chocked before loading WMM.
- WMM is secured to the vehicle to prevent movement.
- Carriers transporting WMM to be treated have appropriate fire symbols.
- WMM are loaded from the carrier by forklift or other material handing equipment (MHE). The load rating must not be exceeded and equipment without a current inspection must not be used.
- Personnel operating the forklift are fully trained in the handling of explosive material and possess a valid forklift operator's license.
- Explosive containers are banded together to prevent inadvertent dropping of individual containers.

Requirements for transport vehicles:

- Vehicles transporting WMM must be equipped with nonsparking bed, two fire extinguishers, and appropriate fire symbol.
- Appropriate fire symbols and/or chemical hazard symbols must be displayed on vehicles used in transporting WMM within ANAD. These symbols must be affixed to the vehicle when WMM is moved to the OB or OD units. Fire symbols must be turned or removed when the carrier is empty.
- WMM must be transported in packed and closed containers.
- WMM are packed securely and tightly for transport to the point of treatment.

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- The most direct travel route is used from the storage igloo to the OB and OD units.

General procedures for unloading at OB and OD units:

- Trucks positioned for unloading must have the ignition turned off, parking brake set, and wheels chocked.
- No explosives, ammunition, or other hazardous material may be unloaded from vehicles while the engines are running.
- Two Class 2A fire extinguishers must be available during unloading operations.
- Personnel use material handling equipment (MHE) to the greatest extent possible that is consistent with safe and efficient operations.
- Personnel cutting steel strap bands must wear leather gloves, safety glasses, and face shields.
- Empty boxes are inspected to ensure containers are free of explosives and stamped inside and out with certification stamp of the person performing certification

IVF-4b Run-Off

Run-off from the OB and OD units is controlled through administrative controls, process control, engineering controls, and site grading. Administrative controls prevent OB and OD operations from occurring during periods of rain. Since hazardous waste explosive is present at the sites only during operation, this administrative procedure effectively eliminates the potential for run-off from the WMM treated.

Process controls at the OB and OD units include burning in pans. Since the waste propellant is effectively destroyed during the burn and remaining residue collected from the pans, the burning process itself eliminates the potential for run-off. Additional assurance of run-off control is provided by covers over the metal trays. Similarly, during OD the waste explosive is effectively eliminated, leaving no significant amount of residue to be entrained in surface water flow.

Engineering controls include a sediment retention basin located within the OD unit boundary to control sediment runoff from the permitted unit. Sediment retention basin details are described in Section IV D-3e.

A final check on site run-off is the presence of an interceptor ditch around each site. These ditches limit the amount of surface water crossing the sites, reducing the possibility of contaminated run-off.

IVF-4c Water Supplies

Water supplies are addressed in Section II F-4c.

IVF-4d Equipment and Power Failure

The use of equipment and electricity in the operation of the OB and OD units is such that failure to operate does not pose a hazard.

OD operations are currently conducted by non-electric means, although electrical firing is available during low static conditions. Non-electric firing uses detonation cord, time fuze, and manual pull-type ignitors. The fuzes are cut to the appropriate length, and the detonation is monitored in the firing bunker. The detonation is also monitored on closed-circuit television by personnel in the firing bunker.

OD operations can also be initiated by the fixed electrical firing system in the firing bunker, consisting of a firing panel, blasting machine, and buried firing cable to the four firing points. The fixed electrical firing system does not require power from the ANAD power grid. Depressing the plunger on the blasting machine provides necessary electrical power.

OB operations use a time fuze and manual pull-type ignitors.

IVF-4e Personal Protective Equipment

Personal protective equipment requirements are addressed in Section II F-4e. The following general requirements are included in SOPs to enhance personnel safety.

- Personnel handling pentachlorophenol (PCP) treated wooden boxes wear protective gloves and, if necessary, clothing.
- Personnel engaged in demolition operations wear flame-retardant coveralls and spark-proof safety shoes.
- Personnel working in proximity to steel banding wear face shields and safety eyewear. Anyone handling wooden boxes, metal, or sharp objects wears leather or leather-palm gloves.
- Personnel engaged in material handling operations wear flame-retardant coveralls and spark-proof shoes.
- National Institute of Occupational Safety and Health (NIOSH)-approved respirator with filter is worn when sawing and machining wood.
- Electromagnetic resonance-emitting equipment is shut off at least 350 feet from the operation.

IVF-5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste ADEM Admin. Code R.335-14-5-.02(5)(b)9

No ignitable or reactive waste is stored at the OB or OD units. These wastes are moved to the site only at the time of treatment. No matches, lighters, or other flame-producing instruments are allowed in the possession of personnel on the OB and OD units. WMM are, therefore, adequately protected from ignition. During detonation operations, personnel follow detailed safety precautions specified in the SOP and as defined below to eliminate static electricity and random currents and to prevent inadvertent detonation of blasting caps.

- During electrical priming or initiating, vehicles entering the detonation pit area turn radios off. Radios and cell phones remain off until there are no longer electrical firing devices at the pit, or the vehicle leaves the pit area.

- Equipment and the grounding system are tested for electrical resistance and continuity when initially installed and at intervals not to exceed 6 months. Safety inspections are shared by entities outside of ANMC.
- Installed gauges and equipment are properly grounded.
- Metal table tops are grounded.
- Whenever an electrical storm approaches the installation, personnel evacuate from the locations at which there is a hazard from explosives that could be ignited by lightening. Personnel evacuate to the Pit Office (Building 727) and standby for further instructions.
- Conductive soled shoes are worn and tested prior to inspecting any explosive item sensitive to static electricity.

IVF-5a Precautions to prevent Ignition or Reaction of Ignitable or Reactive Waste

The procedures used in the OB and OD units are designed to prevent accidental ignition or reaction of ignitable or reactive waste materials. General safety precautions to be followed for preventing ignition or reaction of the wastes treated include the following:

- No smoking, matches, lighters, open flames, or other unauthorized ignition sources are permitted in the OB and OD units.
- No cutting, welding, or activities involving hot surfaces, frictional heat, radiant heat, or other heat-producing activities are permitted in the OB and OD units whenever ignitable or reactive wastes are present.
- Spark-producing equipment and tools are prohibited from use when ignitable or reactive wastes are present.
- Operating personnel are specifically trained in the handling of explosives.
- The area (200 feet) surrounding the burn pans and the active portion of the OD unit are kept free of combustible materials.
- A fire break surrounds the depot and the area containing the OB and OD units.

IVF-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

General precautions for the OB and OD units include:

- The OB and OD unit operations are under the direct supervision of an experienced and trained supervisor charged with responsibility for all activities within the area. During the supervisor's absence, a competent qualified person is designated to be in charge. This competent person is also charged personally with sole custody of ignition devices. Prior to actual burning or detonation, all personnel, including the supervisor or designee, are evacuated to a safe distance or protective structure affording adequate protection but consistent with the need to monitor the total operation until it is complete.
- No personnel return to the event area until all evidence of flame has disappeared.

- The number of personnel involved in OB and OD operations is kept to a minimum to limit exposure of personnel for a minimum time to a minimum amount of hazardous material consistent with safe and efficient operations. However, at no times are fewer than two personnel present when OB and OD operations are conducted.
- Prior to ignition of items in the pans for burning or in the OD area for detonation, all personnel, except the team leader and required ammunition destroyers, evacuate the burning and detonation areas to a designated distance (1,250 feet at the OB unit and to the Pit Office at the OD unit).
- The roads entering the OB and OD units are barricaded and a flag and flashing light are displayed while OB and OD treatment operations are being conducted. The light and flag remain on until the OB and OD units have been declared safe.
- Anyone entering the area while the flag is flying reports to the Pit Office (Building 727) to obtain permission to enter the area.
- The following conditions affect when and if burning or detonation can be conducted:
  - Operations are not conducted during electrical storms, thunderstorms, periods of precipitation, or periods of forecast high probability (50 percent or more during the scheduled time of the operation) of such.
  - Operations are restricted to periods when surface average wind speed is more than 3 miles per hour (mph) and less than 20 mph with gusts less than 30 mph and from a direction that will not carry emission products over any publicly accessible area within 1 mile of the destruction site.
  - Operations are not conducted during periods when visibility is less than 1 mile.
  - Operations are not carried out when the cloud cover is greater than 80 percent and the cloud ceiling is less than 2,000 feet.
  - Operation is only conducted between 8:00 AM and 4:00 PM, Monday to Saturday.
  - In the event of an electrical storm, personnel will go to the safety of Building 727.
- Meteorological conditions are validated by ANMC prior to moving WMM to the OB and/or OD units. These conditions are documented on a Weather Data Statistics Log by ANMC personnel and maintained at the Pit Office. Specific weather data are obtained by ANMC using on-line information provided by the National Oceanic and Atmospheric Administration (NOAA) in accordance with ANMC SOPs.

IVF-5c Management of Ignitable or Reactive Waste in Containers

Management of reactive wastes is addressed in IV F-5a, b, and c.

IVF-5d Management of Incompatible Waste in Containers

Not applicable.

IVF-5e to f Management of Ignitable or Reactive / Incompatible Wastes in Tanks

Not applicable.

IVF-6 Open Detonation Residue Management

IVF-6a Introduction

IVF-6a(1) Purpose and Scope

This Section establishes the procedures to inspect the permitted Open Detonation (OD) unit for the presence of OD treatment residue and to collect, remove and properly manage that residue. Residue includes unexploded ordnance (UXO) and munition components containing unreacted energetic material that may result from a low-order detonation or kick out. Housekeeping of metal fragments (observable on the soil and measuring 4 inches or greater in any dimension) is also addressed. The requirement to inspect and remove OD treatment residue from within the permitted OD unit has been established by the Alabama Department of Environmental Management (ADEM) to ensure the efficacy of OD in treating the reactive component of the Waste Military Munitions (WMM).

Implementation of the inspection schedule and processes will document continual validation of the efficacy of OD in treating the reactive characteristic of the waste stream and validate the bounds of the permitted OD unit.

IVF-6a(2) Background

Since its inception at ANAD, the primary use of the OD unit has been for the demilitarization of WMM (i.e., neutralizing the military nature of the munitions). Ancillary activities throughout the years have included training in the conduct of OD and military munitions emergency response operations. Though not regulated under RCRA as a hazardous waste management activity until 1988, operations at the OD unit have always been performed in accordance with strict Department of Defense (DoD) and US Army explosives safety standards and regulations. Such regulations impose administrative and engineering controls, reflected in Standard Operating Procedures (SOPs) to ensure the demilitarization process is complete, to mitigate the potential for UXO, low order detonations, fragment throw distance and noise.

Since 1988, ANAD has continued to operate its OD unit in accordance with all applicable DoD and US Army explosives safety and demilitarization requirements in addition to the Resource Conservation and Recovery Act (RCRA) and ADEM regulations as identified in its permit application(s) and SOPs.

Historic photographs from 1962, 1982 and 2009 and included as Figures IV F-5 through IV F-7, show that the outermost bounds of visual impact from OD operations in 2009 encompass the historical visual bounds of 1962 and 1982. The area visually impacted (as observed on aerial photography) consists of a clear area, devoid of most vegetation due to the direct impact of heavy equipment and demolition activities and additional clear area due primarily to the indirect impact from the deposition of particulate that is entrained in the detonation cloud.

FIGURE IV F-5.

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Aerial Photograph 1962

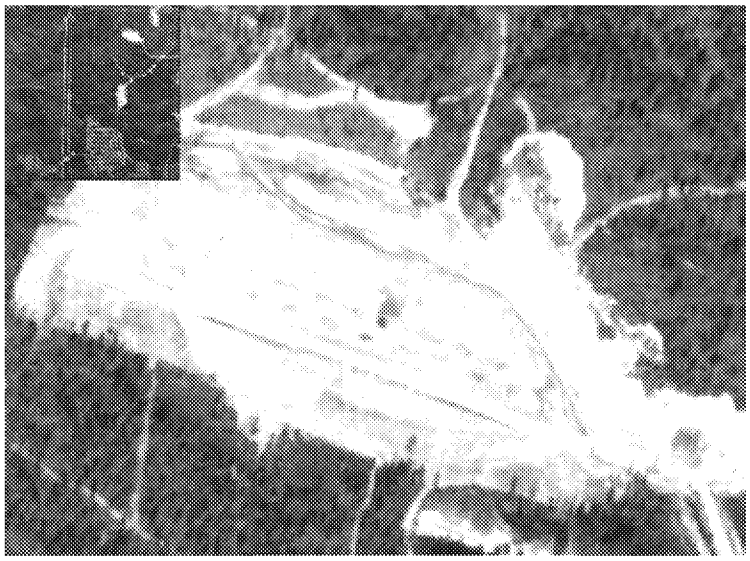


FIGURE IV F-6.
Aerial Photograph 1982

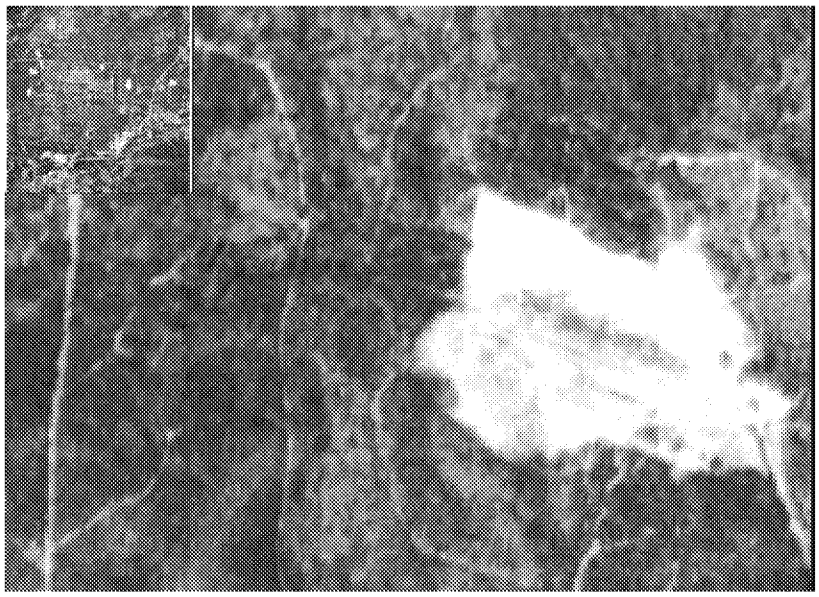
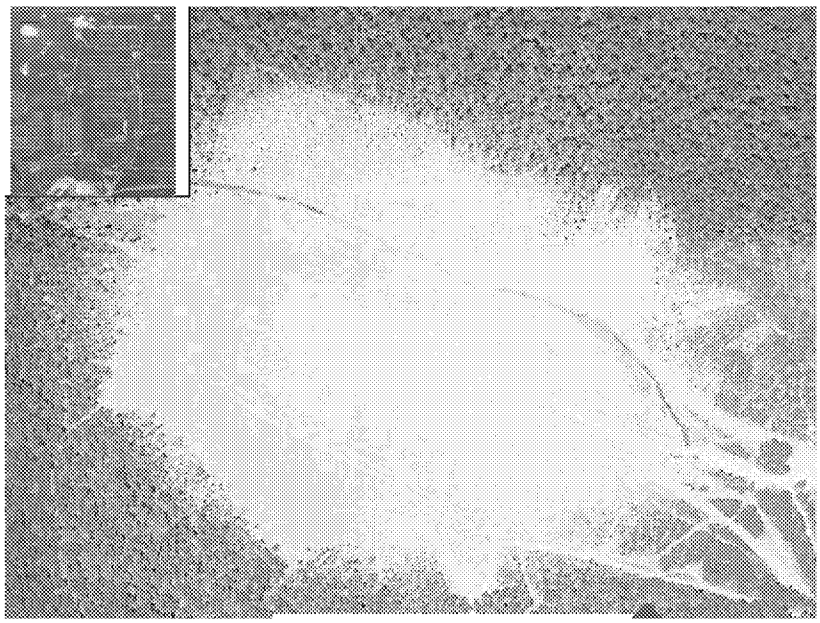


FIGURE IV F-7.
Aerial Photograph 2009



Current processes and procedures when functioning as planned, result in complete treatment with no UXO and only minimal fragment thrown from the pits. It is not currently known whether historical practices may have resulted in UXO and/or munitions components containing unreacted energetic material beyond the bounds of the permitted OD unit.

This Section provides for an inspection schedule to ensure continual validation of the efficacy of OD in treating the reactive characteristic of the waste stream and to validate the bounds of the active OD unit. The potential impacts of historical operations will be addressed via the corrective action process.

IVF-6a(2)a Shot Design and Test Configuration

Upon receipt of a new munitions work load, qualified Anniston Munitions Command (ANMC) technical staff design the shot based on technical expertise. The shots are specifically configured to facilitate complete propagation of the detonation resulting in complete treatment of energetic materials. The donor charge is configured so the force will create a sympathetic detonation. Additional considerations in the overall design of the shot include noise mitigation and mitigation of fragment throw distance. The Buried Explosion Module (BEM), further described in Attachment IV F-1 is one tool that may be used to plan the shot.

A test demonstration of all new shot configurations is accomplished to verify the efficacy of the treatment process. To verify a successful treatment, a visual inspection is conducted after the detonation of the active portion of the detonation area. The test configuration is concurred in Surveillance, Safety Office, Demo Pit Supervisor and the Production Management Division Planner. Failure to meet the shot design goals results in a re-design of the shot parameters and retesting until the goals are met. Once approved, the shot

configuration is depicted in a schematic drawing which is included in the work order and kept on file for use by the site operators in all future shots for the given work load.

IVF-6a(2)b Work Order

The work order identifies the items to be treated. It includes national stock number, nomenclature, lot number and/or serial numbers, quantity, location of the items, condition code, any special instructions, and a copy of the validated schematic. Concurrence of the work order is received from Logistic Support Division (Surveillance), Munitions Division (Storage), Maintenance Division, Production Management Division (PMD) Planner, and the Production Management Division Team Leader.

IVF-6a(2)c Operational Procedures

All demolition operations are conducted in accordance with (IAW) Standing Operating Procedures (SOP) AN-0000-G-026. The purpose of an SOP is to provide clear, concise guidance to operating personnel, and to aid in the training of operators. The SOP is prepared IAW AMC-R 700-107. Demilitarization SOPs require review and concurrence annually by the Logistic Support Division (Surveillance), Industrial Hygiene, Directorate of Risk Management, Safety Office, and the Commander and/or Commander's Representative.

Detonation stations (i.e., pits) are positioned within the area defined in Section IV F-6b(1) as the Active Area in a manner to ensure that the expected crater diameter will not breech the designated area boundary.

IVF-6b Residue Control Inspection Areas

As detailed throughout the permit application, the permitted OD unit comprises that area generally clear of vegetation identified as the Validation Area .

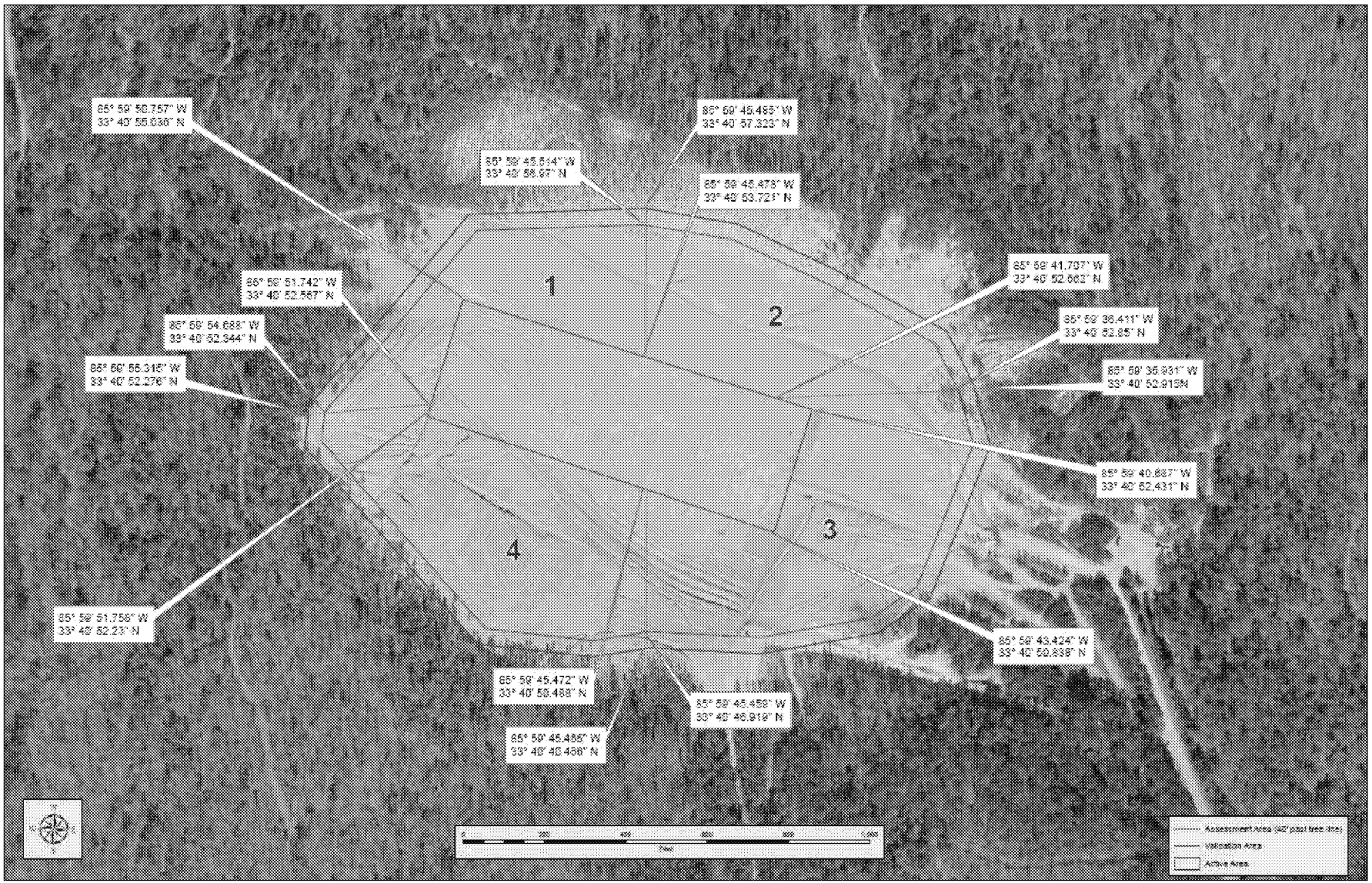


FIGURE IV F-8
OD Unit Inspection Areas

As previously discussed, the configuration of WMM within the disposal pits and the amount of soils cover is predetermined to ensure treatment efficacy and mitigate the potential for UXO, low order detonations, noise, and fragment throw distance. During any given shot, a number of variables may influence actual shot propagation and resulting fragment size, shape and trajectory, at times resulting in unplanned kickout of UXO or munition components containing unreacted material.

For the purpose of implementing OD unit inspection and residue control , three residue control inspection areas have been identified as described below.

IVF-6b(1) Active Area of the OD Unit

The OD process involves surface detonations of up to 6.8 kg (15 lb) Net Explosives Weight (NEW) or buried detonations of up to 450 kg (1,000 lb) NEW of conventional WMM in pits.

A detonation series involves up to 8 pits (detonation stations) that are dug at the beginning of the operating day to a maximum depth of approximately 14 feet. When additional detonation series are planned for the afternoon, craters created by the morning detonations are reformed for the afternoon detonations.

The Active Area of the OD Unit is the area within which the majority of UXO, munitions components containing unreacted material, and or large metal fragments (defined by ADEM as observable on the soil and measuring 4 inches or greater in any dimension) would be expected to fall under low order or kick out circumstances. This distance is determined via historic knowledge and experience of site operators. The Active Area is defined as the open, flat area of soil that measures approximately 900 feet by 300 feet. The 900 feet by 300 feet area is defined by the global positioning system (GPS) coordinates identified in **Figure IV F-8**. This area has been identified by four boundary markers.

Results of several model runs using the BEM (refer to Attachment IV F-1) demonstrates that with the exception of non-cylindrical munitions components and the occasional improperly functioned shot, few fragments of any size are anticipated to be thrown outside of this area.

IVF-6b(2) Validation Area

Based on BEM models, untreated material is not expected to be found outside the Active Area. However, to validate the footprint of the Active Area and BEM modeling tool, a second area, the Validation Area, subject to residue inspection has been identified. Based on historical knowledge, the Validation Area is defined as the area of the permitted OD unit generally clear of vegetation as shown on **Figure IV F-8**. A visual marking system has been established to show the extent of the Validation Area and to mark the Validation Area into four quadrants. The visual marking system consists of concrete blocks, marked trees, rocks and posts.

IVF-6b(3) Assessment Area

In the event that untreated material is found during inspection of the Validation Area, a third area, the Assessment Area, has been delineated to verify that untreated material from current operations has been contained within the two identified residue control areas [Active Area and Validation Area].

The Assessment Area will be one of four quadrants corresponding to the Validation Area quadrant in which the material was found and extending 40 feet past the boundary of the Validation Area. The four quadrants are presented in **Figure IV F-8**.

IVF-6c Residue Control Procedures

IVF-6c(1) Active Area of the OD Unit

Following each detonation series, ANMC operators will visually inspect the Active Area of the OD Unit (as defined in Section IV F-6b(1)) for UXO and munitions components containing unreacted material. At the completion of each operating day, ANMC operators will visually inspect the Active Area (as defined in Section IV F-6b(1)) for UXO and munitions components containing unreacted material. Housekeeping of metal fragments (observable on the soil and measuring 4 inches or greater in any dimension) will also be conducted.

If any UXO or munitions components containing unreacted material is found its location/description will be documented on a site map and the material will be re-treated in accordance with SOPs. The site map (Figure IV F-8) will be maintained at the Pit Office. If untreated material is found, the configuration of the shot must be reevaluated for process efficacy and to assess whether adjustments in shot configuration is needed. Shot schematic(s) will be adjusted accordingly.

The four (4) boundary markers designating the Active Area will be visually inspected to ensure they maintain their integrity. If the markers are damaged or knocked down, the Department of Public Works (DPW) will be notified to repair and/or replace the markers.

Detonation stations will not be positioned within 35 feet of the boundary of the Active Area to ensure that the expected crater diameter does not breech this boundary.

IVF-6c(2) Validation Area

Every calendar month with at least one operating day, ANMC operators will visually inspect the Validation Area (as defined in Section IV F-6b(2)) for UXO and munitions components containing unreacted material. Housekeeping of metal fragments (observable on the soil and measuring 4 inches or greater in any dimension) will also be conducted.

Inspection of the Validation Area has been on-going for some time and to-date, no UXO or unreacted material has been observed. Metal fragments, observed during the inspections have been collected and managed as processed scrap metal following inspection in accordance with DODI 4140.62, Material Potentially Presenting an Explosive Hazard. During the on-going inspection process, if any UXO or munitions components containing unreacted material is found, its location will be identified on a site map and it will be re-treated in accordance with the SOP. The site map will be maintained at the Pit Office. Presence of untreated material in a quadrant of the Validation Area will necessitate inspection of the corresponding quadrant of the Assessment Area.

IVF-6c(3) Assessment Area

If untreated material is found in the Validation Area, ANMC operators will visually inspect the corresponding Assessment Area quadrant(s) (as defined in Section IV F-6b(3)) for materials from current operations to include UXO, munitions components containing unreacted material, and identifiable munitions fragments (observable on the surface and measuring 4 inches or greater in any dimension). If any material from current operations is found, its location will be identified on a site map maintained at the Pit Office. UXO will be treated in accordance with SOPs. The results of the visual inspection of the Assessment Area will be evaluated to ensure the efficacy of the OD treatment process and to determine if any revisions to residue control management procedures are appropriate and/or whether there is an indication that the areal extent of the Validation Area/permitted OD unit boundary needs to be expanded. Any proposed expansion of the boundaries of the permitted unit will be coordinated with ADEM and instituted via a permit modification.

If, during inspection of the Assessment Area, material from historic operations is found, it will be visibly inspected to decide if it is UXO or contains unreacted material. If so, the item(s) will be blown in place or moved and detonated with the next OD treatment event if safe to move. The location and a description of the item will be noted in inspection logs. This information will be considered during the conduct of any future corrective action activities to address the potential impact of historic OD operations.

Inspection of the Assessment Area will be conducted by certified explosive operators who have the expertise to determine if the material is from current operations (within the last year) or from historic operations. The explosive operators are well versed in the visual

identification of munitions and munitions components, in particular those associated with current and recent workloads. In general, the ANAD workload remains consistent for a period of months or years. Visual indications of whether observed UXO or unreacted material is the result of current versus historical operations includes the length, diameter and thickness of the item, its shape, and any other distinguishable markings. In addition, the presence of rust and corrosion, any imbedded soil or dirt and the relative position or location of the item are indications of the time period that the item has been exposed to the environment. In addition, Quality Assurance Specialist, Ammunition, Surveillance (QASAS) personnel are available if further verification is required.

As previously stated, though strict DoD and US Army explosives safety standards have been in place throughout the site history, areas beyond the Validation Area may have been impacted by historic operations. The potential for UXO or munitions components containing unreacted material is anticipated to be very low, but it is possible that past operational procedures may have resulted in large fragments being thrown beyond the Validation Area, potentially impacting the Former OD Unit Buffer Zone. The Former OD Unit Buffer Zone, shown on Figure IV F-9, is outside of the OD unit boundary that comprises the Active Area and Validation Area (as defined in Section 2.1 and 2.2) which make up the permitted unit. The results of the baseline site characterization presented in *the Open Burning and Open Detonation Site Characterization Memorandum, October 2005* and on-going groundwater monitoring program demonstrate that the site media (including surface and subsurface soils and groundwater) of the permitted unit are relatively unimpacted by historic operations. The impact of historic operations beyond the boundaries of the Validation Area/permitted unit have not been assessed, but will be addressed via the corrective action process.

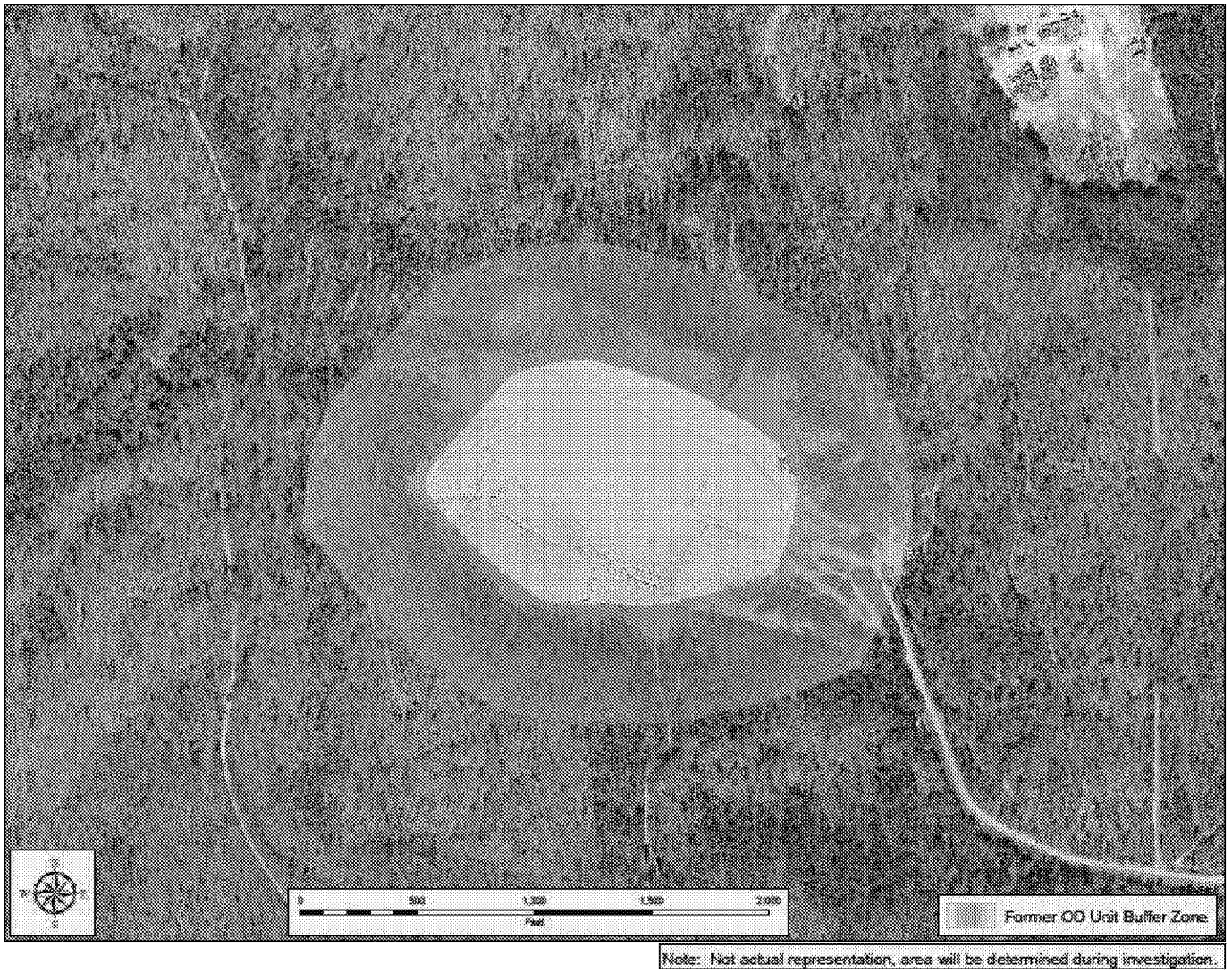


FIGURE IV F-9
Former OD Unit Buffer Zone

Attachment IV F-1

Buried Explosion Module

Technical Paper (TP) 16 Revision 3 provides Department of Defense Explosives Safety Board (DDESB) approved methodologies for calculating the characteristics of primary fragments. It includes methodologies for calculating: primary fragment mass and velocity, maximum fragment range, hazardous fragment distance, effects of detonating stacks of items, effects of detonating buried items, and penetration information. The latest version of the document, the associated software, and the Fragmentation Database can be found on the DDESB Secure Web-Page: https://secureweb.hqda.pentagon.mil/ddesb/login.asp

The Fragmentation Database is an expanding database of munitions-specific Fragmentation Data Review Forms that provides primary fragment characteristics for specific munitions items, including the maximum fragment distance hazard fragment distance (i.e., distance to no more than 1 hazardous fragment per 600 square feet), and maximum fragment weight. Software associated with TP 16 includes: (1) Buried Explosion Module (BEM), (2) the Generic Equation Calculator (GEQ), and the Barricade Angle Calculator (BAC).

TP16 and the important information included in the Fragmentation Data Review Forms are in use throughout the Department of Defense when planning for munitions disposal operations including emergency disposal operations. Information that is generated via modeling and presented in the Fragmentation Data Review forms includes the sandbag thickness that may need to be employed to reduce fragmentation and the expected sandbag throw distance, the thickness of protective materials used to shield personnel from fragmentation hazards, and the distance that non-essential personnel must withdraw during disposal operations to protect them from unintentional detonations.

The BEM has been chosen as a useful tool to demonstrate important characteristics related to buried detonations. It is important to note that the methodologies described in TP 16 and used in the BEM are generally applicable to cylindrical objects. When a cylindrical object detonates, the fragment trajectory is well understood and predictable. Where munitions or munitions components (e.g., nose plugs, base plates, boat tails) are non-cylindrical, these may travel at distances and in patterns not predicted by the BEM. These limitations are understood, yet the modeling provides important information that is used during munitions operations to protect human health and the environment and serves as the best available tools of prediction.

The BEM includes a number of drop-down menus to select munitions type and site-specific variables such as the burial medium and soil type. At ANAD, the burial medium is sand and the soil type may be either dry sandy clay or wet sandy clay depending on precipitation conditions.

The BEM can be used to demonstrate the following general information regarding munitions fragments and buried detonations.

1. In general wet soil conditions decreases the soil ejecta distance but does not impact the maximum fragment distance.

2. The fragments formed by munitions detonation vary in dimension, but the majority of fragments formed are very, very small. Few munitions items in the BEM database will form a fragment with a maximum fragment weight comparable to a 4inch by 4 inch of steel. [Most munitions casings are comprised of steel. Steel weighs approximately 490

lbs/ft^3 or 0.283 lb/in^3. A 4 inch by 4 inch by ¼ inch fragment is estimated to weigh approximately 1.1 lb]. For demonstration purposes, a number of current and past munitions items available in the database were selected; the BEMs printouts are included. The single item maximum fragment weight associated with these are shown in Table A-1.

3. As previously stated, the BEM does not predict the trajectory of all munitions components. A-typical shaped components may occasionally be thrown from the demolitions pits, but such occasions are rare given current practices and procedures. The BEM, is however, based on the most current data set and used throughout the DoD to identify exclusion zones protective of human health and the environment when conducting munitions disposal operations.

4. Increasing the weight of donor charge and total Net Explosive Weight will increase the soil ejecta distance, but the maximum fragment distance will remain unchanged.

5. Given 3 and 4 above, below ground detonations designed to drive the fragment distance to 0 will result in an increase in soil ejecta distance. It is therefore common for a buried detonation to eject soil without ejecting fragment. Table IV F-2 summarizes the results of a number of current and recent shot configurations demonstrating

TABLE IV F-2

Munitions Item Characteristics		Shot Configuration Variables			Shot Parameters as Determined by BEM		
Munitions Item	Maximum Fragment Weight (lbs)	Total Number of Items/Shot	Total Weight of Donor Charges (lbs)	Burial Depth (ft)	True Crater Radius (ft)	Maximum Soil Ejecta Distance (ft)	Maximum Fragment Distance (ft)
Mine AT M15	0.0952	36	2.0	14	23.43	1,050	0.0
90mm HEAT M371 & M431	0.1240	165	280	14	19.57	891	0.0
105mm HEAT M67	0.2581	80	344.0	14	21.16	957	0.0
81mm HE M374	0.0308	180	552.0	14	23.69	1,060	0.0

DDESB
BURIED EXPLOSION MODULE
VERSION 6.2

Based on

DDESB Technical Paper 16, Revision 3,

EARTHEX Software,

and

NSWCDD/TR-92/196

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REQUIRED EXCEL SETTINGS

(1) Under "**Tools**" menu, select "*Macro*", then select "*Security*", then select "*Medium*"

(2) If asked, select the "**Enable Macros**" button

(3) Under "**Tools**" menu, select "*Add-Ins*", then make sure that "*Analysis Tool Pak*" and "*Solver Add-In*" are checked

Distribution authorized to the Department of Defense and U.S. DoD Contractors only for Administrative-Operational Use (19 May 2008). Other requests shall be referred to the Chairman, Department of Defense Explosives Safety Board, Room 856C, Hoffman Building I, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600.

3 November 2009

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Based on DDESB Technical Paper 16 Revision 3, EARTHEX software, and NSWCDD/TR-92/196
(ENGLISH UNITS)

SELECT BURIAL MEDIUM	Soil	**SELECT ITEM DESCRIPTION**	
SELECT SOIL TYPE *(See TP 16, Revision 3 for soil details)*	Dry Sandy Clay	M15 AT Mine	

ENTER TOTAL NUMBER OF ITEMS	36
ENTER TOTAL WEIGHT OF ALL DONOR CHARGES (lbs)	2.00
SINGLE ITEM NEW (lbs)	22.75
SINGLE ITEM MAXIMUM FRAGMENT WEIGHT (lbs)	0.0952
FRAGMENT WEIGHT USED IN CALCULATIONS (lbs)	0.0952
SINGLE ITEM MAXIMUM FRAGMENT VELOCITY (ft/s)	9,846
FRAGMENT VELOCITY USED IN CALCULATIONS (ft/s)	9,846
TOTAL TNT WEIGHT USED (lbs)	952.04
ENTER DEPTH OF BURIAL (ft)	14.00
ENTER HORIZONTAL RANGE (for pressure calculation) (ft)	600

CRATER OR CAMOUFLET?
CRATER

TRUE CRATER RADIUS (ft)	23.43
MAXIMUM SOIL EJECTA DISTANCE (ft)	1,050

FRAGMENT EXIT VELOCITY (ft/s)	0.0	**FRAGMENT LAUNCH ANGLE (°)**	30.9
MAXIMUM FRAGMENT DISTANCE (ft)	0.0		

Distance at which pressure is 0.066 psi= Blast Withdrawal Distance (buried/undex) (ft)			258.7
Open Air Withdrawal Distance, K328 (ft)	3,226.7		
Fragment Hazard Distance (ft)			1,049.8
Pressure at Fragment Hazard Distance		(psi)	0.0134
		(dB)	133.3
Pressure at Range Entered		(psi)	0.0252
		(dB)	138.8

Based on DDESB Technical Paper 16 Revision 3, EARTHEX software, and NSWCDD/TR-92/196
(ENGLISH UNITS)

SELECT BURIAL MEDIUM	Soil	SELECT ITEM DESCRIPTION	
SELECT SOIL TYPE *(See TP 16, Revision 3 for soil details)*	Dry Sandy Clay	90 mm HEAT M371 & M431	

ENTER TOTAL NUMBER OF ITEMS	165
ENTER TOTAL WEIGHT OF ALL DONOR CHARGES (lbs)	280.00
SINGLE ITEM NEW (lbs)	1.20
SINGLE ITEM MAXIMUM FRAGMENT WEIGHT (lbs)	0.1240
FRAGMENT WEIGHT USED IN CALCULATIONS (lbs)	0.1240
SINGLE ITEM MAXIMUM FRAGMENT VELOCITY (ft/s)	3,075
FRAGMENT VELOCITY USED IN CALCULATIONS (ft/s)	3,075
TOTAL TNT WEIGHT USED (lbs)	509.68
ENTER DEPTH OF BURIAL (ft)	14.00
ENTER HORIZONTAL RANGE (for pressure calculation) (ft)	600

CRATER OR CAMOUFLET?
CRATER

TRUE CRATER RADIUS (ft)	19.57
MAXIMUM SOIL EJECTA DISTANCE (ft)	891

FRAGMENT EXIT VELOCITY (ft/s)	0.0	FRAGMENT LAUNCH ANGLE (°)	35.6
MAXIMUM FRAGMENT DISTANCE (ft)	0.0		

Distance at which pressure is 0.066 psi= Blast Withdrawal Distance (buried/undex) (ft)		110.3
Fragment Hazard Distance (ft)		891.0
Pressure at Fragment Hazard Distance	(psi)	0.0061
	(dB)	126.5
Pressure at Range Entered	(psi)	0.0096
	(dB)	130.4

Open Air Withdrawal Distance, K328 (ft): 2,620.0

Based on DDESB Technical Paper 16 Revision 3, EARTHEX software, and NSWCDD/TR-92/196
(ENGLISH UNITS)

SELECT BURIAL MEDIUM	Soil	**SELECT ITEM DESCRIPTION**	
SELECT SOIL TYPE *(See TP 16, Revision 3 for soil details)*	Dry Sandy Clay	105 mm HEAT M67	

ENTER TOTAL NUMBER OF ITEMS	80
ENTER TOTAL WEIGHT OF ALL DONOR CHARGES (lbs)	344.00
SINGLE ITEM NEW (lbs)	2.94
SINGLE ITEM MAXIMUM FRAGMENT WEIGHT (lbs)	0.2581
FRAGMENT WEIGHT USED IN CALCULATIONS (lbs)	0.2581
SINGLE ITEM MAXIMUM FRAGMENT VELOCITY (ft/s)	3,584
FRAGMENT VELOCITY USED IN CALCULATIONS (ft/s)	3,584
TOTAL TNT WEIGHT USED (lbs)	668.58
ENTER DEPTH OF BURIAL (ft)	14.00
ENTER HORIZONTAL RANGE (for pressure calculation) (ft)	600

CRATER OR CAMOUFLET?
CRATER

TRUE CRATER RADIUS (ft)	21.16
MAXIMUM SOIL EJECTA DISTANCE (ft)	957

FRAGMENT EXIT VELOCITY (ft/s)	0.0	**FRAGMENT LAUNCH ANGLE (°)**	33.5
MAXIMUM FRAGMENT DISTANCE (ft)	0.0		

Distance at which pressure is 0.066 psi= Blast Withdrawal Distance (buried/undex) (ft)			162.4
Open Air Withdrawal Distance, K328 (ft)	2,868.1		
Fragment Hazard Distance (ft)			956.8
Pressure at Fragment Hazard Distance	(psi)		0.0087
	(dB)		129.6
Pressure at Range Entered	(psi)		0.0149
	(dB)		134.2

Based on DDESB Technical Paper 16 Revision 3, EARTHEX software, and NSWCDD/TR-92/196
(ENGLISH UNITS)

SELECT BURIAL MEDIUM	Soil	SELECT ITEM DESCRIPTION	
SELECT SOIL TYPE *(See TP 16, Revision 3 for soil details)*	Dry Sandy Clay	81 mm M374	

ENTER TOTAL NUMBER OF ITEMS	180
ENTER TOTAL WEIGHT OF ALL DONOR CHARGES (lbs)	552.00
SINGLE ITEM NEW (lbs)	2.09
SINGLE ITEM MAXIMUM FRAGMENT WEIGHT (lbs)	0.0308
FRAGMENT WEIGHT USED IN CALCULATIONS (lbs)	0.0308
SINGLE ITEM MAXIMUM FRAGMENT VELOCITY (ft/s)	6,721
FRAGMENT VELOCITY USED IN CALCULATIONS (ft/s)	6,721
TOTAL TNT WEIGHT USED (lbs)	988.39
ENTER DEPTH OF BURIAL (ft)	14.00
ENTER HORIZONTAL RANGE (for pressure calculation) (ft)	600

CRATER OR CAMOUFLET?
CRATER

TRUE CRATER RADIUS (ft)	23.69
MAXIMUM SOIL EJECTA DISTANCE (ft)	1,060

FRAGMENT EXIT VELOCITY (ft/s)	0.0	FRAGMENT LAUNCH ANGLE (°)	30.6
MAXIMUM FRAGMENT DISTANCE (ft)	0.0		

Distance at which pressure is 0.066 psi= Blast Withdrawal Distance (buried/undex) (ft)		271.2
Fragment Hazard Distance (ft)		1,060.2
Pressure at Fragment Hazard Distance	(psi)	0.0139
	(dB)	133.6
Pressure at Range Entered	(psi)	0.0266
	(dB)	139.2

Open Air Withdrawal Distance, K328 (ft)	3,267.3

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IV G Contingency Plan
ADEM Admin Code R. 335-14-8-.02(5)(b)7

This section addresses the requirements for contingency planning for wastes generated and stored at ANAD. ANAD's Integrated Contingency Plan (ICP) was prepared to provide response procedures addressing the potential environmental and safety hazards associated with fires, chemical spills, bomb threats, and severe weather. This ICP applies to all areas of the Depot and surrounding areas that could be affected by a major incident. Only certain portions of the ICP apply to RCRA permitted units.

IV G-1 General Information

IV G-1a Description of Wastes Generated

Wastes generated at ANAD are included in Sections II C and III C of the Part B renewal application and IV C of this permit modification application.

IV G-1b General Facility Traffic

Traffic information is included in Sections II B and III B of the Part B renewal application and IV B of this permit modification application.

IV G-1c Topography

Depot topography information is included in Section II B of the Part B permit renewal application.

IV G-1d General Flood Potential

Depot flood information is included in Section II B of the Part B permit renewal application.

IV G-2 Emergency Coordinators

Emergency coordinators for ANAD are specified in Table B-1 of the ICP. Emergency coordinators for ANCDF are specified in the Chemical Accident or Incident Response and Assistance (CAIRA) Plan (Attachment 1 of the ICP).

IV G-3 Implementation

The plan is implemented at ANAD as specified in the Core Plan (Section 2) of the ICP.

IV G-4 Emergency Response Procedures

Emergency response procedures are specified in the Core Plan (Section 2) of the ICP.

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IV H Personnel Training ADEM Admin. Codes R.335-14-5-.02(7) and R.335-14-8-.02(5)(b)12

IV H-1 Outline of Training Programs ADEM Admin. Code R.335-14-8-.02(5)(b)12

Presented below is a general outline of the training plan that is described in greater detail in the following sections. This section covers both the introductory and the current training for the open burn (OB) and open detonation (OD) units.

The personnel training program is designed to ensure that OB and OD operations are conducted in a safe and environmentally sound manner. The training program teaches personnel to follow hazardous waste management procedures, operating procedures, and emergency response procedures to ensure that operations are conducted in compliance with federal regulations.

This personnel training plan is designed to address three functional groups, each of which has different responsibilities for the OB and OD operations at ANAD:

- Anniston Munitions Center (ANMC) Maintenance Division is responsible for the conduct of OB and OD operations. The Maintenance Division includes supervisory staff in addition to those who physically handle munitions and conduct the OB and OD operations.
- The Directorate of Risk Management (DRK) is responsible for writing environmental policies for ANAD and ensuring that ANAD operations are in compliance with RCRA and other environmental regulatory programs. The RCRA Program Manager, who specifically oversees compliance with RCRA regulatory requirements, as well as the Environmental Training Program Director, fall within DRK.
- The Fire and Emergency Services Division is responsible for responding to all hazardous materials related emergencies, including emergencies at the OB and OD units.

The personnel training program consists of four types of training required for the groups that have OB and OD related responsibilities. These include 1) training in basic OB and OD operations, 2) hazardous waste management, 3) emergency response procedures for fires and explosions, and 4) 10 to 20 hours advanced hazardous waste management for the RCRA Program Manager. The program is designed so that the training required of each job position is appropriate for the individual's various responsibilities and ensures that the individual filling each position is adequately trained to carry out his or her responsibilities.

Table IV H-1 presents a matrix illustrating the general training topics required of each functional group with OB and OD responsibilities.

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TABLE IV H-1
General Training Topics Required for Functional Groups With OB and OD-Related Responsibilities

	OB and OD Training	Hazardous Waste Operator Training	RCRA Training
ANMC Maintenance Division OB/OD Personnel	X	X[a]	X
ANMC Demilitarization Planners	X[b]		X
RCRA Program Manager	X[b]	X[a]	X
DRK Environmental Training Program Director			X
Fire and Emergency Services Division		X[c]	

[a] Includes familiarization or general emergency response training.

[b] Includes familiarization or general OB and OD training only.

[c] Includes in-depth emergency response training.

The training program consists of both on-the-job and classroom training. Each position has introductory training requirements (to be completed within an individual's first 6 months of employment) and annual training and refresher requirements. No individuals are allowed to work unsupervised until they have completed their introductory training requirements.

Introductory training may be accomplished on- or off-site and through a variety of training mechanisms including classroom, internet-based, and correspondence, for example. Introductory OB and OD Training for ANMC Munitions Division OB/OD personnel is further detailed in Section IV H-5. Introductory OB and OD training for the RCRA Program Manager currently consists of the Ammo -45 on-line training course provided by the Defense Ammunitions Center (DAC). Introductory OB and OD training for the demilitarization planners also consists of the Ammo-31, -45, and -54 on-line training course if they were not previously certified by the appropriate DAC school. Note that course titles/numbers for Defense Ammunitions Center courses may occasionally change. Introductory Hazardous Waste Operator Training is typically accomplished either on- or off-site via contract. Introductory RCRA Management training is provided in-house at ANAD. Introductory emergency response familiarization training for ANMC Munitions Division operators is incorporated into their Defense Ammunitions Center introductory course work as described in Section IV H-5. Introductory emergency response familiarization training for the RCRA Program Manager is accomplished through review of the facility Integrated Contingency Plan. Introductory emergency response training for Fire and Emergency Services Division is integral to their certification programs.

IV H-2 Job Positions
ADEM Admin Code R. 335-14-8-.02(5)(b)12

Tables IV H-2 and IV H-3 present organization matrices for ANAD personnel that have OB and OD related responsibilities. The positions within each functional group discussed in the

1

TABLE IV H-2
OB and OD Treatment Operation Job Positions and Responsibilities

Job Position	Responsibilities
Functional Group: ANMC Maintenance Division	
U.S. Army Defense Ammunitions Center (DAC)	Sets policies in demilitarization procedures, staffing, and training. Provides initial and continuing education at DAC and on-line.
Explosives Operator Leader	Directs OB and OD operations and determines initiating charge amounts for OD
Explosives Operator	Conducts OB and OD operations, sets charges, controls burn pans, and polices area
Engineering Equipment Operator	Operates heavy equipment and conducts OB and OD operations
Functional Group: Directorate of Risk Management	
Director of Risk Management	Sets polices on procedures for ensuring environmental compliance
RCRA Program Manager	Conducts inspections to ensure compliance with RCRA as well as Army policies and regulations
Environmental Training Program Director	Oversees the environmental training program for all ANAD employees including tenant organizations
Environmental/Chemical Scientist/Engineering	Conducts environmental sampling, designs environmental compliance activities, and assists in response to environmental problems

2

TABLE IV H-3
OB and OD Emergency Job Positions and Responsibilities

Job Position	Responsibilities
Functional Group: Fire and Emergency Services Division	
Emergency Coordinator	Determines need for and directs Contingency Plan implementation
Fire Chief Assistant Chief, Crew Chief	Directs emergency response operations, coordinates with other organizations on response, determines appropriate response
Fire Department Staff	Conducts emergency response operations

3

4

previous section and the general OB and OD responsibilities associated with each position are shown below.

IV H-3 Documentation of Training
ADEM Admin Code R. 335-14-8-.02(5)(b)12

Documentation of training and job experience is maintained in the training files for each employee.

Figures IV H-1 through IV H-2 contain examples of on-the-job training statements for operators and on-the-job training statement for supervisors, respectively.

IV H-4 A Description of How Training Will be Designed to Meet Actual Job Tasks
ADEM Admin. Code R.335-14-8-.02(5)(b)12

A review of the various environmental training requirements was completed to evaluate the types of environmental training that might be applicable for activities at ANAD. The environmental training needs analysis was completed using a personnel database populated with the current positions held at ANAD. The job series code was used to locate details of each position in the Headquarters (HQ), Department of the Army (DA) Fully Automated System for Classification (FASCLASS) web site. FASCLASS provides descriptions of active positions at the Depot. This information was used to evaluate which positions require what type of environmental training. The environmental training courses were then grouped together in different levels in order to administer the environmental training in the most effective manner.

IV H-5 Training for Emergency Response
ADEM Admin. Code R.335-14-8-.02(5)(b)7

Personnel involved in OB and OD treatment operations and emergency response operations at the OB and OD units are trained to be familiar with emergency procedures, emergency equipment, and emergency systems. They are trained in the procedures for using, inspecting, repairing, and replacing the emergency equipment required at ANAD.

ANAD OB and OD personnel receive initial and continuing training related to emergency response through a combination of off-site and on-site classroom and on-the-job training.

Initial and continuing training course work provided by the Defense Ammunitions Center includes emergency procedures related to munitions emergencies. The course descriptors and course content for training offered by DAC are listed at the DAC website:

https://www3.dac.army.mil/AS/view_all_courses.html

Operator's Statement

SOP NO. RA-0000-G-003 REV NO. 4 CHG NO. 2 DATE SEP 12 2000

1. The Operator will sign this statement:
   a. When first assigned to the operation.
   b. When an approved change is made to the SOP.
   c. At least once per quarter during continuing operations.
   d. After absence, in excess of 15 consecutive workdays.

2. I have read or have had read to me and understand the general and specific safety and environmental requirements, personal and explosive limits, work description and inspection requirements necessary to accomplish my operation. I have been thoroughly trained in, and am familiar with, my part of the operation and I agree to abide by these instructions throughout my assignment to the operation.

_____

_____

NAME	DATE	OPERATION NUMBER

FIGURE IV H-1
On-the-Job Training Operator's Statement

Supervisor's Statement

SOP NO. RA-0000-G-003 REV NO. 4 CHG NO. 2 DATE SEP 12 2000

1. The Supervisor will sign this statement:
   a. When first assigned as supervisor of the operation.
   b. When an approved change is made to the SOP.
   c. At least once per quarter during continuing operations.
   d. After absence, in excess of 15 consecutive workdays.
2. I have personally reviewed each of the operational steps of the SOP and have no question in my mind that the operation can be performed safely, efficiently, and in complete compliance with environmental restrictions noted in this SOP. I have verified to my satisfaction that operators have been trained and are capable of performing their part of the operation in a safe and efficient manner, and have instructed them to follow the SOP without deviation.

_____

_____

SUPERVISOR'S PRINTED/TYPED NAME: _____

_____

_____

SUPERVISOR'S NAME	DATE

FIGURE IV H-2
On-the-Job Training Supervisor's Statement

The level of training/certification of OB and OD operators is consistent with their position. The minimum training requirements for OB and OD operators include Ammo-04, -45, and -63; however, OB/OD operators that do not 'tie in' initiating charges (do not handle igniter, time fuze, blasting caps, and detonating cord) do not need Ammo-04. The requirements for OB and OD supervisors also include Ammo-31. A sample of the course work offered by DAC is provided below. The web site describes additional safety considerations related to other course work offered.

Ammo-04: Ammo-04 provides training for personnel in the various methods, procedures, and techniques of performing ammunition demilitarization. Emphasis is placed on procedures required for open burning and detonation. Students are introduced to the emerging technologies for resource recovery and recycling. This course includes a live explosives exercise in which students will conduct set-up and detonation using both electric and non-electric methods on the demolition range. Training is also provided on the changing impact of environmental requirements and decontamination methods.

Ammo-31-DL: Ammo-31 is based on environmental laws and regulations that have the most influence over ammunition and explosive operations. The purpose of this course is to familiarize the learner with environmental considerations that must be taken into account during all phases of ammunition and explosive operations.

Ammo-45-DL: Ammo-45 provides basic training in the safety and fundamental technical aspects of ammunition and explosives for personnel directly involved in hands-on exposure to ammunition items and/or operations. Course content will introduce the characteristics of different classes of ammunition and explosives and safe handling procedures and explosives safety requirements for the receipt, storage, maintenance, demilitarization or issue of ammunition at U.S. Army installations.

Ammo-63-DL Course: U.S. Army Explosives Safety

Description: The Ammo-63 course consists of a final comprehensive exam that covers content from four courses. These courses provide in-depth training in ammunition explosives safety and must be completed prior to registering for the Ammo-63 exam. Upon successful completion of these four courses and the Ammo-63 exam, a certificate will be issued for U.S. Army Explosives Safety. The descriptions of the four courses are as follows:

Ammo-77-CPE: Ammo-77-CPE (Characteristics of Propellant and Explosives) introduces the basic terminology associated with explosives, propellants, and ammunition items. This course also covers the major categories and characteristics of high and low explosives and chemical ammunition fillers.

Ammo-81-HC: Ammo-81-HC (Hazard Classification) provides an introduction to the system of hazard classes and divisions used to categorize hazardous materials, focusing on ammunition and explosives. It also explains how this system is used to enhance safety through the concept of storage compatibility.

Ammo-81-IQD: Ammo-81-IQD (Introduction to Quantity Distance) covers the basic principles of quantity distance, the different categories of QD protection, the general terms associated with

QD, and the regulatory oversight for QD. Students are also provided with simple scenarios to determine QD compliance.

Ammo-81-OPS: Ammo-81-OPS (Operational Safety) covers the basic concepts of operational safety with regards to ammunition and explosives. This course provides an overview of fire prevention measures, maintenance and demilitarization, facilities design requirements, ammunition storage principles, standing operating procedures, and hazard analysis.

Prerequisites: None.

Course Topics:

1. Ammo-77-CPE (Characteristics of Propellant and Explosives
2. Ammo-81-OPS (Operational Safety)
3. Ammo-81-IQD (Introduction to Quantity Distance)
4. Ammo-81-HC (Hazard Classification)
5. Ammo-63 Final Exam

In addition to off-site and web based training provided by DAC, site-specific emergency response procedures including emergency equipment and systems is provided initially to all employees assigned as an OB and OD operator. The training consists of a combination of classroom and on-the-job training covering the ANMC SOPs. All items addressed in the SOPs are reviewed, with a particular emphasis on safety and emergency response.

IV H-6 Maintenance of Training Records/Copy of Personnel Training Documents ADEM Admin. Code R.335-14-8-.02(5)(b)12

ANAD maintains training records for employees, including job titles, names of employees, job descriptions, and types and amount of training given to each employee. Individual training records are maintained as part of an individual's employment history. Training records are maintained for 3 years after an individual leaves ANAD or until closure of the OB and OD units. RCRA training records are maintained by DRK and OB and OD specific and on-the-job training records are maintained by ANMC Training Coordinator (or designated representative).

IV H-7 Training Content, Frequency, and Techniques ADEM Admin Code R.335-14-8-.02(5)(b)12

Training for personnel having OB and OD related responsibilities consists of on-the-job training, which is conducted by the individual's immediate supervisor, and classroom or web-based training. Training for OB and OD operators is designed to teach OB and OD personnel hazardous waste management procedures, including contingency plan implementation. Individuals are required to complete the introductory on-the-job and classroom training within their first 6 months. No individual is allowed to work unsupervised until he or she has completed the classroom training and until the individual's supervisor has determined that he or she has completed the on-the-job training required for the position.

Continuing training for each functional group consists of an annual update/refresher for the hazardous waste training course (for all positions required to take the initial course) and an annual update of OB and OD (demilitarization) training for the ANMC Maintenance Division functional group and annual emergency response updates for the Fire and Emergency Services

Division functional group. The annual update of OB and OD (demilitarization) training and annual emergency response familiarization training for ANMC operators is accomplished through annual review of Standard Operating Procedures (SOPs) pertaining to the operator's area of responsibility and verification of understanding via signature per AMC-R 350-4, Appendix B. SOP signature pages are retained by the employee's direct supervisor or leader (or designated representative).

IV H-8 Training Director is Properly Trained ADEM Admin Code R.335-14-8-.02(5)(b)12

Each functional group at ANAD has a training director (or designated representative) for the group since each group is under separate command. The training director for the Fire and Emergency Services Division functional group is the Fire Chief (or designated representative). The Environmental Training Program Director is the designated training director for DRK. Individuals named as training directors for each functional group are highly qualified to design and implement the personnel training programs for their assigned personnel due to their knowledge in all aspects of the activities and responsibilities of their section. In addition, the ANMC designated representative and the Fire Chief consult with the Environmental Training Program Director when designing and updating their training programs. The Environmental Training Program Director must approve all elements of the program used to fulfill the requirements for environmental and hazardous waste management training.

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IV I Closure Plan, Post Closure Plans, and Financial Requirements ADEM Admin. Code 335-14-8-.02(5)(b)13

This plan identifies steps that will be necessary to permanently close the operational open burn (OB) and open detonation (OD) units at Anniston Army Depot (ANAD) as defined throughout this permit application. ANAD intends to clean close the operational OB and OD units. However, a contingent closure plan is also provided herein in the event that contamination has occurred and it is not possible to achieve clean closure standards.

Closure requirements for properties outside of the operational OB and OD units (as defined in this permit application) are not addressed in this closure plan. Investigation and closure of properties outside of the operational OB and OD units that may have been impacted by historic operations will be managed via the RCRA corrective action process.

The ANAD Directorate of Risk Management will maintain a copy of the closure plan and all revisions until certification of closure completeness has been submitted and accepted by the Alabama Department of Environmental Management (ADEM) and U.S. Environmental Agency (EPA) Region IV.

ANAD is a federally owned facility. Both federal and state regulators [ADEM Admin. Code R.335-14-5-.08(1)(d)] exempt federal government facilities from financial requirements contained in ADEM Admin. Code R.335-14-5-.08. The exempted requirements include (but are not limited to) closure and post-closure cost estimates, financial assurance mechanisms for closure and post-closure, and liability insurance. Therefore, these subjects are not addressed in this Closure and Post-Closure Plan.

IV I-1 Closure Plan Documentation ADEM Admin. Code R.335-14-8-.02(5)(b)13

IV I-1a Description of Partial or Final Closure Procedures

Groundwater underlying the operational OB and OD units will be monitored throughout the active life of the unit in accordance with the requirements in ADEM Admin. Code R.335-14-5-.06. Corrective actions necessary to address contamination during the active life of the permitted units will be completed in accordance with these requirements. If groundwater monitoring during the active life of the ANAD OB and OD units shows no contamination, the groundwater will be considered clean. No groundwater monitoring will be conducted during closure.

If the groundwater becomes contaminated during the active life of the unit, corrective action and monitoring requirements identified in ADEM Admin. Code R.335-14-5-.06 will be incorporated into closure activities.

An accurate determination of closure requirements for the operational OB and OD units can only be made after careful review of existing sampling and monitoring data compiled during the active life of the facility. At the time of closure, a thorough closure assessment will be completed to develop the final approved closure plan. This assessment will include a review by qualified engineers, scientists, and/or geologists of existing facility monitoring data. Since ANAD will be monitoring compliance of the operational thermal treatment units

with environmental performance standards throughout the active life of the units, it is anticipated that contamination resulting from permitted activities, if any, will be limited to the bounds of the OB and OD units (that is, point of compliance). The following discussion of closure procedures is based on this assumption.

In the event that future circumstances or mission changes compel ANAD to discontinue thermal treatment operations at the OB and OD units, and after the closure plan is approved and proper notifications have been made, the following final closure procedures will begin:

- Any remaining waste military munitions (WMM) will be thermally treated onsite and no additional WMM will be accepted for treatment.
- Qualified personnel will conduct a magnetometer survey to assess the potential presence of Munitions and Explosives of Concern (MEC).
- MEC, if any, will be managed by qualified Unexploded Ordnance (UXO) or Explosives Ordnance Disposal (EOD) Technicians as an emergency response operation.
- Munitions , if any, will be collected, certified as being free of explosive hazards, and disposed of in coordination with the supporting Defense Reutilization and Marketing Office (DRMO) or certified vendor.
- The open burn pans will be decontaminated and removed.
- The nature and extent of contamination within and upon the OD unit will be characterized through surface and subsurface sampling.
- Sampling results will be compared to background, preliminary screening values (PSVs), and/or site-specific risk-based clean closure standards as established in coordination with ADEM. Likely parameters for analysis include semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), energetics, Target Analyte List (TAL) metals, cyanide, and perchlorates. Actual parameters will be established in coordination with ANAD at the time of closure and in consideration of the results of data collected during the active life of the units.
- Soils within or upon the OD unit that are present at levels exceeding the levels agreed to between ANAD and ADEM will be removed by mechanical means, containerized, sampled, and disposed of in accordance with the sampling results.
- Clean closure verification sampling will be completed.
- ANAD will certify the results of all tests and prepare a closure report.
- An Alabama registered professional engineer will visually inspect the OB and OD units, review the test results, and if all criteria described above are met, certify the facility closure.

ANAD intends to clean close the OB and OD units. Clean closure is defined as closure to background, screening levels (residential or background), or site-specific risk-based levels. In the event that none of these standards are achievable, soil removal will be conducted as necessary to achieve the ADEM-approved standard. The unit will be closed in a manner that

minimizes the need for further maintenance. Post-closure escape of hazardous waste, hazardous constituents, or contaminated run-off will be controlled, minimized, or eliminated to the extent necessary to protect human health and the environment.

In the event that ANAD is unable to certify that all or part of the treatment units are UXO-free, a Land Use Control Plan will be developed. In addition, the contingent Post-Closure Plan in Section IV I-2 may be implemented for any unit if clean closure cannot be attained. If ANAD cannot attain clean closure, this Closure Plan will be modified, and a detailed Post-Closure Plan will be developed and submitted to ADEM for review and approval.

IV I-1a(1) Comparison to Background

Background soil concentrations will be developed at closure. For parameters that occur naturally, such as metals, the existence of contamination will be determined by a comparison with background concentrations. For contaminants that do not occur naturally, such as explosives and solvents, any concentrations above the method detection limits (MDLs) will indicate potential contamination.

If background values are not exceeded for any parameter, soil at the OB and OD units will be considered clean, and no further analyses will be conducted. If background values are exceeded, concentrations detected above MDLs will be compared to PSVs.

IV I-1a(2) Comparison to Soil Screening Levels

Analytical results will be compared to PSVs identified by ADEM at closure. ADEM has published PSVs in its Alabama Environmental Investigation and Remediation Guidance (2005). Soil screening levels for hazardous waste constituents for which screening levels are not available will be developed using EPA Region IX methodology or other methodology specified by ADEM. The screening level used at closure (such as industrial or residential) will be based on the intended future use of the ANAD OB and OD units. If PSVs are not exceeded, soil at the unit will be considered clean, and no further evaluations will be conducted. If PSVs are exceeded, a quantitative risk assessment will be conducted.

IV I-1a(3) Quantitative Risk Assessment

If cumulative carcinogenic impacts based on screening levels do not exceed the established acceptable risk range (i.e., 1E-04 to 1E-06) and the cumulative hazard index (HI) based on screening levels does not exceed 1.0 for a given target organ, soil at the treatment unit will be considered clean and no further evaluations will be completed. If the carcinogenic impact exceeds 1E-04 or the cumulative non-carcinogenic hazard exceeds 1.0, site-specific action levels will be developed or decontamination activities may be initiated. Quantitative risk estimates will be developed for carcinogenic and non-carcinogenic compounds that exceed background levels and screening levels in accordance with methodology contained in the latest version of EPA Risk Assessment Guidance (2005) or other guidance specified by ADEM.

If the cumulative HI does not exceed 1.0, no further analysis of systemic toxicants will be conducted, and soil at the OB and OD units will be considered clean from the standpoint of non-carcinogenic contamination. If the HI exceeds 1.0, toxicity endpoints will be considered. Chemicals have various toxicity endpoints. For example, one chemical may affect the liver but no other organs; whereas another chemical may affect only the central nervous system.

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The cumulative HI is initially calculated without any regard to the toxicity endpoint. If the cumulative HI exceeds 1.0, additional evaluations will be completed to determine the HI based on toxicity endpoints of the potential chemicals of concern. Under these circumstances, it is likely that several cumulative HIs for chemicals with similar endpoints will be determined. In such cases, separate toxicity endpoints would be determined for the liver, heart, and central nervous system. If each of the cumulative HIs based on toxicity endpoints does not exceed 1.0 for a given target organ, soil at the OB and OD units will be considered clean from the standpoint of non-carcinogenic contamination.

IV I-1b Description of Maximum Unclosed Portion During Active Life of the Facility

The operational OB and OD units will remain 100 percent in service during their operating life. However, one or more burn pans may be taken out of service for repair or replacement. The remaining burn pans within the unit would remain active. Replacement of burn pans or pan covers during the active life of the ANAD OB and OD units would not be considered a closure activity. However, classification and disposal of these items would be conducted in accordance with ADEM regulations.

IV I-1c Estimate of Maximum Waste Inventory in Storage and Treatment During Facility Life

There are no wastes stored at the OB or OD units. WMM is brought to the site only at the time of treatment, and treatment residues are removed following treatment.

IV I-1d Description of Procedures for Removal or Decontamination of Hazardous Waste Residue, Equipment, Structures, and Soils

IV I-1d(1)

Reserved

IV I-1d(2) Magnetometer Survey

A magnetometer survey will be conducted to identify the presence of MEC or other munitions-related metal fragments and debris. The survey will incorporate a grid pattern that encompasses the whole of the operational OB and OD units. The survey will extend as necessary outside of the operational boundaries to ensure the nature and extent of contamination is quantified.

In order to conduct the magnetometer survey, qualified EOD/UXO personnel, working in pairs, will carry hand-held magnetometers while walking slowly across the survey area, from grid to grid. The magnetometer locates surface and potential buried ordnance by detecting the irregularities in the earth's magnetic field caused by the ferromagnetic materials in the ordnance assembly. When the magnetometer indicates the potential presence of UXO, the area is flagged. EOD personnel then excavate the flagged area to determine whether UXO is present. If so, it is removed and/or treated in place. Survey tools such as Digital Geophysical Mapping may also be employed.

IV I-1d(3) Burn Pans

After treatment of the final volume of wastes, the area directly underlying the burn pans will be inspected for the presence of any ejected untreated waste material. If any ejected untreated wastes are found they will be replaced into the burn pans and treated. The burn pans will then contain only treatment residue. This treatment residue will be inspected for

potential reactivity. If determined to be reactive, they will be reburned. Once determined to be free of the reactive characteristic, the treatment residue will be removed from the pans and placed into DOT-approved containers. Treatment residue will be tested for the toxicity characteristic (TC) and for LDR requirements. If the containerized treatment residue results exceed any regulatory TC levels, it will be disposed of as a hazardous waste. If results are below regulatory TC levels, it will be disposed of as a solid waste.

The metal burn pans and lids will be inspected to verify that no treatment residuals remain. Once they are determined to be free of treatment residuals, the burn pans and lids will be decontaminated and the efficacy of the decontamination verified through wipe sampling. Decontamination and sampling of burn pan lids is not required as these have not been exposed to waste materials or residues. The pans and lids will then be removed and sold as scrap metal or used for a nonhazardous waste treatment purpose.

The only structures associated with the OB and OD units are Bunkers 389, 390, and 391. These bunkers have had no contact with hazardous wastes and no closure activities are proposed.

The electric firing system firing panel located in firing bunker 389 and the firing cable leading from the bunker to the firing points will either be left in place or removed to another location.

IV I-1d(4) Soils in the OB and OD Units

A soil sampling grid will be established over the OB and OD units. A sample will be collected from the center of each grid or where the grid lines intersect. Locations surrounding the OD unit where ejected UXO may have been detonated in place will also be sampled. Records of locations of in-place detonations will be kept during the life of the permit. Surface soil samples will be collected to a depth of 0 to 2 feet using a stainless steel auger or similar sampling device. The soil removed from the auger will be thoroughly mixed, and a portion of the blended soil will be placed into the appropriate sample containers. An analysis of grab samples of the residue/soil at these units will be performed for the constituents in Table II G-2. The analysis will provide concentrations for the individual constituents in that table. In addition, TCLP tests will be performed for As, Ba, Cd, Cr, Hg, Pb, Se, and Ag; and reactivity and ignitability tests will be performed on the residue/soil at these units to determine whether they are hazardous wastes. Analyses will be performed using EPA or other equivalent/acceptable methods.

If hazardous wastes are present or hazardous constituents are detected at concentrations above background, PSVs, or site-specific risk-based levels, additional samples will be collected to characterize the nature and extent of contamination. Subsurface samples will be collected deeper than 2 ft, if necessary, to define the vertical extent of contamination, and samples will be collected if necessary to define the horizontal extent of contamination. Downhole magnetometers will be used to monitor for the potential presence of UXO.

If analysis of the soil samples shows that concentrations of all constituents are below background, PSVs, or other site-specific risk-based levels, no further sampling or soil removal will be necessary.

IV I-1d(5) Removal and Disposal of Contaminated Soil

Any contaminated soil at the OB and OD units exceeding background, PSVs, or other site-specific risk-based concentrations will be excavated using backhoes or other excavation equipment. Soil will be removed in layers up to 2 feet thick after a sweep has been conducted for UXO in the OD unit. After a layer of contaminated soil is removed, sampling and analysis will be conducted to determine whether cleanup goals have been attained. If the cleanup goals are not attained, additional layers of soil will be removed until closure goals are attained or the units will be closed as a landfill. At present, removal by excavation is expected. Treatment technologies for contaminated soil cannot be determined at this time. The decision as to whether treatment is appropriate will be determined in the future. The decision will depend on the contaminants present, nature and extent of contamination, and available technology at that time. If treatment is considered to be appropriate, the Closure Plan will be revised and submitted to ADEM for approval.

Contaminated soil will be removed from the units and brought to a temporary staging area located within or adjacent to the OB and OD units. At the staging area, the contaminated materials will be placed in DOT-approved drums, roll-off boxes, or other suitable containers for off-site transport. The staging area will consist of a graded, compacted, earthen foundation surrounded by earthen berms or temporary concrete berms. A 30-mil (minimum) thick liner will overlie the foundation and berms. Plywood or other suitable material will be laid on top of the liner to prevent tearing. Alternatively, the contaminated soil may be loaded directly into trucks, roll-off boxes, etc.

Unstable UXO located during closure activities will be detonated in place. If the UXO is safe to move, it will be detonated at a central location within the OB or OD units.

It is anticipated that contaminated soil would be classified as a nonhazardous waste. However, representative composite samples will be collected and tested for the TC for metals and any other parameters required by the disposal facility. If any excavated soil fails the TC test for metals, it will be disposed of at an off-site hazardous waste landfill.

IV I-1d(6) Equipment Decontamination

Equipment decontamination will be performed in accordance with the Alabama Environmental Investigation and Remediation Guidance (2005). Refer to Appendix II H-1.

IV I-1e Location of Disposal Facility (Equipment, Structures, and Soils When Removed)

DRMO is responsible for managing contracts for disposal and recycling of non-D003 residuals and scrap metal. DRMO will be responsible for establishing contracts with treatment, disposal, and recycling facilities for wastes and metals generated during closure activities at the OB and OD units. DRMO will establish these contracts when closure activities take place. Closure of the OB and OD units is not expected to occur while ANAD is active. Therefore, the date when closure activities will occur is unknown. It is not possible at this time for DRMO to identify disposal and recycling facilities for OB and OD units closure wastes.

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IV I-1f Methods for Sampling and Testing Surrounding Soils

Sampling and testing of surrounding soils or its equivalent will be conducted in accordance with Appendix C.2 of the Alabama Environmental Investigation and Remediation Guidance (2005).

IV I-1g Criteria for Determining Decontamination Levels

Decontamination levels are those levels agreed to by ANAD and ADEM and will consist of one or a combination of background, PSVs, or site-specific risk-based concentrations as described in Section II F-1a.

IV I-1h Description of Additional Activities Performed During Closure

IV I-1h(a) Groundwater Monitoring

Groundwater underlying the OB and OD units will be monitored throughout the active life of the units in accordance with the requirements in ADEM Admin. Code R.335-14-5-.06. Corrective actions necessary to address contamination during the active life of the units will be completed in accordance with these requirements. If groundwater monitoring during the active life of the ANAD OB and OD units shows no contamination, groundwater will be considered clean. Groundwater monitoring will stop at the end of the active life of the OB and OD units. No groundwater monitoring will be conducted during closure.

If the groundwater becomes contaminated during the active life of the unit, corrective action and monitoring requirements identified in ADEM Admin. Code R.335-14-5-.06 will be incorporated into closure activities. Groundwater monitoring activities will be reviewed at closure. The same groundwater sampling, analytical, and data reporting procedures used during the active life of the OB and OD units will also be used during any closure and post-closure activities necessary to comply with corrective action requirements for groundwater.

IV I-1h(b) Leachate Collection

The OB and OD units do not generate leachate. Therefore, this section is not applicable.

IV I-1h(c) Run-On and Run-Off Control

Contaminated soils that are removed from the units will be brought to a temporary staging area located adjacent to the OB and OD units. The staging area will be encircled by a temporary concrete dike to prevent run-on and run-off through the contaminated materials. At the staging area, the contaminated materials will be placed in DOT-approved metal drums for off-site transport.

Interceptor ditches currently bounding the OB and OD units effectively mitigate run-on to and channel run-off from the OB and OD units. These trenches will be maintained throughout the closure process to control run-on and run-off. Interceptor ditches are shown on Figure IVB-8 and IVB-9.

Decontamination of all equipment will be conducted within a constructed decontamination area comprised of impervious plastic and diking of sufficient size to fully contain the equipment and all decontamination fluids.

IV I-1i Description of Closure Schedule

Closure will proceed according to the schedule shown in Table IV I-1.

TABLE IV I-1
Closure Schedule for the OB and OD Units

Closure Activity	Cumulative Time (days)
Receipt of final volume of waste	-90
Notify ADEM in writing of final closure	-45
Start of closure	0
Site investigation (sampling and analysis, data interpretation)	240
Site remediation	270
Complete closure activities	390
Certification of closure	420

IV I-1j Estimate of Year of Closure ADEM Admin. Code R.335-14-5-.07(3)(b)7

No trust fund is being used to establish financial assurance under 40 CFR 24.145; therefore, no closure date is required to be projected.

IV I-1k Extension of Closure Time ADEM Admin. Codes R.335-14-5-.07(4)(a) and R.335-14-5-.07(4)(b)

If unforeseen problems are encountered during closure, an extension of the time frames listed in Table IV.I-1 may be necessary to allow sufficient time to conduct sampling events and to receive and interpret sampling data. Demonstrations required for an extension of closure time will be made in accordance with the requirements and within the time frame required in ADEM Admin. Code R.335-14-5-.07(4)(b).

IV I-1l Certificate of Closure ADEM Admin. Code R.335-14-5-.07(6)

Within 60 days of completion of closure of the OB and OD units, ANAD will submit to ADEM by registered mail a certification that the unit has been closed in accordance with the ADEM-approved Closure Plan. The ANAD Commanding Officer and an independent, qualified, professional engineer, registered in the State of Alabama, will sign the certification. Documentation supporting the independent, qualified, registered professional engineer's certification will be furnished to ADEM upon request.

IV I-2 Copy of Post-Closure Plan 335-14-8-.02(5)(b)13

If post-closure activities are required, ANAD will develop and submit a detailed Post-Closure Plan to ADEM. The contents of the Post-Closure Plan are discussed in the following sections.

This section only applies if all or part of the OB and OD units cannot be clean closed. At this time, risk-based clean closure is anticipated. However, if some soils cannot be fully decontaminated to attain the closure performance standards, a portion of the unit may be

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closed as a land disposal facility. Any final cover will meet ADEM requirements for landfill covers. To minimize migration of liquids through the closed unit, any contaminated soil would be covered with soil or other material having permeability less than or equal to that of the natural subsoil present beneath the unit. The cover will be vegetated and contoured to promote drainage and prevent erosion. The cover material will be of sufficient thickness and elasticity to accommodate settling and subsidence. Any portion of the unit closed as a land disposal unit will also have run-on and run-off controls to prevent damage to the final cover.

Clean closure is also planned for groundwater. However, if groundwater is contaminated above closure standards as the result of OB and OD activities, it may be necessary to conduct long-term corrective action during post-closure at the OB and/or OD units. However, if groundwater underlying the OB and OD units is contaminated as the result of activities that are not attributable to the OB and OD units, this post-closure plan will not be implemented.

If post-closure activities are required, ANAD will develop and submit a detailed Post-Closure Plan to ADEM. The contents of the Post-Closure Plan are discussed in the following sections.

IV I-2a Post-Closure Care Mechanisms

During post-closure the ANAD OB and OD units will comply with the environmental performance standards listed in ADEM Admin. Code R.335-13-4-.24(4).

IV I-2b Description of Maintenance, Monitoring, Inspection, and Frequencies

Groundwater monitoring in accordance with a groundwater monitoring program will continue as necessary throughout the post-closure care period of the OB and OD units.

Inspections and maintenance will be conducted during the post-closure care period. Inspections would be conducted whenever groundwater is sampled or, at a minimum, semiannually. ANAD will maintain records of inspections. Deficiencies noted during inspections of the OB and OD units will be corrected to maintain the integrity of the closed unit. Examples of items to be inspected, preventive and corrective procedures, and equipment required for the post-closure maintenance program are as follows:

- Security: Gates, fencing, and warning signs will be inspected for damage. Signs will be replaced before they become illegible or if missing. Soil at the base of the fence will be regraded, as needed, to maintain adequate site security. The fence will be replaced, as needed, to maintain adequate site security.

- Erosion: The cover (cap), if any, will be inspected for erosion damage, such as washouts. Washouts will be repaired as they are detected. If the cap integrity is in question, repairs will be made as soon as practicable. Restoration of the vegetative cover will be performed as needed.

- Settlement: The cover (cap), if any, will be inspected for indications of settlement, subsidence, or displacement. Settlement will be repaired by placing additional cover material on top of the existing cover and replacing vegetation.

- Vegetative Cover: The condition of the vegetative cover will be inspected for adequacy. Vegetation will be replaced as needed.
- Run-on and Run-off Controls: Drainage channels designed to divert and collect storm water will be inspected to ensure good drainage. Drainage channels will be cleaned and maintained to allow free drainage so that retention of storm water does not occur.
- Monitoring Equipment: The conditions of well casing, caps, and locks will be inspected when the well is sampled. Damage to monitoring equipment will be recorded, and repairs will be made as needed.

IV I-2c Identification and Location of Person Responsible for Storage and for Updating Facility Copy of Post-Closure Plan During Post-Closure Period

The Director, Directorate of Risk Management will be responsible for maintaining and updating the Post-Closure Plan during the post-closure period. The Directorate of Risk Management is located at the following address:

DEPARTMENT OF THE ARMY
Directorate of Risk Management
Anniston Army Depot
ATTN: AMSTA-AN-RKC
7 Frankford Avenue
Anniston, AL 36201-4199

IV I-2d Procedure for Updating All Other Copies of Post-Closure Plan

The Director of the Directorate of Risk Management will make a controlled distribution of the ADEM-approved Post-Closure Plan. The Director will maintain a list of the holders of the approved Post-Closure Plan. All pages of the ADEM-approved Post-Closure Plan, including text, tables, and figures, will have a header with the title of the document, section number, page number, revision number, and revision date.

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ANAD will maintain the Post-Closure Plan to ensure that it is current and accounts for anticipated post-closure activities. The Post-Closure Plan will be amended whenever either of the following occurs:

- Changes in operating plans or facility design that affect the approved Post-Closure Plan or
- Events occurring during the active life of the facility, including partial and final closures that affect the approved Post-Closure Plan.

A written request for permit modification will be made to ADEM if amendment of the Post-Closure Plan is required. The request will be made at least 60 days before the proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred that has affected the Post-Closure Plan.

The Director of the Directorate of Risk Management will distribute any ADEM-approved revisions to all holders of the approved Post-Closure Plan. Holders of the plan will be provided with instructions for removing existing pages and replacing the pages with the appropriate updates. Holders of the approved Post-Closure Plan will be required to verify that the change has been made by returning the removed originals.

IV I-3 Copy of Most Recent Closure and Post-Closure (if applicable) Cost Estimates ADEM Admin. Codes R.335-14-8-.02(5)(b)15 and 16 and R.335-14-5-.08

ANAD is a federally owned and operated facility. Both federal and state regulators [ADEM Admin. Code R.335-14-5-.08(1)(d)] exempt federal government facilities from financial requirements contained in ADEM Admin. Code R.335-14-5-.08.

IV I-4 Copy of Documents Used as Financial Assurance Mechanisms ADEM Admin. Code R.33514-8-.02(5)(b)17

ANAD is a federally owned and operated facility. Both federal and state regulators [ADEM Admin. Code R.335-14-5-.08(1)(d)] exempt federal government facilities from financial requirements contained in ADEM Admin. Code R.335-14-5-.08.

IV I-5 Documentation of Notice of Deed ADEM Admin. Codes R.335-14-8-.02(5)(b)14 and R.335-14-5-.07(10)

The post-closure notices discussed in this section will only be made if the OB and OD units are closed as a land disposal unit. At the current time, clean closure is anticipated.

No later than 60 days after certification of closure of the OB and OD units, ANAD will submit to the local zoning authority (or authority with jurisdiction over local land use) and to ADEM a record of the type, location, and quantity of hazardous wastes disposed of.

Currently ANAD does not have any deeds. Property was obtained through Congressional legislation with Presidential approval. In the event that the Army would transfer ANAD property including the OB and OD units to others, a deed with necessary deed restrictions will be developed.

After certification of closure of the OB and OD units, ANAD will record, in accordance with Alabama law, a notation on the deed to the facility property (or some other instrument that is normally examined during title search) that will, in perpetuity, notify any purchaser of the property that:

- The land has been used to manage hazardous wastes.
- Its use is restricted under ADEM Admin. Code R.335-14-5-.07 and R.335-4-5-.04.
- The survey plat and record of the type, location, and quantity of hazardous waste disposed of required by ADEM Admin. Codes R.335-14-5-.07(7) and R.335-14-5-.07(10)(a) have been filed with the local zoning authority (or the authority with jurisdiction over local land use) and ADEM.

A certification, signed by an authorized ANAD representative, that the notice in the deed has been made will be submitted to ADEM along with a copy of the document in which the notation has been placed.

IV I-6 Copy of Insurance Policy ADEM Admin. Code R.335-14-5-.08(5)(b)17 and R.335-14-5-.08(8)

ANAD is a federally owned and operated facility. Both federal and state regulators [ADEM Admin. Code R.335-14-5-.08(1)(d)] exempt federal government facilities from financial requirements contained in ADEM Admin. Code R.335-14-5-.08.

ADEM
Alabama Department of Environmental Management

HAZARDOUS WASTE FACILITY PERMIT

ISSUED TO: United States Department of the Army, Anniston Army Depot
United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office
Washington Government Environmental Services Company LLC

EPA ID/PERMIT NUMBER: AL3 210 020 027

LOCATION: Calhoun County, Alabama, West of the city of Anniston, Latitude 33° 39' 00" and Longitude 85° 58' 22"

UNITS PERMITTED:

1 Spent Decontamination Storage and Treatment Tank System
1 Metal Parts Furnace
1 Container Handling Building
1 Brine Storage Tank System
3 Industrial Waste Storage Buildings
1 Roll-off Storage Building
1 Waste Transfer Facility
1 Lower Munitions Corridor
1 Brine Treatment Tank System
1 Open Burning Unit
1 Static Detonation Chamber
1 Liquid Incinerator
1 Deactivation Furnace System
1 Agent Storage Tank System
3 Conventional Waste Munitions Storage Igloos
155 Chemical Agent Storage Igloos
1 Toxic Maintenance Area
1 Upper Munitions Corridor
1 Buffer Storage Area
1 Linear Projectile and Mortar Disassembly System
1 Open Detonation Unit

ISSUANCE DATE: **November 14, 2007**

Modification R1	March 24, 2008
Modification R2	September 19, 2008
Modification R3	April 20, 2009
Modification R4	June 15, 2009
Modification R5	August 3, 2009
Modification R6	September 25, 2009
Modification R7	December 17, 2009
Modification R8	February 18, 2010
Modification R9	May 5, 2010
Modification R10	June 8, 2010
Modification R11	September 23, 2010
Modification R12	November 18, 2010
Modification R13	June 8, 2011
Modification R14	September 9, 2011

EXPIRATION DATE: **November 13, 2017**

This Permit is issued pursuant with the ***Code of Alabama 1975****, §§ 22-30-1-****et. seq.****, as amended, and regulations adopted thereunder and the Hazardous Wastes Management and Minimization Act and in accordance with the plans and specifications and applications filed with the Department subject to the conditions appended hereto, all of which are considered a part of this Permit. This Permit shall be subject to all applicable laws of the State of Alabama, rules and regulations and orders of the Department of Environmental Management and shall be effective from the date of issuance.*

Alabama Department of Environmental Management

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE STORAGE AND TREATMENT PERMIT

Permittee: **U.S. Department of the Army, Anniston Army Depot**
United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office
Washington Government Environmental Services Company LLC
Permit Number: AL3210020027
EPA I.D. No.: AL3210020027
Anniston, Alabama
Modification Number: R14

Pursuant to the Hazardous Wastes Management and Minimization Act, Code of Ala. 1975, Section 22-30-1, et. seq., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), a permit is issued to the United States Department of the Army, Anniston Army Depot (Facility Owner, Facility Co-Permittee, Facility Operator); the United States Department of the Army, Anniston Chemical Agent Disposal Facility Field Office (Facility Co-Permittee, Facility Co-Operator (Anniston Chemical Disposal Facility (ANCDF) Site)); and Washington Government Environmental Services Company LLC (Facility Co-Permittee, Facility Co-Operator (ANCDF Site)) to operate a hazardous waste storage and treatment facility located in Calhoun County, Alabama, West of the city of Anniston, latitude 33° 39' 00" and longitude 85° 58' 22".

For purpose of clarification, the designations Facility Owner, Facility Co-Permittee, Facility Operator, and Facility Co-Operator hereinafter shall be referred to as Owner, Permittee, and Operator respectively. The use of referring to Co-Permittee as Permittee and Co-Operator as Operator shall not change legal obligations and/or responsibilities.

In order to ensure the proper execution of this Permit, the Permittee agrees to the following division of operation responsibility:

- The U.S. Department of the Army, Anniston Army Depot (ANAD), as Facility Owner, a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANAD Facility. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- The U.S. Department of the Army, ANCDF Field Office (AFO) as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANCDF Site, including responsibility for funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- Washington Government Environmental Services Company LLC as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANCDF Site for day to day management within its direct management control and authority (including waste analysis, handling and monitoring, record keeping and related hazardous waste activities) as governed by law and the decisions and direction of the Army.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in Chapters 335-14-1, 335-14-2, 335-14-5, 335-14-7, 335-14-8, and 335-14-9 of the ADEM Administrative Code (hereinafter referred to as the "AAC"). Applicable AACs are those which are in effect on the date of issuance of this Permit.

This Permit is based on the assumption that the information contained in the ANCDF Part B Permit Application dated December 6, 2006, as revised on January 5, 2007, August 30, 2007, November 26, 2007, January 7, 2008, February 2, 2008, February 4, 2008, February 19, 2008, June 19, 2008, August 25, 2008, August 27, 2008, November 18, 2008, December 1, 2008, December 22, 2008, February 6, 2009, March 11, 2009, March 23, 2009, May 4, 2009, May 26, 2009, June 25, 2009, July 10, 2009, August 18, 2009, September 2, 2009, October 14, 2009, January 11, 2010, February 5, 2010, April 21, 2010, June 28, 2010, August 12, 2010, September 7, 2010, October 7, 2010, January 18, 2011, May 9, 2011, and August 19, 2011 (hereby incorporated by reference and hereafter collectively referred to as the Application) is accurate.

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Any inaccuracies found in this information could lead to the termination or modification of this Permit and potential enforcement action (AAC 335-14-8).

The Permittee must inform ADEM of any deviation from or changes in the information in the Application which would affect the Permittee's ability to comply with the applicable AAC or permit conditions.

This Permit is effective as of November 14, 2007, as revised March 24, 2008, September 19, 2008, April 20, 2009, June 15, 2009, August 3, 2009, September 25, 2009, December 17, 2009, February 18, 2010, May 5, 2010, June 8, 2010, September 23, 2010, November 18, 2010, June 8, 2011, and September 9, 2011 and shall remain in effect until November 13, 2017, unless revoked and reissued, or terminated (See ADEM Admin. Code rule 335-14-8-.04(4)).

Alabama Department of Environmental Management

9/09/11
Date Signed

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DOCUMENTS INCLUDED BY REFERENCE:

Part B Permit Application (all revisions listed below)

ANCDF 2002 Risk Assessment and Subsequent Addendums

Final Mustard Trial Burn Plan

Mustard Condition 1 and Condition 2 Trial Burn Reports

Final SDC Emission Test Plan

SDC Emissions Test Report

Anniston Chemical Activity Chemical Munitions Storage Igloo Closure Plan

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THE RESOURCE CONSERVATION AND RECOVERY ACT HAZARDOUS WASTE PERMIT APPLICATION FOR THE U.S. DEPARTMENT OF THE ARMY, ANNISTON ARMY DEPOT, THE U.S. DEPARTMENT OF THE ARMY, ANNISTON CHEMICAL AGENT DISPOSAL FACILITY FIELD OFFICE, AND WASHINGTON GOVERNMENT ENVIRONMENTAL SERVICES, LLC DATED DECEMBER 6, 2006, AS AMENDED JANUARY 5, 2007, RESUBMITTED AUGUST 30, 2007, AS MODIFIED BY SUBSEQUENT AMENDMENTS DATED NOVEMBER 26, 2007, JANUARY 7, 2008, FEBRUARY 2, 2008, FEBRUARY 4, 2008, FEBRUARY 19, 2008, JUNE 19, 2008, AUGUST 25, 2008, AUGUST 27, 2008, NOVEMBER 18, 2008, DECEMBER 1, 2008, DECEMBER 22, 2008, FEBRUARY 6, 2009, MARCH 11, 2009, MARCH 23, 2009, MAY 4, 2009, MAY 26, 2009, JUNE 25, 2009, JULY 10, 2009, AUGUST 18, 2009, SEPTEMBER 2, 2009, OCTOBER 14, 2009, JANUARY 11, 2010, FEBRUARY 5, 2010, APRIL 21, 2010, JUNE 28, 2010, AUGUST 12, 2010, SEPTEMBER 7, 2010, OCTOBER 7, 2010, JANUARY 18, 2011, MAY 9, 2011, AND AUGUST 19, 2011 (HEREAFTER COLLECTIVELY REFERRED TO AS THE APPLICATION) IS HEREBY INCORPORATED BY REFERENCE INTO THIS PERMIT AND THE PERMITTEES SHALL BE SUBJECT TO THE REQUIREMENTS THEREIN.

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LIST OF ACRONYMS

%	Percent
°F	Degrees Fahrenheit
2MRA	2 Minute Rolling Average
AAC	ADEM Administrative Code
ACAMS	Automatic Continuous Air Monitoring System
ACFM	Actual Cubic Feet per Minute
ACS	Agent Collection System
ACT	Agent Collection Tank
ADEM	Alabama Department of Environmental Management
AFO	Anniston Field Office
AHWMMA	Alabama Hazardous Wastes Management and Minimization Act
AL	Airlock
ANAD	Anniston Army Depot
ANCA	Anniston Chemical Activity
ANCDF	Anniston Chemical Demilitarization Facility
AOC	Area of Concern
AQS	Agent Quantification System
ASC	Allowable Stack Concentration
ASME	American Society of Mechanical Engineers
ATB	Agent Trial Burn
AWFCO	Automatic Waste Feed Cutoff
BD	Buried Detonation
BDAT	Best Demonstrated Available Technology
BSA	Buffer Storage Area
BTS	Brine Treatment System
BTU	British Thermal Unit
CAIRA	Chemical Accident/Incident Response and Assistance
CAMDS	Chemical Agent/Munition Disposal System
CAMU	Corrective Action Management Unit
CDC	Centers for Disease Control
CEC	Cation Exchange Capacity
CEM	Continuous Emissions Monitor
CFM	Cubic Feet Per Minute
CFR	Codified Federal Regulations
CHB	Container Handling Building
Cl_2	Chlorine
CLA	Chemical Limited Area
CMS	Corrective Measure Study
CO	Carbon Monoxide
CO_c	Corrected CO ppm
CO_m	Measured CO ppm
CON	Control Room
CS	Confirmatory Sampling
CSDP	Chemical Stockpile Disposal Program
CWA	Clean Water Act
D/P	Differential Pressure
DAAMS	Depot Area Air Monitoring System
DAL	MPF Discharge Air Lock

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DDESB	Department of Defense Explosive Safety Board
DECON	Decontamination
DFS	Deactivation Furnace
DHHS	Department of Health and Human Services
DOD	Department of Defense
DOT	Department of Transportation
DPE	Disposable Protective Ensemble
DRE	Destruction and Removal Efficiency
DSCFM	Dry Standard Cubic Feet per minute
ECR	Explosive Containment Room
ECV	Explosive Containment Room Vestibule
EONC	Enhanced On-site Container
EPA	Environmental Protection Agency
EVAP	Evaporator
EXCH	Exchanger
FD	Forced Draft
FFA	Federal Facilities Agreement
FPI	Feed Prohibitive Interlock
FT	Foot
FT^2	Squared Feet
FT^3	Cubed Feet
G	Grams
GAL	Gallons
GC	Gas Chromatograph
GFE	Government Furnished Equipment
GPL	General Population Limit
GPM	Gallons Per Minute
HCl	Hydrochloride
HDC	DFS Heated Discharge Conveyor
HEPA	High Efficiency Particulate Air
HF	Hydrofluoride
HHRA	Human Health Risk Assessment
HHS	Health and Human Services
HMMS	Hazardous Materials Management System
HPLC	High Performance Liquid Chromatography
HR	Hour
HSWA	Hazardous and Solid Waste Amendment
HTH	High Test Hypochlorite
HVAC	Heating, Ventilation, and Air Conditioning
HWMU	Hazardous Waste Management Unit
IAW	In Accordance With
I.D.	Identification
ID	Induced Draft
IDLH	Immediately Dangerous to Life and Health
IDS	Intrusion Detection System
INWC	Inches of Water Column
JACADS	Johnston Atoll Chemical Agent Disposal System
JSB	Job Safety Breakdown
LAB	Laboratory
LBs	Pounds
LBs/2-min	Pounds Per 2-minute Average

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LDR	Land Disposal Restrictions
LIC	Liquid Incinerator
LMC	Lower Munitions Corridor
LPMD	Linear Projectile/Mortar Disassembly
LSS	Life Support System
m^3	Cubed Meter
MCL	Maximum Contaminant Level
M-CR	Munition Corridor
M-CR-AL	Munitions Corridor Airlock
MDB	Munition Demilitarization Building
MEK	Methyl Ethyl Ketone
MG	Milligram
MIN	Minute
Mini-CAMS	Miniature Continuous Air Monitoring System
MMR	Military Munition Rule
MPB-AL	Munitions Processing Bay Airlock
MPF	Metal Parts Furnace
MSDS	Material, Safety and Data Sheets
ND	Non-Detect
NDE	Non-Destructive Examination
NEW	Net Explosive Weight
No	Number
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
O_2	Oxygen
O_m	Measured Percent Oxygen
OB	Open Burning
OD	Open Detonation
ONC	Onsite Storage Container
P_c	Corrected Concentration of Particulate Matter
P_m	Measured Concentration of Particulate Matter
PAS	Pollution Abatement System
PCB	Polychlorobiphenyls
PFS	Pollution Abatement System Filtration System
PIC	Products of Incomplete Combustion
PM	Particulate Matter
PMB	Personnel Maintenance Building
POHC	Principal Organic Hazardous Constituents
POL	Petroleum, Oil and Lubricants
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PPMW	Parts Per Million by Weight
PRA	Preliminary Risk Assessment
PRW	Process Water
PSIG	Pounds Per Square Inch Gauge
PUB	Process and Utility Building
QAPP	Quality Assurance Project Plans
QA/QC	Quality Assurance/ Quality Control
RA	Risk Assessment
RAA	Risk Assessment Addendum

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RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFC	Request for Concurrence
RFI	RCRA Facility Investigation
RHA	Residue Handling Area
RL	Reporting Limit
ROHA	Rolling Hourly Average
RPM	Rounds Per Minute
S	Seconds
SAR	SWMU Assessment Report
SCBA	Self Contained Breathing Apparatus
SCFH	Standard Cubic Feet per Hour
SDC	Static Detonation Chamber
SDS	Spent Decontamination Solution
SGU	Specific Gravity Unit
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SOPC	Substances of Potential Concern
STB	Surrogate Trial Burn
STEL	Short-Term Exposure Level
STL	Short Term Limit
SWMU	Solid Waste Management Unit
TAP	Toxicological Agent Protective Gear
TBD	To Be Determined
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TMA	Toxic Management Area
TOX	Toxic Cubicle
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, Disposal
TSDF	Treatment, Storage, Disposal Facility
UMC	Upper Munition Corridor
UPA	Unpack Area
US	United States
WAP	Waste Analysis Plan
WCL	Waste Control Limit
WIC	Waste Incineration Container
WMM	Waste Military Munitions
WPL	Worker Protection Limit
WTF	Waste Transfer Facility
Y	Measured Oxygen Concentration in the Stack Gas

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MODULE I: STANDARD PERMIT CONDITIONS

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MODULE I: STANDARD PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

1. At the Anniston Chemical Agent Disposal Facility (ANCDF), the Permittee is allowed to store and treat hazardous waste or chemical agent in accordance with (IAW) the conditions of this Permit and IAW ADEM Administrative Code (AAC) 335 Division 14. The Permittee is allowed to store hazardous waste or chemical agent in containers, treat and store hazardous waste or chemical agent in tanks, treat hazardous waste or chemical agent in miscellaneous treatment units, and treat hazardous waste or chemical agent by incineration at the ANCDF. ANCDF is also allowed to accumulate hazardous waste onsite for less than 90 calendar days pursuant to AAC 335-14-3-.03(5).

2. Within the Anniston Army Depot (ANAD), the Permittee is allowed to thermally treat conventional waste military munitions hazardous waste by open burning and open detonation (OB/OD) IAW AAC 335-14-5-.24 in the designated OB and OD units. Any treatment, storage, or disposal (TSD) of hazardous waste or chemical agent not authorized in this Permit, by AAC 335 Division 14 or any other Resource Conservation and Recovery Act (RCRA) permit is prohibited. Within the ANAD, the Permittee is allowed to store industrially derived hazardous waste, non-regulated waste (solid and universal waste, used oil, etc.), waste conventional munitions, waste chemical agent munitions, and chemical agent derived wastes IAW the conditions of this Permit and IAW AAC 335 Division 14. The Permittee is allowed to receive shipment from off-site sources of waste conventional munitions for the purpose of reuse, recycle, recovery, or for disposal. Receipt of any other hazardous waste from off-site sources is not allowed. The Permittee is allowed to store waste chemical agent munitions and chemical agent derived wastes for a time period of greater than one year.

3. Pursuant to AAC 335-14-8-.01(4), compliance with this Permit constitutes compliance, for purposes of enforcement, with the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) and RCRA, as amended by Hazardous and Solid Waste Amendments (HSWA), except for those requirements not included in the requirements which become effective by statute, or future regulatory changes to include those requirements promulgated under AAC 335-14-9 restricting the placement of hazardous wastes in or on the land. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. Compliance with the terms of this Permit does not constitute a defense to any action brought under Code of Alabama 1975, Section 22-30-1, et. seq., as amended, or any other law governing protection of public health or the environment for any imminent and substantial endangerment to human health, welfare, or the environment.

I.B. DEFINITIONS

For the purpose of this Permit, terms used herein shall have the same meaning as those in AAC 335-14-1, 335-14-2, 335-14-5, and 335-14-8, unless this Permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

"Active life" for the purposes of this Permit refers to the time period between receipt of the first batch of hazardous waste or chemical agent munition at the hazardous waste management site and certification of closure of the hazardous waste management site.

"Action levels" for the purposes of this Permit are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.

"ADEM" means the Alabama Department of Environmental Management as established by Code of Alabama 1975, § 22-22A-4.

"Area of concern" (AOC) for purposes of this Permit includes any area having a probable release of a hazardous waste, chemical agent, or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the RCRA and AAC 335-14-8-.03(3) (b)2. in order to ensure adequate protection of human health and the environment.

"Chemical agent" for purposes of this Permit, includes the nerve agents VX or GB (Sarin) and the blister agent mustard (HD/HT dependent on mixture).

"Chemical agent free" for the purposes of this Permit refers to the condition of a material that, after being analyzed for chemical agents to which the material was exposed, is determined to have chemical agent concentrations below the lowest achievable detection limits as specified by the method.

"Chemical Stockpile Disposal Program" (CSDP) means the program created by the Department of Defense to dispose of all of their stockpile of unitary chemical weapons.

"Contamination" for purposes of this Permit refers to the presence of any hazardous constituent in a concentration which exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the facility (in areas not affected by the facility).

"Conventional munitions" for the purposes of this Permit means military munitions and munition products and components produced for or used by the military for national defense and security, as defined by AAC 335-14-1-.02 as "military munitions", and are <u>not</u> chemical agent munitions.

"Corrective action" for purposes of this Permit may include all corrective measures necessary to protect human health and the environment for all releases of hazardous waste, chemical agent, or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required by AAC 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater.

"Corrective Action Management Unit" (CAMU) for purposes of this Permit, includes any area within a facility that is designated by the Department under AAC 335-14-5-.19 for the purpose of implementing corrective action requirements under AAC 335-14-5-.06(12) , 22-30-19 et seq., Code of Alabama 1975, and/or RCRA Section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

"Corrective measures" for purposes of this Permit, include all corrective action necessary to protect human health and the environment for all releases of hazardous waste, chemical agent, or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required under AAC 335-14-5-.06(12).

"DDESB" means the Department of Defense Explosive Safety Board.

"Decontamination" means the application of a solution to any waste, whether primary or secondary, equipment or facilities for the purposes of reducing agent contamination.

"Department" means the Alabama Department of Environmental Management as established by Code of Alabama 1975, § 22-22A-4.

"Extent of contamination" for the purposes of this Permit is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

"Facility" for purposes of this Permit includes ANAD and any contiguous property and structures, other appurtenances, and improvements on the property, under the control of the owner or operator seeking a permit under Subtitle C of RCRA. For the purposes of implementing corrective action under AAC 335-14-5-.06(12) a facility includes all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

"Government furnished equipment" (GFE) is hazardous waste management unit (HWMU) equipment that shall be delivered to the site as a pre-fabricated assembly.

"Hazardous constituent" for purposes of this Permit are those substances listed in AAC 335-14-2- Appendix VIII and/or Appendix IX of Chapter 335-14-5 and

include hazardous constituents released from solid waste, hazardous waste, chemical agent and hazardous waste constituents that are reaction by-products.

"Heel" refers to the amount by weight of chemical agent remaining in a munition or container after the munition or container has gone through the chemical agent draining process.

"Hourly rolling average" (ROHA) is the arithmetic mean of the 60 most recent 1-minute averages recorded.

"In process" refers to any waste - primary or secondary – loaded for charging entering through the Unpack Area (UPA)/Toxic Maintenance Area (TMA) configured with the intent of processing through the furnace.

"Interim measures" for purposes of this Permit are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long term corrective action remedies are evaluated and, if necessary, implemented.

"Land disposal" for purposes of this Permit and AAC 335-14-9 means placement in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

"Landfill" for the purposes of this Permit includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

"Normal operating" period for a unit for the purposes of this Permit shall begin when all requirements provided in Module VI for that unit have been met by the Permittee and approved by the Department, the trial burn results and the health risk assessment provided for in Condition II.N. have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Module VII have been established and last until the unit re-enters a shakedown, trial burn, or post-trial burn period or until the unit treats the last batch of waste prior to beginning closure operations.

"Operating day" refers to a 24-hour period during which operations occurred for any length of time.

"Operating record" for each site within the ANAD facility shall be in written format or electronic format and must be immediately accessible for viewing and printing a hard copy.

"Post-trial burn period" shall refer to the period of time extending from the completion of the final run of a trial burn as described in the trial burn plan for that unit until all requirements provided in Module VI for that unit have been met by the Permittee and approved by the Department, the trial burn results and health risk Assessment

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provided for in Condition II.N. have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Module VII have been established.

"Primary waste" is defined as munitions, ton containers, nerve agents GB and VX and mustard agents HD and HT.

"Release" for purposes of this Permit includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, pumping, or disposing into the environment of any chemical agent, hazardous waste or hazardous constituent.

"Remediation waste" for the purposes of this Permit includes all solid and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under AAC 335-14-5-.06(12) and RCRA Section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004(v) or 3008(h) for releases beyond the facility boundary.

"Secondary waste" is defined as all waste that is not characterized as primary waste.

"Shakedown period" shall refer to the period of time required to determine operational readiness extending from systemization until the beginning of the trial burn period.

"Shutdown" for the purposes of this Permit shall be defined as the normal procedure performed to bring the furnaces from a condition of induced and forced-draft fans being operated or fuel being combusted in either chamber to a condition where no fuel is being combusted and induced and forced-draft fans are not operating.

"Site" for the purposes of this Permit includes, but is not limited to, any permitted treatment, storage or disposal activity that may be comprised of one or more HWMUs.

"Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

"Solid waste management unit" (SWMU) for the purposes of this Permit includes any unit which has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA regulated HWMUs are also solid waste

management units. SWMUs include areas that have been contaminated by routine and systematic releases of chemical agent, hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).

"Spent decontamination solution" (SDS) is a caustic, bleach or other suitable solution that has been used to neutralize agent.

"Standard operating procedure" (SOP) is a written description of the procedures by which a process, machine, etc. shall be operated. An SOP may be written by the manufacturer and/or the Permittee. Adherence to any SOP employed by the Permittee does not necessarily constitute regulatory compliance.

"Startup" for the purposes of this Permit shall be defined as the procedure and the period of time required to bring the furnaces from a state of no fuel being introduced to the combustion chambers and all induced and forced-draft fans being off to a state at which all waste feed cut-off parameters are in compliance with the permitted conditions.

"Standby" for the purpose of this Permit shall be defined as the period of time which the furnace is firing only primary or backup fuel for the purpose of maintaining furnace temperatures.

"Tank system" for the purposes of this Permit shall include the tank(s) and all primary and secondary sumps, pumps, valves, and associated piping and any other appurtenances.

"Trial burn period" shall refer to the period of time from the first run until the final run of the trial burn for that unit is completed as described in the trial burn plan for that unit.

"Unit" for the purposes of this Permit includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, miscellaneous treatment unit, or recycling unit.

I.C. PERMIT ACTIONS

This Permit may be modified, revoked and reissued, or terminated for cause as specified in AAC 335-14-8-.04 (2) through (4). The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition (AAC 335-14-8-.03(1)(f)).

I.D. SEVERABILITY

The provisions of this Permit are severable and if any provision of this Permit, or the application of any provision of this Permit 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. Invalidation of any State or Federal statutory or regulatory provision which forms the basis for any condition of this Permit does not affect the validity of any other State or federal statutory or regulatory basis for said condition.

I.E. DUTIES AND RESPONSIBILITIES

1. Duty to Comply

The Permittee must comply with all conditions of this Permit except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of Code of Alabama 1975, Section 22-30-1 et. seq., as amended, and is grounds for enforcement action, permit termination, revocation and re-issuance, modification, or denial of a permit renewal application (AAC 335-14-8-.03(1)(a)).

2. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must apply for and obtain a new permit. Notification shall be at least 180 calendar days before this Permit expires (AAC 335-14-8-.03(1)(b)).

3. Permit Expiration

a. This Permit and all conditions therein shall be effective for 10 years from the effective date of this Permit. This Permit and all conditions therein shall remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application and, through no fault of the Permittee, the Department has not made a final determination regarding reissuance of the Permit (AAC 335-14-8-.05(1) and (2)).

b. Total operating time for the Liquid Incinerator (LIC), Deactivation Furnace System (DFS), and Metal Parts Furnace (MPF) shall be no more than 22,260 operational hours (excluding standby) with no more than 6,000 operational hours for the LIC, 8,760 operational hours for the DFS, and 7,500 hours for the MPF (excluding standby) in any consecutive 12-month period.

4. Continuation of Expiring Permit

This Permit and all conditions herein shall continue in force until the effective date of a new permit, if the Permittee has submitted a timely application under AAC 335-14-8-.02(5) and the applicable paragraphs in AAC 335-14-8-.02(6) through (20) which is a complete (under AAC 335-14-8-.02(1)(c)) application for a new permit; and through no fault of the Permittee, the Department has neither issued or denied a new permit on or before the expiration date of this Permit (AAC 335-14-8-.05(2)).

5. **Obligation for Corrective Action**

Owners or operators of HWMUs must have all necessary permits during the active life (including the closure period) of the unit, and for any period necessary to comply with the corrective action requirements in Module VIII. The corrective action obligations required by this Permit shall continue regardless of whether the facility continues to operate or ceases operation and closes. The facility is obligated to complete facility-wide corrective action regardless of the operational status of the facility.

6. **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 (AAC 335-14-8-.03(1)(c)).

7. **Duty to Mitigate**

In the event of noncompliance with the permit, the Permittee shall take all reasonable steps to minimize releases to the environment resulting from the noncompliance, and shall carry out such measures as are reasonable, to prevent significant adverse impacts on human health or the environment (AAC 335-14-8-.03(1)(d)).

8. **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) which are 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 project plans (QAPP) to include following SOPs. Adherence to any SOP employed by the Permittee does not necessarily constitute regulatory compliance. This provision requires the operation of back-up or auxiliary equipment or similar systems only when necessary to achieve compliance with the conditions of this Permit (AAC 335-14-8-.03(1)(e)).

9. **Duty to Provide Information**

The Permittee shall furnish to the Department, within a reasonable time, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Department upon request, copies of records required to be kept by this Permit (AAC 335-14-8-.03(1)(h)).

10. Inspection and Entry

Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow duly designated officers and the employees of the Department or their authorized representative to (AAC 335-14-8-.03(1)(i)):

a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted; or where records must be kept under the conditions of this Permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

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

d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMA, as amended.

e. The Permittee shall provide to the Department unrestricted real-time remote access to continuously monitored and recorded ANCDF operating data and emissions monitoring data required by this Permit using a remote computer monitoring station.

11. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The methods used to obtain representative samples of the wastes to be analyzed must be the appropriate method from AAC 335-14-2 Appendix I or the methods as specified in the Waste Analysis Plan (see Sections II C-2 and III C-2 of the RCRA Permit Application). Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), or the methods as specified in the attached Waste Analysis Plan (AAC 335-14-8-.03(1)(j)).

b. The Permittee shall retain records at the facility of all monitoring information, including all calibration and maintenance records, copies of all reports and records required by this Permit, and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report or record or for periods elsewhere specified in this Permit. The Permittee shall retain, at the Facility, all monitoring records from all surface water sampling, seep sampling, soil sampling, sediment sampling, groundwater monitoring wells, and associated groundwater surface elevations until 3 years past the end of the corrective action instituted to address releases of chemical agent, hazardous waste or hazardous waste constituents from any solid

waste management unit. These periods may be extended by the request of the Department at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility (AAC 335-14-8-.03(1)(j)2. and 335-14-5-.05(5)(b)).

c. Records of monitoring information shall include (AAC 335-14-8-.03(1)(j)3.):

i. The date, exact place, and time of sampling or measurement;

ii. The individual(s) who performed the sampling for measurements;

iii. The date(s) analyses were performed;

iv. The individual(s) who performed the analyses;

v. The analytical techniques or methods used; and

vi. The results of such analyses.

d. The Permittee shall submit all monitoring results at the intervals specified elsewhere in this Permit.

12. Reporting Planned Changes

As soon as possible prior to any planned physical alteration or addition, the Permittee shall give notice to the Department of such planned physical alterations or additions to the permitted areas on the ANAD facility (AAC 335-14-8-.03(1)(l)1.).

13. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted ANAD facility or activity which may result in noncompliance with permit requirements. Advanced notice shall not constitute a defense for any noncompliance (AAC 335-14-8-.03(1)(l)2.).

14. Certification of Construction or Modification

a. The Permittee may not commence storage (except less than ninety day storage) or treatment of chemical agent or hazardous wastes in any new unit including GFE at the ANCDF until the Permittee has submitted to the Department, by certified mail or hand delivery, a certification of construction signed by the Permittee and a qualified professional engineer stating that the unit has been constructed in compliance with the permit and applicable regulations; and

i. The Department has inspected the modified or newly constructed site and finds it is in compliance with the conditions of the permit (AAC 335-14-8-.03(1)(l)2.(ii)(I)); or

ii. The Department has either waived the inspection or has not within 15 calendar days notified the Permittee of its intent to inspect (AAC 335-14-8-.03(1)(l)2.(ii)(II)).

b. The above mentioned certification of construction must include, at a minimum:

   i. As built drawings;

   ii. Descriptions and delineation of any changes to proposed drawings;

   iii. All required professional certifications;

   iv. All quality assurance/quality control documentation (QA/QC); and

   v. All required physical testing results.

c. Construction certification shall be maintained for the following ANCDF HWMUs or systems:

   i. Brine Storage Tanks System

   ii. Spent Decontamination Holding Tank System

   iii. Agent Collection Tank System

   iv. LIC and Pollution Abatement System (PAS)

   v. MPF and PAS

   vi. DFS and PAS

   vii. Container Handling Building (CHB)

   viii. Demilitarization machines by system

   ix. Heating, Ventilation, and Air Conditioning (HVAC) System (including carbon filter system)

   x. PAS Carbon Filters

   xi. Toxic Maintenance Area (TMA)

   xii. Waste Transfer Facility (WTF)

   xiii. Upper and Lower Munitions Corridors (UMC and LMC)

   xiv. Buffer Storage Area (BSA)

   xv. Brine Treatment System (BTS)

15. <u>Transfer of Permit</u>

This Permit shall be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to AAC 335-14-8-.04(1) and 335-14-8-.03(3)d. Prior to transferring ownership or operation of the permitted ANAD facility during its operating life, the Permittee shall notify the new owner or operator, in writing, of the requirements of AAC 335-14-5, 335-14-8, and this Permit (AAC 335-14-8-.03(1)(l)3).

16. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than 14 calendar days following each schedule date (AAC 335-14-8-.03(1)(l)5.).

17. 24-Hour Reporting

a. In accordance with AAC 335-14-8-.03(1)(l)6.(i), the Permittee shall verbally report to the Department any noncompliance with this Permit which may endanger human health or the environment. Any such information shall be reported as soon as possible, but not later than 24 hours from the time the Permittee becomes aware of the noncompliance.

i. Potential endangerment to human health and the environment shall include, but not be limited to, noncompliance with Condition II.A.1.

ii. Potential endangerment to human health or the environment shall include, but not be limited to, any release to the environment of any chemical agent (i.e., GB, VX, HD, and/or HT) or any chemical agent residue which results in the following:

(I) Any release to the atmosphere from the combined stack for the LIC, DFS, and MPF, MPF Cool-Down Conveyor Enclosure Ventilation, DFS Discharge Conveyor (DC) bin change out opening, or from any stack for the air filtration system if the confirmed stack emission levels exceeds the maximum Allowable Stack Concentrations (ASCs) identified for any individual chemical agent in Table 1-1.

(II) Chemical agent concentrations, at any of the ANCDF monitoring perimeter stations, exceeding the General Population Limits (GPL) specified in Table 1-1 for each chemical agent.

(III) Any unprotected workers exposed to chemical agent, exceeding the Short-Term Exposure Level (STEL) specified in Table 1-1 at any chemical agent monitor (i.e., Automatic Continuous Air Monitoring System (ACAMS)/Depot Area Air Monitoring System (DAAMS)) within the ANCDF.

iii. Potential endangerment to human health or the environment shall include any non-confirmed indication that a release to the atmosphere from the combined stack for the LIC, DFS, and MPF, or from any stack for the air filtration system has occurred. The Permittee shall verbally report to the Department within 24 hours

of a chemical agent monitor alarm at the maximum ASC level that indicates a potential release to the atmosphere if the stack emission levels have not been verified as a chemical agent anomaly (i.e., false positive).

b. In accordance with AAC 335-14-8-.03(1)(l)6.(i) and (ii), the immediate and 24 hour verbal report required in Condition I.E.17.a. shall include, but not be limited to, the following:

i. Information concerning the release of any hazardous waste or chemical agent which may endanger public drinking water supplies;

ii. Any information of a release or discharge of hazardous waste or chemical agent, or of a fire or explosion at the ANAD facility, which could threaten the environment or human health; and

iii. A description of the release or discharge and its cause including, at a minimum:

(I) Name, title, and telephone number of individual reporting;

(II) Name, address, and telephone number of the owner or operator;

(III) Name, address, and telephone number of the ANAD facility;

(IV) Date, time, and type of incident;

(V) Location and cause of incident;

(VI) Name and quantity of materials involved;

(VII) The extent of injuries, if any;

(VIII) An assessment of actual or potential hazard to the environment and human health, where this is applicable;

(IX) Description of any emergency action taken to minimize the threat to human health and the environment;

(X) Estimated quantity and disposition of recovered material that resulted from the incident; and

(XI) Any other information necessary to fully evaluate the situation and to develop an appropriate course of action.

c. Within 5 calendar days of the time the Permittee is required to provide verbal notification, as specified in Conditions I.E.17.a. through b., the Permittee shall provide to the Department a written submission IAW AAC 35-14-8-.03(1)(l)6.(iii).

i. The written submission shall include, but not be limited to the following:

(I) Name, address, and telephone number of the individual reporting;

(II) A description (including cause, location, extent of injuries, if any, and an assessment of actual or potential hazard to the environment and human health outside the ANAD facility, where this is applicable) of the incident (noncompliance and/or release);

(III) The period(s) in which the incident (noncompliance and/or release) occurred (including exact dates and times);

(IV) Whether the results of the incident remain a threat to human health and the environment (whether the noncompliance has been corrected and/or the release has been adequately cleaned up); and

(V) If not, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and/or the steps taken or planned to adequately clean up the release.

ii. The Permittee need not comply with the 5 calendar day written notice requirement if the Department waives the requirement and the Permittee submits a written report within 15 calendar days from the time the Permittee is required to provide verbal notification, as specified in Conditions I.E.17.a. through b.

18. <u>Other Noncompliance</u>

The Permittee shall report all instances of noncompliance not reported under Condition I.E.17 on a quarterly basis. The reports shall contain the information required by the AAC 335-14-8-.03(1)(1)6.

19. <u>Other Information</u>

If the Permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application, permit modification request, or in any report to the Department, such facts or information shall be promptly submitted by the Permittee (AAC 335-14-8-.03 (1)(l)11.). In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with the permit. The Permittee shall also promptly provide the Department all incident reports generated at any other CSDP facility.

I.F. SIGNATORY REQUIREMENT

All modifications to the RCRA Permit or Application submitted to the Department, shall be signed and certified by the ANAD Commander, AFO Field Office Project Manager, and Systems Contractor Project Manager, or by duly authorized representatives of those persons IAW the AAC 335-14-8-.02(2).

I.G. CONFIDENTIAL INFORMATION

The Permittee may claim information submitted as confidential if the information is protectable under Code of Alabama 1975, § 22-30-18, as amended. The term "Trade Secret" as used in § 22-30-18 is defined in Code of Alabama 1975, § 22-30-3(12). (AAC 335-14-8-.02(3)).

I.H. REPORTS, NOTIFICATIONS, AND SUBMITTALS

1. All modifications to the RCRA Permit or Application to be sent or given to the Department should be sent by certified mail, express mail, or hand delivered to:

   Chief, Land Division
   Alabama Department of Environmental Management
   Mailing: PO Box 301463, Montgomery, AL 36130-1463
   OR
   Physical: 1400 Coliseum Blvd., Montgomery, AL 36109-2608
   Phone: (334) 271-7700
   FAX: (334) 279-3050

2. All modifications to the RCRA Permit or Application to be sent or given to the Regional Administrator should be sent by certified mail, express mail, or hand delivered to the United States (US) Environmental Protection Agency (EPA), Region 4, Waste Management Division at:

   Director, Waste Management Division
   U.S. Environmental Protection Agency, Region 4
   Atlanta Federal Center
   61 Forsyth Street SW
   Atlanta, GA 30303-3104
   Phone: (404) 562-8526

I.I. DOCUMENTS TO BE MAINTAINED AT THE ANAD FACILITY

The Permittee shall maintain at ANAD/ANCDF controlled facilities, until closure is completed and certified by a qualified professional engineer, the following documents and amendments, revisions and modifications to these documents:

1. Waste Analysis Plan (see Section C-2 of the RCRA Permit Application), as required by AAC 335-14-8-.02(5)(b)3.
2. Inspection Schedules (see Section F-2 of the RCRA Permit Application), as required by AAC 335-14-8-.02(5)(b)5.
3. Personnel training documents and records, as required by AAC 335-14-8-.02(5)(b)12.
4. Contingency Plan (Sections II G and III G of the Application), as required by AAC 335-14-8-.02(5)(b)7.
5. Operating record, as required by AAC 335-14-5-.05(4).

6. Closure Plan, as required by AAC 335-14-8-.02(5)(b)13.7. Annually adjusted closure cost estimate as required by AAC 335-14-5-.08(3)(b).

7. Copy of this Permit, Permit Attachments, current Permit Application and the current Permit Application Attachments.

8. Construction certification and as built drawings for the ANCDF HWMUs identified under Condition I.E.14.c. Construction certification and as-built drawings for any new HWMU(s) that may be constructed at ANAD or ANCD.

9. Independent tank system assessment, installation, and repair certifications; as required by AAC 335-14-8-.02(7).

10. Groundwater monitoring reports as required by AAC 335-14-5-.06.

I.J. ATTACHMENTS

1. If any of the Attachments to this Permit are found to conflict with any of the conditions in Modules I through IX, the condition shall take precedence.

2. If any section of the Application is found to be in conflict with any condition of this Permit, the condition of this Permit shall take precedence.

3. If any section of the Application is found to be in conflict with any Attachment to this Permit, the Attachment to this Permit shall take precedence.

I.K. PERMIT MODIFICATIONS AND SUBMITTALS

1. The individual trial burn plan for each different chemical agent to be treated in that incinerator shall be resubmitted by the Permittee as major permit modification(s) at least 180 calendar days prior to the proposed start date of the shakedown period for each trial burn. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed. The revised individual trial burn plans shall be approved by the Department prior to the start of the shakedown period for the respective trial burn.

2. The Permittee shall submit a revised Screening Risk Assessment Protocol at least 180 calendar days prior to the start date of the shakedown period for the initial agent trial burn which shall reflect the most current EPA guidance at the time of submittal. The revised Screening Risk Assessment Protocol shall be approved by the Department prior to the shakedown period for the initial agent trial burn.

3. The Permittee shall request a permit modification whenever changes in operating plans or facility design affect any plan (e.g. closure, groundwater monitoring, post-closure, or corrective actions) required or referenced by this permit. The Permittee must submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2) at least 60 calendar days prior to the proposed change in facility design or operation.

Table 1-1: Chemical Agent Exposure and Stack Limits

Location	Chemical Agent Concentrations (mg/m^3)		
	VX	GB	HD/HT[3]
Maximum Instantaneous ASC[1,2]	0.0003	0.0003	0.03
Maximum ROHA ASC[1,2]	0.00006	0.00006	0.006
GPL[1,3,4] (Averaging Time: 24 hours)	0.0000006	0.000001	0.00002
WPL[1,3,4] (Averaging Time: 12 Hours)	0.0000006	0.00002	0.00027
STEL [5] (Averaging Time: 15 minutes)	0.00001	0.0001	0.003
IDLH	0.003	0.1	0.7

NOTE: CDC determined that the current available data precluded acceptable exposure limits for mustard agent being precisely defined. CDC concluded that the work-place limits shall amply protect a general population 1000 meters or more from the demilitarization site or transportation route. Therefore, protection of the general public is dependent upon meeting the work-place limits within the facility.

Footnotes:

(1) Public Law 91-121/144 (USC 1512) mandates that the United States Department of Health and Human Services (DHHS) review the plans for transporting and/or disposing of lethal chemical agents and make recommendations for protecting human health and safety. DHHS delegated review and recommendation authority to the Centers for Disease Control (CDC).

(2) The Department of Army proposed the maximum ASCs indicated in Table 1-1. DHHS reviewed the concentrations and announced in the March 15, 1988 Federal Register (53 FR 8504) [corrected in 53 FR 11002, April 4, 1988] that the concentrations "met HHS criteria and appear to be more restrictive than limits set on a health base alone," and therefore made no recommendation for changes.

(3) 3 The March 15, 1988 Federal Register (53 FR 8504) [corrected in 53 FR 11002, April 4, 1988] announced that CDC concluded that the concentrations indicated in Table 1-1 shall adequately protect human health; "even long-term exposure to these concentrations would not create any adverse health effects."

(4) The October 9, 2003 Federal Register [Vol.68, No. 196, pp 58348-51] announced the final recommendations for protecting human health from potential adverse effects of exposure to agent GA, GB, and VX. The CDC conclusions in (3) above were not altered, but the human exposure values were lowered.

(5) The STEL is the 15-minute average of the ACAMS cycle concentrations. The STL is defined as the concentration determined by one ACAMS cycle.

Abbreviations:

ASC .....Allowable Stack Concentration
GPL .....General Population Limit
IDLH .....Immediately Dangerous to Live and Health
mg/m^3 .....milligrams per cubic meter
STEL .....Short-Term Exposure Level
WPL.....Worker Population Limit (time-weighted average)

MODULE II: GENERAL FACILITY CONDITIONS

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MODULE II: GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

1. The Permittee shall design, construct, maintain, and operate the permitted sites at the ANAD/ANCDF facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of chemical agent, hazardous waste, or hazardous waste constituents to air, soil, groundwater, or surface water which could threaten human health or the environment.

2. The Permittee shall construct all HWMUs IAW the approved designs and specifications that are included in the Application for new units, except for minor changes deemed necessary by the Permittee to facilitate proper construction of the HWMUs. Minor deviations from the approved designs or specifications necessary to accommodate proper construction shall be noted on the as-built drawings and the rationale for those deviations shall be provided in written narrative form to the Department. After completion of construction of each HWMU, the Permittee shall submit final as-built drawings and the narrative report to the Department as part of the construction certification documentation specified in Condition I.E.14.

3. The Permittee shall ensure that all waste shipped from the facility for offsite treatment has been appropriately characterized in accordance with Section III C of the permit application. Decontamination of items identified for offsite shipment is allowed.

II.B. RECEIPT OF OFF-SITE WASTE

The Permittee is not authorized and therefore, shall not receive hazardous waste from outside the State of Alabama at the ANCDF site. The Permittee shall only treat chemical agent and/or chemical agent munitions stored onsite at the time of issuance of this Permit. The Permittee may receive hazardous waste conventional munitions from off-site Department of Defense facilities at the ANAD site (from both within and outside the State of Alabama) for the purpose of reuse, recycle, recovery and/or disposal.

II.C. GENERAL WASTE ANALYSIS

1. The Permittee shall comply with all requirements set forth under AAC 335-14-5-.02(4) and shall follow the procedures described in the Waste Analysis Plan (see Application Sections II C-2 and III C-2).

2. The Permittee may not accept an unidentified waste for storage or treatment until it has been completely characterized and this Permit has been modified.

3. The Permittee shall utilize the methods of the Waste Analysis Plan (see Application Sections II C-2 and III C-2), for the analysis of any of the wastes listed in the Part A Application (see Section I of the Application).

Modification of the Waste Analysis Plan shall require a major permit modification except as provided in AAC 335-14-8-.04(2).

4. The Permittee has verified, through testing at the Chemical Agent Munitions Disposal System (CAMDS) in Utah, that metal scrap generated from the operation of the DFS or MPF (i.e., subjected to 1,000°F for at least 15 minutes in either unit) is thermally decontaminated. Scrap metal (bulk containers, projectiles, mortar rounds, etc.) that is thermally decontaminated will be further cleaned to remove any remaining loose residue that has been determined to be a hazardous waste (e.g. vacuumed to remove any remaining loose residue in the interior and on the exterior of the part(s)). When the interior is not vacuumed these munitions will remain in closed containers until being fed into the smelting process. That hazardous waste residue shall be disposed of IAW AAC 335-14-5, -7, & -9. Thermally decontaminated scrap metal from the MPF will be recycled by using it exclusively as feedstock for the steel-making process. ANCDF must maintain records to specifically document that thermally decontaminated scrap metal has been managed and recycled in this manner. Such records must be maintained on site and presented to the Department on request.

II.D. SECURITY PROCEDURES

The Permittee shall comply with the Security Procedures set forth under AAC 335-14-5-.02(5) and as described in Sections II F-1and III F-1 of the Application. The map of the ANCDF site depicting the location of fencing and gates for the ANCDF is located in Section III B, Figure III B-4 and the entire ANAD facility is located in Sections II B, Figures II B-2 and II B-4 of the Application.

II.E. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall comply with all requirements under AAC 335-14-5-.02(6), 335-14-5-.10(6), 335-14-5-.09(5), and 335-14-5-.15(8)(b) and the Inspection Schedules (see Sections II F-2 and III F-2 of the RCRA Permit Application).

2. The Permittee shall remedy any deterioration or malfunction (of equipment or structures) discovered during any inspection as required by AAC 335-14-5-.02(6)(c).

3. The Permittee shall record all inspection reports in the operating record for each permitted hazardous waste management site as required by AAC 335-14-5-.02(6)(d).

4. The Permittee shall maintain a copy of the Inspection Schedules (see Sections II F-2 and III F-2 of the RCRA Permit Application) for each permitted HWMU at the ANAD facility until the ANAD facility is certified closed.

II.F. TRAINING PLAN

1. The Permittee shall ensure that all personnel who handle hazardous waste or chemical agent are trained in hazardous waste management, safety procedures and emergency procedures, as applicable to their job description, IAW AAC 335-14-5-.02(7) and by following the outlines and procedures in Sections II H and III H of the Application.

2. The Permittee shall maintain a copy of the training documents and records as required by AAC 335-14-5-.02(7)(d) and (e).

II.G. PREPAREDNESS AND PREVENTION

1. The Permittee shall follow the preparedness and prevention procedures in Sections II F-3 and III F-3 of the Application.

2. The Permittee shall operate and perform preventative maintenance, inspections and repair of the equipment listed in Table 2-1, at a minimum, IAW the equipment manufacturer's specifications. The Permittee shall maintain records of these preventative maintenance and repair activities on this equipment with schedules (reflecting minimum and planned frequency for the performance of these preventative maintenance activities) in the operating record of each permitted HWMU IAW Condition I.E.11.

3. The Permittee shall maintain arrangements with state and local authorities as required by AAC 335-14-5-.03(8). If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

II.H. CONTINGENCY PLAN

1. The Permittee shall follow the procedures and schedules outlined in the Contingency Plan in Sections II G and III G of the Application. The Contingency Plan for all hazardous waste activities within the boundaries of the ANAD shall be maintained in Sections II G and III G of the Application.

2. In case of a fire*[1] or unplanned release of hazardous waste of hazardous constituents to the environment from the ANCDF site, the Permittee shall, in addition to implementing the Integrated Contingency Plan, Attachment II in the Application, perform a staged shutdown of all affected process operations at the ANCDF site, with the exception of container storage operations and storage and treatment operations in tanks, IAW the procedures specified in Sections III D-5 through D-7 of the Application.

3. The Permittee shall not restart affected process operations after shutdown under either Condition II.H.2. or shutdown as a result of a major

*[1] With the exception of munition processing fires in the ECR, unless the sprinkler system is activated.

explosion, as designated in Section III G of the Application, unless the following has occurred:

a. The Permittee has submitted a request to resume operations to the Department accompanied by the following information:

   i. Detailed description of the accident/incident;

   ii. The cause of the accident as determined by the results of investigation of the accident;

   iii. The corrective action(s) taken; and

   iv. A copy of the notification received by the Permittee from the Anniston Chemical Agent Disposal Facility Field Office (AFO) that affected process operations are authorized to resume.

b. The Permittee has ensured that all contingency equipment and resources required for plan implementation are in place.

c. The Department has provided the Permittee a written approval to resume affected process operations.

II.I. RECORDKEEPING AND REPORTING

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, the Permittee shall comply with the following:

1. The Permittee shall maintain a written or electronic operating record at the facility, IAW with AAC 335-14-5-.05(4) for all records identified in AAC 335-14-5-.05(4).

2. The Permittee shall, by March 31 of each year, submit to the Department a certification pursuant to AAC 335-14-5-.05(4), signed IAW AAC 335-14-8-.02(2), that the Permittee has a program in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable; and the proposed method of treatment, storage, or disposal is the most practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment.

3. The Permittee shall submit a biennial report covering the activities of each of the permitted HWMUs at the ANAD facility to the Department IAW AAC 335-14-5-.05(6) and 335-14-8-.03(1)(l)9.

4. The Permittee shall submit to the Department any additional reports specified in AAC 335-14-5-.05(8).

5. All reports, notifications, applications, or other materials required to be submitted to the Department shall be submitted at the address provided in Condition I.H.1.

6. All reports, notifications, applications, or other materials required to be submitted to the Regional Administrator shall be submitted at the EPA Regional address provided in Condition I.H.2.

7. From the beginning of chemical agent disposal until the closure of the ANCDF, the Permittee shall submit a monthly report within 2 weeks after the close of the calendar month. This report shall state the number of munitions and amount of chemical agents disposed of during the previous calendar month. This report shall also report the total number of munitions and amount of chemical agents disposed of since the beginning of agent operations. This report shall also report the number of munitions and amount of chemical agents remaining to be disposed.

II.J. CLOSURE

1. The Permittee shall amend the Closure Plan, included in Sections II I and III I of the Application, IAW AAC 335-14-5-.07(3)(c) and submit it to the Department for review and approval at least 180 calendar days prior to the date scheduled for commencing closure of the ANAD and/or ANCDF.

2. The Permittee shall amend the Closure Plan, included in Section II I of the Part B Application, IAW AAC 335-14-5-.07(3)(c) and submit it to the Department for review and approval at least 180 calendar days prior to the date scheduled for commencing closure of the ANAD chemical agent storage units.

3. The Permittee shall close the ANCDF and all ANAD chemical agent storage units according to the approved Closure Plan following completion of treatment of all onsite chemical agent and/or chemical agent munitions and associated waste.

4. The Permittee shall close the ANAD Industrial/Process Hazardous Waste Storage Buildings and the ANAD Hazardous Waste Conventional Munitions Components storage igloos according to the approved ANAD Closure Plan.

5. The Permittee shall not commence closure of any HWMU without first receiving approval of a Closure Plan for that unit from the Department.

6. Within 90 calendar days of the Permittee's receipt of the written approval from the Department for any HWMU's Closure Plan, modified closure plan and the post-closure plan, IAW AAC 335-14-5-.07(4)(a), the Permittee shall complete closure of the HWMU IAW the approved plans unless otherwise approved by ADEM.

7. The Permittee shall decontaminate or dispose of all ANCDF equipment as specified in the Waste Analysis Plan included as Application Section III C-2, or the Closure Plan included in Section III I of the Application.

8. The Permittee shall meet the general closure performance standard as specified in AAC 335-14-5-.07 during closure of all HWMUs at the

ANAD facility. Compliance with AAC 335-14-5-.07 shall require closure IAW Condition II.J. and the Closure Plan, included in Sections II I and III I of the Application for HWMUs.

9. The Permittee shall provide certification statements upon completion of closure for each HWMU when that HWMU at the ANAD facility has been closed IAW the applicable specifications in the Closure Plan as required by AAC 335-14-5-.07.

10. For all HWMUs, minor deviations from the permitted closure procedures necessary to accommodate proper closure shall be described in a narrative form with the closure certification statements. The Permittee shall describe the rationale for implementing minor changes as part of this narrative report. Within 60 calendar days after completion of closure of each HWMU, the Permittee shall submit the certification statements and narrative report to the Department.

11. In the event that any hazardous waste, hazardous waste constituents, contaminated subsoil, or any contaminated groundwater as specified in the Closure Plan for any HWMU cannot be clean closed by complete removal of chemical agent to below the limits specified in the ANCDF Waste Analysis Plan, the Permittee shall submit the modified closure and post-closure plans for that HWMU to the Department, as a permit modification request IAW AAC 335-14-8-.04(2) or (3), within 30 calendar days of the date that the Department notifies the Permittee in writing that the unit shall be closed in place as a landfill, IAW AAC 335-14-5-.07.

II.K. FINANCIAL ASSURANCE FOR FACILITY CLOSURE

The Permittee is exempt from the closure financial assurance requirements, IAW AAC 335-14-5-.08(1)(c).

II.L. COST ESTIMATE FOR FACILITY CLOSURE

1. The Permittee must adjust the closure cost estimate(s) annually for inflation and submit the closure cost estimate(s) to the Department no later than June 1st of each calendar year.

2. The Permittee must revise the closure cost estimate whenever there is a change in any permitted HWMU's Closure Plan as required by AAC 335-14-5-.08(3)(c).

3. The Permittee must keep in the operating record for each permitted HWMU at the ANAD facility and submit to the Department the latest closure cost estimate as required by AAC 335-14-5-.08(3)(d).

II.M. LIABILITY REQUIREMENTS

At least 180 calendar days prior to the proposed date of the shakedown period for the surrogate trial burn, Washington Government Environmental Services Company LLC shall demonstrate continuous compliance with the requirements of

AAC 335-14-5-.08(8)(a), including the requirements to have and maintain liability coverage for sudden and accidental occurrences from the ANCDF in the amount of at least $1 million per occurrence with an annual aggregate of at least $2 million, exclusive of legal defense costs.

II.N. RISK ASSESSMENT REQUIREMENTS

1. After each trial burn at the ANCDF, as provided for in Module VI, the Permittee shall submit to the Department a risk assessment addendum (RAA) following the revised protocol provided for in Condition I.K.2.,which shall compare the results of each trial burn or performance test to the data used in the preliminary risk assessment (PRA) with respect to emission estimates, stack parameters, and toxicity values.

2. The Permittee shall submit to the Department a post-trial burn risk assessment (RA) following the revised protocol provided for in Condition I.K.2. for the ANCDF under any of the following scenarios:

   a. The emission estimates from the trial burn have changed from the preliminary risk assessment to the degree that an unacceptable risk would result. The post-trial burn RA shall include those substances of potential concern (SOPCs) originally evaluated in the preliminary RA, all new compounds, and the mass of the unidentified emissions;

   b. The stack parameters from the trial burn have changed from the preliminary RA to the degree that an unacceptable risk would result; or,

   c. The toxicity values for the SOPCs originally evaluated in the preliminary RA have changed to the degree that an unacceptable risk would result.

II.O. CARBON FILTER OPERATION

This section applies only to the Munitions Demilitarization Building (MDB) and Laboratory (LAB) carbon filter system. Any reference to the term "LAB" refers to both the ANCDF and ANAD Laboratories (associated with chemical agent) unless specified otherwise.

1. The MDB and LAB filter systems shall be operational during chemical agent operations.

2. The MDB filter systems shall be monitored as follows:

   a. For the current agent campaign, semi-continuous chemical agent monitoring and data recording utilizing the ACAMS and the DAAMS shall be performed between carbon banks 1 and 2, 2 and 3, 3 and 4, 4 and 5, and in the filter stack . The ACAMS monitoring between carbon banks 1 and 2, 2 and 3, 3 and 4, and 4 and 5 shall be conducted by a single ACAMS connected to a

manifold that samples each location between carbon banks sequentially. If chemical agent is detected between carbon banks 1 and 2, a confirmation DAAMS sample is analyzed. If agent is confirmed, ACAMS and DAAMS sampling at this location will be suspended until the carbon in bank 1 is replaced, as described in Application Section III D-2.

b. The MDB filter stack shall have a dedicated ACAMS for the current agent campaign and additional ACAMS standardized for all previous agent campaigns.

c. At completion of the VX campaign, a VX ACAMS must be installed and connected to a manifold that samples between carbon banks 2 and 3 sequentially across each of the 7 of 9 filter bank systems in operation. Each filter bank system shall also have a dedicated VX DAAMS between banks 2 and 3 for confirmation of the VX rotating ACAMS should it be required. Each filter bank shall also have a dedicated GB DAAMS located between banks 2 and 3 of each filter that will be analyzed to monitor for chemical agent GB.

d. ACAMS and DAAMS monitoring as described in II.O.2.b and II.O.2.c. for a previous agent campaign shall continue until:

i. all secondary waste related to the previous agent has been processed, and

ii. carbon banks 1 and 2 of each of the 9 HVAC filter systems has been changed out with new carbon.

e. Continuous pressure drop monitoring and data recording shall be performed across each pre-filter and high efficiency particulate air (HEPA) filter element.

3. The LAB filter systems shall be monitored as follows:

a. Semi-continuous chemical agent monitoring and data recording utilizing the ACAMS and the DAAMS shall be performed between carbon banks 1 and 2, and in the filter stack. The LAB filter stack shall have a dedicated ACAMS.

b. Continuous pressure drop monitoring and data recording shall be performed across each pre-filter and HEPA filter element.

4. The MDB filter system shall be maintained IAW Table 2-2.

5. The LAB filter systems shall be maintained IAW Table 2-3.

6. If chemical agent is detected above the STL after the second carbon bank of an MDB or ANCDF LAB filter unit, the first and second carbon bank of that filter unit shall be changed out IAW Section III D-1h of the Application.

7. Pre- and HEPA filters in the MDB and LAB filter systems shall be changed when the pressure drop across the filter element exceeds 10 inwc.

8. The MDB and LAB filter systems shall be leak checked at the following minimum frequencies IAW Army SOPs:

   a. Initial set-up of filter unit leak check frequency:

      i. Carbon trays shall be leak checked prior to installation.

      ii. Carbon banks shall be leak checked once carbon trays are in place in the unit.

   b. Operation after initial set-up of filter unit leak check frequency:

      i. Carbon banks and filter elements shall be leak checked whenever an element of the bank is installed, modified or replaced.

      ii. Carbon banks and filter elements shall be leak checked IAW with Section III F Table III F-1 of the Permit Application.

      iii. Carbon banks and filter elements shall be leak checked (or equivalent procedure that proves filter has not been compromised) within 30 days following significant painting or a fire in the ventilation area.

9. MDB Closure Monitoring

   a. Monitoring within the MDB during the closure process shall be performed as described in Section III.I of the ANCDF Part B Application. This monitoring will include ventilated and unventilated monitoring.

   b. Once unventilated monitoring status is believed to be achieved by the facility, the facility must notify the Department in writing and receive written approval prior to releasing the MDB for demolition. The HVAC system must remain functional until ADEM approval to dismantle the MDB is obtained.

II.P. AIR EMISSION STANDARDS

1. General Introduction

Phase I Organic Air Emission Standards consist of AAC 335-14-5-.27 and .28 and/or 335-14-6-.27 and .28, for hazardous waste TSD facilities. AAC 335-14-5-.27 and 335-14-6-.27 contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste or chemical agent with an annual average total organic concentration of at least 10 parts per million (ppm) by weight. AAC 335-

14-5-.28 and 335-14-6-.28 contains emission standards that address leaks from specific equipment (i.e., pumps, valves, compressors, etc.) that contains or contacts hazardous waste or chemical agent that has a total organic concentration of at least ten percent by weight.

Phase II Organic Air Emission Standards consist of AAC 335-14-5-.29 for hazardous waste TSD facilities, including certain hazardous waste generators accumulating waste on-site in RCRA permit-exempt (90-day) tanks and containers. In general, under these standards air emission controls must be used for tanks, surface impoundments, containers, and miscellaneous units which contact hazardous waste containing an average organic concentration greater than 500 ppm by weight (ppmw) at the point of origination determined by the procedure outlined in AAC 335-14-5-.29(4), except as specifically exempted under AAC 335-14-5-.29(1) and (3).

2. <u>Standards</u>

a. Prior to constructing any additional equipment not covered under this Permit with process vents subject to the requirements of AAC 335-14-5-.27, the Permittee shall supply the specific Part B information required pursuant to AAC 335-14-8-.02(15), and shall obtain a permit modification IAW the provisions of AAC 335-14-8-.04.

b. Prior to constructing any additional equipment not covered under this Permit subject to the requirements of AAC 335-14-5-.28, the Permittee shall supply the specific Part B information required pursuant to AAC 335-14-8-.02(16), and shall obtain a permit modification IAW the provisions of AAC 335-14-8-.04.

c. The Permittee shall comply with the organic air emission standards for equipment leaks in AAC 335-14-5-.28 as applicable and as specifically set forth in Section III F-2 of the RCRA Permit Application.

3. <u>Organic Air Emissions</u>

a. The Permittee shall comply with the applicable requirements of 40 CFR 264, Subpart CC, as amended November 25, 1996, effective December 6, 1996.

b. The Permittee shall immediately comply with the applicable requirements under 40 Code of Federal Regulations (CFR) 265 Subpart CC for each tank, surface impoundment, container/container storage area, and/or miscellaneous unit listed in Table 2-4.

c. The following information shall be submitted to the Department as part of the construction certification documentation specified in Condition I.E.14.:

i. For every unit listed on Table 2-4, provide "Subpart CC Status/Control Option" information regarding the applicability and chosen control option. Regulatory citations shall be noted for each exemption and/or control option. Also specify the "Operational Status" for units where Subpart CC controls are or will be implemented.

ii. For each unit listed on Table 2-4, that is exempt from Subpart CC under 40 CFR 264.1080(b)(5) through § 264.1080(b)(8), or under 40 CFR 264.1082(c), provide documentation, certifications, analytical data, and/or calculations which support each exemption.

iii. For each unit listed on Table 2-4, for which a control option has been specified, provide applicable Part B information and/or certifications required under 40 CFR 270.27.

d. The permit will be modified IAW AAC 335-14-8-.04(3) to incorporate information provided pursuant to Condition II.P.3.c.i., and the Permittee shall subsequently be evaluated for compliance based on the regulatory provisions cited under "Subpart CC Status/Option."

II.Q WASTE MINIMIZATION

1. Certification Requirements

Pursuant to AAC 335-14-5-.05(4), and Section 3005(h) of RCRA, 42 U.S.C. 6925(h), the Permittee must certify, no less often than annually, that:

a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and

b. The proposed method of TSD is the most practicable method available to the Permittee which minimizes the present and future threat to human health and the environment.

2. Recording Requirements

If Condition II.Q.1. is applicable, then the Permittee shall maintain copies of this certification in the facility operating record as required by AAC 335-14-5-.05(4).

3. **Solid Waste Minimization Objectives**

If Condition II.Q.1. is applicable, then the Waste Minimization program required under II.Q.1. should address the objectives listed in Attachment 8.

II.R. LAND DISPOSAL RESTRICTIONS

1. **General Restrictions**

AAC 335-14-9 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances which an otherwise prohibited waste may continue to be placed on or in a land TSD unit. The Permittee shall maintain compliance with the requirements of AAC 335-14-9. Where the Permittee has applied for an extension, waiver, or variance under AAC 335-14-9 the Permittee shall comply with all restrictions on land disposal under this part once the effective date for the waste has been reached pending final approval of such application.

2. **Land Disposal Prohibitions and Treatment Standards**

a. A restricted waste identified in AAC 335-14-9-.03 may not be placed in a land disposal unit without further treatment unless the requirements of AAC 335-14-9-.03 and/or .04 are met.

b. The storage of hazardous wastes restricted from land disposal under AAC 335-14-9 is prohibited unless the requirements of AAC 335-14-9-.05 are met.

II.S. PAS FILTRATION SYSTEM CARBON FILTERS

This section applies only to the PAS Filtration System (PFS) carbon filters for the LIC, DFS, and MPF.

1. The PFS carbon filters and the associated reheaters for the LIC, DFS, and MPF shall be operational at all times during agent processing for each furnace that is in operation.

2. The PFS carbon filters shall be monitored as follows:

a. Temperature of the exhaust stream entering the PFS carbon filters shall be continuously monitored;

b. Pressure drop across the inlet and outlet HEPA filter within each PFS carbon filter shall be continuously monitored; and

c. The mid-bed DAAMS tube will be analyzed for the presence of agent on a weekly basis.

3. At each carbon change out and at project completion, carbon contained within the units will be removed and disposed of IAW the Waste Analysis Plan (see Application Section III C-2).

4. The Permittee shall monitor the pressure drop across the PFS filter beds and shall use DAAMS tubes to monitor the mid-bed of the carbon as additional indicators to determine carbon change out. The criteria for change out shall be as follows:

   a. If an upset condition in the furnace occurs, the DAAMS tube on the mid-bed of the PFS carbon filter will be analyzed. If any analysis of any mid-bed DAAMS tube indicates agent breakthrough of the first bed of a PFS carbon filter, then that carbon filter must be taken out of service. The filter cannot be placed back into service until the first bed of carbon has been replaced and leak checked.

   b. If a 0.2 ASC is confirmed by monitoring of the duct downstream of the PFS carbon filter(s) (two carbon filters associated with the DFS) then that carbon filter(s) must be taken out of service. The filter(s) cannot be placed back into service until all of the carbon has been replaced and leak checked.

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Table 2-1: ANCDF Site Process Areas and Equipment

UNPACK AREA

- Conveyor Systems
- Airlock

ROCKET PROCESS SYSTEM

- Computerized Process Control System Interlocks
- Monorail With Lifting Device System
- Indexing Drum
- Rotary Metering Input Assembly
- Blast Gate Valves
- Blast Gates/Doors
- Airhole puncher
- Drain puncher
- Rocket Shear Machine/Burster Size Reduction Machine
- Conveyor System

MINE PROCESS SYSTEM

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Glove Box
- Blast Gates/Doors
- Blast Gate Valves
- Mine Machine
- Drain Station
- Pushout Station

PROJECTILE AND MORTAR PROCESSING SYSTEMS

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Blast Gates/Doors
- Blast Gate Valves
- Projectile/Mortar Disassembly Machines
- Linear Projectile / Mortar Disassembly Machines
- Multiposition Loader
- Lift Station
- Pick & Place Device

TON CONTAINER PROCESSING SYSTEM

- Computerized Process Control System Interlocks
- Monorail with Lifting Device System
- Conveyor Systems
- Bulk Drain Station
- Lift Station

Table 2-2: Carbon Change-Out Schedule for the MDB Filter System

Chemical Agent	Detection Level	Monitor Location	Banks to be Replaced	Time Frame for Banks Replacement
VX, GB, Mustard	> STL	Between Banks 2 and 3	Replace Banks 1 and 2 of the affected unit, or;	Suspension of chemical agent processing being addressed by the filter unit and immediate replacement
			Replace Banks 1, 2, and 3 of the affected unit	Within 3 months of detection
	> STL	Between Banks 3 and 4	Replace Banks 1, 2, and 3 of the affected unit	Suspension of chemical agent processing being addressed by the filter unit and immediate replacement
	> STL	Between Banks 4 and 5	Replace all banks of the affected unit	
	0.2 ASC	Filter stack		

Abbreviations:
>.....greater than
MDB.....Munitions Demilitarization Building
ASC.....Allowable Stack Concentration
STL.....Short-Term Level

Table 2-3: Carbon Change-Out Schedule for the LAB Filter System

Chemical Agent	Detection Level	Monitor Location	Banks to be Replaced	Time Frame for Banks Replacement
VX, GB, Mustard	> STL	Between Banks 1 and 2	Replace bank 1 of the affected unit	Immediate replacement
	0.2 ASC	Filter stack	Replace all banks of the affected unit	

Abbreviations:
>.....greater than
LAB.....Laboratory
ASC.....Allowable Stack Concentration
STL.....Short-Term Level

Table 2-4: Subpart CC Regulated Units

Unit Identification	Unit Type	Subpart CC Status/Control Option	Operational Status
ACS-TANK-101	Tank	Level 1 Controls/40 CFR 264.1084(c)	Operational
ACS-TANK-102			
SDS-TANK-101	Tank	Level 1 Controls/40 CFR 264.1084(c)	Operational
SDS-TANK-102			
SDS-TANK-103			
BRA-TANK-101	Tank	Exempt	Not Applicable
BRA-TANK-102			
Industrial Hazardous Waste Storage Bldg (Building 466)	Container Storage	Level 1 Controls/40 CFR 264.1086(c)	Operational
Hazardous Waste Storage Bldg (Building 512)			
Hazardous Waste Storage Bldg (Building 527)			
TWS-TANK-900	Tank	Exempt	Not Applicable
TWS-TANK-901			
TWS-TANK-902			
TWS-TANK-903			
BRA-FILT-902	Tank	Exempt	Not Applicable
BRA-FILT-903			
BRA-FILT-904			
BRA-FILT-905			
BRA-FILT-906			
BRA-FILT-907			
BRA-WTPK-900	Tank	Exempt	Not Applicable
BRA-WTPK-901			
BRA-WTPK-902			

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MODULE III: ANCDF CONTAINER STORAGE

The ANCDF site is permitted for six container storage areas:

1) Container Handling Building (CHB) divided into two parts designated as the East and West Storage Areas (Figure 3-1),
2) Toxic Maintenance Area (TMA) (Figure 3-2),
3) Waste Transfer Facility (WTF) (Figure 3-3),
4) Upper Munition Corridor (UMC) (Figure 3-4),
5) Lower Munition Corridors (LMC) (Figure 3-4), and
6) Buffer Storage Area (BSA) (Figure 3-5).

The CHB shall be limited to the storage of munitions and various munition components containing chemical agents, explosives, and propellants; bulk containers containing chemical agents; and secondary waste from chemical agent activity. The material stored in the CHB, TMA, WTF, LMC, UMC, and BSA shall only have hazardous waste numbers D001 through D043, F001 through F005, P042, P081, U002 through U003, U044, U070, U080, U117, U154, U159, U161 and U220. Primary waste is defined as munitions, ton containers, nerve agents GB and VX and mustard agents HD and HT; and, secondary waste is defined as all waste that is not primary waste. Secondary waste will be managed IAW the Waste Analysis Plan (see Application Section III C-2). The TMA is permitted to store all primary and secondary wastes. The WTF shall be limited to the storage of waste that is below the Short Term Limit (STL) or WCL. The UMC/LMC and BSA are permitted to store all primary and secondary wastes.

The ANCDF will also have less than 90 calendar day storage areas. If the 90-day storage period is exceeded and a variance cannot be attained from the Department, then a permit modification shall be submitted to the Department. All containers in these areas shall be managed IAW the generator requirements of ADEM Administrative Code 335-14-3 as less than 90 calendar day storage areas.

The permitted container storage area has conveyor tracks that route the EONCs to the MDB for demilitarization processing.

III.A. CONTAINER HANDLING BUILDING

1. CHB Operation

The Permittee shall operate the CHB as specified in Sections III D-3a(1) of the Application.

2. Permitted and Prohibited Waste in the CHB Storage Area

a. The Permittee shall only store primary and secondary waste containing the hazardous wastes listed in Table 3-1 in the permitted storage areas of the CHB IAW the terms of this Permit. Primary waste shall be stored in the CHB permitted storage areas only when contained within an EONC.

b. The permitted container storage area shall consist of the areas within the CHB as designated in Figure 3-1. The Permittee shall not store EONCs

within the unloading areas, the conveyor corridor, or the lift areas of the CHB.

c. The Permittee shall not store more than 24 EONCs in the East or West Storage Areas or more than a total of 48 EONCs in the permitted storage area of the CHB at any one time.

d. The Permittee shall not exceed the maximum allowable number of munitions per individual EONC as specified below and shall not exceed the maximum allowable number of munitions in the permitted storage area of the CHB as specified below:

Munition	Maximum Allowable Munitions/EONC	Maximum Allowable Munitions/CHB
155-mm Projectile	72	3,456
4.2-inch Projectile	144	6,912
105-mm Projectile	96	4,608
M55 Rocket	30	1,440
Mine (w/activators and fuzes)	36	1,728
Ton Container	2	96

e. The permitted secondary waste storage area shall consist of the areas within the CHB as designated in Figure 3-1. The Permittee shall only store waste in the unloading areas and in the areas allowed for EONC storage.

f. Any container of secondary waste containing free liquids shall be provided with a secondary containment device in the CHB. The Permittee shall inspect secondary containment in the CHB for containers of secondary wastes that have free liquids weekly.

3. <u>EONC Design and Maintenance</u>

a. If an EONC holding primary waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the Permittee shall transfer the EONC to the TMA for unloading of its contents. If agent is detected inside the EONC, the Permittee shall decontaminate the EONC to less than WPL prior to removal from the TMA.

b. If an EONC has been found to not be in good condition as specified in Condition III.C.2, the EONC shall not be used to transport chemical agent containing munitions or ton containers until the defective EONC has been decontaminated if required, repaired and re-certified IAW the manufacturer's specifications.

4. **Compatibility of Waste with EONCs**

The Permittee shall assure that the ability of the EONCs to contain the primary waste is not impaired, IAW AAC 335-14-5-.09(3).

5. **Management of EONCs**

a. The Permittee shall deliver EONCs to the CHB only during daylight hours. EONCS will be leak checked prior to opening or weekly in accordance with RCRA Permit Application Section III F-2. The Permittee shall keep all EONCs closed during storage and transport. The Permittee shall not handle or store EONCs in a manner which may rupture the EONC or cause it to leak. EONCs containing leaking munitions will be handled in accordance with Section III D-2b of the Application.

b. EONCs containing leaking munitions shall not be returned to the igloos for storage or accumulation without ADEM approval.

c. The Permittee shall not place any munition in an EONC that previously held leaking munitions unless the EONC has been decontaminated to less than the WPL.

d. The Permittee shall ensure that each EONC is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Individual munitions will not be labeled.

6. **Secondary Containment System**

a. The EONC provides secondary containment for munitions and meets the requirements of AAC 335-14-5-.09(6) for the munitions contained within the CHB. Secondary waste containing free liquids will be placed upon self contained secondary containment devices IAW AAC-335-14-5-.09(6).

b. EONCs shall be tested for vapor tightness every time agent filled chemical munitions or bulk containers are placed into them.

c. Records of vapor tightness testing shall be kept on site as part of the ANCDF operating record and shall be subject to inspection.

d. If the ability of an EONC to contain vapors is impaired (i.e., fails a leak test), the EONC will be moved to the TMA. EONCs which failed the leak test may be repaired and retested. If the EONC cannot be repaired, the munitions will be unloaded in the TMA.

e. The CHB provides the third level of containment for agent. In the event of a spill from the EONCs, the Permittee shall send those liquids that are to be suspected to be contaminated by chemical agent to a Spent Decontamination Storage Tank. Non-agent contaminated liquids will be managed in accordance with applicable regulations.

7. **Inspection Schedules and Procedures**

The Permittee shall inspect the CHB weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspection data shall be recorded and the records shall be placed in the operating record IAW Condition II.I.

8. **Recordkeeping**

The Permittee shall document the results of any waste analyses and tests in the operating record IAW Condition II.I.

9. **Closure**

At closure of the CHB area, the Permittee shall remove all chemical agent and hazardous waste from the CHB IAW the approved Closure Plan.

10. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.B. TOXIC MAINTENANCE AREA

1. **TMA Operation**

The Permittee shall operate the TMA as specified in Section III D-3a(1) of the ANCDF Application.

2. **Permitted and Prohibited Waste in the TMA Storage Area**

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the TMA IAW the terms of this Permit.

b. The permitted container storage area shall consist of the entire area of the TMA shown in Figure 3-2. The TMA may contain both primary and secondary wastes.

c. The TMA shall provide storage of secondary waste that is contaminated to varying degrees of chemical agent. It will also provide storage for primary and secondary waste that is in process and awaiting thermal decontamination.

d. "In process" refers to any waste - Primary or Secondary – loaded for charging entering through the UPA/TMA configured with the intent of processing through the furnace.

3. **Compatibility of Waste with Containers**

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3). In the event of a

spill that does not involve chemical agent, those liquids will be containerized for off-site disposal IAW Section C-2, Waste Analysis Plan.

4. **Management of Containers**

   a. The Permittee shall keep all containers containing waste closed during storage and transport.

   b. The Permittee shall ensure that containers other than munitions and ton containers are clearly marked to identify its content and the date each period of accumulation began as specified in AAC 335-14-9-.05(1).

5. **Secondary Containment System**

   The primary sump system in the TMA will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the TMA A, A/B, and C areas. A secondary containment device will be used for containers of secondary waste containing free liquids to meet the secondary containment requirements of AAC 335-14-5-.09(6) in the TMA D area.

6. **Inspection Schedules and Procedures**

   The Permittee shall inspect the TMA storage areas and containers weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

   The Permittee shall document the results of all waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

   At closure of the TMA, the Permittee shall remove all hazardous waste from the TMA IAW the approved Closure Plan.

9. **Reactive Waste**

   The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.C. WASTE TRANSFER FACILITY

1. **WTF Operation**

   The Permittee shall operate the WTF as specified in Section III D-3a(1) of the ANCDF Application.

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2. **Permitted and Prohibited Waste in the WTF Storage Area**

   a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the WTF IAW the terms of this Permit.

   b. The permitted container storage area shall consist of the entire WTF as designated in Figure 3-3. The WTF may contain wastes that are less than the Short Term Limit (STL) or not greater than the Waste Control Limit (WCL) levels for chemical agent.

3. **Compatibility of Waste with Containers**

   The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3). In the event of a spill that does not involve chemical agent, those liquids will be containerized for off-site disposal IAW Section C-2, Waste Analysis Plan.

4. **Management of Containers**

   a. The Permittee shall keep all containers containing waste closed during storage and transport.

   b. The Permittee shall ensure that each container is clearly marked to identify its content and the date each period of accumulation began as specified in AAC 335-14-9-.05(1).

5. **Secondary Containment System**

   The WTF secondary containment system must satisfy the secondary containment requirements of AAC 335-14-5-.09(6) for the WTF.

6. **Inspection Schedules and Procedures**

   The Permittee shall inspect the WTF weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

   The Permittee shall document the results of all waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

   At closure of the WTF area, the Permittee shall remove all hazardous waste from the WTF IAW the approved Closure Plan.

9. **Reactive Waste**

   The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.D. UPPER AND LOWER MUNITION CORRIDORS STORAGE AREAS

1. UMC/LMC Operation

The Permittee shall operate the UMC and LMC as specified in Section III D-3a(1) of the ANCDF Application.

2. Permitted and Prohibited Wastes in the UMC and LMC

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage of the UMC and LMC IAW the terms of this Permit.

b. The permitted container storage areas shall consist of the entire UMC and LMC as designated in Figure 3-4. The UMC and LMC shall provide storage of secondary waste that is contaminated to varying degrees of chemical agent. It will also provide storage for primary and secondary waste that is in process and awaiting thermal decontamination.

c. "In process" refers to any waste - Primary or Secondary – loaded for charging entering through the UPA/TMA configured with the intent of processing through the furnace.

3. Compatibility of Waste with Containers

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5-.09(3).

4. Management of Containers

a. Munitions and ton containers in the UMC and LMC areas will be tracked using the HMMS (Hazardous Materials Management System). Secondary waste will be tracked using a logbook.

b. The Permittee shall ensure that each container is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Waste that is "in process" shall not require labeling of containers nor shall the containers be required to be closed.

5. Secondary Containment System

The primary sump systems in the LMC and UMC will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the LMC and UMC areas.

6. Inspection Schedules and Procedures

The Permittee shall inspect the containers located in the UMC and LMC weekly either by physical inspection or remotely by CCTV to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed

in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

The Permittee shall document the results of any waste analyses and tests in the operating record IAW Condition II.I.

8. **Closure**

At the closure of the UMC and the LMC, the Permittee shall remove all hazardous waste from the UMC and the LMC IAW the approved closure plan.

9. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

III.E. BUFFER STORAGE AREA

1. **BSA Operation**

The Permittee shall operate the BSA as specified in Section III D-3a(1) of the ANCDF Application.

2. **Permitted and Prohibited Wastes in the BSA**

a. The Permittee shall only store the hazardous wastes listed in Table 3-2 in the permitted storage area of the BSA IAW the terms of this Permit.

b. The permitted container storage area shall consist of the entire BSA as designated in Figure 3-5. The BSA shall provide storage of secondary waste of varying levels of agent contamination. It will also provide a buffer for primary waste that is in process and awaiting thermal decontamination.

3. **Compatibility of Waste with Containers**

The Permittee shall assure that the ability of the containers to contain the hazardous wastes is not impaired, IAW AAC 335-14-5.09(3).

4. **Management of Containers**

a. Waste in the BSA areas will be tracked using the HMMS. In addition, secondary waste will be tracked using a logbook.

b. The Permittee shall ensure that each container is clearly marked to identify its contents and the date each period of accumulation began as specified in AAC 335-14-9-.05(1). Primary waste that is designated as "in process" shall not require labeling of containers. Also, primary waste that is designated as "in process" shall not be required to be in closed containers provided that they are under engineering controls in the designated permitted storage areas within the MDB.

5. **Secondary Containment System**

The primary sump system in the BSA will meet the requirements of AAC 335-14-5-.10. These sumps will be additionally utilized for secondary containment of secondary waste in the BSA area.

6. **Inspection Schedules and Procedures**

The Permittee shall inspect the BSA weekly to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (see Section III F-2 of the RCRA Permit Application). All inspections performed in accordance with the Inspection Plan shall be documented and the records shall be placed in the operating record IAW Condition II.I.

7. **Recordkeeping**

The Permittee shall document the results of all waste analyses and tests IAW Condition II.I.

8. **Closure**

At the closure of the BSA, the Permittee shall remove all hazardous waste from the BSA IAW the approved closure plan.

9. **Reactive Waste**

The Permittee shall take precautions to prevent accidental reaction of wastes as stated in Section III F-5 of the ANCDF Application.

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Table 3-1: Hazardous Wastes to be Stored in the Permitted Area of the CHB

Description of Hazardous Waste	ADEM Hazardous Waste I.D. Numbers
Agent GB	D003, D004-D011
Agent VX	D003,D004-D011
Mustard Agent - HD	D003, D004-D011, D022, D028, D043
Explosives	D003
Propellants	D003, D030[2] (M6, M67)
Fuzes	D003
Detonators	D003, D005, D008
Squibs	D003, D008
Igniters	D003
Initiators	D003
Bursters	D003
Rocket Components	D003
Munition Body Components	D003
Mine Drums	D003
Secondary Waste	D001-D011, TC Organics (D012-D043)[1,3]

Footnotes:
(1) Toxicity Characteristic organic waste codes D022, D028, and D043 apply to mustard agent only.
(2) Toxicity Characteristic organic waste code D030 applies to the M6 and M67 propellant, which contains 2,4-dinitrotoluene.
(3) ANCA secondary wastes, specifically laboratory and miscellaneous wastes may carry codes D001 to D043.

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D001	Waste Mixed Fuels (Diesel, Gasoline, Kerosene)/ Miscellaneous Lab Waste (Liquid)/ Miscellaneous Waste Ignitable Materials/Reactive Waste Materials/Waste Paint and Paint Related Materials/Waste Flammable Gases Managed in Cylinders (punched) (maximum of 25 units per furnace charge)/Waste Flammable Materials Lab Packs/Waste Adhesives and Sealants/Aerosols.
D002	Miscellaneous Waste Corrosive Waste/Waste Lead Acid Batteries/Waste Acids/ Miscellaneous Lab Waste (Liquid)/Waste Corrosive Materials Lab Packs/ Waste Adhesives and Sealants/Waste Citric Acid.
D003	Waste Activated Carbon/Miscellaneous Waste Air and/or Water Reactive Chemicals & Related Waste/ Miscellaneous and Related Waste/Miscellaneous ignitable Wastes/ Miscellaneous Lab Waste (Liquid)/ Waste Flammable Gases Managed in Cylinders/Waste (i.e. waste that is above STL, Waste that is between the WPL and STL and Waste that is below the WPL) Materials (Halogen & non-Halogen Plastic, Conveyors, Chains, Rollers, Links, Gears, Bearings, Bushings, Wheels, Idlers, Gear Boxes, Gasket Materials, Seals, Collets, Drain Probes, Shear Blades, Punches, Paper, Cloth, Pads, Wood, Pallets, Gearboxes, Turntable Projectile Bushings, Projectile Pickup Heads, Carbon Absorber Trays, Pusher Assemblies, Jaw Gripper Assemblies, Pillows, Spill Adsorbents / Absorbents / Cleanup Residues, Sump Solids, Projectile Cans, Hoists, Crimp Jaws & Pins, Bore Station Blades, Motors, Conduit Solenoids, Light Fixtures, Switches, Pumps, Accumulator Bladders, Valves (Hand, Solenoid, Agent Decon, Hydraulic), Piping, Fittings, Tubing, Fittings, Spray Nozzles, Filters Cartridges/Elements & Associated Residue / Cleanup Material (Including AQS/ACS/SDS Filter Elements), Pipe Gaskets, Hydraulic Tubing, Hydraulic Motors, Hydraulic Cylinders, Chemical Seals, Pressure Regulators, Flow Control Valves, Pneumatic Actuators, Hydraulic Hose Fittings, Sensors, Load Cells, Speakers, Transmitters, Transducers, Pressure Gauges, Thermocouples, Thermowells, Test Equipment, (Meters, Gauges, etc.),Switches (Flow, Pressure, & Proximity), Cameras or Camera Parts, Low Volume Agent Samplers, Hand Tools, Grating, Glassware, Plaster, Metal Buckets, Pans & Barrels, Scrub Brushes, Banding Material, Empty Overpacks, Drums, Silicone Parts, Monitoring Sample Probes (DAAMS, etc.), PPE, LAB Debris, MDB Maintenance Equipment/DFS Cyclone Residue/ Waste Ruby Mortar, Fire Brick, Fire Brick Insulation, HARCO Bond Mortar/M55 Rocket Residue/ LIC Slag/ Kicker Chute Residues/Empty Rocket Overpacks/Empty projectile Overpacks/Agent VX/Agent GB, Mark I Antidote Kits (1 atropine and 1 pralidoxime injector), DPE leather overgarments, plastic bags used to contain contaminated wastes; metal brackets, stands, fixtures, etc,; escape air tank, mask and regulators .

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D004-D011	Waste Carbon /Waste Adhesives & Sealants / Spent Hydraulic Fluid/Miscellaneous Toxic or Other-Regulated Waste (Heavy Metals, Organics; Solid & Liquid)/ Waste Citric Acid/Waste Acid/Waste Hydrochloric Acid residue from various operations /Waste Materials that are between the WPL and STL (Halogen and non-Halogen Plastic, Conveyors, Chains, Rollers, Links, Gears, Bearings, Bushings, Wheels, Idlers, Gear Boxes, Gasket Materials, Seals, Collets, Drain Probes, Shear Blades, Punches, Paper, Cloth, Pads, Wood, Pallets, Gearboxes, Turntable Projectile Bushings, Projectile Pickup Heads, Carbon Absorber Trays, Pusher Assemblies, Jaw Gripper Assemblies, Pillows, Spill Adsorbents / Absorbents / Cleanup Residues, Sump Solids, Projectile Cans, Hoists, Crimp Jaws and Pins, Bore Station Blades, Motors, Conduit Solenoids, Light Fixtures, Switches, Pumps, Accumulator Bladders, Valves (Hand, Solenoid, Agent Decon, Hydraulic), Piping, Fittings, Tubing, Fittings, Spray Nozzles, Filters Cartridges/Elements & Associated Residue / Cleanup Material(Including AQS/ACS/SDS Filter Elements),Pipe Gaskets, Hydraulic Tubing, Hydraulic Motors, Hydraulic Cylinders, Chemical Seals, Pressure Regulators, Flow Control Valves, Pneumatic Actuators, Hydraulic Hose Fittings, Sensors, Load Cells, Speakers, Transmitters, Transducers, Pressure Gauges, Thermocouples, Thermowells, Test Equipment,(Meters, Gauges, etc.),Switches (Flow, Pressure, & Proximity), Cameras or Camera Parts, Low Volume Agent Samplers, Hand Tools, Grating, Glassware, Plaster, Metal Buckets Pans and Barrels, Scrub Brushes, Banding Material, Empty Overpacks, Drums, Silicone Parts, Monitoring, Sample Probes (DAAMS, etc.), PPE, LAB Debris, MDB Maintenance Equipment), MDB Sump Sludge/Demister Fiber & Frames/LIC Slag/Furnace Clean Out Debris/Spent Carbon/HEPA and Prefilters/Aluminum, Bulk Metal, Concrete, Foam/Insulation, Rags/Cotton, Toxic Area Protective Gear, M-40 masks, M-40 cartridges, fiberglass/Filter Media, Leather Gloves, LSS Air Hose, DPE Suits, Teflon Wire, ACS Sludge, SDS Sludge, Paint Chips/Agent GB/Agent VX/ Miscellaneous Lab Waste (Liquid & Solid)/ DFS Cyclone Residue/ Waste Ruby Mortar, Fire Brick, Fire Brick Insulation, HARCO Bond Mortar/ LIC Slag/M55 Rocket Residue (including Kicker Chute Residue)/ Spent Hydraulic Fluid, Oils and/or Ethylene Glycol/ Miscellaneous Waste Materials Containing Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and/or Silver/ Metal Parts Furnace Residue/Waste Paint and Paint Related Materials/Waste Batteries/Lead Acid Batteries/ Spent Fluorescent Light Bulbs, Mark I Antidote Kits (1 atropine and 1 pralidoxime injector), DPE leather overgarments, plastic bags used to contain contaminated wastes; metal brackets, stands, fixtures, etc,; escape air tank, mask and regulators .
D012	Miscellaneous Waste Materials Containing Endrin
D013	Miscellaneous Waste Materials Containing Lindane
D014	Miscellaneous Waste Materials Containing Methoxychlor
D015	Miscellaneous Waste Materials Containing Toxaphene
D016	Miscellaneous Waste Materials Containing 2,4-D

D017	Miscellaneous Waste Materials Containing 2,4,5-TP (Silvex)

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D018	Waste Gasoline/Waste Diesel/Waste Kerosene / Miscellaneous Waste Materials Containing Benzene
D019	Miscellaneous Waste Materials Containing Carbon Tetrachloride
D020	Miscellaneous Waste Materials Containing Chlordane
D021	Miscellaneous Waste Materials Containing Chlorobenzene
D022	Miscellaneous Waste Materials Containing Chloroform/ Mustard Agent - HD
D023	Miscellaneous Waste Materials Containing o-Cresol
D024	Miscellaneous Waste Materials Containing m-Cresol
D025	Miscellaneous Waste Materials Containing p-Cresol
D026	Miscellaneous Waste Materials Containing Cresol
D027	Miscellaneous Waste Materials Containing 1,4-dichlorobenzene
D028	Miscellaneous Waste Materials Containing 1,2-Dichloroethane/ Mustard Agent - HD
D029	Miscellaneous Waste Materials Containing 1,1-Dichloroethylene
D030	Miscellaneous Waste Materials Containing 2,4-Dinitrotoluene
D031	Miscellaneous Waste Materials Containing Hepachlor (and its Epodide)
D032	Miscellaneous Waste Materials Containing Hexachlorobenzene
D033	Miscellaneous Waste Materials Containing Hexachlorobutadiene
D034	Miscellaneous Waste Materials Containing Hexachloroethane
D035	Miscellaneous Waste Materials Containing Methyl Ethyl Ketone
D036	Miscellaneous Waste Materials Containing Nitrobenzene
D037	Miscellaneous Waste Materials Containing Pentrachlorophenol

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
D038	Miscellaneous Waste Materials Containing Pyridine
D039	Miscellaneous Waste Materials Containing Tetrachloroethylene
D040	Miscellaneous Waste Materials Containing Trichloroethylene
D041	Miscellaneous Waste Materials Containing 2,4,5-Trichlorophenol
D042	Miscellaneous Waste Materials Containing 2,4,6- Trichlorophenol
D043	Miscellaneous Waste Materials Containing Vinyl Chroride/ Mustard Agent - HD
F001	Spent Solvents
F002	Spent Solvents
F003	Spent Solvents/ Adhesives and Sealants
F004	Spent Solvents
F005	Spent Solvents/ Adhesives and Sealants
P042	Medical Pharmaceuticals Waste (Epinephrine)
P081	Medical Pharmaceuticals Waste (Nitroglycerin)
U002	Waste Acetone
U003	Miscellaneous Lab Waste (Solids and Liquids)
U044	Miscellaneous Lab Waste (Solids and Liquids)
U070	Miscellaneous Lab Waste (Solids and Liquids)
U080	Miscellaneous Lab Waste (Solids and Liquids)
U117	Miscellaneous Lab Waste (Solids and Liquids)
U154	Miscellaneous Lab Waste (Solids and Liquids)

Table 3-2: Hazardous Primary and Secondary Wastes to be Stored in the Permitted Area of the CHB, TMA, WTF, UMC, LMC, and BSA (Continued)

ADEM Hazardous Waste I.D. Numbers	Description of Hazardous Waste
U159	Miscellaneous Lab Waste (Solids and Liquids)
U161	Miscellaneous Lab Waste (Solids and Liquids)
U220	Miscellaneous Lab Waste (Solids and Liquids)

Figure 3-1: Permitted Storage Areas in the CHB

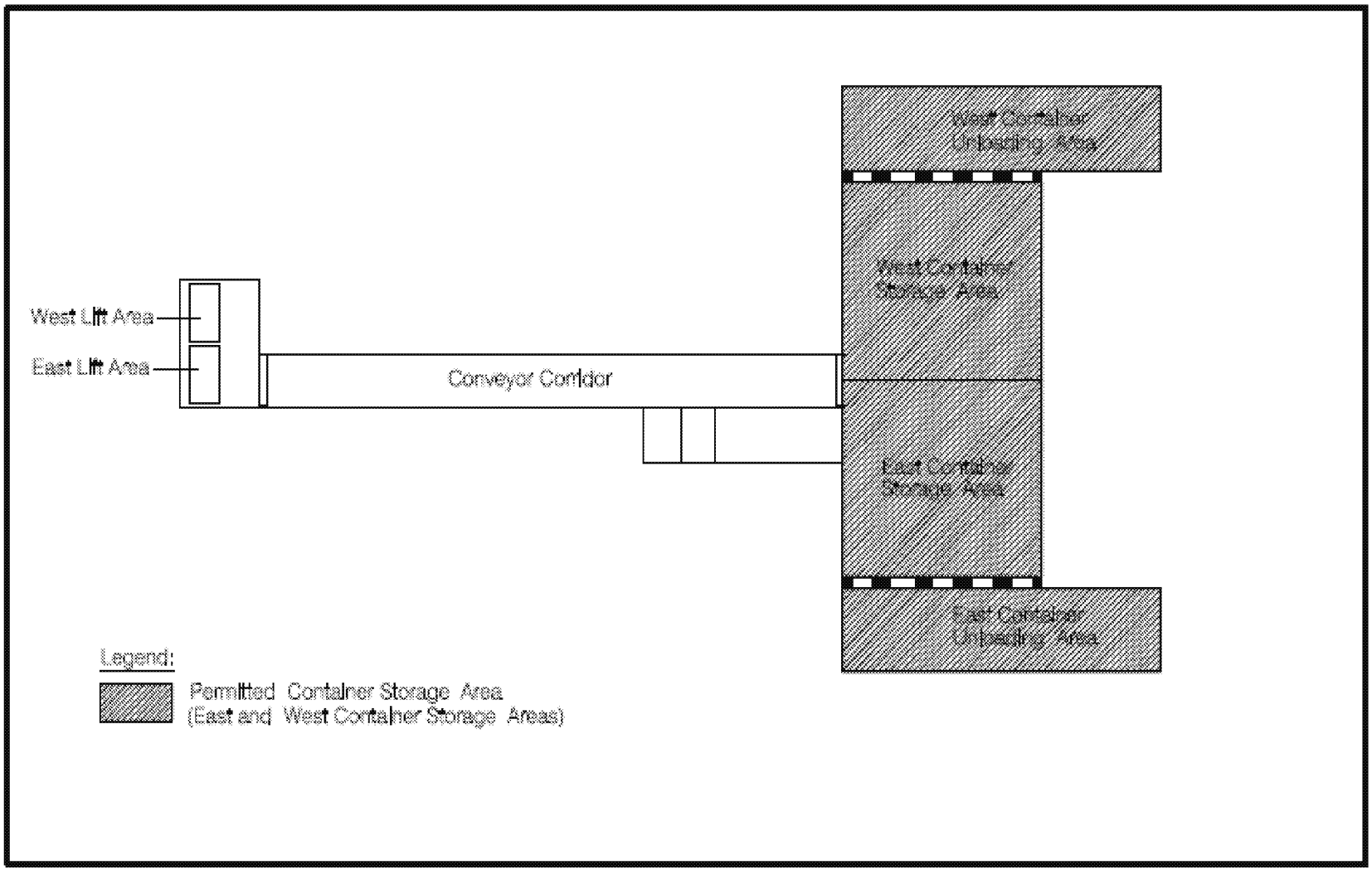


Figure 3-2: Permitted Storage in TMA

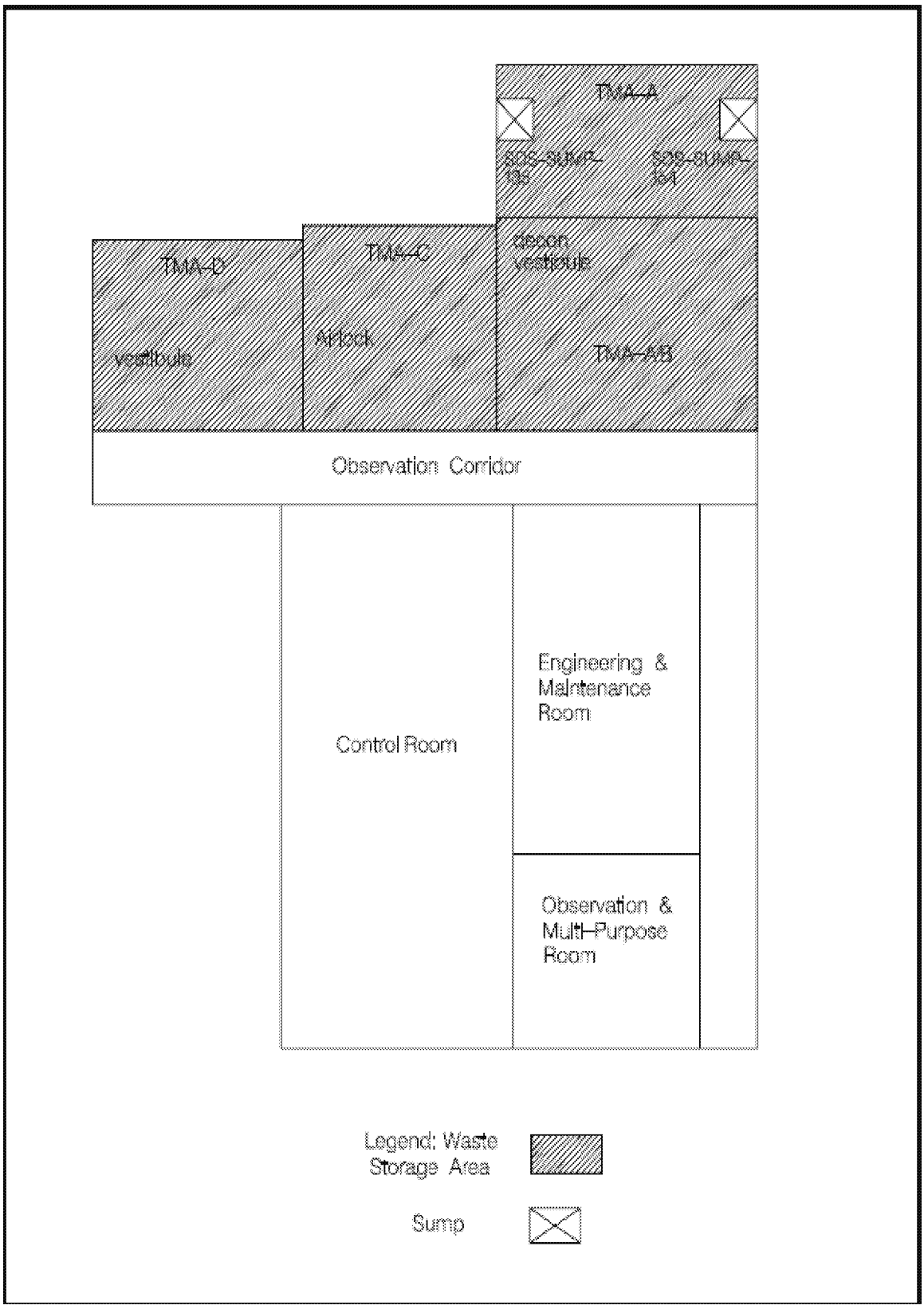


Figure 3-3: Permitted Storage at the WTF

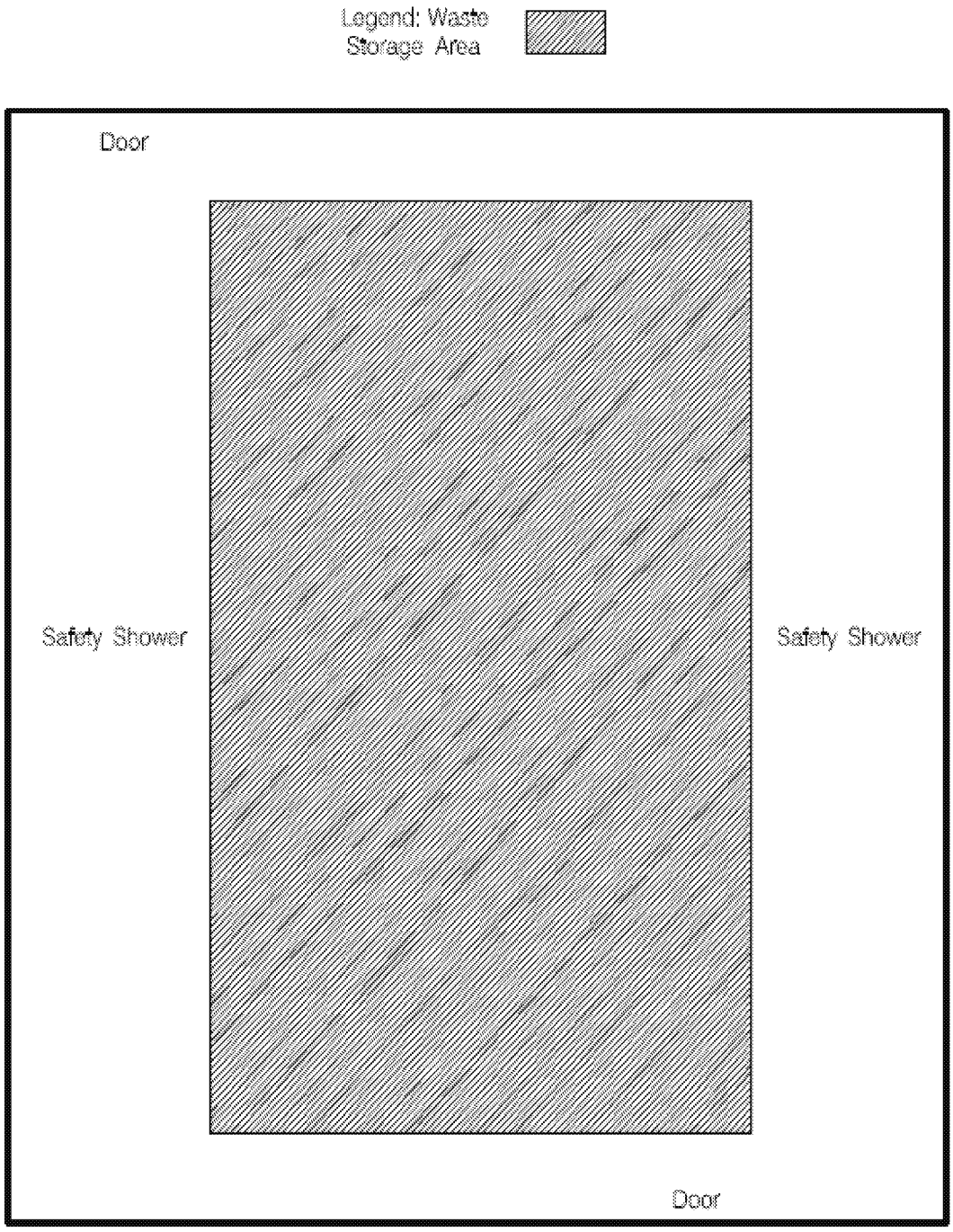


Figure 3-4: Permitted Storage at the UMC and LMC

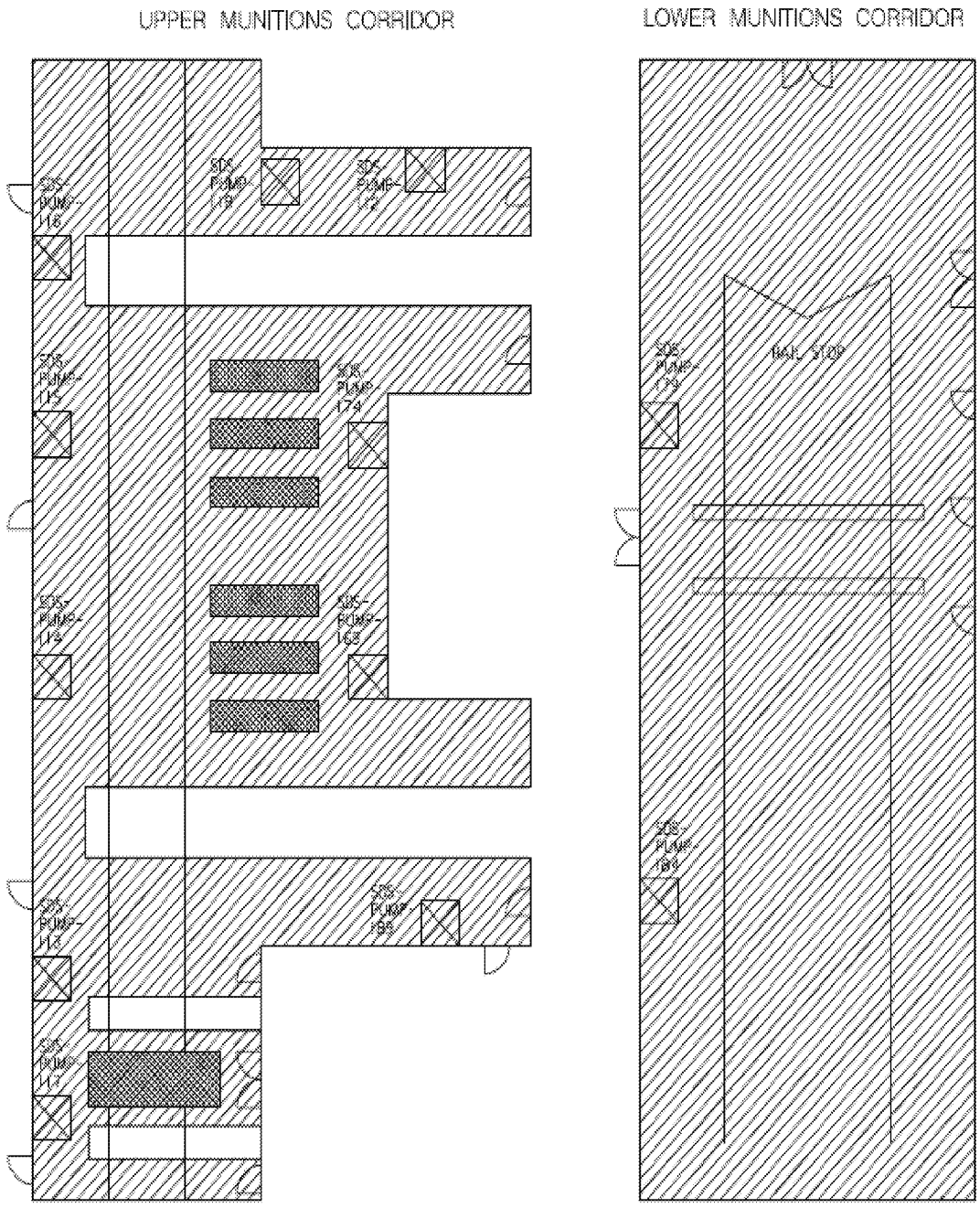
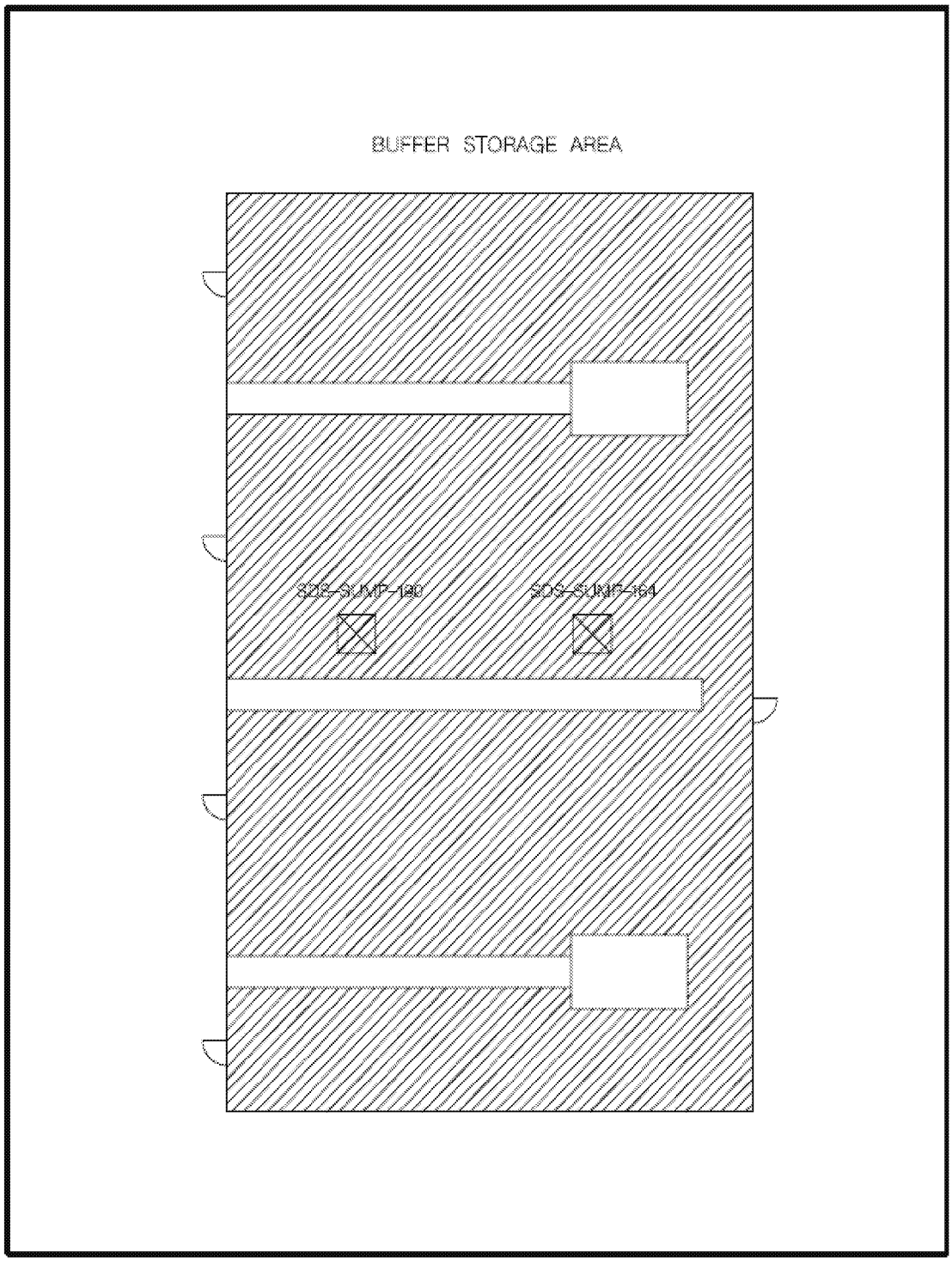


Figure 3-5: Permitted Storage in the BSA



MODULE IV: TANK SYSTEMS

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MODULE IV: TANK SYSTEMS

This Module describes the tank systems at the ANCDF. There are four permitted tank systems at the ANCDF site. These four tank systems (listed in Table 4-1) include the following: Agent Collection Tank System and Spent Decontamination Holding Tank System, Brine Surge Tank System, and Brine Treatment System. A tank system generally consists of holding tanks and/or surge tanks, containment sumps or trenches, pumps, associated piping, and any ancillary equipment.

IV.A. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. Subject to the terms of this Permit, the Permittee shall store only the specified chemical agent or hazardous wastes in the specified tank systems identified in Tables 4-1 and 4-2 during the shakedown, trial burn, and post-trial burn periods for chemical agents as detailed in Module VI.
2. Subject to the terms of this Permit, the Permittee shall store only the specified chemical agent or hazardous wastes in the hazardous waste tank systems identified in Tables 4-1 and 4-2 during normal operations detailed in Module VII.
3. The Permittee is prohibited from storing chemical agent or hazardous wastes not listed in Table 4-1 in the hazardous waste tank systems listed in Tables 4-1 and 4-2 except as identified in Condition I.A.

IV.B. TANK SYSTEM DESIGN AND CONSTRUCTION

1. The Permittee shall maintain the Agent Collection Tank System (ACS-TANK-101 and ACS-TANK-102), Spent Decontamination Holding Tank System (SDS-TANK-101, SDS-TANK-102, and SDS-TANK-103), Brine Surge Tank System (BRA-TANK-101, BRA-TANK-102), and the Brine Treatment System (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, TWS-TANK-903, WPTK-900, WPTK-901, WPTK-902, BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) as specified in:
   a. All applicable drawings in III Appendix D-3 of the ANCDF Application;
   b. The applicable specifications referenced in Section III D-4 and III Appendix D-3-3 of the Application.
2. The Permittee shall maintain the primary containment and secondary containment sump systems identified in Tables 4-2 and 4-3 as specified in:
   a. All applicable drawings in Attachment D of the ANCDF Application;
   b. The applicable specifications found in III Appendix D-3-3 of the Application; and

c. Table 4-4.

3. The Permittee shall provide the external corrosion protection for the tank systems identified in Tables 4-1, 4-2, and 4-3 using the methods in III Appendix D-3-3 of the Application.

4. The Permittee shall not install any altered hazardous waste tank system until such time that the Department has:

   a. Received certification from a qualified professional engineer, that attests to the structural integrity and the suitability of the altered tank system for handling the specified chemical agent or hazardous waste IAW AAC 335-14-5-.10.;

   b. Approved the design and specifications of the altered tank system; and

   c. Received and approved a permit modification IAW AAC 335-14-8-.04.

IV.C. TANK SYSTEM INSTALLATION

1. The Permittee shall maintain the following installation documentation on file at the ANAD/ANCDF facility until such time that the tank system is certified closed IAW Condition II.J.:

   a. A written certification from a qualified professional engineer attesting that proper installation procedures were used for each tank system listed in Tables 4-1 and 4-2. The tank system installation inspection and subsequent written certification, shall consider, but not be limited to, the following tank system installation documentation:

      i. Field installation report with date of installation;

      ii. Approved welding procedures;

      iii. Welder qualifications and certifications;

      iv. Hydro-test reports IAW the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII, Division 1;

      v. Tester credentials;

      vi. Field inspector credentials;

      vii. Field inspection reports;

      viii. Field waiver reports; and

      ix. Non-compliance reports and corrective action (including field waiver reports) and repair reports.

   b. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation

certification documentation submitted to the Department for the Agent Collection Tank System (ACS-TANK-101/102) and Spent Decontamination Holding Tank System (SDS-TANK-101/102/103), shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Vessel wall thickness and nozzle reinforcement calculations;

iii. Vessel structural support calculations;

iv. Approved welding procedures;

v. Welder qualifications and certifications;

vi. Materiel reports and mill certifications;

vii. Results of X-ray testing;

viii. Tester credential;

ix. Non-compliance reports and corrective action;

x. Hydrotest reports;

xi. ASME code data report;

xii. Shop inspection reports; and

xiii. Shop inspector credentials.

c. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the Department for the Brine Surge Tanks (BRA-TANK-101 and BRA-TANK-102) shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Design calculations, including seismic and wind loading;

iii. Approved welding procedures;

iv. Welder qualifications and certifications;

v. Materiel reports and mill certifications;

vi. Results of non-destructive examinations;

vii. Qualifications of NDE inspectors;

viii. Non-compliance report and corrective action;

ix. Leak test report;

x. Shop inspection reports; and

xi. Shop inspector credentials.

d. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the Department for the Brine Treatment System Tanks (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, TWS-TANK-903, WPTK-900, WPTK-901, WPTK-902, BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Design calculations, including seismic and wind loading;

iii. Approved welding procedures;

iv. Welder qualifications and certifications;

v. Materiel reports and mill certifications;

vi. Results of non-destructive examinations;

vii. Qualifications of NDE inspectors;

viii. Non-compliance report and corrective action;

ix. Leak test report;

x. Shop inspection reports; and

xi. Shop inspector credentials.

e. A written certification from a qualified professional engineer attesting that proper installation procedures were used. The tank system installation certification documentation submitted to the department for the primary containment system sumps listed in Table 4-2 shall include, but not be limited to, the following manufacturing design, fabrication, and testing documentation:

i. Shop drawings with dimensional and capacity data;

ii. Approved welding procedures;

iii. Materiel reports and mill certifications;

iv. Shop inspection reports; and

v. Shop inspector credentials.

2. The Permittee shall provide the installation documentation by certified mail, express mail, or hand delivery to the Department within 15 calendar days upon written request.

IV.D. GENERAL OPERATING REQUIREMENTS

1. The Permittee shall not place chemical agent, hazardous wastes, treatment reagents, or other materials in the tank system(s) if they could cause the tank system(s) to rupture, leak, corrode, or otherwise fail.
2. The Permittee shall operate the tank systems to prevent spills and overflows using the procedures and equipment described in Section III D-4 of the ANCDF Application.
3. The Permittee shall install tank level transmitters indicating an alarm at a high-high level corresponding to the maximum allowable liquid height given in Table 4-1.
4. The Permittee shall install primary containment and secondary containment level transmitters for the sumps listed in Tables 4-2 and 4-3 that shall indicate and send alarms to the CON at a low and high level.
5. The Permittee shall ensure that each tank is clearly marked with a description of its contents, the quantity of each chemical agent or hazardous waste received, and the date each period of accumulation begins, or such information for each tank is recorded and maintained in the operating record as specified in AAC 335-14-9-.05(1).

IV.E. AGENT COLLECTION TANK SYSTEM OPERATING CONDITIONS

1. The Agent Collection Tank system consists of the agent holding tank (ACS-TANK-102), agent surge tank (ACS-TANK-101), agent tank secondary containment sump (MDB-SUMP-151), pumps (ACS-PUMP-102/201), associated piping, and ancillary equipment.

IV.F. SPENT DECONTAMINATION HOLDING TANK SYSTEM OPERATING CONDITIONS

1. The Spent Decontamination Holding Tank System consists of three spent decontamination holding tanks (SDS-TANK-101/102/103), primary containment sump (as listed in Table 4-2), pumps (SDS-PUMP-271/172), trenches, associated piping, and ancillary equipment.

2. The Permittee shall maintain a minimum of one Spent Decontamination Holding Tank (either SDS-TANK-101, 102, or 103) empty during agent processing at the ANCDF.3. The Permittee may utilize the empty tank specified in Condition IV.F.2. in the event of an agent waste spill (i.e., Agent Collection Tank failure, Spent Decontamination Tank failure, munition overpack failure, etc.).

4. Upon completion of munitions and ton container processing according to Section III.D of the Application, the Permittee may utilize the empty SDS tank specified in Condition IV.F.2 in conjunction with the other two tanks.

5. The Permittee shall not process any munitions which have not passed the Explosive Containment Vestibule in the munition processing line at the time of an agent waste spill until such time that the circumstance(s) which resulted in the waste spill has been rectified and a minimum of one Spent Decontamination Holding Tank is empty as specified in Condition IV.F.2.

6. The Permittee shall characterize the waste in the Spent Decontamination Holding Tank System IAW the Waste Analysis Plan (see Section III C-2 of the Application).

IV.G. BRINE SURGE TANK SYSTEM OPERATING CONDITIONS

1. The Brine Surge System consists of two Brine Surge Tanks (BRA-TANK-101/, BRA-Tank-102), secondary containment sump, vault, pumps, associated piping, and ancillary equipment.

2. The Permittee shall begin the procedure to switch waste feed from the brine surge tank receiving waste to the empty brine surge tank when the receiving tank's high level is reached.

3. The Permittee shall sample and analyze the waste in the Brine Surge System IAW the Waste Analysis Plan (see Section III C-2 of the Application).

IV.H. BRINE TREATMENT SYSTEM OPERATING CONDITIONS

1. The Brine Treatment System consists of four Treated Water Storage Tanks (TWS-TANK-900, TWS-TANK-901, TWS-TANK-902, and TWS-TANK-903), three Chelating Resin Columns (WPTK-900, WPTK-901, and WPTK-902), six filter vessels (BRA-FILT-902, BRA-FILT-903, BRA-FILT-904, BRA-FILT-905, BRA-FILT-906, and BRA-FILT-907) secondary containment sump, pumps, associated piping, and ancillary equipment.

2. The Permittee shall sample and analyze the waste in the Brine Surge System IAW the Waste Analysis Plan (see Section C-2 of the ANCDF Application).

3. The Permittee shall be required to minimize accumulation of moisture within the interstitial space of the Treated Water Storage Tanks for the Brine Treatment

System. Methods employed for this purpose must include the ability to limit accumulation, and should liquid be identified within the interstitial space, an analytical method (such as pH, alkalinity, chlorine levels, etc.) must be available to verify the liquid is not a result of a leak of the primary vessel.

IV.I. OPERATING PROCEDURES FOR PRIMARY CONTAINMENT SUMPS

1. The primary sump system shall consist of the sumps listed in Table 4-2.
2. The Permittee shall operate the primary sump system IAW Section III D-4 of the ANCDF Application.
3. Operation of the sump level indicators and interstitial probes shall be inspected and tested per the Inspection Schedule (see Section III F-2 of the ANCDF Application).
4. The Permittee shall use a boroscope to visually inspect the metal sump liner and underlying concrete (or remove the metal sump) annually and before commencement of each chemical agent campaign to visually inspect for any signs of deterioration of the coating, leakage or corrosion of the metal sump, or cracking of the concrete liner. The use of the boroscope is contingent upon obtaining clear photographs documenting the condition of the sump and underlying concrete.
5. All primary sumps shall have a dedicated sump pump and sump level indicators. All liquids evacuated from these sumps shall be pumped to the Spent Decontamination Tanks.
6. The Permittee shall maintain a liquid level in any of the primary containment sumps no higher than the low level assigned in Table 4-2.
7. All primary sumps may be used to treat agent and agent contaminated hazardous wastes with decontamination solution before they are pumped to the Spent Decontamination Holding Tanks. Wastes that have been treated shall not remain in these sumps for more than 24 hours above the allowable level described in Condition IV.G.6.
8. As part of every chemical agent changeover, primary sumps in rooms where agent was processed shall be rinsed with decontamination solution to remove residual chemical agent after room decontamination activities are complete.
9. The permittee may exceed the capacity of the sumps identified in Table 4-2 during a toxic area entry, in the event that the sump pump ceases to work and the subsequent decontamination of entrants causes the sump capacity to be exceeded and the decontamination is necessary to ensure a safe exit from the room or in the event of a failure of any of the Spent Decontamination Holding Tanks or Agent Collection Tanks. If this occurs, the Permittee shall record in the Operating

Record the circumstances that caused the overfill and shall remove the waste as soon as it can be safely accomplished.

10. The permittee may store waste in the sumps listed in Table 4-2 for greater than 24 hours if a toxic area entry necessary to support waste removal cannot be initiated or completed for any of the following reasons:

    a. Agent concentrations exceed the authorized level for the PPE to be worn.

    b. A breach or tear occurs in a DPE suit.

    c. A loss of communications occurs between the parties involved in an entry.

    d. The room temperature is too high to allow for an entry.

    e. Any of the participants in an entry suffer from an illness or heat stress.

    f. A loss of Life Support System (LSS) air occurs.

    g. A loss of either utility power or the Heating, Ventilation, and Air Conditioning (HVAC) system occurs.

    h. Explosive components are present, endanger worker safety, and cannot be removed so as to allow for removal of waste from the sump within 24 hours.

    i. For those instances where waste is not removed from the sumps within 24 hours, the permittee shall record in the Operating Record the circumstances that prevented removal within 24 hours and shall remove the waste as soon as it can be safely accomplished. In addition, the onsite ADEM compliance staff will be notified of the condition in a timely manner.

    j. Should a condition listed above occur, all maintenance activities will be postponed until they can be performed safely.

    k. Severe weather restrictions.

IV.J. OPERATING PROCEDURES FOR SECONDARY CONTAINMENT SUMPS

1. The secondary containment sumps shall consist of all sumps listed in Table 4-3.

2. The Permittee shall operate the secondary containment sumps IAW Section III D-4 of the Application.

3. The Permittee shall consider any materials or liquids detected in the secondary sumps of the Agent Collection Tank System and Spent Decontamination Holding Tank System to be a hazardous waste until the Permittee has sampled and analyzed the materials or liquids for chemical agent, TCLP metals, TCLP organics and any other suspected hazardous waste or hazardous waste constituents, IAW the methods of the Waste Analysis Plan (see Section III C-2 of

the ANCDF Application) of this Permit. The Permittee shall consider any materials or liquid in the secondary containment for the Brine Surge Tank System to be non-hazardous unless a leak has been detected from the tank system. If a leak has been detected, the liquid will be considered hazardous waste until analyzed for chemical agent, TCLP metals, TCLP organics, and any other suspected hazardous constituents. Liquids in the secondary containment for the brine surge tank system shall be analyzed for pH and sheen prior to discharge as stormwater.

4. The Permittee shall send those liquids that are determined to be hazardous waste and contain chemical agent to a Spent Decontamination Holding Tank. For materials or liquids that are sampled and analyzed and found to be chemical agent free and not to be hazardous waste, they shall be managed as not being hazardous waste but must be evacuated from the sump.

5. The Permittee shall remove all materials or liquids in the secondary sumps by either a vacuum truck or dedicated sump pump. The dedicated sump pump system may not leave a residual liquid depth of more than 3 inches. All sumps evacuated using a vacuum truck shall not leave pumpable residual liquids in the sump. The low level alarm will activate when the level from the bottom of the sump reaches 3 inches.

6. Operation of the sump level indicators shall be visually inspected per the Inspection Schedule (see Section III F-2 of the Application) and shall be tested upon installation, annually, and between every chemical agent change as specified in Section III F-2 of the Application.

IV.K. RESPONSE TO LEAKS OR SPILLS

1. In the event of a leak or a spill from a hazardous waste tank system, or if a hazardous waste system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions:

   a. Stop the flow of chemical agent or hazardous waste into the system and inspect the system to determine the cause of the release.

   b. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and allow inspection and repair of the system. If the Permittee finds that it shall be impossible to meet this time period, the Permittee shall notify the Department and demonstrate that the longer time period is required.

   c. If the collected material is a hazardous waste and contains chemical agent, it shall be managed IAW all applicable requirements of AAC 335-14-3, 335-14-4, and 335-14-5.

   d. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment

and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.

e. Close the system IAW the Closure Plan specified in Section III I of the Application unless the following actions are taken:

i. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.

ii. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.

iii. For a release to the environment caused by a leak from an aboveground portion of the ancillary equipment that does not have secondary containment, the Permittee shall repair the tank system or ancillary equipment before returning it to service.

iv. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in AAC 335-14-5-.10.

2. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee shall obtain a certification by a qualified professional engineer that the repaired system is capable of handling chemical agent or hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner; repair of a ruptured tank; or, repair or replacement of a secondary containment vault.

3. The Permittee shall submit to the Department all certifications of major repairs to correct leaks within 7 calendar days from returning the hazardous waste tank systems to use.

IV.L. INSPECTION SCHEDULES AND PROCEDURES

1. The Permittee shall inspect the hazardous waste tank systems, IAW the Inspection Schedule (see Section III F-2 of the Application).

2. The Permittee shall inspect the overfill controls, IAW the Inspection Schedule (see Section III F-2 of the Application).

IV.M. RECORDKEEPING AND REPORTING

1. The Permittee shall verbally report to the Department within 24 hours of detection, when a leak or spill occurs from a hazardous waste tank system to the environment, IAW Condition I.E.17.

2. Releases from a hazardous waste tank system that are contained within a secondary containment system shall be reported as required in Condition IV.L.1. and shall be recorded in the Operating Record required by Condition II.I.1.

3. In addition to complying with the requirements of Condition I.E.17.b., within 30 calendar days of detecting a release to the environment from a hazardous waste tank system, the Permittee shall submit a written report detailing, at a minimum, the following to the Department:

   a. Likely route of migration of the release;

   b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);

   c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it shall be impossible to meet this time period, the Permittee shall provide the Department with a schedule of when the results shall be available. This schedule must be provided before the required 30 calendar day submittal period expires;

   d. Proximity of downgradient drinking water, surface water, and populated areas; and

   e. Description of response actions taken or planned.

4. The Permittee shall obtain, and keep on file at the ANAD facility, the written statements by those persons required to certify the design and installation of the hazardous waste tank systems as specified in Condition IV.C.4. until such time that the tank system is certified closed IAW Condition II.J.7.

5. The Permittee shall keep on file at the ANAD facility the written hazardous waste tank system assessments IAW AAC 335-14-5-.10 of each hazardous waste tank system's integrity and suitability for handling chemical agent and hazardous waste, until such time that the hazardous waste tank system is certified closed IAW Condition II.J.7.

6. The Permittee shall maintain at the ANAD facility a record of the results of leak tests and integrity tests conducted, IAW Conditions IV.C.4. or IV.J.2.

7. In the event that a hazardous waste tank (including primary containment sumps) exceeds the maximum allowable capacity designated for that tank in Tables 4-1 and 4-2, the Permittee shall document in the Operating Record, as required by Condition II.I.1., the following information:

   a. The date and time of occurrence;

b. Identify the tank by the identification number specified in Tables 4-1 and 4-2;

c. Indicate if any other available tank storage volume, within the system, is available and identify such tank by the tank identification number, specified in Tables 4-1 or 4-2;

d. Indicate if the tank system automatically switched the feed or if an operator manually switched the feed from the high level tank to the tank with the available storage;

e. If no additional storage capacity was available within the storage system, indicate if the associated collection and/or treatment activities were automatically cut-off;

f. Indicate if the high-high level tank(s) intake valves were automatically closed;

g. Indicate if any associated incinerator AWFCO interlocks were required. Identify the required interlock and whether the interlocks were successfully activated; and

h. Describe the operating control procedures that allowed the tank system to reach the high-high level volume (e.g., why the operator was not successful in managing the waste within the high level volume (i.e., the working capacity)).

8. The Permittee shall document compliance with Conditions IV.L.2. and IV.L.3. and place this documentation in the operating record for the ANCDF site.

9. The Permittee shall document and record the results of each Spent Decontamination Holding Tank System waste analysis required by Condition IV.F.5. in the Operating Record specified in Condition II.I.1.

10. The Permittee shall document in the Operating Record, specified in Condition II.I.1., the results of each Brine Surge Tank System waste analysis and any subsequent treatment required by Condition IV.G.3.

11. The permittee shall document in the Operating Record, specified in Condition II.I.1., the results of each Brine Treatment System waste analysis and any subsequent treatment required by Condition IV.H.2.

IV.N. CLOSURE

1. The Permittee shall close the hazardous waste tank systems listed in Tables 4-1 and 4-2 IAW the Closure Plan, included as Section III I of the Application.

2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, at closure, the Permittee shall comply with the Condition II.J.9.

IV.O. SPECIAL TANK PROVISIONS FOR INCOMPATIBLE WASTES

1. The Permittee shall not place chemical agent or hazardous waste in a tank system that has not been decontaminated and that previously held a different chemical agent and/or incompatible material.

2. The Permittee shall only place the type of chemical agent (e.g., GB, VX, HD, or HT) specified for the particular campaign in the tank systems during any one chemical agent campaign.

3. Prior to initiating a campaign with a new chemical agent, the Permittee shall rinse the ACS, Brine Surge Tank, and Brine Treatment Systems with the appropriate decontamination solution to remove chemical agent residuals. The decontamination solution generated from these activities shall be collected in the SDS tanks and treated in the Liquid Incinerator secondary combustion chamber IAW Condition VI.B. of this Permit during shakedown, trial burn, and post trial burn and in Condition VII.B. of this Permit during normal operations. If no agent is detected above WCL in BRA-TANK-101/102 at the end of the campaign, rinsing is not required.

Table 4-1: Hazardous Waste Storage Tank Systems Permitted for Use During Shakedown Periods I and II, Surrogate and Chemical Agent Trial Burns and Normal Chemical Agent Operations

Tank I.D. Number	Maximum Allowable Capacity (gallons)	Maximum Allowable Liquid Height[1] (feet)	Dimensions of Tank (feet)	Secondary Containment Required (gallons)	Permitted Hazardous Waste Activity	Permitted Hazardous Waste Codes
ACS-TANK-101	582	7.5	3.5 Diameter 8.0 Height	660	Storage of drained chemical agent	D003 to D011, D022, D028, and D043
ACS-TANK-102	1,130	8.75	5.0 Diameter 10.0 Height	1,300		
SDS-TANK-101	2,168	9.25	6.0 Diameter 10.25 Height	2,379	Storage of spent decontamination and lab waste	D004 to D011, D022, D028, D030 and D043
SDS-TANK-102						
SDS-TANK-103						
BRA-TANK-101	42,629	18.25	20.0 Diameter 20.0 Height	47,000	Liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
BRA-TANK-102						
TWS-TANK-900	33,970	29.5	14 Diameter 30 Height	None. Tanks are double walled tanks with interstitial space monitoring	Storage of treated liquids from brine treatment system	D004 to D011, D022, D028, D030 and D043
TWS-TANK-901						
TWS-TANK-902						
TWS-TANK-903						
WPTK-900	962	7.25 (from bottom of tank)	5 Diameter 6 Height (tangent)	6867 gal. total secondary containment	Treatment of liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
WPTK-901						
WPTK-902						

BRA-FILT-902	7	2	Dia=10”, Ht=55”	6867 gal. total secondary containment	Treatment of liquids from incinerator pollution abatement systems	D004 to D011, D022, D028, D030 and D043
BRA-FILT-903	7	2	Dia=10”, Ht=55”			
BRA-FILT-904	7	2	Dia=10”, Ht=55”			
BRA-FILT-905	7	2	Dia=10”, Ht=55”			
BRA-FILT-906	21	3	Dia=14”, Ht=66”			
BRA-FILT-907	21	3	Dia=14”, Ht=66”			

Footnote:
(1) High-high level alarm.

Table 4-2: Hazardous Waste Primary Containment Sump Systems

Sump I.D. Number[1,2]	Maximum Sump Capacity (gallons)	Dimensions of Sump (feet)	Maximum Allowable Liquid Height[3] (inches)	Secondary Containment Volume (gallons)	Location Reference			
					RCRA Drawing Reference	Floor	Location	Room Name/ Number[4]
SDS-SUMP-106	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-6	ECR/05-212
SDS-SUMP-107	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	C-6	ECR/05-211
SDS-SUMP-108	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	J-10	ECV/04-213
SDS-SUMP-109	89	2.3x2.3x2.25	3.0	134	AN-1-G-508	2	D-10	ECV/04-213
SDS-SUMP-110	89	2.3x2.3x2.25	3.0	134	AN-1-G-508	2	B.1-10	ECV/04-213
SDS-SUMP-112	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-7	M-CR/05-210
SDS-SUMP-113	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	M-3	M-CR/05-210
SDS-SUMP-114	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-3	M-CR/05-210
SDS-SUMP-115	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	D-3	M-CR/05-210
SDS-SUMP-116	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-3	M-CR/05-210
SDS-SUMP-117	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	N-3	M-CR/05-210
SDS-SUMP-118	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	B.1-5	M-CR/05-210
SDS-SUMP-124	89	2.3x2.3x2.25	3.0	134	AN-G-1-510	2	B.1-4	M-CR-AL/06-221*
SDS-SUMP-125	89	2.3x2.3x2.25	3.0	134	AN-1-G-507	1P	L-5	AL/06-169*
SDS-SUMP-126	89	2.3x2.3x2.25	3.0	134	AN-G-1-511	2	L-8	MPB-AL/06-217
SDS-SUMP-134	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	T-6	M-CR-AL/06-164
SDS-SUMP-135	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	L-3	TMA/12-120
SDS-SUMP-145	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	N-11	MPB/10-205
SDS-SUMP-146	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	N-8	MPB/10-205
SDS-SUMP-147	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	L-11	MPB/10-205
SDS-SUMP-148	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	L-8	MPB/10-205

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Table 4-2: Hazardous Waste Primary Containment Sump Systems (Continued)

Sump I.D. Number[1,2]	Maximum Sump Capacity (gallons)	Dimensions of Sump (feet)	Maximum Allowable Liquid Height[3] (inches)	Secondary Containment Volume (gallons)	Location Reference			
					RCRA Drawing Reference	Floor	Location	Room Name/ Number[4]
SDS-SUMP-149	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	L-6	MPB/10-205
SDS-SUMP-153	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	P-5	DECON AREA/12-118
SDS-SUMP-154	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	L-6	TMA/12-120
SDS-SUMP-164	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-11	BSA/17-146
SDS-SUMP-168	89	2.3x2.3x2.25	3.0	134	AN-G-1-509	2	N-6	MPB/10-205
SDS-SUMP-169	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	H-6	M-CR/05-210
SDS-SUMP-174	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	D-6	M-CR/05-210
SDS-SUMP-175	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	M-11	MPB/10-205
SDS-SUMP-179	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-6	M-CR/05-153
SDS-SUMP-184	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	Q-6	M-CR/05-153
SDS-SUMP-189	89	2.3x2.3x2.25	3.0	134	AN-G-1-508	2	K-7	M-CR/05-210
SDS-SUMP-190	89	2.3x2.3x2.25	3.0	134	AN-1-G-505	1	M-9	BSA/17-146

Footnotes:
(1) Hazardous waste sumps (meeting the RCRA definition of a tank) must comply with all applicable hazardous waste tank system requirements (ADEM Admin. Code R. 335-14-5-.10).
(2) SDS = Spent Decontamination Solution
(3) Low-level alarm height. This is the level at which the sumps shall be maintained.
* Indicates location on platform level.

Abbreviations:
AL.....Airlock
DECON .....Decontamination
ECV.....Explosive Containment Room Vestibule
M-CR.....Munition Corridor
MPB-AL.....Munitions Processing Bay Airlock
TMA.....Toxic Maintenance Area
BSA .....1st Floor Buffer Storage Area
ECR .....Explosive Containment Room
I.D. .....identification
M-CR-AL .....Munitions Corridor Airlock
RCRA .....Resource Conservation and Recovery Act

Table 4-3: Hazardous Waste Secondary Containment Sumps Systems

Sump I.D. Number	Maximum Allowable Capacity (gallons)	Dimensions of Sump (feet)	Location Reference					
			Drawing Column - Row	Floor	Location	Room Name/ Number	Comments	Purpose
SDS-SUMP-151	511	4.42x4.42x3.5	AN-1-G-504	1	J-8	TOX/11-141	In Pit	2,072 gallons Secondary Containment
SDS-SUMP-150	85	2.25x2.25x2.25	AN-1-G-504	1	H-7	SDS/21-140	In Pit	3,060-gallons Secondary Containment
BRA-SUMP-103	85	2.25x2.25x2.25	AN-2-D-501	-	Within diked area of Brine Surge Tanks	Outside of PUB	Vault	48,862-gallons Secondary Containment
BRA-SUMP-104	85	2.25x2.25.2.25	AN-2-D-503	1	PUB	PUB Interior	-	6,867 gallons Secondary Containment

Abbreviations:
I.D.....identification
SDS.....spent decontamination solution
BRA brine reduction area
PUB .....Process and Utility Building
TOX.....Toxic Cubicle

Table 4-4: Sump Systems Design Standards

Sump And Trench Design Standards[1]	Sump Systems			
	Primary Containment Sumps	**Secondary Containment Sumps of the TOX and SDS Room**	**Vault Outside of PUB Within Diked Area of Brine Surge Tanks**	**Secondary Containment Sump Inside PUB**
PRIMARY CONTAINMENT:				
Construction Material:	Welded carbon steel	See below	See below	See below
Shell Thickness	3/16 inch	See below	See below	See below
Grating Material	Reinforced fiberglass	See below	See below	See below
Protective Coating	Chemical resistant epoxy coating	See below	See below	See below
SECONDARY CONTAINMENT:				
Construction Material	Concrete	Concrete with embedded steel lining	Concrete	Concrete
Grating Material	See above	Reinforced Fiberglass	Galvanized Steel	Reinforced Fiberglass
Thickness	6 inches	6 inches	6 inches	6 inches
Protective Coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating	Chemical resistant epoxy coating
LEAK DETECTION SYSTEM	Visually inspect manually, visually inspect by borescope, and by level indicator	Visually inspect and by level indicator	Visually inspect and by level indicator	Visually inspect and by level indicator

Footnote:
(1) Standards apply to trenches (for sump collection system designed with trench).

Abbreviations:
TOX.....Toxic Cubicle
SDS.....Spent Decontamination Solution
PUB .....Process and Utility Building

MODULE V: MISCELLANEOUS TREATMENT UNITS (SUBPART X)

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MODULE V: MISCELLANEOUS TREATMENT UNITS (SUBPART X)

V.A. APPLICABILITY OF MISCELLANEOUS TREATMENT UNITS

1. This Module allows the thermal treatment of conventional waste military munitions (WMM) and chemical agent munitions, disassembled explosive components of WMM and chemical munitions, including hazardous energetic and energetic-contaminated wastes, and non-energetic contaminated wastes within permitted miscellaneous treatment units. Additionally, the units may be used to treat by-products from non-permitted activities such as test programs, reduce, reuse, and recycling (R3) programs, surveillance, emergency response operations including components described in Permit Condition V.C.5 as described in the Section IV of the facility permit application. The thermal treatment units described in this module are regulated under AAC 335-14-5-.24. The following units are permitted for thermal treatment of wastes:

   a. Open Burning (OB) Unit #1 – SWMU 16

   b. Open Detonation (OD) Unit – SWMU 17

   c. Static Detonation Chamber (SDC) – SWMU 70

2. All thermal treatment operations shall be accomplished by trained explosives personnel in accordance with Department of Defense (DOD) Standard Operating Procedures (SOPs), Sections III K-H, IV J-H, and IV-H of the facility permit application, and the conditions of this permit.

3. The Permittee shall maintain an operating record describing the thermal treatment activities. The record shall include the following information:

   a. Description and quantity [number and Net Explosive Weight (NEW)] of each hazardous waste munition, initiator, and donor received and treated in each tray fed into the SDC unit, each pan of the OB unit and each detonation pit for the OD unit. For processing operations in the SDC that are consistent (same type and number of munitions per event) within a processing day, one record is acceptable provided it captures the initial evaluation and time of each subsequent tray,

   b. All agent feed quantities associated with the SDC unit,

   c. The annual running total of the NEW of all energetics treated at the thermal treatment units,

   d. Date of thermal treatment,

e. Copies of all documents showing the disposition of residues transported from the thermal treatment units,

f. Current copies of all SOPs used at the thermal treatment units,

g. Meteorological conditions during each treatment (open burn or open detonation) as listed in Condition V.D of this permit,

h. All information to characterize waste including information to support Condition V.B of this permit,

i. Copies of all inspection records for each unit,

j. Copies of all employee training records in accordance with Sections III K-H, IV J-H, and IV H of the facility permit application,

k. All groundwater monitoring reports required by Permit Condition X.B.6.

l. For SDC unit operations, the date and time of all Feed Prohibitive Interlock (FPI) malfunctions including the cause, corrective action, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the FPI function failures including the corrective measures taken to correct the condition that caused the failure, and

m. All monitoring equipment data and inspection records of monitoring equipment compiled under the conditions of this permit.

V.B. DESCRIPTION OF THERMAL TREATMENT UNITS

1. Open Burning (OB):

a. The Open Burning unit occupies approximately 17 acres in the northwestern corner of the Ammunition Storage Area (ASA) [also referred to as the Ammunition Limited Area (ALA)]. Treatment by OB may be conducted in ten burn pans within the designated open burn unit encompassing an area of soil approximately 400 feet by 800 feet. All burn pans shall be similarly constructed, as shown in Figure IV B-2 of the permit application. The general arrangement of the OB unit within the facility boundary is located in Figure IV.B-1 of the facility permit application. The general arrangement of the OB pans within the OB unit is shown in Figure IV.B-8 of the permit application. Photographs of the area layout and the burn pans are located in Figures IV.B-4 and IV.B-5 of the permit application.

b. The OB unit is dedicated to the thermal destruction of Hazard Class 1 explosives including propellants, WMM, and explosive-contaminated

wastes. The OB unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

2. Open Detonation (OD):

   a. The OD unit occupies approximately 51 acres in the northwestern corner of the ASA. Treatment by OD may be conducted within an approximate 1200 feet by 300 feet area designated for digging of pits which are used for detonation stations. No more than 8 detonation pits shall be used during any detonation series. Detonation stations may be ignited electrically or non-electrically. Both above ground and buried detonations are allowed. The general arrangement of the OD unit within the facility boundary is located in Figure IV.B-1 of the permit application. Photographs of the detonation pit are located in Figure IV.B-6 and IV.B-7 of the permit application.

   b. The OD unit is dedicated to the detonation of Hazard Class 1 explosives including WMM and explosive-contaminated wastes. The OD unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

3. Static Detonation Chamber (SDC)

   a. The Static Detonation Chamber (SDC) is located on the west side of G block near Building 695 in the Chemical Limited Area (CLA) of ANAD. The footprint for the structure is approximately 70 x 100 feet. Treatment by SDC shall be conducted by loading ammunition trays which are conveyed into the SDC unit. No more than one feed tray may be loaded into the SDC per feed event. The general arrangement of the SDC facility is located in Figure III.K-5 of the Permit Application.

   b. The SDC unit is dedicated to the detonation of chemical and/or WMM munitions which are either explosively or not-explosively configured and secondary waste generated by the SDC operations. The explosive capacity of the SDC unit shall not exceed 6.7 pounds (lbs) of explosive material, both mass and non-mass detonating. The SDC unit may be used to treat wastes that are generated on-site by the facility or off-site by other DOD installations.

V.C. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. The majority of WMM treated by OB, OD, and SDC at ANAD require disposal because the munition has exceeded its shelf life and the Designated Disposition Authority (DDA) has determined that it cannot be reused or recycled. These military munitions become hazardous WMM when they are removed from the munitions storage igloos in accordance with the military munitions rule (AAC 335-14-7-.13).

2. All WMM treated at the OB, OD, and SDC units exhibit the reactivity (D003) hazardous waste characteristic as defined in ADEM Admin. Code R.335-14-2-.03(3). In addition, these wastes may also exhibit the ignitability characteristic (D001), corrosivity (D002), and/or nine toxicity characteristics (D004, D005, D006, D007, D008, D009, D011, D030 or D039).

3. The wastes treated at the OB and OD units shall not contain pesticides, herbicides, dioxins, or polychlorinated biphenyls (PCBs). Conventional waste types and waste characteristics are detailed in Sections IV.C of the permit application. All WMM must be identified using the procedures in Section IV.C of the permit application. Only the Munitions Items Disposition Action System (MIDAS) classifications listed in Table IV.C-9 of the permit application may be treated by ANAD at the OB and OD units.

4. Thermal treatment of hazardous waste by means other than as specifically authorized by this permit is prohibited. Recovered liquid-filled rounds, chemical warfare materiel, components of recovered liquid filled rounds or chemical warfare materiel, and liquid agent-contaminated explosive components may be treated in the SDC, but are prohibited to be processed at the OB and OD units. No other agent munitions except those containing mustard may be treated at the SDC. Mustard contaminated waste types and waste characteristics are detailed in Section III.C of the permit application.

5. Items containing depleted uranium, either loaded or expended, are prohibited at all locations. Treatment of loaded munitions or components containing colored smokes, white phosphorous, red phosphorous, hexachlorethane, or riot control agents may also be treated at the SDC or during an emergency operation as determined by facility Quality Assurance Surveillance, Ammunition Specialists (QASAS) in accordance with Section IV D-3f(1) of the permit application.

6. Disassembled explosive components of chemical munitions may be processed by open/buried detonation once they have been verified agent free by monitoring in accordance with the Waste Analysis Plan in Section III.J of the facility permit application. If not verified agent free, these components may only be treated in the SDC.

7. The donor charge and placement geometry for OB and OD/BD thermal treatment operations shall be optimized to minimize the generation of unburned and un-detonated waste and residue. All re-burns and re-detonations shall be recorded in the operating record.

8. Under no circumstances shall the facility receive any materiels originating from any chemical weapons stockpile other than Anniston Army Depot pursuant to the ***Code of Alabama 1975****, §§ 22-30-C-1-4,****et. seq.****, as amended,* otherwise referred to as the "Chemical Weapons Destruction Limitation Act".

9. The SDC facility may not receive any recovered liquid-filled rounds, chemical warfare materiel or any components of recovered liquid filled rounds or chemical warfare materiel from any off-site locations.

V.D. THERMAL TREATMENT OPERATIONS

1. Open Burning (OB)

a. Meteorological Restrictions

The listed meteorological restrictions are applicable to open burning treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

i. Less than a 50 percent chance of precipitation (including thunderstorms or electrical storms),

ii. Average wind speed between 3 and 20 miles per hour,

iii. Cloud cover less than 80 percent and ceilings greater than 2,000 feet, and

iv. Wind direction which will not carry emissions over any publicly accessible area within one mile of the unit boundary.

b. Other Restrictions

i. Open burning operations are limited to the hours between 8:00am and 4:00pm Monday through Saturday, and

ii. Open burning may be conducted in each pan no more than once per day

c. Treatment Quantities and Daily Maximum Limits

The following quantity of material may be treated at the OB unit, expressed as net explosive weight (NEW). NEW represents the combined explosives weight of all energetics contained in a munitions item and initiators. Explosive limits have been established for the OB unit and these limits shall not be exceeded at any time. The volume of WMM treated at the OB unit varies based on the disposal and demilitarization needs of DoD. The operating limits are as follows:

i. Open Burning (OB): Shall not exceed 2,000 pounds NEW per pan (total daily limit of 20,000 pounds NEW for ten open burn pans). Only one burn per pan is allowed in an operating day. Treatment of WMM on the ground is prohibited. Burn pan lids shall remain in place at all times when the pans are not in use.

d. Residue Control

The open burning operation of WMM results in the generation of treatment residues in the forms of residue and scrap metal. The OB residue is a fine powdery or feathery material resembling ash. These residues shall be handled in the following manner:

i. Ash Residue

At the completion of each burn, the Permittee will allow a 4-hour cooling period and then verify via visual inspection that all of the reactive material has been properly treated. Within 24-hours following the treatment event and verification that all explosives have been treated, or in as timely a manner as is possible to prevent harm to human health and the environment, the ash residue shall be removed from the pan and placed into DOT-approved containers. The containers shall be properly labeled with the appropriate hazardous waste designation including the applicable RCRA waste codes and the date(s) where appropriate. All containers must be managed in accordance with the conditions set forth in Module IX of this permit and all appropriate state and Federal regulations governing hazardous waste accumulation, storage, and disposal. Filled containers may be removed to a permitted hazardous waste storage area (Building 466, 512 or 527) before disposal. Accumulation of up to 55 gallons of waste residue is allowed at the OB area in accordance with 335-14-3-.03(5)(c). All waste in containers shall be characterized in accordance with Section IV.C-2 (Waste Analysis Plan) of the permit application. Wind dispersal of ash shall be controlled by limiting burns in accordance with Permit Condition V.D.1.a. When ash is present following the cooling period and prior to removal, lids are to be placed on the burn pans in order to prevent precipitation from accumulating in the burn pans.

ii. Scrap Metal from Open Burning

At the completion of each burn, the Permittee will allow a 4-hour cooling period. Metal fragments shall be visually inspected, certified, and verified as free of explosives on a DA Form 1348-1A (or equivalent document). The scrap metal shall be collected, loaded into containers, and transported to the Permittee's Defense Reutilization Marketing Office (DRMO) or suitable scrap vendor for recycling or disposal. The DA Form 1348-1A (or equivalent document) shall be retained by the ADMC as the document of record.

2. Open Detonation (OD) / Buried Detonation (BD)

a. Meteorological Restrictions

The listed meteorological restrictions are applicable to open detonation treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

i. Less than a 50 percent chance of precipitation (including thunderstorms or electrical storms),

ii. Average wind speed between 3 and 20 miles per hour,

iii. Cloud cover less than 80 percent and ceilings greater than 2,000 feet, and

iv. Wind direction which will not carry emissions over any publicly accessible area within one mile of the unit boundary.

b. Other Restrictions

i. Open detonations are limited to the hours between 8:00am and 4:00pm Monday through Saturday, and

ii. Open detonation may be conducted in each station within the detonation pit area no more than twice per day.

c. Treatment Quantities and Daily Maximum Limits

The following quantity of material may be treated at the OD unit, expressed as net explosive weight (NEW). NEW represents the combined explosives weight of all energetics contained in a munitions item and donor materiel. Explosive limits have been established for the OD unit and these limits shall not be exceeded at any time. The volume of WMM treated at the OD unit varies based on the disposal and demilitarization needs of DoD. The operating limits are as follows:

i. Open (above ground) Detonation (OD): Shall not exceed 15 pounds NEW per detonation (maximum daily limit of 240 pounds NEW for the eight detonation stations). No more than two detonations may be conducted per station per operating day.

ii. Buried Detonation (BD): Shall not exceed 1,000 pounds NEW per detonation (maximum daily limit 16,000 pounds NEW for the eight detonation stations). No more than two detonations may be conducted per station per operating day. Buried detonations shall not occur at depths below 14 feet or above 1 foot below ground surface.

d. Residue Control

The open detonation operation generates metal fragments, unexploded items, and non-metallic residuals ejected from the open detonation area.

i. Metal Fragments (Shrapnel)

At the completion of each detonation series, the Permittee will visually inspect the active portion of the detonation area for the presence of shrapnel (metal fragments). Any fragments/shrapnel that are (1) observable on the soil and (2) measure 4 inches or greater in any dimension shall be collected and removed. Any shrapnel found shall be visually inspected to verify that the energetic component of the waste munitions has been successfully treated. If shrapnel is observed or suspected to contain unreacted energetics, it shall be retreated with the next available detonation. If shrapnel is found to be free of energetics, it will be certified as explosive-free and removed as scrap metal as described in X.C.1.d.ii.

ii. Other residuals

At the completion of each operating day the immediate area surrounding the active portion of the detonation pits shall be visually inspected for the presence of unexploded items or ejected items including munitions or components thereof. All items found shall be re-treated in the next available detonation. At least monthly the inspection area shall include a boundary designated by the facility which shall encompass all potential areas where ejected material may fall beyond the immediate area of the active portion of the unit.

3. Static Detonation Chamber (SDC)

a. Meteorological Restrictions

There are no meteorological restrictions for the SDC, as it is an enclosed system.

b. Hours of Operation

The SDC has no restriction on the hours of operation.

c. Treatment Quantities and Maximum Limits

The following quantity of material may be treated at the SDC unit, expressed as net explosive weight (NEW). NEW represents the combined

explosives weight of all energetics contained in a munitions item. Explosive limits have been established for the SDC unit and these limits shall not be exceeded at any time. The volume of WMM treated at the SDC unit may vary based on the disposal and demilitarization needs of DoD but shall not exceed the limits below. Conventional WMM listed in Table IV.C. of the permit application (including small arms, projectiles, mines, rockets, grenades, pyrotechnics, and explosives contaminated material, toxic containing materials, fuses, detonators, etc.), mustard containing chemical munitions, and secondary waste generated by the SDC may be processed in the SDC provided the following boundary conditions are not exceeded. An event shall be defined as processing of one tray within the SDC.

i. No shape charges unless shape charge is disengaged or altered prior to feeding in order to prevent equipment damage,

ii. Mustard agent ≤ 56.6 lbs/hr (see table 5-2).

iii. Overall weight < 330.7 lbs/event (including feed tray) (see table 5-4),

iv. Chlorine < 11.1 lbs/event (see table 5-4),

v. Sulfur < 6.3 lbs/event (see table 5-4),

vi. Non-Mass Detonating Explosives < 6.7 lbs NEW/event (see table 5-4), and

vii. Mass Detonating Explosives < 6.7 lbs NEW/event (see table 5-4).

d. Maintenance

i. All RCRA and MACT required process monitors shall be equipped with alarms operated to warn of deviation from the limits specified in Table 5-1.

ii. Modifications to the design plans, specifications, and operating conditions in the ANCDF Application for the SDC shall be allowed only IAW Permit Condition II.A.2.

iii. Prior to treating hazardous waste in the SDC unit, the Permittee shall install and test all process monitoring and control instrumentation specified in Table 5-1 according to manufacturer specifications and the ANCDF Laboratory Analysis and Monitoring Plan (LAMP).

iv. The Permittee shall not process hazardous waste in the SDC until such time that the Permittee has demonstrated compliance with the

certification of construction or modification requirements, as specified in Permit Condition I.E.14 of this permit.

v. The Permittee shall maintain the SDC during systemization, emissions testing, post emissions testing, and normal operating periods such that when operated IAW the operating requirements specified in this Permit, it shall meet the applicable performance standards specified in the Emissions Test Plan and Section V.D.3.f of this permit.

vi. The off-gas treatment system (OGT and carbon filtration system shall be maintained and operated so as to minimize the emissions of air contaminants. This equipment shall be properly operated and maintained in accordance with Section III.K of the facility permit application. Carbon filter disposal shall be managed in accordance with Section III.K.C.2a and Table III K-5 of the facility permit application.

vii. SDC Carbon Filtration Systems shall be monitored in accordance with the ANCDF LAMP and the RCRA Permit.

a) The OGT Safeguard Filtration unit must be operational at all times during Chemical or Conventional WMM processing. If agent breakthrough is confirmed by mid-bed monitoring with DAAMS (>) 0.2 Allowable Stack Concentration (ASC), then the filter must be taken out of service until both carbon banks have been replaced and leak checked.

b) The SDC-Sprung Structure Filtration unit must be operational at all times during Chemical Agent operations and until agent decontamination at the SDC is complete. If agent breakthrough is indicated by mid-bed monitoring with DAAMS at (>) STL, then the filter must be taken out of service until banks 1 and 2 have been replaced and leak checked.

c) The first bank of each carbon filtration unit shall contain Sulfur Impregnated Carbon (SIC) as demonstrated during emissions testing for mercury removal.

e. Emissions Test Plan and Data Submittal

i. The Permittee shall operate and monitor the SDC unit during the short-term periods (systemization, emissions testing, and post emissions testing) as specified in the approved Emissions Test Plan for both mustard and conventional munitions dated February 2010 and revised August 2010.

ii. The emissions test plan for both mustard and conventional munitions shall be submitted by the Permittee as a request for major permit modification(s) at least 180 calendar days prior to the proposed start date of the systemization period for each test. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed.

iii. The emissions test plan shall define operating conditions and waste feed rates that shall be used to determine SDC performance IAW AAC 335-14-8-.06(2)(b).

iv. The Permittee shall not start a systemization period in the SDC unit until the Department has approved the emissions test plan for the SDC unit.

v. The Permittee shall submit a summary of all data collected during the emissions test to the Department upon completion of each test period. The Permittee shall submit to the Department an emissions test report within 90 calendar days of completion of each test. All submissions shall be certified IAW AAC 335-14-8-.02(2).

vi. If the preliminary calculations show that one or more of the performance standards listed in this permit for the SDC were not met during the emissions test, the Permittee shall immediately stop waste feed to the SDC system. The Department shall be verbally notified within 24 hours of this discovery. If necessary, a revised post-emissions test feed rate may be submitted to the Department for approval.

f. Systemization

i. The systemization period for the SDC shall be conducted IAW the approved emissions test plans provided.

ii. The systemization period for the SDC shall begin with the introduction of conventional munitions into the SDC unit and shall end with the start of the emissions test. There will be a separate systemization period for the mustard munitions emissions test.

iii. Each systemization period shall not exceed 720 operating hours. The Permittee may petition the Department for one extension of any systemization period for up to 720 additional operational hours IAW AAC 335-14-8-.06(2)(a).

g. Reporting

i. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced

with mustard agent stack gas monitors and ambient air mustard agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

a) Identification of the monitor experiencing the problem

b) Identification of the type of problem

c) Date the problem was experienced

d) Frequency of the problem

e) Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW AAC 335-3-11-.06 [56] within 60 calendar days of the date of the tests.

h. Performance Standards

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the SDC must achieve a destruction and removal efficiency (DRE) of 99.9999% for mustard agent (HD/HT). The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall control emissions of products of incomplete combustion (PICs) from the stack such that the CO level in the stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

iii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall monitor emissions of mustard agent being treated from the SDC using an ACAMS installed at the stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	HD/HT
ROHA	0.006
Instantaneous	0.03

iv. During the systemization, emissions test, post-emissions test, and normal operating periods, the PM emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

v. During the systemization and emissions test periods, emissions limits must be established for the following parameters in grams/second (g/s);

a) HCl emissions

b) Metal emission rates for antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorous, selenium, silver, thallium, tin, vanadium, and zinc

c) Volatile, semivolatile, and total organic compound emissions

d) Dioxin/furan emissions

e) Energetic emissions

During normal operations, the established emissions limits shall be met by limiting the overall feed rate into the SDC. The Permittee shall submit a request to modify this permit to include numerically specified data for the above parameters not later than 90 days following the emissions test.

i. Limitations on Waste Feed

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall treat only the hazardous wastes that meet the requirements listed in Section V.D.3.c and Table 5-2 and in compliance with the operating requirements specified in Condition V.D.3.h.

ii. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC

at rates up to 50 % of the maximum feed rates indicated in Tables 5-2 for all hazardous waste processing.

iii. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 75% of the maximum feed rates indicated in Tables 5-2 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Section V.D.3.h.

iv. After successful completion of the Emissions Test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 100% of the maximum feed rates demonstrated during the previous emissions test for the SDC upon submittal and Departmental approval of the following:

a) A complete emissions test report,

b) A submittal proposing operating conditions for post-emissions test and normal operating periods; and

c) An updated RAA and/or a final HHRA report.

v. Reserve flush tank solution meeting the requirements in Section V.D.3. may be fed to the SDC during the systemization, emissions test, post-emissions test, and normal operating periods.

vi. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall verify that the waste feed is within the physical and chemical composition limits specified in this Permit. Mustard agent and metal feed rates will be based upon the results of emissions testing. Feed rates for sulfur, chlorine and energetics (NEW) will be established by using munitions specific data available from MIDAS. Feed determinations must be made for each feed event to the SDC. One determination is sufficient for identical feed trays.

vii. During the systemization and emissions testing periods, the SDC is limited to only the conventional munitions from the ANAD storage igloos which are required to conduct performance and emissions testing. This includes up to 68 pyrotechnic rounds and up to 24 60mm rounds per hour. Normal operating periods for the SDC may include conventional munitions processing upon completion of the chemical weapons stockpile destruction and decontamination of the unit.

viii. During the systemization, emissions testing, post-emissions testing, and normal operating periods, the SDC will only process from the ANAD chemical weapons stockpile overpacked mustard munitions, reject mustard munitions, mustard munitions with limited safety features, and mustard munitions necessary for demonstrating testing such as emissions testing and feasibility until such time as all chemical stockpile items have been destroyed. Upon completion of the stockpile and decontamination of the unit, the SDC may be used to process conventional munitions in accordance with the conditions of this permit.

j. Operating Conditions

i. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall operate the SDC in order to maintain the system and process parameters listed in Table 5-1.

ii. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall operate the FPI systems, specified in Table 5-1, to automatically prohibit waste feed to the SDC when the monitored operating conditions deviate from the setpoints specified in Table 5-1.

iii. After approval of the emissions test report, the Permittee shall operate the SDC in accordance with the feed limitations specified in this Section. The agent waste feed shall be limited to the rates specified in Table 5-2.

k. Monitoring Requirements

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table 5-1 while treating hazardous waste.

ii. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall not treat any hazardous waste in the SDC at any time if any of the monitoring instruments listed in Table 5-1, fail to operate properly.

l. Feed Prohibitive Interlock (FPI) Requirements

i. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall operate the systems, specified in Table 5-1, to automatically prohibit hazardous waste

feed to the SDC when the monitored operating conditions deviate from the setpoints specified in Table 5-1. The destruction sequence may not resume until the parameter(s) which cause the interlock is/are restored to permit limits and all other parameters are within permit limits.

ii. In the event of a malfunction of the FPI systems listed in Table 5-1 during the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed prohibitive condition is/are restored to permit limits and all other parameters are within permit limits.

iii. During the systemization, emissions test, post-emissions test and normal operating periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition V.D.3.i unless the deviation automatically activates the FPI sequence.

V.E. INSPECTION

The Permittee is required to conduct routine inspections at the OB, OD, and SDC units. During such inspections, the Permittee will check for malfunction and/or deterioration, operator error, and evidence of discharge, that may cause or lead to the release of hazardous constituents or that may have caused or lead to a potential threat to human health or the environment. These inspections shall be conducted at frequencies specified in Tables III.K-3, IV.J-3, and IV.F-1 of the facility permit application.

Any equipment or structure deterioration or malfunction (i.e., non-compliance) identified in the inspection must be promptly remedied to ensure the non-compliance does not cause environmental or human health hazard. If a hazard is determined to be imminent, or has already occurred, remedial action must be taken immediately. No further OB, OD, or SDC operation is allowed to commence if the non-compliance has the potential to cause imminent hazard. The Department shall be notified within 24 hours of the determination of an imminent hazard in accordance with the reporting requirements of Conditions I.17 and I.18 of this permit.

OB and OD inspections shall be performed in accordance with Section IV.F-2 of the permit application. OB and OD inspections shall be documented in accordance with Figures IV.F-1, IV.F-2, and IV.F-3 (inspection log sheets) of the facility permit application.

SDC inspections shall be performed in accordance with Sections III.K.F and IV.J.F of the permit application and in accordance with the SDC inspection log sheets.

V.F. GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program shall be established for the OB and OD units in accordance with the requirements in Module X of this permit.

V.G. AIR MONITORING

The Permittee shall operate the thermal treatment units to protect human health of on-site workers and off-site receptors and to minimize significant effects to the ecosystem surrounding the treatment areas. The Permittee shall adhere to the following conditions to minimize risk of cancer and non-cancer effects due to exposure to thermal treatment air emissions:

1. The Permittee shall conduct a Human Health and Ecological Risk Assessment based upon operational limits of the thermal treatment units in Section V.C of this permit.

2. A cumulative assessment of cancer risk to off-site receptors posed by the Anniston Chemical Agent Disposal Facility (ANCDF) and ANAD's OB, OD, and SDC units must be evaluated to determine cancer risk. Results of the cumulative evaluation must indicate that the summation of the risk estimates is below the cancer risk factor of 1×10^{-5}.

3. The maximum NEW, including donors and initiators, to be treated shall not exceed the values in Condition V.D.

4. Any changes in operational limits of the thermal treatment units shall require submission of a revised risk assessment to the Department under permit modification pursuant to condition I.K of this permit.

5. The Permittee shall perform sampling and analysis of the waste and exhaust emissions at the SDC to verify that the operating requirements established in the permit achieve the performance standards delineated in this Permit. Initial testing must be done within 6 months after start up of the SDC. Subsequent tests shall be conducted no later than 61 months after the previous test. The Department must be notified in writing at least one year prior to the scheduled date of the test.

6. During the systemization, emissions test, and post-emissions test periods for the SDC, the Permittee shall calibrate the oxygen (O_2) and carbon monoxide (CO) Continuous Emissions Monitoring Systems (CEMS) specified in this Permit IAW the Performance Specifications for CEMS referenced by AAC 335-3-11-.06[56].

V.H. CLOSURE AND POST-CLOSURE PLAN

The Permittee shall close the OB, OD, and SDC units in accordance with ADEM Admin. Code R. 335-14-5-.07 and Sections III.K.I, VI.K.I, and IV.I of the facility permit application. If clean closure according to ADEM Admin. Code R. 335-14-5-.07(2) cannot be obtained, then the Permittee shall submit a post-closure plan as part of a permit modification in accordance with Permit Condition I.K.

1. Closure Procedures

   a. All untreated reactive hazardous wastes, contaminated ash residue, unexploded ordnance (UXO), contaminated concrete pads, and contaminated soils shall be removed from the OB and OD units as described in Section IV.G of the facility permit application and disposed in accordance with all state and Federal regulations governing hazardous waste handling and disposal.

   b. All burn pans and lids shall be decontaminated or disposed as required by ADEM Admin. Code R 335-14-5-.07(5) and as described in Section IV.G of the facility permit application. Decontaminated burn pans and lids may be removed from the OB unit and disposed as scrap metal or may be put to other use at ANAD. All SDC equipment shall be decontaminated or disposed of as required by ADEM Admin. Code R335-14-5-.07(5) and as described in Sections III.K.I and IV.K.I of the facility permit application.

   c. Concrete pads shall be decontaminated and/or cleaned to remove untreated waste and/or ashes as required by ADEM Admin. Code R 335-14-5-.07 and as described in Section IV.I of the facility permit application. The supports and pads may be left in place if decontaminated to acceptable criteria approved by the Department or disposed of as a non-hazardous waste. If concrete cannot be cleaned and properly decontaminated, it shall be disposed of in accordance with Permit Condition V.H.1.a.

   d. All soil in the OB and OD unit areas shall be sampled for contamination in accordance with the ADEM approved closure plan required by Permit Condition V.H. If removal or remediation of all contaminated soil cannot be attained during approved closure activities, the OB and OD units shall be closed in accordance with ADEM Admin. Code R 335-14-5-.07 and an approved post-closure plan.

   e. If the OB, OD, and SDC units cannot be clean-closed and certified for unrestricted use pursuant to the Uniform Environmental Covenant Act (UECA)[AAC 335-5], then a Land Use Control Plan must be developed and submitted in the post-closure plan.

2. Groundwater

a. Groundwater underlying the OB and OD units is required to be monitored throughout the operating life of the OB and OD units in accordance with Permit Conditions X.A through X.E and Section IV.I of the facility permit application. If at the time of closure the current and historical groundwater monitoring results indicate no evidence of contamination from the OB and OD units, then the groundwater will be considered un-impacted by OB and OD operations. If groundwater contamination is present from OB and OD operations, then the Permittee must address continued groundwater monitoring and corrective action in the post-closure plan.

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Table 5-1: FPI Conditions for Mustard and Conventional WMM[1]

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	362 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000°F (Permit Required Temperature)
SDC-FPI-03	TICS 310 AVG	Thermal Oxidizer Temperature	MIN	1,400° F (Permit Required Temperature)
SDC-FPI-04	PICS 310 AVG	Thermal Oxidizer Pressure	MAX	0.0 psi
SDC-FPI-05	TICS 320 AVG	Spray Dryer Temperature	MAX	500° F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.3 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	1.0 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	0.5 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	190°F
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200°F
SDC-11	SDC 038 A/B/C	Chemical Agent Emissions (Common Stack)	MAX	0.03 mg/m^3 (instantaneous)
SDC-12	SDC 038 A/B/C	Chemical Agent Emissions (Common Stack)	MAX	0.006 mg/m^3 (ROHA)
SDC-13	AAHH-900	CO Concentration	MAX	100 ppm, dry basis @ 7% O_2 (ROHA)

Footnote:

1. Operational parameter(s) interlock will prohibit the transfer from loading chamber 1 into chamber 2 until all conditions are met or are within range. These conditions will be re-established as necessary upon approval of Condition 4b Emissions Test Report.

Abbreviations:

%.....percent
°F .....degrees Fahrenheit
FPI .....feed prohibitive interlock
MAX.....maximum
MIN .....minimum
ppm.....parts per million
ROHA.....rolling hourly average
TBD .....to be determined
@ .....at
CO.....carbon monoxide
cfm.....cubic feet per minute
mg/m^3.....milligrams per cubic meter
O_2.....oxygen
psi .....pounds per square inch
SDC .....Static Detonation Chamber
WMM .....waste military munition

Table 5-2: Systemization, Emissions Test, Post-Emissions Test, and Normal Operations Feed Rates for Mustard and Conventional WMM

Munition Type	Munition Content (lbs/munition)		Feed Rate (munitions/hr)(1)	Total Feed Rate (lbs/tray)		Total Feed Rate (lbs/hr) (1)	
	Agent	Explosive		Agent	Explosive	Agent	Explosive
4.2-inch Mortars	6.0	0.14	10	12	0.29	56.6	1.44
105mm Projectiles	2.97	0.26	19	11.9	1.04	56.6	4.94
155mm Projectiles	11.7	0.41	3	23.4	0.82	56.6	1.23
Combined	N/A	N/A	6(2)	12	0.66	56.6	1.33
Conventional	N/A	6.7	N/A	N/A	6.7	N/A	134

Footnotes:
1. Rates subject to 50% and 75% Post-Emissions Test Limitations IAW permit conditions V.D.3.i.ii-iii. Combined example shown for one (1) over packed mortar, with two (2) 105mm projectiles twice per hour.

Table 5-3: Metal Feed Rates for Munitions and WMM Feed Events

Metal	Total Feed Rate (lbs/hr) (1)	Metal	Total Feed Rate (lbs/hr) (1)
Antimony	1.23E-01	Manganese	3.37E-01
Arsenic	1.11E-01	Mercury	1.36E-02
Barium	2.46	Nickel	2.46E-02
Beryllium	8.52E-04	Phosphorus	4.95E-01
Boron	7.53E-02	Selenium	1.58E-03
Cadmium	1.16E-03	Silver	2.61E-03
Chromium	9.50E-01	Thallium	3.27E-04
Cobalt	8.67E-03	Tin	5.15E-02
Copper	8.96E-02	Vanadium	1.02E-03
Lead	3.59	Zinc	6.89E-02

Footnotes:
1. Rates subject to 50% and 75% Post-Emissions Test Limitations

MODULE VI: INCINERATION – SHAKEDOWN, TRIAL-BURN AND POST TRIAL-BURN

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MODULE VI: INCINERATION – SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN

This module covers the incinerator shakedown, trial burn, and post-trial burn periods for each incinerator. For clarity, this module is organized as follows:

- Section VI.A. - Conditions applicable to all incinerators,
- Section VI.B. - Liquid Incinerator,
- Section VI.C. - Metal Parts Furnace,
- Section VI.D. - Deactivation Furnace System, and
- Section VI.E. - Combined stack for the LIC, MPF, and DFS.

VI.A. GENERAL CONDITIONS DURING SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN FOR ALL INCINERATORS AT THE ANCDF SITE

1. Maintenance

a. All process monitors required, pursuant to Conditions VI.B.4., VI.C.4, VI.D.4., and VI.E.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Tables 6-3, 6-7, 7-3, 7-7, and 7-10.

b. Modifications to the design plans and specifications in the ANCDF Application for any incinerator shall be allowed only IAW Condition II.A.2.

c. Prior to treating hazardous waste in any incinerator, the Permittee shall install and test all process monitoring and control instrumentation specified in Tables 7-3, 7-7, and 7-10 for the incinerators IAW the design plans in Sections D-5 through D-7 of the ANCDF Application.

d. The Permittee shall not feed hazardous wastes into any incinerator until such time that the Permittee has demonstrated compliance with the certification of construction or modification requirements, as specified in Condition I.E.14.

e. The Permittee shall maintain each incinerator during shakedown, trial burn, and post-trial burn periods such that when operated, IAW the operating requirements specified in this Permit, it shall meet the applicable performance standards specified in Conditions VI.B.1., VI.C.1., VI.D.1., and VI.E.1.

f. All air pollution control devices and capture systems for which this Permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

2. Inspection Requirements

a. The Permittee shall inspect each incinerator IAW the Inspection Schedule (see Section III F-2 of the Application).

b. The inspection data for each incinerator shall be recorded, and the records shall be placed in the operating record for the respective incinerator, IAW Condition II.I.

3. Monitoring Requirements

a. Upon receipt of a written request from the Department, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the permit achieve the performance standards delineated in this Permit.

b. All monitoring, recording, maintenance, calibration, and test data shall be recorded and the records for each incinerator shall be placed in the operating record for each respective incinerator, IAW Condition II.I.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall calibrate the oxygen (O_2) and carbon monoxide (CO) Continuous Emission Monitoring Systems (CEMS) specified in this Permit IAW the Performance Specifications for CEMS referenced by AAC 335-3-11-.06[56].

4. Recordkeeping

a. The Permittee shall record and maintain in the operating record for each incinerator, all monitoring and inspection data compiled under the conditions of this Permit, IAW Condition II.I.

b. The Permittee shall record in the operating record the date, time, and duration of all AWFCOs, including the triggering parameters, reason for the deviation, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the AWFCO function failures, including the corrective measures taken to correct the condition that caused the failure.

c. A quarterly report as defined below will be submitted to the Director each calendar quarter within 30 days following the end of the quarter. The report will include the following information (all times in hours) (operating time does not include standby):

i. Total operating time since introduction of agent in device,

ii. Operating time in quarter (by Month), which is defined as rolling 12 month total)

iii. Date/time of all startups and shutdowns,

iv. Date/time/duration/cause/corrective action taken for all shutdowns caused by malfunction of either process or control equipment, and

v. Date/time/duration/cause/corrective action taken for all instances of waste feed cutoff.

5. **Trial Burn Plan and Data Submittal**

a. The Permittee shall operate and monitor each incinerator during the short-term periods (shakedown, trial burn, and post-trial burn) as specified in Module VI and in the trial burn plans for each different chemical agent for the applicable furnace.

b. The individual trial burn plan for each different chemical agent for the incinerator treating such agent shall be submitted by the Permittee as major permit modification(s) at least 180 calendar days prior to the proposed start date of the shakedown period for each trial burn. All applicable public comment periods and notifications as required by AAC 335-14-8-.04(2) shall be followed.

c. The trial burn plans shall define operating conditions and waste feed rates that shall be used to determine incinerator performance IAW AAC 335-14-8-.06(2)(b). The trial burn plans shall also include ramp up procedures during the shakedown periods and a plan detailing the allocation of resources during the shakedown and trial burn periods. Shakedown periods shall not begin until permit modifications IAW Condition VI.A.5.b. have been approved by the Department.

d. The Permittee may not start a shakedown period in any furnace system until the Department has approved the specific trial burn plan for that furnace system.

e. The Permittee shall submit a summary of all data collected during the trial burn to the Department upon completion of each trial burn period. The Permittee shall submit to the Department a trial burn test report within 90 calendar days of completion of each trial burn. All submissions shall be certified IAW AAC 335-14-8-.02(2).

f. If the preliminary calculations show that one or more of the performance standards listed in this permit for the respective incinerator were not met during the trial burn, the Permittee shall immediately stop waste feed to the incinerator system. The Department shall be verbally notified within 24 hours of this discovery. As necessary, a revised post-trial burn feed rate may be submitted to the Department for approval that shall allow the Permittee to dispose of the remaining hazardous wastes present in the tank systems.

6. **Shakedown**

a. Shakedown periods for each incinerator shall be conducted IAW the approved trial burn plans provided for in Condition VI.A.5.

b. Shakedown periods for each incinerator shall begin with the introduction of chemical agent into the furnace system and shall end with the start of

the trial burn. There shall be a separate shakedown period for each chemical agent.

c. Each shakedown period shall not exceed 720 operating hours. The Permittee may petition the Department for one extension of any shakedown period for up to 720 additional operational hours IAW AAC 335-14-8-.06(2)(a).

d. A natural gas-only trial burn, consisting of three valid test runs, shall be performed as part of the initial agent trial burn (ATB) for each furnace/incinerator system. The natural gas-only trial burn for each furnace/incinerator system shall commence at a time to be determined by the Department and shall occur during either the agent shakedown period or within a reasonable time as determined by the Department after the commencement of the initial trial burn for that furnace/incinerator. The sample locations and parameters collected and analyzed from the natural gas-only trial burn shall be the same as those collected/analyzed from the ATB for that system.

7. <u>Reporting</u>

a. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced with hydrogen chloride (HCl), and chemical agent stack gas monitors and ambient air chemical agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

i. Identification of the monitor experiencing the problem;

ii. Identification of the type of problem (e.g., borderline or deficient recoveries);

iii. Date problem experienced;

iv. Frequency of problem; and

v. Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW Condition VI.A.7.i. within 60 calendar days of the date of the tests.

VI.B. LIQUID INCINERATOR

1. <u>Performance Standards</u>

a. During the shakedown, trial burn, and post-trial burn periods, the LIC must achieve a destruction and removal efficiency (DRE) of 99.9999% for the chemical agents GB, VX, and Mustard (HD/HT). The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the particulate matter (PM) emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dry standard cubic feet (dscf).

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the LIC shall not exceed 5.99E-03 grams per second (g/s). The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the LIC as specified in Condition VI.B.2.g.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the LIC shall not be exceeded:

Antimony	6.44E-05 g/s	Arsenic	9.73E-05 g/s
Barium	6.44E-05 g/s	Beryllium	1.29E-05 g/s
Boron	1.70E-03 g/s	Cadmium	1.61E-05 g/s
Chromium	1.88E-05 g/s	Cobalt	3.22E-05 g/s
Copper	3.22E-05 g/s	Lead	1.98E-04 g/s
Manganese	2.47E-03 g/s	Mercury	3.08E-05 g/s
Nickel	3.22E-05 g/s	Phosphorous	2.54E-03 g/s
Selenium	3.30E-05 g/s	Silver	6.44E-05 g/s
Thallium	6.44E-06 g/s	Tin	1.22E-04 g/s
Vanadium	3.83E-05 g/s	Zinc	9.96E-04 g/s

The above emission limits shall be met by limiting feed rate of each metal into the LIC as specified in Condition VI.B.2.g.

e. During the shakedown period, trial burn, and post-trial burn periods, the following emission rates from the LIC shall not be exceeded:

HCl	5.99E-03 g/s	Cl_2	5.99E-03 g/s
HF	1.21E-02 g/s	Tetra CDD	3.32E-11 g/s
Penta CDD	1.66E-10 g/s	Hexa CDD	4.98E-10 g/s
Hepta CDD	1.66E-10 g/s	Octa CDD	3.32E-10 g/s
Tetra CDF	4.81E-11 g/s	Penta CDF	3.32E-10 g/s
Hexa CDF	6.64E-10 g/s	Hepta CDF	4.68E-10 g/s

Octa CDF	3.32E-10 g/s	Benzene	1.36E-04 g/s
Vinyl Chloride	1.82E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the LIC.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emissions of products of incomplete combustion (PICs) from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor emissions of chemical agents being treated from the LIC using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.B.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.B.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.B.3. is not sufficient to ensure compliance with the performance standards specified in Conditions VI.B.1.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. Limitation on Waste Feed

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall incinerate only the hazardous wastes in Table 6-1 in the LIC, in compliance with the operating requirements specified in Condition VI.B.3.

b. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-1 and 6-2 and shall not deviate from the operating conditions specified in Tables 6-3 and 7-3.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-1 and 6-2 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.B.1.

d. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the LIC up to 100% of the maximum feed rates demonstrated during the previous trial burn for the LIC upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

e. SDS and aqueous laboratory liquids may be fed to the secondary chamber of the LIC during the shakedown period only when the operating conditions as specified in Condition VI.B.3. are satisfied.

f. During the trial burn and post-trial burn the SDS and laboratory aqueous liquid wastes shall be fed only into the secondary combustion chamber of the LIC with, or without, the chemical agent feed to the primary combustion chamber.

g. During the shakedown, trial burn, and post-trial burn periods, the feed rates of metals and chlorine/chloride to the LIC shall not exceed the limits in Table 6-2.

h. During the chemical agent post-trial burn periods, the Permittee shall incinerate the chemical agent that has been test burned during a preceding ATB at the feed rates specified in Table 6-1.

i. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall conduct sufficient analysis of the waste treated in the LIC to verify that the waste feed is within the physical and chemical composition limits specified in this Permit.

j. Only one chemical agent shall be fed to the LIC, at any given time.

3. <u>Operating Conditions</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the LIC in order to maintain the system and process parameters listed in Table 7-1 within the ranges or setpoints specified in Table 7-1.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems, specified in Table 6-3, to

automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 6-3.

c. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the LIC has operated within the planned trial burn operating setpoints in Table 6-3 and at a minimum of 90% of the feed rates in Table 6-1 for a minimum of an 8 consecutive hour period on 2 consecutive processing days.

d. The Permittee shall not burn chemical agent in the primary combustion chamber of the LIC until the primary and secondary combustion chambers are within the operating parameters in Conditions VI.B.3.a. and b.

e. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the LIC until agent concentration within the LIC primary chamber room is below 1 ASC.

4. <u>Monitoring Requirements</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 6-3 and 7-3, while incinerating hazardous waste.

b. During the shakedown, trial burn, and post-trial burn periods, hazardous wastes shall not be fed to the LIC if any of the monitoring instruments listed in Table 7-3, fail to operate properly.

5. <u>Waste Feed Cut-Off Requirements</u>

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the systems, specified in Table 6-3, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 6-3. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 6-3 during the shakedown, trial burn, and post-trial burn, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the

operating conditions deviate from the limits specified in Condition VI.B.3. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.B.5.i.

VI.C. METAL PARTS FURNACE

1. Performance Standards

a. During the shakedown, trial burn, and post-trial burn periods, the MPF shall achieve a DRE of 99.9999% for the chemical agents GB, VX, and Mustard (HD/HT) and secondary waste-like material using surrogate potential organic hazardous constituents (POHCs) Hexachloroethane and Monochlorobenzene. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the PM emission from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the MPF shall not exceed 8.18E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the MPF as specified in Condition VI.C.2.e.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the MPF shall not be exceeded:

Antimony	1.19 E-04 g/s	Arsenic	8.52 E-05 g/s
Barium	2.95 E-04 g/s	Beryllium	2.38 E-05 g/s
Boron	2.29 E-03 g/s	Cadmium	7.30 E-05 g/s
Chromium	8.62 E-05 g/s	Cobalt	5.95 E-05 g/s
Copper	5.95 E-05 g/s	Lead	1.82 E-04 g/s
Manganese	1.57 E-03 g/s	Mercury	4.29 E-05 g/s
Nickel	1.46 E-04 g/s	Phosphorous	1.16 E-03 g/s
Selenium	7.23 E-05 g/s	Silver	1.19 E-04 g/s
Thallium	1.19 E-05 g/s	Tin	1.19 E-04 g/s
Vanadium	2.38 E-05 g/s	Zinc	2.09 E-04 g/s

The above emission limits shall be met by limiting feed rate of each metal into the MPF as specified in Condition VI.C.2.e.

e. During the shakedown, trial burn, and post-trial burn periods, the following emission rates from the MPF shall not be exceeded:

HCl	8.18 E-03 g/s	Cl_2	2.58 E-02 g/s
HF	1.93 E-02 g/s	Tetra CDD	9.17 E-11 g/s
Penta CDD	4.58 E-10 g/s	Hexa CDD	4.58 E-10 g/s
Hepta CDD	4.58 E-10 g/s	Octa CDD	9.77 E-10 g/s
Tetra CDF	9.17 E-11 g/s	Penta CDF	7.64 E-10 g/s
Hexa CDF	1.20 E-09 g/s	Hepta CDF	2.28 E-09 g/s
Octa CDF	1.36 E-09 g/s	Benzene	3.16 E-04 g/s
Vinyl Chloride	5.66 E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the MPF.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emission of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor emissions of chemical agents being treated from the MPF using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.C.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.C.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.C.3., is not sufficient to ensure compliance with the performance standards specified in Conditions

VI.C.1.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. Limitation on Waste Feed

a. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-4, 6-5 and 6-6 and shall not deviate from the operating conditions specified in Tables 6-7 and 7-7.

b. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-4, 6-5 and 6-6 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.C.1.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the MPF up to 100% of the maximum feed rates demonstrated during the previous trial burn for the MPF upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

d. During the chemical agent shakedown, trial burn, and post-trial burn periods, the Permittee shall incinerate the hazardous wastes in Table 6-4 and 6-5, in compliance with the operating requirements specified in Condition VI.C.3.

e. During the shakedown, trial burn, and post-trial burn, the feed rates of metals and chlorine to the MPF shall not exceed the limits in Table 6-6.

f. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the MPF to verify that the waste feed is within the physical and chemical composition limits specified in this Permit.

g. Only one chemical agent munition type shall be fed to the MPF, at any given time.

3. **Operating Conditions**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the MPF in order to maintain the system and process parameters within the ranges or setpoints specified in Table 6-7.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems, specified in Table 6-7, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoints specified in Table 6-7.

c. Only one loaded tray/WIC containing the waste materials shall be fed into the MPF at any given time, with a minimum interval between each tray feed.

d. The hourly feed rate of the residual chemical agent contained in the MPF feed, which was calculated based on the estimated drain from each munition type and from the amount of chemical agent in the munitions, shall not exceed the limits provided in Table 6-5. The following should be performed for munitions that cannot be drained to below the approved agent feed rate:

i. The Permittee shall provide the Department verbal notice of the detection of the munition/ton container that cannot be drained to below the maximum feed rates as set forth in Table 6-5 indicating its type and its location (i.e., process line leading to furnace, temporary holding location) and the efforts expended to facilitate additional draining.

ii. The Permittee must provide the Department with written procedures for processing of munitions that cannot be drained to below the maximum feed rates as set forth in Table 6-5. Operating procedures must be consistent with the following:

(I) the temperature and residence time in Zones 1, 2, and 3 shall not vary from limits set forth in Table 6-7.

(II) The temperature maintained in the afterburner shall be IAW Conditions VI.C.3.a and b.

iii. The Permittee shall develop a vaporization curve and calculations for the munition type and the quantity of residual chemical agent..

iv. The Permittee receives approval from the Department for processing the munitions that cannot be drained to below the maximum feed rates as set forth in Table 6-5.

e. The Permittee shall keep a record of the percentage heel for each munition.

f. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the MPF has operated within the planned trial burn operating setpoints in Table 6-7 and at a minimum of 90% of the feed rates in Table 6-5 for a minimum of an 8 consecutive hour period on each of 2 consecutive processing days. (NOTE: Processing days for purposes of this requirement shall not be separated by more than 5 calendar days.)

g. The Permittee shall not burn chemical agent in the primary combustion chamber of the MPF until the primary chamber and afterburner are within the operating parameters in Conditions VI.C.3.a. and b.

h. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the MPF until agent concentration within the MPF primary chamber room is below 1 ASC.

i. Trays/WICs/containment devices containing secondary waste shall be prepared IAW limits in Table 6-4. In addition, they shall comply with the following requirements:

   i. Each tray/WIC/containment device shall contain only one type of waste (e.g. metal parts, wood, PPE, absorbent materials, sludge, etc.), or

   ii. If waste types are combined in a single tray/WIC/containment device;

      (I) Bulk metal shall be considered to be a metal item with less than 10% combustible material or aluminum integrated into the piece.

      (II) Rubblized concrete, refractory, and scabbled concrete shall be processed in WICs containing pans and heat transfer fins, and shall be filled to a maximum depth of 7 inches.

      (III) Sludge shall be processed in tray/WICs/containment devices to a depth no greater than 1.5 inches and shall not be fed in combination with any other waste.

      (IV) Bulk combustible waste is any combustible waste that is not polyethylene, polystyrene or halogenated plastic. When WICs are used to process bulk combustibles, metal pans should be placed in the WICs and,

         1. Waste shall be placed in the WIC loosely packed in plastic bags or spread evenly in the WIC. Wastes shall not be rolled or bunched.

2. Wood and other dense combustible items shall be placed towards the top of loaded WIC's.
3. Toxicological agents protective (TAP) gear and LSS air hoses shall not be processed together in the same WIC.
4. M-40 masks shall be limited to one (1) mask per WIC.
5. M-40 Respirator Cartridges shall be limited to 2 cartridges per WIC unless the cartridges are opened, exposing the cartridge interior prior to loading.

(V) All non-munition wastes that envelop an interior space (e.g., gauges, cans, escape air tanks, overpacks, glassware, etc.) must be opened or punctured before being placed in the MPF.

iii.. The permittee shall prepare an inventory/feed sheet of all secondary waste contents in each tray/WIC/containment device; to contain an inventory of each waste type, including weight, Btu value of each waste type, chlorine, and metal contents.

iv. Secondary waste shall not be processed in the MPF until the construction of the Cool-Down Conveyor enclosure has been certified and approved by the Department pursuant to Condition I.E.14. and a DRE of 99.9999% for agent has been documented to the Department.

j. Munitions and secondary waste shall not be fed to the MPF at the same time.

k. In the event of a low temperature related AWFCO while processing trays/WICs/containment devices in the primary chamber of the MPF, forward zone movement of trays/WICs shall be governed as follows:

i. Trays containing ton containers, or WICs containing bulk combustibles (defined as any combustible waste that is not polyethylene, polystyrene or halogenated plastics), or bulk wastes containing interior or enveloping spaces (i.e., pumps, gauges) will either be held in position, moved forward to the MPF Discharge Airlock awaiting return to the furnace to complete the necessary treatment cycle, or returned to the charge airlock or lower munitions corridor awaiting return to the furnace for treatment.

ii. Trays containing other munition types or WICs containing secondary waste other than bulk combustibles, will be assessed in

accordance with the treatment requirements identified in Tables 6-4 or 6-5 for the respective waste or munition type. Trays/WICs that have completed the entirety of the residence time identified in Tables 6-4 or 6-5, regardless of the Zone in which the treatment occurred, will be transferred to the MPF Discharge Airlock for monitoring and discharge in accordance with this Permit. Trays/WICs that have not completed the required residence times will be managed in accordance with the requirements specified in VI.C.3 k.i above.

When furnace conditions are returned to operating parameters listed in Table 6-7, all zone timers shall be reset to zero (0) and no forward zone movement shall occur until the residence times listed in Tables 6-4 and 6-5 are completed.

l. In the event of an ACAMS alarm in the MPF Cool-Down Conveyor enclosure, the Permittee shall immediately:

i. Cease hazardous waste feed into the charge airlock of the MPF and out of the discharge air lock of the MPF.

ii. Automatically secure the cool-down enclosure louvered discharge fans.

iii. Secure the enclosure area doors.

iv. Vent the enclosure through ducting into the LIC 1 Secondary Room and thus through the MDB HVAC.

v. Analyze DAAMS from all monitoring stations within the Cool-Down Conveyor enclosure for the time period up to and including the ACAMS alarm, and

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then waste feed may be restarted upon return to the operating parameters listed in Table 6-7.

(II) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VI.3.k.v.(II) and upon return to operating parameters listed in Table 6-7.

vi. Identify the tray/WIC/containment device that initiated the alarm and return it to the MPF for further treatment or overpack and process through the TMA.

4. **Monitoring Requirements**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 6-7 and 7-7, while incinerating hazardous waste.

b. During the shakedown, trial burn, and post-trial burn periods, hazardous wastes shall not be fed to the MPF if any of the monitoring instruments listed in Tables 6-7 and 7-7, fails to operate properly.

5. **Waste Feed Cut-Off Requirements**

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the systems, specified in Table 6-7, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoint specified in Table 6-7. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. During the shakedown, trial burn, and post-trial burn periods, in the event of a malfunction of the AWFCO systems listed in Table 6-7, the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cutoff or lockout is/are restored to permit limits and all other parameters are within permit limits.

c. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Table 6-7, unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.C.5.a.

d. During the shakedown, trial burn, and post-trial burn periods, the ACAMS monitoring the exhaust from the Metal parts Furnace Cool-Down Conveyor Enclosure (MPF-32 and MPF-33) may be operated as follows:

i. During the treatment of munitions or waste, the ACAMS may be taken off-line to perform maintenance or calibration under the following conditions:

I. No waste will be discharged from the MPF Discharge Airlock while the ACAMS are off-line.

II. Secondary waste meeting the definition of sludge has not been discharged from the MPF during a 1-hour period prior to taking the ACAMS off-line, and

III. No waste will be removed from the Cool-Down Conveyor Enclosure until the ACAMS has been returned to service and has been in operation for a period of at least 15-minutes.

ii. If the maintenance or calibration activities fail to return the ACAMS to service within two hours of taking the instrument off-line, no additional feed will be charged to the MPF until such time as the ACAMS has been returned to service.

VI.D. DEACTIVATION FURNACE SYSTEM

1. Performance Standards

a. During the shakedown, trial burn, and post-trial burn periods, the DFS must achieve a DRE of 99.9999% for the chemical agents GB and VX. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. During the shakedown, trial burn, and post-trial burn periods, the PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: Pc = corrected concentration of PM

Pm = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. During the shakedown, trial burn, and post-trial burn periods, the HCl emission from the DFS shall not exceed 8.46E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the DFS as specified in Condition VI.D.2.e.

d. During the shakedown, trial burn, and post-trial burn periods, the following metals emission rates from the DFS shall not be exceeded:

Antimony	1.53E-04 g/s	Arsenic	4.41E-05 g/s
Barium	8.82E-05 g/s	Beryllium	6.50E-06 g/s
Boron	1.95E-03 g/s	Cadmium	1.96E-05 g/s
Chromium	5.10E-05 g/s	Cobalt	1.76E-05 g/s
Copper	5.64E-05 g/s	Lead	5.21E-04 g/s
Manganese	4.42E-03 g/s	Mercury	1.54E-05 g/s
Nickel	3.20E-05 g/s	Phosphorous	1.18E-03 g/s
Selenium	4.41E-05 g/s	Silver	1.76E-05 g/s

Thallium	8.82E-06 g/s	Tin	1.80E-04 g/s
Vanadium	4.41E-05 g/s	Zinc	9.45E-04 g/s

The metals emission limits shall be met by limiting feed rate of each metal into the DFS as specified in Condition VI.D.2.e.

e. During the shakedown, trial burn, and post-trial burn periods, the emission from the DFS shall not exceed the following limits:

HCl	8.46E-03 g/s	Cl_2	9.09E-03 g/s
HF	1.77E-02 g/s	Tetra CDD	5.71E-11 g/s
Penta CDD	2.85E-10 g/s	Hexa CDD	8.55E-10 g/s
Hepta CDD	6.11E-10 g/s	Octa CDD	1.23E-09 g/s
Tetra CDF	1.87E-10 g/s	Penta CDF	6.10E-10 g/s
Hexa CDF	1.25E-09 g/s	Hepta CDF	7.27E-10 g/s
Octa CDF	5.71E-10 g/s	Benzene	2.30E-04 g/s
Vinyl Chloride	1.37E-05 g/s	Nitroglycerine	3.34E-05 g/s
2,4-Dintirotoluene	1.47E-05 g/s	2,6-Dinitrotoluene	1.47E-05 g/s
2,4,6-Trinitrotoluene	4.04E-05 g/s	Diphenylamine	2.90E-05 g/s
RDX	3.59E-05 g/s	HMX	2.71E-06 g/s

The above emission limits shall be met by limiting the overall feed rate into the DFS.

f. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall control emission of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall, not exceed 100 ppm, dry volume, over a ROHA.

$$Co_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. During the shakedown period, trial burn, and post-trial burn periods, the Permittee shall monitor and control emission of chemical agents from the DFS using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. During the shakedown, trial burn, and post-trial burn periods, compliance with the operating conditions specified in Condition VI.D.3., shall be regarded as compliance with the required performance standards identified in Conditions VI.D.1.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Condition VI.D.3. is not sufficient to ensure compliance with the performance standards specified in Conditions VI.D.1.g. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

2. <u>Limitation on Waste Feed</u>

a. After successful completion of the ATB the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 50% of the maximum post-trial burn feed rates indicated in Tables 6-8 and 6-9 and shall not deviate from the operating conditions specified in Table and 7-10.

b. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 75% of the maximum post-trial burn feed rates indicated in Tables 6-8 and 6-9 upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Conditions VI.D.1.

c. After successful completion of the ATB, the Permittee shall be authorized to commence hazardous waste feed to the DFS up to 100% of the maximum feed rates demonstrated during the previous trial burn for the DFS upon submittal and Departmental approval of the following:

   i. A complete trial burn report;

   ii. A submittal proposing operating conditions for post-trial burn and normal operating periods; and

   iii. A RAA and/or a final HRA report completed pursuant to Condition II.N.

d. During the ATB, the Permittee shall incinerate the hazardous wastes in Table 6-8 in the DFS, in compliance with the operating requirements specified in Condition VI.D.3.

e. During the shakedown, trial burn, and post-trial burn periods, the feed rate of metals and chlorine to the DFS shall not exceed the limits in Table 6-9.

f. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the DFS to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the WAP (see Section III C-2).

g. Only one chemical agent, or waste containing one chemical agent, shall be fed to the DFS, at any given time.

3. Operating Conditions

a. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the DFS in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-10.

b. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall operate the AWFCO systems to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints.

c. The Permittee shall not commence any trial burn period until documentation has been submitted to the Department verifying that the DFS has operated within the planned trial burn operating setpoints in Table 6-11 and at a minimum of 90% of the feed rates in Table 6-8 for a minimum of an 8 consecutive hour period on 2 consecutive processing days.

d. The rate of movement to the discharge conveyor shall be controlled during the GB and VX campaigns so as to provide a minimum solid retention time of 15 minutes inside the heated enclosure. Since the discharge conveyor will not be heated during the mustard campaign, this requirement will be met by either reducing the kiln speed or by placing the kiln in oscillation to ensure the treatment cycle is satisfied. This is only required for mustard contaminated components within the kiln

e. The rocket shear blade shall be sprayed with a SDS or process water (PRW) at all times when a rocket piece is at the blast gate and the shear blade is in operation; or at all times when a rocket piece is at the blast gate and the gate is jammed. The flow rate of the SDS or PRW to the rocket shear blade shall be continuously monitored and recorded during rocket processing operations.

f. A time delay of 30 seconds shall be provided for feeding M55 rocket sections before and after feeding fuses to the DFS, with the exception that tailfins from the previous rocket and nose plugs can be fed with the fuses.

g. The Permittee shall not burn chemical agent in the rotary kiln of the DFS until the rotary kiln and the afterburner are within the operating parameters in Conditions VI.D.3.a. and b.

h. During startup, with the afterburner temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the rotary kiln of the DFS until agent concentration within the DFS rotary kiln room is below 1 ASC.

i. The Permittee shall continue to operate the burners in the primary combustion chamber of the DFS for at least 21 minutes after feed to the DFS has ceased.

j. In the event of an ACAMS alarm in the Discharge Conveyor (DC) bin enclosure which occurs while the enclosure door is closed and the enclosure is under engineering controls, the Permittee shall immediately:

i. Stop waste feed.

ii. Place DFS kiln in oscillate mode.

iii. Stop DC motion.

iv. Recover and analyze A and B DAAMS tubes.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VI.3.j.iv.(II) and upon return to the operating parameters.

k. In the event of an ACAMS alarm in the DC bin enclosure which occurs while the enclosure door is open or the enclosure is otherwise not under engineering controls, the Permittee shall immediately:

i. Stop waste feed.

ii. Place DFS kiln in oscillate mode.

iii. Stop DC motion.

iv. Recover and analyze the associated DAAMS monitors.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(IV) Normal operations and waste feed may be restarted after completion of the requirements in Conditions VI.3.k.iv.(II) and (III) and upon return to the operating parameters.

l. In the event waste is charged to the DFS that has been contaminated with HD/HT, the permittee will ensure the waste is contained within the confines of the rotary kiln to ensure destruction of the agent prior to discharge from the kiln to the DC.

4. <u>Monitoring Requirements</u>

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table 7-10, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the DFS if any of the monitoring instruments listed in Table 7-10 fail to operate properly.

5. <u>Waste Feed Cut-Off Requirements</u>

a. The Permittee shall maintain the systems to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In case of a malfunction of the AWFCO systems the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VI.D.3., unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VI.D.5.a.

VI.E. COMMON STACK FOR LIC, MPF, AND DFS

1. During the shakedown, trial burn, and post-trial burn periods, the Permittee shall install and maintain three ACAMS in the common stack. The instruments installed on the common stack will be configured so that two are alternating sampling and analysis and the third is in standby to replace either of the two active instruments in case one must be removed from service for any reason.

2. During the shakedown, trial burn, and post-trial burn periods, the exhaust gas monitoring systems specified in Condition VI.E.1., shall be calibrated, inspected and operated IAW the applicable elements of Conditions VI.A.2. and VI.A.3.

3. During the shakedown, trial burn, and post-trial burn periods, the chemical agent emission from the common stack, monitored as specified in Condition VI.E.2., shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

4. During the shakedown, trial burn, and post-trial burn periods, the waste feeds to all contributing incinerator(s) shall be automatically cut-off or lock-out when the chemical agent emission level in the common stack exceeds the values specified in Condition VI.E.3.

Table 6-1: Maximum Feed Rates to the LIC

Feed Stream	Shakedown, Trial Burn, and Post-Trial Burn [ROHA]		Shakedown, Trial Burn, and Post-Trial Burn [2MRA (Hourly/30)(1.1)][1]	
	Agent	Surrogate	Agent	Surrogate
Surrogate	---	1,015 lbs/hr	---	37 lbs/2-min
GB	1,015 lbs/hr	---	34.5 lbs/2-min	---
VX	675 lbs/hr	---	22.5 lbs/2-min	---
HD	1275 lbs/hr	---	46.8 lbs/2-min	---
HT	1275 lbs/hr	---	46.8 lbs/2-min	---
SDS, Laboratory, Aqueous Liquid Wastes	2,000 lbs/hr when not processing agent or 1,600 lbs/hr when processing agent	2,000 lbs/hr	---	---

Footnote:
1 The feedrates listed in this table are the intended limits to be demonstrated during the associated agent trial burns. AWFCO limitations are contained in Table 6-3.

Abbreviations:
2MRA.....2-minute rolling average
lbs/2-min.....pounds per 2-minute average
ROHA.....rolling hourly average
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
SDS.....spent decontamination solution

Table 6-2: Maximum Metals and Chlorine/Chloride Feed Rates to the LIC during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	519.0
Antimony	0.4577
Arsenic	0.0865
Barium	0.0693
Beryllium	0.0229
Boron	4.655
Cadmium	0.0229
Chromium	0.0343
Cobalt	0.0286
Copper	0.1264
Lead	2.928
Manganese	0.1020
Mercury	0.0179
Nickel	0.0696
Phosphorus	243.2
Selenium	0.0347
Silver	0.3647
Thallium	0.2286
Tin	0.8686
Vanadium	0.0347
Zinc	0.8524

Abbreviations:
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
ROHA.....rolling hourly average

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-01	TAHH-710	Primary Chamber Temperature High-High	2,750° F	2,750° F	2,750° F	2,900° F
LIC-02	TSLL-710	Primary Chamber Temperature Low-Low	2,475° F	2,475° F	2,475° F	2,400° F
LIC-03	TAHH-782	Secondary Chamber Temperature High-High	2,150° F	2,150° F	2,150° F	2,200° F
LIC-04	TSLL-782	Secondary Chamber Temperature Low-Low	1,850° F	1,850° F	1,850° F	1,800° F
LIC-05	PSHH-845	Primary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc	-0.25 inwc with 10 second delay
LIC-06	PSHH-896	Secondary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc	-0.25 inwc with 10 second delay
LIC-07	PDAH-855	Secondary Chamber Flue Gas Flow Rate High	0.7 inwc	0.7 inwc	0.7 inwc	0.7 inwc with 10 second delay
LIC-08	AAHH-778C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA
LIC-09	AAHH-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis	15% dry basis
LIC-10	AALL-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis	3% dry basis
LIC-11	PSLL-737C	Primary Chamber Atomizing Air Pressure Low-Low	55 psig	55 psig	55 psig	55 psig
LIC-12	PSL-809	Secondary Chamber Atomizing Air Pressure Low	65 psig	65 psig	65 psig	65 psig
LIC-14	FAHH-731C	Feed Rate High-High 2MRA (hourly/30)(1.1)	47.3 lbs/2 min	25 lbs/2 min	37 lbs/2 min[2]	37 lbs/2 min
LIC-15	FAHH-731D	Feed Rate High-High ROHA	1,290 lbs/hr	740 lbs/hr	1,110 lbs/hr[2]	1,100 lbs/hr
LIC-16	FAHH-763	SDS Feed Rate High-High	1,600 lbs/hr			2,000 lbs/hr
LIC-17	PDALL-814	Venturi Scrubber Pressure Differential Low-Low	23 inwc	23 inwc	20 inwc	18 inwc

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-18	FALL-828	Venturi Scrubber Brine Flow Rate Low-Low	135 gpm with 10 second delay	135 gpm with 10 second delay	126 gpm with 10 second delay	126 gpm with 30 second delay
LIC-19	DAHH-835	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.28 sgu	1.28 sgu
LIC-20	FALL-825	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm	540 gpm
LIC-21	AALL-832	Scrubber Tower pH Low-Low	7.28	7.28	6.5	6.5
LIC-22	TSHH-800	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215° F	215° F
LIC-23	PALL-170	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig	25 psig
LIC-24	LSHH-02/06	Brine Surge Tank Level High-High	219 inches	219 inches	219 inches	18 feet 3 inches
LIC-25	PSLL-760	Chemical Agent Feed Pressure Low-Low	5 psig	5 psig	5 psig	Not applicable
LIC-26	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not applicable	Not applicable	0.0003 mg/m^3	Not applicable
LIC-27	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not applicable	Not applicable	0.00006 mg/m^3	Not applicable
LIC-28	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not applicable	Not applicable	0.0003 mg/m^3	Not Applicable
LIC-29	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	Not applicable	Not applicable	0.00006 mg/m^3	Not Applicable
LIC-30[3]	TAHH-433	PFS Carbon Filter Inlet Exhaust Gas Temperature High-High	180° F	180° F	180° F	Not Applicable
LIC-31[3]	PDAH-436B PDAH-438B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
LIC-32[3]	PDAH-436E PDAH-438E PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
LIC-33	ACAM-911-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3	Not Applicable	Not Applicable
LIC-34	ACAM-911-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3	Not Applicable	Not Applicable
LIC-35	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3	Not Applicable	Not Applicable
LIC-36	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006mg/m^3	Not Applicable	Not Applicable
LIC-37	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-38	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-39	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
LIC-40	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Footnotes:

(1) All values are instantaneous unless otherwise noted.

(2) Post-trial burn feed rate to be reduced to Table 6-1 limits within 24 hours of the conclusion of the trial burn period.

(3) Stop feed parameters only apply to the on-line PFS unit. PDAH-436B and E are installed within PFS-FILT-209 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the LIC through the MPF PFS or the common spare PFS. As such, PDAH-438B and E or PDAH-487B and E will be the units of measure in the event that the exhaust from the LIC is being channeled through any of the other filter units.

(4) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).

Table 6-3: LIC AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Abbreviations:

%.....percent
AAHH.....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm .....gallons per minute
inwc .....inches of water column
lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF .....Metal Parts Furnace
PALL .....pressure alarm high-high
PDAH .....pressure differential alarm high
PFS .....Pollution Abatement System Filtration System
PSHH .....pressure switch high-high
PSL .....pressure switch low
RCRA .....Resource Conservation and Recovery Act
SDS.....spent decontamination solution
TAHH .....temperature alarm high-high
2MRA.....2-minute rolling average
°F ..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF ..... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL ..... flow alarm low-low
HEPA..... high efficiency particulate air
lbs/2-min..... pounds per 2-minute average
LIC..... Liquid Incinerator
mg/m^3 ..... milligrams per cubic meter
O_2 ..... oxygen
PDAH ..... pressure differential alarm high
PDALL ..... pressure differential alarm low-low
ppm..... parts per million
psig ..... pounds per square inch gauge
PSLL..... pressure switch low-low
ROHA..... rolling hourly average
sgu ..... specific gravity unit
TSLL ..... temperature switch low-low

Table 6-4: Maximum Feed Rates of Secondary Waste to the MPF during Agent Shakedown, Trial Burn, and Post-Trial Burn

Secondary Waste Type	Max Units per Charge	Feed Interval per Charge[1] (min)	Max Weight per Charge (lbs)
Chlorine	---	90	93
Organic Material	---	90	335
Sludge	---	90	---[2]
Embedded Metals	---	90	1,920
BTU value (MM)	4	90	---

Footnotes:
(1) Time required in Zones 1 and 2 or as specified in VI.C.3.j.
(2) Sludge to be fed in containment pans, spread to a depth no greater than 1.5 inches.

Abbreviations:
BTU ..... British thermal unit
MM ..... million
MPF ..... Metal Parts Furnace
lbs ..... pounds
min ..... minutes

Table 6-5: Maximum Munition Feed Rates to the MPF during Agent Shakedown, Trial Burn, and Post-Trial Burn

Munition Type	Agent Type	Max Units per Tray	Feed Interval per Tray[a] (min)	Max Weight per Tray[b] (lbs)	Maximum Feed Rate (lbs/hr)[d]		
					VX	GB	HD/HT
M121A1 Proj., 155MM	VX	48	35	16.5	28.3	---	---
M121A1/M122 Proj., 155MM[c]	GB	48	35	---	---	148	---
M426 Proj., 8-inch	GB	27	35	---	---	148	---
M360 Proj., 105MM	GB	96	35	---	---	148	---
M2/M2A1 Proj., 4.2-inch (Condition 1 – proposed)	HD/HT	96	25	83.5	---	---	200.4
M2/M2A1 Proj., 4.2-inch (Condition 2 – 75% demonstrated)	HD/HT	96	60	540.9	---	---	600
M60 Proj., 105MM	HD	96	68	285	---	---	251.5
M110 Proj., 155MM	HD	48	80	562	---	---	421.5
Ton Container	HD	1	125	0 to ≤ 220	---	---	105.6
Ton Container	HD	1	140	>220 to ≤ 450	---	---	192.9
Ton Container	HD	1	165	>450 to ≤ 600	---	---	218.2

Footnotes:
(a) Time required in Zones 1 and 2 or as specified in VI.C.3.k.
(b) Agent only, does not include the weight of the base, tray, or munition bodies.
(c) Not to exceed 25% agent heel per munition. Permit Condition VI.C.2 feed rates shall also apply.
(d) The feedrates listed in this table are the intended limits to be demonstrated during the associated agent trial burns. AWFCO limitations are contained in Table 6-7. The instantaneous Maximum Feed Rate in pounds per hour is calculated by Max Weight per Tray (lbs) x 1 tray/feed interval (min) x 60 min/hr.

Abbreviations:
--- ..... not applicable
lbs ..... pounds
min ..... minutes
MPF ..... Metal Parts Furnace
% ..... percent
lbs/hr ..... pounds per hour
MM ..... millimeter

Table 6-6: Maximum Metals and Chlorine/Chloride Feed Rates to the MPF during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	312(1)
Antimony	0.9262(2)
Arsenic	0.2856(2)
Barium	11.37(2)
Beryllium	0.0167(2)
Boron	2.037(2)
Cadmium	5.862(2)
Chromium	3.277(2)
Cobalt	0.0418(2)
Copper	2.050(2)
Lead	20.51(2)
Manganese	0.7416(2)
Mercury	0.0583(2)
Nickel	5.862(2)
Phosphorus	60.8
Selenium	0.0508(2)
Silver	0.7323(2)
Thallium	0.0083(2)
Tin	0.1733(2)
Vanadium	0.0167(2)
Zinc	0.3702(2)

Footnotes:
(1) Maximum chlorine feed rate for munitions. Secondary waste chlorine maximum feed rates per Table 6-4 is 93 lbs/WIC.
(2) Feed Rates do not include embedded metal from such items as munition bodies.

Abbreviations:
lbs .....pounds
lbs/hr.....pounds per hour
MPF .....Metal Parts Furnace
ROHA.....rolling hourly average
WIC .....waste incineration container

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-01	TAHH-152	Primary Chamber Zone 1 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-02	TALL-152	Primary Chamber Zone 1 Temperature Low-Low [2]	1,175 ° F	1,175 ° F	1,125 ° F	1,000 ° F
MPF-03	TAHH-141	Primary Chamber Zone 2 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-04	TALL-141	Primary Chamber Zone 2 Temperature Low-Low [2]	1,175 ° F	1,175 ° F	1,125 ° F	1,000 ° F
MPF-05	TAHH-153	Primary Chamber Zone 3 Temperature High-High	1,705 ° F	1,705 ° F	1,705 ° F	1,800 ° F
MPF-06	TALL-153	Primary Chamber Zone 3 Temperature Low-Low [2]	1,175° F	1,175° F	1,125 ° F	1,000 ° F
MPF-07	TAHH-87	Afterburner Temperature High-High	2,250 ° F	2,150 ° F	2,150 ° F	2,150 ° F
MPF-08	TSLL-87	Afterburner Temperature Low-Low	1,772 ° F	1,772 ° F	1,720 ° F	1,600 ° F
MPF-09	PSHH-34	Primary Chamber Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-10	PSHH-390	Afterburner Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-11	PDAHH-786	Afterburner Flue Gas Flow Rate High-High	0.5 inwc	0.5 inwc	0.5 inwc	1.5 inwc
MPF-12	AAHH-384C	Exhaust Blower Duct Flue Gas CO Level High-High	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA	100ppm 7% O_2, dry basis ROHA
MPF-13	AAHH-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis	15% dry basis
MPF-14	AALL-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis	3% dry basis
MPF-15	Programmed Feed Permissive	Munitions Feed Rate High	Condition 1: 220 lbs/hr Condition 2: 704 lbs/hr	16.5 lbs/tray	300 lbs/hr [M426 Proj., 8-inch (GB)]	730 lbs/hr Surrogate
		Secondary Waste Feed Rate High	Chlorine: 93 lbs/ WIC Organic Material: 335 lbs/WIC Sludge: 1.5 inches in containment pan Embedded Metals: 1,920 lbs/WIC BTU: 4.0 MM/WIC			3,300 lbs/hr SWLM

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-16	PDALL-222	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc	18 inwc
MPF-17	FALL-218	Venturi Scrubber Brine Flow Rate Low-Low	130 gpm with 10-second delay	130 gpm with 10-second delay	130 gpm with 10-second delay	126 gpm with 30-second delay
MPF-18	DAHH-216	Venturi Scrubber Brine Density High-High	1.24 sgu	1.10 sgu	1.28 sgu	1.28 sgu
MPF-19	FALL-248	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm	540 gpm
MPF-20	AALL-247	Scrubber Tower pH Low-Low	7.12	7.12	6.5	6.5
MPF-21	BSLL-883 BSLL-884 BSLL-885 BSLL-886 BSLL-887 BSLL-888 BSLL-889 BSLL-890 BSLL-891 BSLL-892	Primary Chamber Flame Loss Low-Low	Zone 1 all burners out or 2 burners out and the zone temperature less than 1,400° F Zone 2 all burners out or 2 burners out and zone temperature less than 1,400° F Zone 3 both burners out or 1 burner out and zone temperature less than 1,400° F.			
MPF-22	TSHH-223	Quench Tower Flue Gas Temperature High- High	215 ° F	215 ° F	215 ° F	215 ° F
MPF-23	PALL-358	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig	25 psig
MPF-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches	219 inches
MPF-25	ACAM-167 ACAM-907	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-26	ACAM-167 ACAM-907	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.00006 mg/m^3 GB	Not Applicable
MPF-27	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-28	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	Not Applicable	0.00006 mg/m^3 GB	Not Applicable

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
MPF-29	TAHH-097	PFS Carbon Filter Exhaust Gas Temperature High-High	180 ° F	180 ° F	180 ° F	Not Applicable
MPF-30[3]	PDAH-436B PDAH-438B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
MPF-31[3]	PDAH-436E PDAH-438E PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc	Not Applicable
MPF-32[5]	ACAM-401A (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	Not Applicable	Not Applicable	0.0003 mg/m^3 GB	Not Applicable
MPF-33[5]	ACAM-401-SC (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-34	ACAM-908-SC ACAM-909-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-35	ACAM-908-SC ACAM-909-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3 VX	Not Applicable	Not Applicable
MPF-36	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3 VX	Not Applicable	Not Applicable
MPF-37	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006 mg/m^3 VX	Not Applicable	Not Applicable
MPF-38	ACAM-932-SC ACAM-933-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-39	ACAM-932-SC ACAM-933-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-40	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable
MPF-41	ACAM-923-SC ACAM-924-SC ACAM-925-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Table 6-7: MPF AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,4] Setpoints			
			HD/HT ATB	HD/HT ATB	HD/HT ATB	HD/HT ATB
MPF-42	ACAM-401A (Cool-Down Conveyor Enclosure)	Chemical Agent Emissions High-High Instantaneous	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable	Not Applicable

Footnotes:
(1) All values are instantaneous unless otherwise noted.
(2) In the event of an AWFCO, all zone timers will be reset.
(3) Stop feed parameters only apply to the on-line PFS unit. PDAH-438B and E are installed within PFS-FILT-111 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the MPF through the LIC PFS or the common spare PFS. As such, PDAH-436B and E or PDAH-487B and E will be the units of measure in the event that the exhaust from the MPF is being channeled through any of the other filter units.
(4) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).
(5) The ACAMS may be taken off-line during processing in accordance with VI.C.5.d.

Abbreviations:
%..... percent
AAHH..... analyzer alarm high-high
AIT ..... analyzer indicator transmitter
AWFCO..... automatic waste feed cut-off
FAHH ..... flow alarm high-high
gpm..... gallons per minute
inwc ..... inches of water column
lbs/hr..... pounds per hour
LSHH..... level switch high-high
MPF ..... Metal Parts Furnace
PALL ..... pressure alarm high-high
PDAH ..... pressure differential alarm high
PFS ..... Pollution Abatement System Filtration System
PSHH..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
SWLM..... secondary waste-like material
TSLL.....temperature switch low-low
°F.....degrees Fahrenheit
AALL.....analyzer alarm low-low
ANCDF.....Anniston Chemical Agent Disposal Facility
CO.....carbon monoxide
FALL.....flow alarm low-low
HEPA ..... high efficiency particulate air
lbs/2-min ..... pounds per 2-minute average
LIC ..... Liquid Incinerator
mg/m^3..... milligrams per cubic meter
O_2.. ..... oxygen
PDAH..... pressure differential alarm high
PDALL..... pressure differential alarm low-low
ppm ..... parts per million
psig ..... pounds per square inch gauge
PSLL ..... pressure switch low-low
ROHA ..... rolling hourly average
sgu. ..... specific gravity unit
TAHH ..... temperature alarm high-high

Table 6-8: Maximum Munition Feed Rates to the DFS during Agent Shakedown, Trial Burn, and Post-Trial Burn

Munition Type	Agent Type	Max Units per Hour	Min Feed Interval (sec)	Maximum Feed Rate (lbs/hr)			
				VX[f]	GB	EXPLOSIVES	PROPELLANTS
M55/56 Rocket	GB	40[a]/14	90[a]/106	---	50[b,c]/149.8	123.5	767.7
M55/56 Rocket	VX	34	---	17	---	108.8	656.2
M121A1 Proj., 155MM	VX	---	---	---	---	635.25	---
M121A1/M122 Proj., 155MM	GB	---	---	---	---	374[d]	---
M426 Proj., 8-inch	GB	---	---	---	---	416.1	---
M360 Proj., 105MM	GB	---	---	---	---	337[d]	---
M2/M2A1 Proj., 4.2-inch	HD/HT	[g]	[g]	---	---	[g]	---
M60 Proj., 105MM	HD	[g]	[g]	---	---	[g]	---
M110 Proj., 155MM	HD	[g]	[g]	---	---	[g]	---
M23 Landmine	VX	60[e]	60[e]	31.5[e]	---	58[e]	---
Explosive Contaminated Solids	---	---	---	17/31.5[e]	149.8	123.5	767.7
Explosive Contaminated Sludges	---	---	---	17/31.5[e]	105.8	123.5	767.7

Footnotes:

(a) Feed rate of drained or gelled rockets during GB agent shakedown and trial burn (drained/gelled). M55 rockets that are suspected to be gelled (based on inventory of lot numbers) shall not be fed to the DFS during the post-trial burn condition.

(b) Maximum feed rate during agent shakedown and trial burn periods of the drainable rocket condition shall be 50 lbs/hr. Maximum feed rate during agent shakedown and trial burn periods of the gelled rocket condition shall be 149.8 lbs/hr.

(c) Maximum post-trial burn feed rate for all conditions shall be limited by Condition VI.D.2.

(d) TNT equivalent.

(e) Should a VX ATB need to be re-conducted with an insufficient inventory of M55 rockets, the M23 landmines will be utilized for retesting purposes. If a M23 landmine contingency ATB is not necessary, an additional DFS VX DRE landmine ATB will be performed to re-establish a munition and VX agent feed rate using M23 landmines.

(f) Agent weight only.

(g) Mustard agents HD/HT will not be fed to the DFS during the HD/HT trial burn operations. If mustard contaminated components are encountered, they will be treated within the DFS kiln at sufficient time and temperature requirements as to ensure 5X decontamination is achieved in accordance with VII.D.4.k.

Table 6-8: Maximum Munition Feed Rates to the DFS during Agent Shakedown, Trial Burn, and Post-Trial Burn (continued)

Abbreviations:

--- ..... not applicable
DFS ..... Deactivation Furnace System
sec ..... seconds
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
TNT ..... trinitrotoluene

Table 6-9: Maximum Metals and Chlorine/Chloride Feed Rates to the DFS during Shakedown, Trial Burn, and Post-Trial Burn

Constituent	ROHA (lbs/hr)
Chlorine	88.3
Antimony	1.132(1)
Arsenic	0.2005(1)
Barium	6.154(1)
Beryllium	0.0051(1)
Boron	11.526(1)
Cadmium	3.190(1)
Chromium	1.856(1)
Cobalt	0.0246(1)
Copper	0.2933(1)
Lead	19.36(1)
Manganese	0.2509(1)
Mercury	0.0036(1)
Nickel	3.331(1)
Phosphorus	33.12
Selenium	0.0344(1)
Silver	0.0138(1)
Thallium	0.0069(1)
Tin	0.1341(1)
Vanadium	0.0344(1)
Zinc	0.6869(1)

Footnote:
(1) Feed rates do not include embedded metal from such items as munition bodies.

Abbreviations:
lbs/hr.....pounds per hour
DFS.....Deactivation Furnace System
ROHA.....rolling hourly average

Table 6-10: DFS AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-01	TAHH-182	Rotary Kiln Temperature High-High	(5)	1,650° F	1,650° F	1,950° F
DFS-02	TALL-182	Rotary Kiln Temperature Low-Low	(5)	965° F	950° F	950° F
DFS-03	TAHH-92	Afterburner Temperature High-High	(5)	2,160° F	2,160° F	2,160° F
DFS-04	TALL-92	Afterburner Temperature Low-Low	(5)	1,850° F	1,850° F	1,850° F
DFS-05	PSHH-204	Rotary Kiln Pressure High-High	(5)	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay
DFS-06	PAH-65	Afterburner Pressure High	(5)	-0.1 inwc	-0.1 inwc	-0.1 inwc
DFS-07	PDAH-813	Afterburner Flue Gas Flow Rate High	(5)	1.0 inwc	1.0 inwc	1.0 inwc
DFS-08	AAHH-59C	Exhaust Blower Duct Flue Gas CO Level High-High	(5)	100 ppm, 7% O_2 dry basis ROHA	100 ppm, 7% O_2 dry basis ROHA	100 ppm, 7% O_2 dry basis ROHA
DFS-09	AAHH-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	(5)	15% dry basis	15% dry basis	15% dry basis
DFS-10	AALL-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	(5)	3% dry basis	3% dry basis	3% dry basis
DFS-11	TALL-184	DC (Upper) Temperature Low-Low	Not Applicable [4]	1,000° F	1,000° F	1,000° F
DFS-12	TALL-42	DC (Lower) Temperature Low-Low	Not Applicable [4]	1,000° F	1,000° F	1,000° F
DFS-13	PLC Software	Munitions Feed Rate High-High	(5)	Rockets 19 lbs/hr and/or 36 rockets/hr Mines 34.7 lbs/hr and/or 66 mines/hr	Condition 1 40 Rockets/hr (M55) or 50 lbs/hr Condition 2 14 Rockets/hr (M55) or 149.8 lbs/hr	382.0 lbs/hr
DFS-14	PDALL-08	Venturi Scrubber Pressure Differential Low-Low	(5)	25 inwc	25 inwc	18 inwc
DFS-15	FAL-06	Venturi Scrubber Brine Flow Rate Low	(5)	300 gpm with 10 second delay	300 gpm with 10 second delay	275 gpm with 30 second delay
DFS-16	DAHH-33	Venturi Scrubber Brine Density High-High	(5)	1.20 sgu	1.28 sgu	1.28 sgu
DFS-17	FALL-30	Scrubber Tower Clean Liquor Flow Rate Low-Low	(5)	1,635 gpm	1,635 gpm	1,575 gpm
DFS-18	AALL-34	Scrubber Tower pH Low-Low	(5)	7.48	6.5	6.5
DFS-19	TAHH-51A/B/C/D/E	Rotary Kiln Shell Temperature High-High	(5)	1,600° F	1,600° F	1,600° F

Table 6-10: DFS AWFCO Parameters during Shakedown, Trial Burn, and Post-Trial Burn (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-20	SAHH-602	Rotary Kiln Rotational Speed High-High	(5)	2 rpm	2 rpm	2 rpm
DFS-21	SALL-602	Rotary Kiln Rotational Speed Low-Low	(5)	0.33 rpm	0.33 rpm	0.33 rpm
DFS-22	XS-58/821	DC Operation (jam)	Not Applicable [4]	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-23	SAL-57	DC Operation (no motion)	Not Applicable[4]	No motion	No motion	No motion
DFS-24	XS-207/209	Feed Chute Operation	(5)	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-25	TSHH-01	Quench Tower Flue Gas Temperature High-High	(5)	215° F	215° F	215° F
DFS-26	PALL-344	Scrubber Tower Clean Liquor Pressure Low-Low	(5)	25 psig	25 psig	25 psig
DFS-27	LSHH-02/06	Brine Surge Tanks Level High-High	(5)	219 inches	219 inches	18 feet 3 inches
DFS-28	ACAM-297	Chemical Agent Emissions High-High Instantaneous (Cyclone Enclosure)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-29	ACAM-183 ACAM-910-SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable
DFS-30	ACAM-183 ACAM-910-SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-31	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable
DFS-32	ACAM-904-SC ACAM-905-SC ACAM-906-SC	Chemical Agent Emissions High-High ROHA (Common Stack)	(5)	0.00006 mg/m^3	Not Applicable	Not Applicable
DFS-33	TAHH-430	PFS Carbon Filter Exhaust Gas Temperature High-High	(5)	180° F	180° F	Not Applicable
DFS-34	PDAH-436B PDAH-438B PDAH-440B PDAH-442B PDAH-487B	PFS HEPA Filter Inlet Pressure Drop High	(5)	5 inwc	5 inwc	Not Applicable
DFS-35	PDAH-436E PDAH-438E PDAH-440E PDAH-442D PDAH-487E	PFS HEPA Filter Outlet Pressure Drop High	(5)	5 inwc	5 inwc	Not Applicable

TABLE 6-10: DFS AWFCO PARAMETERS DURING SHAKEDOWN, TRIAL BURN, AND POST-TRIAL BURN (CONTINUED)

Item No.	Tag Number	Process Data Description	AWFCO[1,3] Setpoints			
			HD/HT ATB	VX ATB	GB ATB	STB
DFS-36	ACAM-365	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area)	(5)	0.0003 mg/m^3	Not Applicable	Not Applicable

Footnotes:

(1) All values instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAH-440B and E and PDAH-442B and E are installed within PFS-FILT-111 and -112 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the DFS through any of the PFS units. As such, PDAH-436B and E, PDAH-438B and E, or PDAH-487B and E will be the units of measure in the event that the exhaust from the DFS is being channeled through any of the other filter units.

(3) All setpoints from this table will be used until submittal of the agent trial burn report, and then the most conservative setpoints from either this table or the report will be used as per MACT regulation 40 CFR 63.1207(j)(ii).

(4) The Discharge Conveyor will not be heated during the mustard campaign, but shall remain heated during both the GB and VX campaigns. Mustard contaminated components within the kiln will be processed for greater than 15 minutes at 1000° F.

(5) HD/HT ATB AWFCO Parameters are listed in Table 7-9 as the DFS will not conduct agent trial burn operations for HD/HT.

Abbreviations:

%..... percent
AAHH ..... analyzer alarm high-high
AIT ..... analyzer indicator transmitter
AWFCO... automatic waste feed cut-off
FAHH ..... flow alarm high-high
gpm..... gallons per minute
inwc ..... inches of water column
lbs/hr..... pounds per hour
LSHH..... level switch high-high
MPF..... Metal Parts Furnace
PALL ..... pressure alarm high-high
PDAH ..... pressure differential alarm high
PFS ..... Pollution Abatement System Filtration System
PSHH..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
TAHH ..... temperature alarm high-high
°F..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF ... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL..... flow alarm low-low
HEPA ..... high efficiency particulate air
lbs/2-min . pounds per 2-minute average
LIC ..... Liquid Incinerator
mg/m^3 ..... milligrams per cubic meter
O_2 ..... oxygen
PDAH..... pressure differential alarm high
PDALL.... pressure differential alarm low-low
ppm..... parts per million
psig..... pounds per square inch gauge
PSLL ..... pressure switch low-low
ROHA ..... rolling hourly average
sgu..... specific gravity unit
TSLL ..... temperature switch low-low

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MODULE VII: INCINERATION - NORMAL OPERATION

Three types of incinerators are used to deactivate and destroy the components of the waste generated from the CSDP – LIC, MPF, and DFS. All of these incinerators are new and each one is provided with a PAS. One exhaust stack is shared by the LIC, MPF, and DFS (hereafter referred to as "common stack").

Liquid chemical agents drained from munitions, liquid laboratory wastes, and SDS are incinerated in the LIC. Explosives, propellants, and explosive contaminated solids and sludges are incinerated in the DFS. In general, metal parts and a variety of secondary waste streams are decontaminated and detoxified in the MPF.

This module covers the incineration normal operation periods. For clarity, this module is organized as follows:

- Section VII.A. - Conditions applicable to all incinerators
- Section VII.B. - Liquid Incinerator
- Section VII.C. - Metal Parts Furnace
- Section VII.D. - Deactivation Furnace System
- Section VII.E. - Combined Stack for the LIC, MPF, and DFS

VII.A. GENERAL CONDITIONS FOR ALL INCINERATORS AT THE ANCDF SITE

1. Requirements for Entering Normal Operation

Prior to commencing normal operations provided for in Module VII, all requirements provided in Module VI shall have been met by the Permittee and approved by the Department, the trial burn results and the HRA provided for in Condition II.N. shall have been evaluated and approved by the Department, and the applicable numerical values represented with an asterisk (*) in the conditions and tables of Module VII shall have been established.

2. Limitation on Waste Feed

The Permittee shall not incinerate any chemical agent, or any waste containing the chemical agent, in which treatment has not been successfully demonstrated through a chemical agent trial burn IAW Module VI.

3. Inspection Requirements

a. The Permittee shall inspect each incinerator IAW the Inspection Schedule (see Section III F-2 of the Application).

b. The inspection data for each incinerator shall be recorded, and the records shall be placed in the operating record for the respective incinerator IAW Condition II.I.

4. **Monitoring Requirements**

a. Upon receipt of a written request from the Department, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established achieve the performance standards delineated in this Permit.

b. All monitoring, recording, maintenance, calibration, and test data shall be recorded and the records for each incinerator shall be placed in the operating record for each respective incinerator IAW Condition II.I.

c. The Permittee shall calibrate the O_2 and CO CEMS specified in this Permit IAW the Performance Specifications for Continuous Emission Monitoring Systems referenced by AAC 335-3-11-.06[56].

5. **Reporting**

a. The Permittee shall submit to the Department an annual report which summarizes the QA/QC reliability problems experienced with HCl, and chemical agent stack gas monitors and ambient air chemical agent monitors during the previous year. This summary report shall include, but not be limited to, the following:

i. Identification of the monitor experiencing the problem;

ii. Identification of the type of problem (e.g., borderline or deficient recoveries);

iii. Date problem experienced;

iv. Frequency of problem; and

v. Corrective action implemented to correct the problem, and whether or not or to what degree the corrective action was successful.

b. The Permittee shall submit a report of all quarterly CEM Calibration Error and annual CEM Performance Specification Tests conducted IAW VII.A.4.c. within 60 calendar days of the date of the tests.

c. A quarterly report as defined below will be submitted to the Director each calendar quarter within 30 days following the end of the quarter. The report will include the following information (all times in hours) (operating time does not include standby):

i. Total operating time since introduction of agent in device,

ii. Operating time in quarter (by Month, which is defined as rolling 12 month total),

iii. Date/time of all startups and shutdowns,

iv. Date/time/duration/cause/corrective action taken for all shutdowns caused by malfunction of either process or control equipment,

v. Date/time/duration/cause/corrective action taken for all instances of waste feed cut-off,

vi. A calculation of the site specific upset factor(s) derived from ANCDF facility operating data using the methodology described by the Risk Assessment Protocol. The value of the site specific upset factor shall be compared to that value used in the Preliminary Risk Assessment (PRA) Report. If the actual facility upset factor is greater than that value used in the PRA Report, than a RAA shall also be submitted to the Department which describes any potential increase in risk.

6. Closure

At closure, the Permittee shall follow the procedures in the Closure Plan, Section III I of the Application as revised IAW Condition II.J.3.

7. Recording

a. The Permittee shall record and maintain, in the operating record for each incinerator, all monitoring and inspection data compiled under the requirements of Condition II.I.

b. The Permittee shall record in the operating record the date, time, and duration of all AWFCOs, including the triggering parameters, reason for the deviation, and corrective measures taken to prevent recurrence of the incident. The Permittee shall also record all incidents of the AWFCO function failures, including the corrective measures taken to correct the condition that caused the failure.

VII.B. LIQUID INCINERATOR

The LIC shall be used to burn liquid wastes. The LIC is provided with a PAS that includes a quench tower, venturi scrubber, packed-bed scrubber tower, clean liquor air coolers, demister, gas-fired reheater, and carbon bed filter. Both combustion chambers of the LIC are refractory-lined and are equipped with natural gas burners which are used to preheat and to maintain the required combustion temperature in each chamber while burning the liquid wastes. The stack emissions shall be monitored for the presence of chemical agents and other emissions. The LIC shall shut down automatically when the monitor detects the presence of chemical agent at the ASC level, see Condition VII.B.2.g.

1. Maintenance

a. All process monitors required, pursuant to Condition VII.B.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.B.4.

b. The Permittee shall test all process monitoring and control instrumentation for the LIC IAW the design plans in Section III D-5 of the Application, specifications approved by the Department, and IAW the calibration,

performance specifications, and maintenance procedures contained in Table 7-3 prior to treating hazardous waste in the LIC.

c. Modifications to the design plans and specifications in the Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the LIC such that, when operated IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.B.2.a. through g.

e. All air pollution control devices and capture systems for which this Permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

2. <u>Performance Standards</u>

a. The LIC must achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emission from the LIC shall not exceed 5.99E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the LIC as specified in Condition VII.B.3.c.

d. The following metal emission rates from the LIC shall not be exceeded:

Antimony	6.44E-05 g/s	Arsenic	9.73E-05 g/s
Barium	6.44E-05 g/s	Beryllium	1.29E-05 g/s
Boron	1.70E-03 g/s	Cadmium	1.61E-05 g/s
Chromium	1.88E-05 g/s	Cobalt	3.22E-05 g/s
Copper	3.22E-05 g/s	Lead	1.98E-04 g/s
Manganese	2.47E-03 g/s	Mercury	3.08E-05 g/s
Nickel	3.22E-05 g/s	Phosphorous	2.54E-03 g/s
Selenium	3.30E-05 g/s	Silver	6.44E-05 g/s

Thallium	6.44E-06 g/s	Tin	1.22E-04 g/s
Vanadium	3.83E-05 g/s	Zinc	9.96E-04 g/s

The above emission limits shall be met by limiting the feed rate of each metal into the LIC as specified in Condition VII.B.3.c.

e. The following emission rates from the LIC shall not be exceeded:

HCl	5.99E-03 g/s	Cl_2	5.99E-03 g/s
HF	1.21E-02 g/s	Tetra CDD	3.32E-11 g/s
Penta CDD	1.66E-10 g/s	Hexa CDD	4.98E-10 g/s
Hepta CDD	1.66E-10 g/s	Octa CDD	3.32E-10 g/s
Tetra CDF	4.81E-11 g/s	Penta CDF	3.32E-10 g/s
Hexa CDF	6.64E-10 g/s	Hepta CDF	4.68E-10 g/s
Octa CDF	3.32E-10 g/s	Benzene	1.36E-04 g/s
Vinyl Chloride	1.82E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the LIC.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below, shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the LIC using an ACAMS installed in the duct work feeding the common stack. The emission levels shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. Compliance with the operating conditions specified in Condition VII.B.4., shall be regarded as compliance with the required performance standards identified in Conditions VII.B.2.a. through g. However, if it is determined during the effective period of this Permit that compliance with the operating conditions in Condition VII.B.4. is not sufficient to ensure

compliance with the performance standards specified in Conditions VII.B.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. Limitation on Waste Feed

a. Except during the short-term periods specified in Conditions VI.B. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate the hazardous wastes in the LIC, as specified in Table 7-1, in compliance with the operating requirements specified in Condition VII.B.4.

b. The SDS and laboratory aqueous liquid waste shall be fed only into the secondary combustion chamber of the LIC with, or without, the chemical agent feed to the LIC primary combustion chamber.

c. The feed rates of metal and chlorine to the LIC based on a ROHA shall not exceed the following limits:

Antimony	0.4577 lbs/hr	Arsenic	0.0865 lbs/hr
Barium	0.0693 lbs/hr	Beryllium	0.0229 lbs/hr
Boron	4.655 lbs/hr	Cadmium	0.0229 lbs/hr
Chromium	0.343 lbs/hr	Cobalt	0.0286 lbs/hr
Copper	0.1264 lbs/hr	Lead	2.928 lbs/hr
Manganese	0.1020 lbs/r	Mercury	0.0179 lbs/hr
Nickel	0.0696 lbs/hr	Phosphorus	243.2 lbs/hr
Selenium	0.0347 lbs/hr	Silver	0.3647 lbs/hr
Thallium	0.2286 lbs/hr	Tin	0.8686 lbs/hr
Vanadium	0.0347 lbs/hr	Zinc	0.8524 lbs/hr
Chlorine	519.0 lbs/hr		

d. The Permittee shall conduct sufficient analysis of the waste treated in the LIC to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

e. Only one chemical agent shall be fed to the LIC, at any given time.

4. Operating Conditions

a. During normal operations, the Permittee shall operate the LIC in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-3.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-2, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating

conditions deviate from the setpoints specified in Table 7-2 based on the agent type being processed.

c. The Permittee shall not burn chemical agent in the primary combustion chamber of the LIC until the primary and secondary combustion chambers are within the operating parameters in Conditions VII.B.4.a. and b.

d. During startup, with the secondary combustion chamber temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the primary combustion chamber of the LIC until agent concentration within the LIC primary chamber room is below 1 ASC.

5. Monitoring Requirements

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-2 and 7-3, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the LIC if any of the monitoring instruments listed in Tables 7-2 and 7-3 fail to operate properly.

6. Waste Feed Cut-Off Requirements

a. The Permittee shall operate the systems, specified in Table 7-2, to automatically cut-off and/or lock-out the hazardous waste feed to the LIC when the monitored operating conditions deviate from the setpoints specified in Table 7-2. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 7-2, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.B.4. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.B.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-2 for the LIC is activated greater than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the Department the information required in Condition VII.A.7.b. by the close of the following business day.

VII.C. METAL PARTS FURNACE

The MPF treats projectiles, bulk items, and a variety of secondary waste IAW Section III C-2 of the Application. No explosives are fed to the MPF. The MPF is a direct-fired, roller-hearth furnace with an afterburner. The chemical agent-contaminated metals parts or munitions and bulk items containing chemical agent are placed on trays and conveyed through the heated furnace to be detoxified of chemical agents. Secondary waste is placed on trays, WICs, and/or containment devices and conveyed through the furnace for thermal treatment. The vaporized chemical agents from the metal parts undergo thermal destruction in the furnace and the afterburner. The PAS is of similar design to that of the LIC, and is comprised of a quench tower, venturi scrubber, packed scrubber tower, clean liquor air coolers, demister, gas-fired reheater, and carbon bed.

1. Maintenance

a. All process monitors required, pursuant to Condition VII.C.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.C.4.

b. The Permittee shall test all process monitoring and control instrumentation for the MPF IAW the design plans in Section III D-6 of the Application, specifications approved by the Department, and IAW the calibration, performance specifications and maintenance procedures contained in Table 7-7 prior to treating hazardous waste in the MPF.

c. Modifications to the design plans and specifications in the ANCDF Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the MPF such that, when operated IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.C.2.a. through g.

2. Performance Standards

a. The MPF shall achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emissions from the MPF shall not exceed 8.18 E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the MPF as specified in Condition VII.C.3.b.

d. The following metal emission rates from the MPF shall not be exceeded:

Antimony	1.19 E-04 g/s	Arsenic	8.52 E-05 g/s
Barium	2.95 E-04 g/s	Beryllium	2.38 E-05 g/s
Boron	2.29 E-03 g/s	Cadmium	7.30 E-05 g/s
Chromium	8.62 E-05 g/s	Cobalt	5.95 E-05 g/s
Copper	5.95 E-05 g/s	Lead	1.82 E-04 g/s
Manganese	1.57 E-03 g/s	Mercury	4.29 E-05 g/s
Nickel	1.46 E-04 g/s	Phosphorous	1.16 E-03 g/s
Selenium	7.23 E-05 g/s	Silver	1.19 E-04 g/s
Thallium	1.19 E-05 g/s	Tin	1.19 E-04 g/s
Vanadium	2.38 E-05 g/s	Zinc	2.09 E-04 g/s

The above emission limits shall be met by limiting the feed rate of each metal into the MPF as specified in Conditions VII.C.3.b.

e. The following emission rates from the MPF shall not be exceeded:

HCl	8.18 E-03 g/s	Cl_2	2.58 E-02 g/s
HF	1.93 E-02 g/s	Tetra CDD	9.17 E-11 g/s
Penta CDD	4.58 E-10 g/s	Hexa CDD	4.58 E-10 g/s
Hepta CDD	4.58 E-10 g/s	Octa CDD	9.77 E-10 g/s
Tetra CDF	9.17 E-11 g/s	Penta CDD	7.64 E-10 g/s
Hexa CDF	1.20 E-09 g/s	Hepta CDD	2.28 E-09 g/s
Octa CDF	1.36 E-09 g/s	Benzene	3.16 E-04 g/s
Vinyl Chloride	5.66 E-05 g/s		

The above emission limits shall be met by limiting the overall feed rate into the MPF.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall not exceed 100 ppm, dry volume, over a ROHA.

$$CO_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the MPF using an ACAMS installed in the duct work feeding the common stack. The emission level shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

h. Compliance with the operating conditions specified in Condition VII.C.4., shall be regarded as compliance with the required performance standards identified in Conditions VII.C.2.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Conditions VII.C.4., is not sufficient to ensure compliance with the performance standards specified in Conditions VII.C.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. Limitation on Waste Feed

a. Except during the short-term periods specified in Conditions VI.C. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate the following hazardous wastes in the MPF, as specified in Tables 7-4 and 7-5, in compliance with the operating requirements specified in Condition VII.C.4.

b. The feed rates of metal and chlorine to the MPF based on a ROHA shall not exceed the following limits:

Antimony	0.9262 lb/hr	Arsenic	0.2856 lb/hr
Barium	11.37 lb/hr	Beryllium	0.0167 lb/hr
Boron	2.037 lb/hr	Cadmium	5.862 lb/hr
Chromium	3.277 lb/hr	Cobalt	0.0418 lb/hr
Copper	2.050 lb/hr	Lead	20.51 lb/hr
Manganese	0.7416 lb/hr	Mercury	0.0583 lb/hr
Nickel	5.862 lb/hr	Phosphorous	60.8 lb/hr
Selenium	0.0508 lb/hr	Silver	0.7323 lb/hr
Thallium	0.0083 lb/hr	Tin	0.1733 lb/hr
Vanadium	0.0167 lb/hr	Zinc	0.3702 lb/hr
Cl_2	312.0 lb/hr		

c. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the MPF to verify that the waste feed is within the

physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

d. The hourly feed rate of the residual chemical agent contained in the MPF feed, which was calculated based on the estimated drain from each munition type and from the amount of chemical agent in the munitions, shall not exceed the limits provided in Table 7-6 and Condition VII.C.3.a., unless the following conditions are met:

i. The Permittee has provided the Department verbal notice of the following:

(I) The detection of a munition/ton container that cannot be drained to below the maximum feed rates as set forth in Table 7-6, indicating its type and its location (i.e., process line leading to furnace, temporary holding location).

(II) The amount of chemical agent heel remaining in the munition.

(III) Efforts expended to facilitate additional draining of the munition.

ii. The Permittee has provided the Department written procedures for processing of the munition that cannot be drained below the maximum feed rates as set forth in Table 7-6. These procedures must be consistent with the following:

(I) The temperature and residence time in Zones 1, 2, and 3 shall be specified based on the development of a vaporization curve and calculations for the munition type and the quantity and type of residual chemical agent remaining. The supporting vaporization curve and calculations shall be provided with the procedures to the Department.

(II) The temperature maintained in the afterburner shall be IAW Table 7-6 and Condition VII.C.3.a.

iii. The Permittee receives approved procedures from the Department for processing the munition that cannot be drained below the maximum feed rates as set forth in Table 7-6.

e. Trays/WICs/containment devices containing secondary waste shall be prepared IAW limits in Condition VII.3.a. In addition, they shall comply with the following requirements:

i. Each tray/WIC/containment device shall contain only one type of waste (e.g., metal parts, wood, PPE, absorbent materials, sludge, etc.), or

ii. If waste types are combined in a single tray/WIC/containment device;

(I) Bulk metal shall be considered to be a metal item with less than 10% combustible material or aluminum integrated into the piece.

(II) Rubblized concrete, refractory, and scabbled concrete shall be processed in WIC's containing pans and heat transfer fins, and shall be filled to a maximum depth of 7 inches.

(III) Sludge shall be processed in trays/WICs/containment devices to a depth no greater than 1.5 inches and shall not be fed in combination with any other waste.

(IV) Bulk combustible waste is any combustible waste that is not polyethylene, polystyrene, or halogenated plastic. When WICs are used to process bulk combustibles, metal pans shall be placed in the WICs and,

1. Waste shall be placed in the WIC loosely packed in plastic bags or spread evenly in the WIC. Wastes shall not be rolled or bunched.

2. Wood and other dense combustible items shall be placed towards the top of loaded WICs.

3. Toxicological agents protective (TAP) gear and Life Support System (LSS) air hoses shall not be processed together in the same WIC.

4. M-40 masks shall be limited to one (1) mask per WIC.

5. M-40 respirator cartridges shall be limited to 2 cartridges per WIC unless the cartridges are opened, exposing the cartridge interior prior to loading.

(V) All non-munition wastes that envelop an interior space (e.g., gauges, cans, escape air tanks, overpacks, glassware, etc.) must be opened or punctured before being placed in the MPF.

iii. The Permittee shall prepare an inventory/feed sheet of all secondary waste contents in each tray/WIC/containment device; to contain an inventory of each waste type, including weight, Btu value of each waste type, chlorine, and metal contents.

f. Munitions and secondary waste shall not be fed to the MPF at the same time.

g. In the event of a low temperature related AWFCO while processing trays/WICs/containment devices in the primary chamber of the MPF, forward zone movement of trays/WICs shall be governed as follows:

   i. Trays containing ton containers, or WICs containing bulk combustibles (defined as any combustible waste that is not polyethylene, polystyrene or halogenated plastics), or bulk wastes containing interior or enveloping spaces (i.e., pumps, gauges) will either be held in position, moved forward to the MPF Discharge Airlock awaiting return to the furnace to complete the necessary treatment cycle, or returned to the charge airlock or lower munitions corridor awaiting return to the furnace for treatment.

   ii. Trays containing munitions or WICs containing secondary waste other than those identified in VII.C.3.g.i above will be assessed in accordance with the treatment requirements identified in Tables 7-4 and 7-5 for the respective waste or munition type. Trays/WICs that have completed the entirety of the residence time identified in Tables 7-4 and 7-5, regardless of the Zone in which the treatment occurred, will be transferred to the MPF Discharge Airlock for monitoring and discharge in accordance with this Permit. Trays/WICs that have not completed the required residence times will be managed in accordance with the requirements specified in VII.C.3.g.i above.

   When furnace conditions are returned to operating parameters listed in Table 7-6, all zone timers shall be reset to zero (0) and no forward zone movement shall occur until the residence times listed in Tables 7-4 and 7-5 are completed.

h. In the event of an ACAMS alarm in the MPF Cool-Down Conveyor Enclosure, the Permittee shall immediately:

   i. Cease hazardous waste feed into the charge airlock and out of the discharge airlock of the MPF.

   ii. Automatically secure the cool-down enclosure louvered discharge fans.

   iii. Secure the enclosure area doors.

   iv. Vent the enclosure through ducting into the LIC 1 Secondary Room and thus through the MDB HVAC.

   v. Analyze DAAMS from all monitoring stations within the Cool-Down Conveyor Enclosure for the time period up to and including the ACAMS alarm, and

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then waste feed may be restarted upon return to the operating parameters listed in Table 7-6.

(II) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VII.3.h.v.(II) and upon return to operating parameters listed in Table 7-6.

vi. Identify the tray/WIC/containment device that initiated the alarm and return it to the MPF for further treatment or overpack and process through the TMA.

i. Only one chemical agent munition type shall be fed to the MPF, at any given time.

4. <u>Operating Conditions</u>

a. During normal operations, the Permittee shall operate the MPF in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-7.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-6, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoints specified in Table 7-6 based on the agent type being processed.

c. Only one loaded tray containing the waste materials shall be fed into the MPF at any given time, with a minimum interval between each tray feed as specified in Condition VII.C.3.a.

d. The Permittee shall not burn chemical agent in the primary combustion chamber of the MPF until the primary chamber and afterburner are within the operating parameters in Conditions VII.C.4.a. and b.

e. During startup, with the afterburner temperature less than 1,400° F, the Permittee shall not burn fuel in or purge the primary chamber of the MPF until agent concentration within the MPF primary chamber room is below 1 ASC.

5. <u>Monitoring Requirements</u>

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-6 and 7-7, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the MPF if any of the monitoring instruments listed in Tables 7-6 and 7-7 fails to operate properly.

6. <u>Waste Feed Cut-Off Requirements</u>

a. The Permittee shall operate the systems, specified in Table 7-6, to automatically cut-off and/or lock-out the hazardous waste feed to the MPF when the monitored operating conditions deviate from the setpoint specified in Table 7-6. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In the event of a malfunction of the AWFCO systems listed in Table 7-6, the Permittee shall immediately, manually, cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until all parameter(s) which caused the waste feed cut-off or lock-out is/are restored to within the permit limits and all other parameters are also within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.C.4., unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.C.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-6 for the MPF is activated more than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the Department the information required in Condition VII.A.7.b. by the close of the following business day.

e. During the shakedown, trial burn, and post-trial burn periods, the ACAMS monitoring the exhaust from the Metal parts Furnace Cool-Down Conveyor Enclosure (MPF-32 and MPF-33) may be operated as follows:

i. During the treatment of munitions or waste, the ACAMS may be taken off-line to perform maintenance or calibration under the following conditions:

I. No waste will be discharged from the MPF Discharge Airlock while the ACAMS are off-line.

II. Secondary waste meeting the definition of sludge has not been discharged from the MPF during a 1-hour period prior to taking the ACAMS off-line, and

III. No waste will be removed from the Cool-Down Conveyor Enclosure until the ACAMS has been returned to service and has been in operation for a period of at least 15-minutes.

ii. If the maintenance or calibration activities fail to return the ACAMS to service within two hours of taking the instrument off-line, no additional feed will be charged to the MPF until such time as the ACAMS has been returned to service.

7. Closure

a. All scabbling of concrete outside the MPF area must be completed and processed before securing the MPF.

b. The facility shall certify to the Department in writing that all agent contaminated materials such as filters, scabbled concrete, secondary waste, which require decontamination in the MPF according to the closure plan, have been processed, and obtain written Departmental concurrence with this certification, prior to MPF final shutdown.

c. The facility shall notify the Department in writing once the MPF has been dismantled and the ability to process waste on site is no longer available. Shipping of any demolition waste that does not meet the disposal requirements in the WAP must have written Departmental approval before being shipped off-site.

VII.D. DEACTIVATION FURNACE SYSTEM

The DFS incinerates fuzes, explosives and propellants from drained rockets, mines and other munitions and explosive contaminated solids and sludges. The DFS consists of a rotary kiln, a cyclone, and an afterburner. The chemical agent-contaminated or noncontaminated, highly reactive and explosive materials are fed into the retort and deactivated while the vaporized chemical agents undergo thermal destruction in the retort as well as in the afterburner. The PAS is of similar design to that of the LIC and MPF, and consists of a quench tower, venturi scrubber, packed scrubber tower, clean liquor air coolers, gas-fired reheater, demister, and carbon bed filter.

1. Maintenance

a. All process monitors required, pursuant to Condition VII.D.4., shall be equipped with alarms operated to warn of deviation, or imminent deviation, from the limits specified in Condition VII.D.4.

b. The Permittee shall test all process monitoring and control instrumentation for the DFS IAW the design plans in Section D-7 of the ANCDF Application, specifications approved by the Department, and IAW the calibration, performance specifications, and maintenance procedures contained in Table 7-10, prior to handling hazardous waste in the DFS.

c. Modifications to the design plans and specifications in the ANCDF Application for all incinerators shall be allowed only IAW Condition II.A.2.

d. The Permittee shall maintain the DFS such that when operated, IAW the operating requirements specified in this Permit, it shall meet the performance standards specified in Conditions VII.D.2.a. through g.

2. Performance Standards

a. The DFS must achieve and maintain a DRE of 99.9999% for the chemical agent. The DRE shall be calculated by the method specified in AAC 335-14-5-.15(4)(a)1.

b. The PM emissions from the common stack, corrected to 7% O_2 IAW the formula given below (AAC 335-14-5-.15(4)(c)), shall not exceed 0.013 grains/dscf.

$$P_c = P_m \times 14/(21 - Y)$$

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

c. The HCl emissions from the DFS shall not exceed 8.46E-03 g/s. The HCl emission limit shall be met by limiting the feed rate of chlorine/chloride into the DFS as specified in Conditions VII.D.3.b.

d. The following metal emission rates from the DFS shall not be exceeded:

Antimony	1.53E-04 g/s	Arsenic	4.41E-05 g/s
Barium	8.82E-05 g/s	Beryllium	6.50E-06 g/s
Boron	1.95E-03 g/s	Cadmium	1.96E-05 g/s
Chromium	5.10E-05 g/s	Cobalt	1.76E-05 g/s
Copper	5.64E-05 g/s	Lead	5.21E-04 g/s
Manganese	4.42E-03 g/s	Mercury	1.54E-05 g/s
Nickel	3.20E-05 g/s	Phosphorous	1.18E-03 g/s
Selenium	4.41E-05 g/s	Silver	1.76E-05 g/s
Thallium	8.82E-06 g/s	Tin	1.80E-04 g/s
Vanadium	4.41E-05 g/s	Zinc	9.45E-04 g/s

The metal emission limits shall be met by limiting the feed rate of each metal into the DFS as specified in Condition VII.D.3.b.

e. The organic emission rates from the DFS shall not be exceeded:

HCl	8.46E-03 g/s	Cl_2	9.09E-03 g/s
HF	1.77E-02 g/s	Tetra CDD	5.71E-11 g/s
Penta CDD	2.85E-10 g/s	Hexa CDD	8.55E-10 g/s

Hepta CDD	6.11E-10 g/s	Octa CDD	1.23E-09 g/s
Tetra CDF	1.87E-10 g/s	Penta CDF	6.10E-10 g/s
Hexa CDF	1.25E-09 g/s	Hepta CDF	7.27E-10 g/s
Octa CDF	5.71E-10 g/s	Benzene	2.30E-04 g/s
Vinyl Chloride	1.37E-05 g/s	Nitroglycerine	3.34E-05 g/s
2,4-Dintirotoluene	1.47E-05 g/s	2,6-Dinitrotoluene	1.47E-05 g/s
2,4,6-Trinitrotoluene	4.04E-05 g/s	Diphenylamine	2.90E-05 g/s
RDX	3.59E-05 g/s	HMX	2.71E-06 g/s

The above emission limits shall be met by limiting the overall feed rate into the DFS.

f. The Permittee shall control emissions of PICs from the common stack such that the CO level in the common stack, corrected to 7% O_2 IAW the formula given below shall, not exceed 100 ppm, dry volume, over a ROHA.

$$Co_c = CO_m \times (21 - 7)/(21 - O_m)$$

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

g. The Permittee shall monitor emissions of chemical agents being treated from the DFS using an ACAMS installed in the duct work feeding the common stack. The emission levels shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous		0.0003	0.03
	0.0003		

h. Compliance with the operating conditions specified in Condition VII.D.4., shall be regarded as compliance with the required performance standards identified in Conditions VII.D.2.a. through g. However, if it is determined that during the effective period of this Permit that compliance with the operating conditions in Conditions VII.D.4., is not sufficient to ensure compliance with the performance standards specified in Conditions VII.D.2.a. through g., the Permit may be modified, revoked, or reissued, pursuant to AAC 335-14-8-.04(2) or (3).

3. **Limitation on Waste Feed**

a. Except during the short-term periods specified in Condition VI.D. for shakedown, trial burn, and post-trial burn, the Permittee shall incinerate only the hazardous wastes in the DFS, as specified in Table 7-8, in compliance with the operating requirements specified in Condition VII.D.4.

b. The feed rate of metals and chlorine to the DFS based on a ROHA shall not exceed the following limits:

Antimony	1.132 lbs/hr	Arsenic	0.2005 lbs/hr
Barium	6.154 lbs/hr	Beryllium	0.0051 lbs/hr
Boron	11.526 lbs/hr	Cadmium	3.190 lbs/hr
Chromium	1.856 lbs/hr	Cobalt	0.0246 lbs/hr
Copper	0.2933 lbs/hr	Lead	19.36 lbs/hr
Manganese	0.2509 lbs/hr	Mercury	0.0036 lbs/hr
Nickel	3.331 lbs/hr	Phosphorous	33.12 lbs/hr
Selenium	0.0344 lbs/hr	Silver	0.0138 lbs/hr
Thallium	0.0069 lbs/hr	Tin	0.1341 lbs/hr
Vanadium	0.0344 lbs/hr	Zinc	0.6869 lbs/hr
Cl	88.3 lbs/hr		

c. Throughout operation, the Permittee shall conduct sufficient analysis of the waste treated in the DFS to verify that the waste feed is within the physical and chemical composition limits specified in this Permit, IAW the Waste Analysis Plan (see Application Section III C-2).

d. Only one chemical agent, or waste containing one chemical agent, shall be fed to the DFS, at any given time.

4. **Operating Conditions**

a. During normal operations, the Permittee shall operate the DFS in order to maintain the system and process parameters within the ranges or setpoints specified in Table 7-10.

b. During normal operations, the Permittee shall operate the AWFCO systems, specified in Table 7-9, to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoints specified in Table 7-9 based on the agent type being processed.

c. The rate of movement to the discharge conveyor shall be controlled during the GB and VX campaigns so as to provide a minimum solid retention

time of 15 minutes inside the heated enclosure. Since the discharge conveyor will not be heated during the mustard campaign, this requirement will be met by either reducing the kiln speed or by placing the kiln in oscillation to ensure the treatment cycle is satisfied. This is only required for mustard contaminated components within the kiln.

d. The rocket shear blade shall be sprayed with SDS or PRW at all times when a rocket piece is at the blast gate and the shear blade is in operation; or at all times when a rocket piece is at the blast gate and the gate is jammed. The flow rate of SDS or PRW to the rocket shear blade shall be continuously monitored and recorded during rocket processing operations.

e. A time delay of 30 seconds shall be provided for feeding M55 rocket sections before and after feeding fuses to the DFS, with the exception that the tailfins from the previous rocket and nose plugs can be fed with the fuses.

f. The Permittee shall not burn chemical agent in the rotary kiln of the DFS until the rotary kiln and afterburner are within the operating parameters in Conditions VII.D.4.a. and b.

g. During startup, with the afterburner temperature less than 1,400°F, the Permittee shall not burn fuel in or purge the rotary kiln of the DFS until agent concentration within the DFS rotary kiln room is below 1 ASC.

h. The Permittee shall continue to operate the burners in the primary combustion chamber of the DFS for at least 21 minutes after feed to the DFS has ceased.

i. In the event of an ACAMS alarm in the DC Bin Enclosure which occurs while the enclosure door is closed and the enclosure is under engineering controls, the Permittee shall immediately:

   i. Stop waste feed,

   ii. Place DFS kiln in oscillate mode,

   iii. Stop DC motion, and

   iv. Recover and analyze DAAMS tubes.

      (I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters listed in Table 7-9.

      (II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) Normal operations and waste feed may be restarted after completion of the requirements in Condition VII.4.i.iv.(II) and upon return to the operating parameters listed in Table 7-9.

j. In the event of an ACAMS alarm in the DC Bin Enclosure which occurs while the enclosure door is open or the enclosure is otherwise not under engineering controls, the Permittee shall immediately:

i. Stop waste feed,

ii. Place DFS kiln in oscillate mode,

iii. Stop DC motion, and

iv. Recover and analyze the associated DAAMS monitors.

(I) If the alarm is determined to be non-confirmed/false positive via DAAMS analysis, then normal operations and waste feed may be restarted upon return to the operating parameters listed in Table 7-9.

(II) If the alarm is confirmed to be agent, the DC bin must be handled IAW 1X DC bin change-out procedures and transferred to the TMA for sample collection and analysis. This characterization will determine ultimate disposal of the DC bin contents.

(III) If the alarm is confirmed to be agent, waste feed shall not restart until all requirements in Condition II.H. are met.

(IV) Normal operations and waste feed may be restarted after completion of the requirements in Conditions VI.3.xi.d.(II) and (III) and upon return to the operating parameters listed in Table 7-9.

k. In the event waste is charged to the DFS that has been contaminated with HD/HT, the permittee will ensure the waste is contained within the confines of the rotary kiln to ensure destruction of the agent prior to discharge from the kiln to the DC.

5. Monitoring Requirements

a. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Tables 7-9 and 7-10, while incinerating hazardous waste.

b. Hazardous wastes shall not be fed to the DFS if any of the monitoring instruments listed in Tables 7-9 and 7-10 fail to operate properly.

6. **Waste Feed Cut-Off Requirements**

a. The Permittee shall operate the systems, specified in Table 7-9, to automatically cut-off and/or lock-out the hazardous waste feed to the DFS when the monitored operating conditions deviate from the setpoint specified in the Table 7-9. Waste feed may not restart until the parameter(s) which caused the feed cut-off or lock-out is/are restored to permit limits and all other parameters are within permit limits.

b. In case of a malfunction of the AWFCO systems listed in Table 7-9, the Permittee shall immediately, manually cut-off and/or lock-out the waste feed. The Permittee shall not restart waste feed until the problem causing the malfunction has been identified and corrected. Waste feed may not restart until all parameters specified in Table 7-9 are restored to within permit limits and all other parameters are within permit limits.

c. The Permittee shall manually cut-off and/or lock-out the waste feed when the operating conditions deviate from the limits specified in Condition VII.D.4. unless the deviation automatically activates the waste feed cut-off and/or lock-out sequence specified in Condition VII.D.6.a.

d. If the number of AWFCOs from an individual parameter on Table 7-9 for the DFS is activated greater than twice within any operating day, the Permittee shall be required to, at a minimum, verbally provide to the Department the information required in Condition VII.A.7.b. by the close of the following business day.

VII.E. COMMON STACK FOR LIC, MPF, AND DFS

1. The Permittee shall maintain three ACAMS for the current agent campaign in the common stack. The instruments installed on the common stack will be configured so that two are alternating sampling and analysis and the third is in standby to replace either of the two active instruments in case one must be removed from service for any reason. Additionally, the facility will be required to maintain monitoring for previous agent campaigns in the common stack until such time as the conditions in section 4.10 of the ANCDF LAMP are fulfilled and the Department concurs in writing that monitoring may be discontinued either permanently or for an extended period. Written concurrence is not required for normal operational outage periods where monitoring will be restored after a brief, predetermined period of time such as for munition changeovers, furnace outage periods or other similar period.

2. The exhaust gas monitoring systems specified in Condition VII.E.1., shall be calibrated, inspected and operated IAW with the applicable subparagraphs of Conditions VII.A.4.c. and VII.A.5.

3. The chemical agent emissions from the common stack, monitored as specified in Condition VII.E.2., shall not exceed the following concentrations:

Maximum Stack Emission (mg/m^3)	VX	GB	HD/HT
ROHA	0.00006	0.00006	0.006
Instantaneous	0.0003	0.0003	0.03

4. The waste feeds to all contributing incinerator(s) shall be automatically cut-off or lock-out when the chemical agent emission level(s) in the common stack exceeds the values specified in Condition VII.E.3.

Table 7-1: Maximum Feed Rates to the LIC during Normal Agent Operations

Description of Hazardous Waste	Maximum Feed Rate	
	ROHA	2MRA
GB	1,015 lbs/hr	34.5 lbs/2-min
VX	675 lbs/hr	23.00 lbs/2-min
HD	1,111 lbs/hr	37lbs/2-min
HT	1,111 lbs/hr	37lbs/2-min
SDS, Laboratory, Aqueous Liquid Wastes	1,600 lbs/hr	Not Applicable

Footnotes:

Abbreviations:
2MRA.....2-minute rolling average
lbs/hr.....pounds per hour
LIC.....Liquid Incinerator
SDS.....spent decontamination solution
ATB.....agent trial burn
lbs/2-min.....pounds per 2-minute average
ROHA.....rolling hourly average

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-01	TAHH-710	Primary Chamber Temperature High-High	2,750° F	2,750° F	2,750°F
LIC-02	TSLL-710	Primary Chamber Temperature Low-Low	2,475° F	2,475° F	2,475°F
LIC-03	TAHH-782	Secondary Chamber Temperature High-High	2,150° F	2,150° F	2,150°F
LIC-04	TSLL-782	Secondary Chamber Temperature Low-Low	1,850° F	1,850° F	1,850°F
LIC-05	PSHH-845	Primary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc
LIC-06	PSHH-896	Secondary Chamber Pressure High-High	-0.25 inwc	-0.25 inwc	-0.25 inwc
LIC-07	PDAH-855	Secondary Chamber Flue Gas Flow Rate High	0.7 inwc	0.7 inwc	0.7 inwc
LIC-08	AAHH-778C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA	100 ppm 7% O_2, dry basis ROHA
LIC-09	AAHH-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High	15% dry basis	15% dry basis	15% dry basis
LIC-10	AALL-798A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis
LIC-11	PSLL-737C	Primary Chamber Atomizing Air Pressure Low-Low	55 psig	55 psig	55 psig
LIC-12	PSL-809	Secondary Chamber Atomizing Air Pressure Low	65 psig	65 psig	65 psig

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-14	FAHH-731C	Agent Feed Rate High-High 2MRA	37 lbs/2-min	23.00 lbs/2-min	34.5 lbs/2-min
LIC-15	FAHH-731D	Agent Feed Rate High-High ROHA	1,111 lbs/hr	675 lbs/hr	1,015 lbs/hr
LIC-16	FAHH-763	SDS Feed Rate High-High	1,600 lb/hr	1,600 lb/hr	1,600 lb/hr
LIC-17	PDALL-814	Venturi Scrubber Pressure Differential Low-Low	23 inwc	23 inwc	23 inwc
LIC-18	FALL-828	Venturi Scrubber |Flow Rate Low-Low	135 gpm with 10 second delay	135 gpm with 10 second delay	135 gpm with 10 second delay
LIC-19	DAHH-835	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.20 sgu
LIC-20	FALL-825	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm
LIC-21	AALL-832	Scrubber Tower pH Low-Low	7.28	7.28	7.28
LIC-22	TSHH-800	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215°F
LIC-23	PALL-170	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
LIC-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches
LIC-25	PALL-761	Chemical Agent Feed Pressure Low-Low	5 psig	5 psig	5 psig

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
LIC-26[4]	ACAM-134	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3	NA	0.0003 mg/m^3
LIC-27[4]	ACAM-134	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3	NA	0.00006 mg/m^3
LIC-28[3]	ACAM-129/225/223	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	NA	0.0003 mg/m^3
LIC-29[3]	ACAM-129 ACAM-225 ACAM-223	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	NA	0.00006 mg/m^3
LIC-30[2]	TAHH-433	PFS Carbon Filter Exhaust Gas Temperature High-High	180° F	180° F	180°F
LIC-31[2]	PDAHH-436B PDAHH-438B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
LIC-32[2]	PDAHH-436 PDAHH-438E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
LIC-33	ACAM-911SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	NA	0.0003 mg/m^3	NA
LIC-34	ACAM-911SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	NA	0.00006 mg/m^3	NA

Table 7-2: LIC AWFCO Parameters during Normal Agent Operations (Continued)

Item No	Tag Number	Process Data Description	AWFCO(1) Setpoints		
			HD/HT	VX	GB
LIC-35(3)	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	0.0003 mg/m^3	NA
LIC-36(3)	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	0.00006 mg/m^3	NA
LIC-37(3)	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3	NA	NA
LIC-38(3)	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3	NA	NA

Footnotes:

(1) All values are instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAHH-436B and E are installed within PFS-FILT-209 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the LIC through the MPF PFS or the common spare PFS. As such, PDAHH-438B and E or PDAHH-487B and E will be the units of measure in the event that the exhaust from the LIC is being channeled through any of the other filter units.

(3) Common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

(4) ACAM 134 was converted from GB to HD monitoring during agent changeover for HD processing.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
inwc .....inches of water column
°F ..... degrees Fahrenheit
AALL ..... analyzer alarm low-low
ANCDF ... Anniston Chemical Agent Disposal Facility
CO ..... carbon monoxide
FALL..... flow alarm low-low
HEPA ..... high efficiency particulate air
lbs/2-min.. pounds per 2-minute average

Abbreviations (continued):

lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF.....Metal Parts Furnace
PALL.....pressure alarm high-high
PDAH.....pressure differential alarm high
PFS.....Pollution Abatement System Filtration System
PSHH.....pressure switch high-high
PSL.....pressure switch low
RCRA.....Resource Conservation and Recovery Act
SDS.....spent decontamination solution
TAHH.....temperature alarm high-high
2MRA.....2-minute rolling average
LIC.....Liquid Incinerator
mg/m^3.....milligrams per cubic meter
O_2.....oxygen
PDAH.....pressure differential alarm high
PDALL....pressure differential alarm low-low
ppm.....parts per million
psig.....pounds per square inch gauge
PSLL.....pressure switch low-low
ROHA.....rolling hourly average
sgu.....specific gravity unit
TSLL.....temperature switch low-low

Table 7-3: LIC System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Primary Chamber Temperature 13-TIT-710	LIC-01/02	Thermocouple	212 to 3,000°F	±1.0% of Range
2 [a,b]	Secondary Chamber Temperature 13-TIT-782	LIC-03/04		32 to 2,400°F	
3 [a]	Primary Chamber Pressure 13-PSHH-845	LIC-05	Diaphragm	-5.0 to 0.5 inwc	±3.0% of Range
4 [a,b]	Primary Chamber Pressure 13-PIT-706	LIC-05		-20.0 to 5.0 inwc	±1.0% of Range
5 [a]	Secondary Chamber Pressure 13-PSHH-896	LIC-06		-5.0 to 5.0 inwc	±3.0% of Range
6 [a,b]	Secondary Chamber Flow Rate 13-PDIT-855	LIC-07	Orifice and D/P Cell	0 to 3.00 inwc	±1.0% of Range
7 [a,b]	Exhaust Blower Duct CO Level 24-AIT-778A/B	LIC-08	Non-Dispersive Infrared Cell Analyzer	0 – 200 to 0 – 3,000 ppm	Refer to ANCDF CEMS Certification Plan
8 [a,b]	Exhaust Blower Duct O_2 Concentration 24-AIT-798A/B	LIC-09/10	Zirconium Oxide Cell Analyzer	0 to 25%	
9 [a]	Primary Chamber Atomizing Air Pressure 13-PSLL-737C	LIC-11	Diaphragm	12 to 100 psig	±3.0% of Range

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a]	Secondary Chamber Atomizing Air Pressure 13-PSL-809	LIC-12	Diaphragm	12 to 100 psig	±3.0% of Range
11	Deleted	LIC-13	---	---	---
12 [a,b]	Agent Feed Rate 13-FT-731A/B	LIC-14/15	Mass Flow Meter Vibrating U-Tube Type	0 to 1,500 lb/hr	±1.0% of Range
13 [a,b]	SDS Flow Rate 13-FIT-763	LIC-16		0 to 5 gpm	
14 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-814	LIC-17	D/P Cell	0 to 50 inwc	
15 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-828	LIC-18	Electromagnetic Flow Meter	0 to 200 gpm	
16 [a,b]	Venturi Scrubber Brine Density 24-DIT-835	LIC-19	Magnetically Vibrated Tube (PAS-PUMP 211/212 Discharge to Suction)	0.6 to 1.4 sgu	±3.0% of Range
17 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-825	LIC-20	Electromagnetic Flow Meter	0 to 1,000 gpm	±1.0% of Range
18 [a,b]	Scrubber Tower pH 24-AIT-832A/B	LIC-21	Electrodes (PFS-PUMP-234/235 Discharge to Suction)	0 to 14 pH units	±3.0% of Range
19 [a]	Quench Tower Flue Gas Temperature 24-TSHH-800	LIC-22	Filled System Temperature Switch	100 to 300°F	

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
20 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-816	LIC-22	Thermocouple	0 to 300°F	±1.0% of Range
21 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-170	LIC-23	D/P Cell	0 to 100 psig	
22 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	LIC-24	Ultrasonic	0 to 216 inches	
23 [a]	Brine Surge Tanks 23-LSHH-02/06	LIC-24	Level Switch	On or Off	Not Applicable
24 [a]	Chemical Agent Feed Pressure 13-PIT-761	LIC-25	D/P Cell	0 to 25 psig	±1.0% of Range
25 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-134	LIC-26/27 AIT-134	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
26 [a,b]	Chemical Agent Emissions Common Stack ACAM-129 ACAM-223 ACAM-225	LIC-28/29 AIT-129			
27 [a]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-433	LIC-30	Temperature Switch	68 to 203°F	±3.0% of Range

Table 7-3: LIC System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
28 [a,b]	PFS HEPA Filter Inlet Pressure Drop 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	LIC-31	D/P Transmitter	0 to 6 inwc	±1.0% of Range
29 [a,b]	PFS HEPA Filter Outlet Pressure Drop 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	LIC-32			
30 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-911SC	LIC-33/34 AIT-134	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
31 [a,b]	Chemical Agent Emissions Common Stack ACAM-904/905/906SC	LIC-35/36 AIT-129			
32 [a,b]	Chemical Agent Emissions Common Stack ACAM-923/924/925SC	LIC-37/38 AIT-129	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	

Footnotes:
a Continuous monitoring
b Continuous recording

Abbreviations:

%.....percentage
AAH .....analyzer alarm high
AIT .....analyzer indicating transmitter
AWFCO.....automatic waste feed cutoff
D/P.....differential pressure
°F .....degrees Fahrenheit
FT .....flow transmitter
gpm.....gallons per minute
lb/ft^3 .....pounds per cubic feet
LIC.....Liquid Incinerator
LSHH.....level switch high-high
PSHH.....pressure switch high-high
PFS .....PAS filtration System
ppm.....parts per million
psig .....pounds per square inch gauge
PSL .....pressure switch low
sgu .....specific gravity units
TIT.....temperature indicating transmitter
ZS .....position switch
±.....plus/minus
AAL.....analyzer alarm low
ANCDF.....Anniston Chemical Agent Disposal Facility
CEMS .....Continuous Emission Monitoring System
DIT .....density indicating transmitter
FIT .....flow indicating transmitter
IAW .....in accordance with
inwc .....inches of water column
lb/hr.....pounds per hour
LIT.....level indicating transmitter
PAS.....Pollution Abatement System
PDIT .....pressure differential indicating transmitter
PIT .....pressure indicating transmitter
PRW .....process water
PSHH.....pressure switch high-high
PSLL.....pressure switch low-low
SDS.....spent decontamination solution
TSHH.....temperature switch high-high

Table 7-4: Maximum Feed Rates of Munitions to the MPF during Normal Agent Operations

Munition Type	Agent Type	Max Units per Tray	Feed Interval per Tray[a] (min)	Max Weight per Tray[b] (lbs)	Maximum Feed Rate (lbs/hr)[c]		
					VX	GB	HD/HT
M121A1 Proj., 155MM	VX	48	35	13.9	23.8	---	---
M121A1/M122 Proj., 155MM	GB	48	35	---	---	147.9	---
M426 Proj., 8-inch	GB	27	35	---	---	147.9	---
M360 Proj., 105MM	GB	96	35	---	---	147.9	---
M2/M2A1 Proj., 4.2-inch (Condition 1 – drained)	HD/HT	96	30	66.2	---	---	132.4
M2/M2A1 Proj., 4.2-inch (Condition 2 – undrained)	HD/HT	96	60	540.9	---	---	540.9
M60 Proj., 105MM	HD	96	68	285	---	---	540.9
M110 Proj., 155MM	HD	48	80	540.9	---	---	540.9
Ton Container	HD	1	125	0 to ≤ 220	---	---	540.9
Ton Container	HD	1	140	>220 to ≤ 450	---	---	540.9
Ton Container	HD	1	165	> 450 to ≤ 540.9	---	---	540.9

Footnotes:
(a) Time required in Zones 1 and 2 or as specified in VII.C.3.g.
(b) Agent only, does not include the weight of the base, tray, or munition bodies nor any HD collected by the Froth Collection System
(c) The instantaneous feed rate in pounds per hour is calculated by Max Weight per Tray (lbs) x 1 tray/feed interval (min) x 60 min/hr not to exceed 540.9 lb/hr HD.

Abbreviations:
--- ..... not applicable
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
MM ..... millimeter
% ..... percent
lbs ..... pounds
min ..... minutes
MPF ..... Metal Parts Furnace

Table 7-5: Maximum Feed Rates of Secondary Waste to the MPF during Normal Agent Operations

Secondary Waste Type	Max Units per Charge	Feed Interval per Charge[1] (min)	Max Weight per Charge (lbs)
Chlorine	---	90	93
Organic Material	---	90	335
Sludge	---	90	---[2]
Non-Combustible Waste [4]	---	30	---[4]
Embedded Metals[3]	---	90	4,050
BTU value (MM)	4	90	---
VX Agent	---	90	13.9

Footnotes:
(1) Time required in Zones 1 and 2 or as specified in VII.C.3.g.
(2) Sludge to be fed in containment pans, spread to a depth no greater than 1.5 inches.
(3) -Embedded is defined as the metallic content of a munition body or secondary waste; e.g., projo bodies, overpacks, pumps, etc.
(4) Non-combustible secondary waste such as bulk embedded metals, concrete, etc. will be fed to the MPF with zone timers of 30 minutes for Zones 1 and 2 and a zone timer of 20 minutes for Zone 3, as the treatment within the MPF is for thermal decontamination to the 5X level.

Abbreviations:
ACT.....Agent Collection Tank
lbs .....pounds
min.....minutes
SDS.....spent decontamination solution
BTU.....British thermal unit
MM.....million
MPF.....Metal Parts Furnace

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-01	TAHH-152	Primary Chamber Zone 1 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-02	TALL-152	Primary Chamber Zone 1 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-03	TAHH-141	Primary Chamber Zone 2 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-04	TALL-141	Primary Chamber Zone 2 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-05	TAHH-153	Primary Chamber Zone 3 Temperature High-High	1,705° F	1,705° F	1,705° F
MPF-06	TALL-153	Primary Chamber Zone 3 Temperature Low-Low[2]	1,175° F	1,175° F	1,175° F
MPF-07	TAHH-87	Afterburner Temperature High-High	2,150° F	2,150° F	2,150° F
MPF-08	TSLL-87	Afterburner Temperature Low-Low	1,772° F	1,772° F	1,772° F
MPF-09	PSHH-34	Primary Chamber Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-10	PSHH-390	Afterburner Pressure High-High	-0.1 inwc	-0.1 inwc	-0.1 inwc
MPF-11	PDAHH-786	Afterburner Flue Gas Flow Rate High-High	0.5 inwc	0.5 inwc	0.5 inwc
MPF-12	AAHH-384C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm	100 ppm	100 ppm
MPF-13	AAHH-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry	15% dry	15% dry
MPF-14	AALL-81A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry	3% dry	3% dry
MPF-15	Programmed Feed Permissive	Munitions Feed Rate High	132.4 lbs/hour – Condition 1 540.9 lbs/hour – Condition 2	23.8 lbs/hour	147.9 lbs/hour
		Secondary Waste Feed Rate High	Chlorine: 93 lbs/WIC Organic Material: 335 lbs/WIC Sludge: 1.5 inches in containment pan VX: 13.9 lbs/tray Non-embedded Metals: 1,920 lbs/WIC BTU: 4.0 MM/WIC		

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-16	PDALL-222	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc
MPF-17	FALL-218	Venturi Scrubber Brine Flow Rate Low-Low	130 gpm (10 second delay)	130 gpm (10 second delay)	130 gpm (10 second delay)
MPF-18	DAHH-216	Venturi Scrubber Brine Density High-High	1.10 sgu	1.10 sgu	1.10 sgu
MPF-19	FALL-248	Scrubber Tower Clean Liquor Flow Rate Low-Low	600 gpm	600 gpm	600 gpm
MPF-20	AALL-247	Scrubber Tower pH Low-Low	7.12 pH	7.12 pH	7.12 pH
MPF-21	BSLL-883 BSLL-884 BSLL-885 BSLL-886 BSLL-887 BSLL-888 BSLL-889 BSLL-890 BSLL-891 BSLL-892	Primary Chamber Flame Loss Low-Low	Zones 1 and 2, all or 2 burners out: <1,400° F		

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-22	TSHH-223	Quench Tower Flue Gas Temperature High-High	215° F	215° F	215° F
MPF-23	PALL-358	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
MPF-24	LSHH-02/06	Brine Surge Tanks Level High-High	219 in	219 in	219 in
MPF-25	ACAM-167 ACAM-907	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.0003 mg/m^3
MPF-26	ACAM-167 ACAM-907	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	Not Applicable	0.00006 mg/m^3
MPF-27[5]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	Not Applicable	0.0003 mg/m^3

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-28[5]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	Not Applicable	0.00006 mg/m^3
MPF-29	TAHH-097	PFS Carbon Filter Exhaust Gas Temperature High-High	180° F	180° F	180° F
MPF-30[3]	PDAHH-436B PDAHH-438B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
MPF-31[3]	PDAHH-436E PDAHH-438E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
MPF-32[4]	ACAM-401A	Chemical Agent Emissions High-High Instantaneous (Cool-Down Conveyor Enclosure)	0.03 mg/m^3 HD/HT	Not Applicable	Not Applicable
MPF-33[4]	ACAM-401	Chemical Agent Emissions High-High Instantaneous (Cool Down Conveyor Enclosure)	Not Applicable	0.0003 mg/m^3	Not Applicable
MPF-34	ACAM-908-SC ACAM-909SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	Not Applicable	0.0003 mg/m^3	Not Applicable

Table 7-6: MPF AWFCO Parameters during Normal Agent Operations (Continued)

Item No	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
MPF-35	ACAM-908-SC ACAM-909SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	Not Applicable	0.00006 mg/m^3	Not Applicable
MPF-36[5]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	Not Applicable	0.0003 mg/m^3	Not Applicable
MPF-37[5]	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	Not Applicable	0.00006 mg/m^3	Not Applicable
MPF-38	ACAM-932SC ACAM-933SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	NA	NA
MPF-39	ACAM-932SC ACAM-933SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	NA	NA
MPF-40[5]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	NA	NA
MPF-41[5]	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	NA	NA

Footnotes:
(1) All values are instantaneous unless otherwise noted.
(2) In the event of an AWFCO, all zone timers will be reset.

Footnotes (continued):

(3) Stop feed parameters only apply to the on-line PFS unit. PDAHH-438B and E are installed within PFS-FILT-111 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the MPF through the LIC PFS or the common spare PFS. As such, PDAHH-436B and E or PDAHH-487B and E will be the units of measure in the event that the exhaust from the MPF is being channeled through any of the other filter units.

(4) The ACAMS may be taken off-line during processing in accordance with VII.C.6.e.

(5) All common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
inwc .....inches of water column
lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF .....Metal Parts Furnace
PALL .....pressure alarm high-high
PDAH .....pressure differential alarm high
PDALL .....pressure differential alarm low-low
ppm.....parts per million
psig .....pounds per square inch gauge
PSLL.....pressure switch low-low
ROHA.....rolling hourly average
sgu .....specific gravity unit
TSLL .....temperature switch low-low

°F ..... degrees Fahrenheit
AALL..... analyzer alarm low-low
ANCDF..... Anniston Chemical Agent Disposal Facility
CO..... carbon monoxide
FALL ..... flow alarm low-low
HEPA..... high efficiency particulate air
lbs/2-min ..... pounds per 2-minute average
LIC..... Liquid Incinerator
mg/m^3..... milligrams per cubic meter
O_2..... oxygen
PAS..... Pollution Abatement System
PDAH ..... pressure differential alarm high
PFS..... PAS Filtration System
PSHH ..... pressure switch high-high
PSL ..... pressure switch low
RCRA ..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
TAHH ..... temperature alarm high-high

Table 7-7: MPF System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Primary Chamber Zone 1 Temperature 14-TIT-152	MPF-01/02	Thermocouple	0 to 2,000°F	±1.0% of Range
2 [a,b]	Primary Chamber Zone 2 Temperature 14-TIT-141	MPF-03/04			
3 [a,b]	Primary Chamber Zone 3 Temperature 14-TIT-153	MPF-05/06			
4 [a,b]	Afterburner Temperature 14-TIT-87	MPF-07/08		0 to 2,282°F	
5 [a,b]	Primary Chamber Pressure 14-PIT-34	MPF-09	Diaphragm	-10.0 to 0.0 inwc	
6 [a,]	Afterburner Pressure 14-PSHH-390	MPF-10		-15.0 to 15 inwc	±3.0% of Range
7 [a,b]	Afterburner Flow Rate 14-PDIT-786	MPF-11	D/P Cell	0 to 2.0 inwc	±1.0% of Range
8 [a,b]	Exhaust Blower Duct CO Level 24-AIT-384A/B	MPF-12	Non-Dispersive Infrared Analyzer	0 – 200 to 0 - 3,000 ppm	Refer to ANCDF CEMS Certification Plan
9 [a,b]	Exhaust Blower Duct O_2 Concentration 24-AIT-81A/B	MPF-13/14	Zirconium Oxide Cell Analyzer	0 to 25%	

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-222	MPF-16	D/P Cell	0 to 50 inwc	± 1.0% of Range
11 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-218	MPF-17	Electromagnetic flow meter (In-line)	0 to 200 gpm	± 1.0% of Range
12 [a,b]	Venturi Scrubber Brine Density 24-DIT-216	MPF-18	Magnetically Vibrated Tube (PAS-PUMP-102/103 Discharge to Suction)	0.6 to 1.40 sgu	±2.0% of Range
13 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-248	MPF-19	Electromagnetic Flow Meter (In-line)	0 to 1,500 gpm	±1.0% of Range
14 [a,b]	Scrubber Tower pH 24-AIT-247A/B	MPF-20	Electrodes (PFS-PUMP-136/137 Discharge to Suction)	0 to 14 pH units	±3.0% of pH Unit
15 [a]	Quench Tower Flue Gas Temperature 24-TSHH-223	MPF-22	Filled System Temperature Switch	175 to 360°F	±3.0% of Range
16 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-509		Thermocouple	0 to 300°F	±1.0% of Range
17 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-358	MPF-23	D/P Cell (In-line)	0 to 100 psig	±3.0% of Range
18 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	MPF-24	Ultrasonic	0 to 216 inches	±1.0% of Range

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
19 [a]	Brine Surge Tanks Level 23-LSHH-02/066	MPF-24	Level Switch	On or Off	Function Tested
20 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-167 ACAM-907	MPF-25/26 AIT-167	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application	
21 [a,b]	Chemical Agent Emissions Common Stack ACAM-129	MPF-27/28 AIT-129			
22 [a,b]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-97	MPF-29	Temperature Switch	75 to 205°F	±3.0% of Range
23 [a,b]	PFS HEPA Filter Inlet Pressure drop 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	MPF-30	D/P Transmitter	0 to 6 inwc	±1.0% of Range
24 [a,b]	PFS HEPA Filter Outlet Pressure drop 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	MPF-31			
25 [a,b]	Chemical Agent Emissions DAL Cool-Down Conveyor Enclosure ACAM-401A	MPF-32 AIT-401	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application	

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range
26 [a,b]	Chemical Agent Emissions DAL Cool-Down Conveyor Enclosure ACAM-401	MPF-33 AIT401	Gas Chromatograph (extractive)	See Appendix III D-2-2 of the Application
27 [a,b]	Chemical Agent Emissions High-High (Exhaust Blower Duct) ACAM-908SC ACAM-909SC	MPF-34 MPF-35 AIT-167		
28 [a,b]	Chemical Agent Emissions High-High (Common Stack) ACAM-904SC ACAM-905SC ACAM-906SC	MPF-36 MPF-37 AIT-129		
29 [a,b]	Chemical Agent Emissions High-High (Exhaust Blower Duct) ACAM-932SC ACAM-933SC	MPF-38 MPF-39 AIT-167		
30 [a,b]	Chemical Agent Emissions High-High (Common Stack) ACAM-923SC ACAM-924SC ACAM-925SC	MPF-40 MPF-41 AIT-129		

Table 7-7: MPF System Instrument and Process Parameters (Continued)

Footnotes:
(a) Continuous monitoring
(b) Continuous recording

Abbreviations:

±.....plus or minus
ACAMS.....automatic continuous air monitoring system
ANCDF .....Anniston Chemical Agent Disposal Facility
CEMS .....Continuous Emissions Monitoring System
D/P.....differential pressure
°F .....degrees Fahrenheit
gpm.....gallons per minute
inwc .....inches of water column
LSHH.....level switch high-high
O_2 .....oxygen
PDIT .....pressure differential indicating transmitter
PIT.....pressure indicating transmitter
PSHH.....pressure switch high-high
RCRA .....Resource Conservation and Recovery Act
TIT.....temperature indicating transmitter
%.....percent
AIT .....analyzer indicating transmitter
AWFCO.....automatic waste feed cut-off
CO.....carbon monoxide
DIT .....density indicating transmitter
FIT .....flow indicating transmitter
IAW .....in accordance with
LIT.....level indicating transmitter
MPF .....Metal Parts Furnace
PAS.....Pollution Abatement System
PFS .....PAS Filtration System
ppm.....parts per million
psig .....pounds per square inch gauge
sgu.....specific gravity unit
TSHH.....temperature switch high-high

Table 7-8: Maximum Feed Rates of Munitions to the DFS during Normal Agent Operations

Munition Type	Agent Type	Max Units per Hour	Min Feed Interval (sec)	Maximum Feed Rate (lbs/hr)			
				VX	GB	EXPLOSIVES	PROPELLANT
M55/56 Rocket	GB	34	90	---	149.8	123.5	767.7
M55/56 Rocket	Gelled GB	17/10[1]	---	---	105.8	108.8	656.2
M55/56 Rocket	VX	31	---	4.48	---	102.4	617.6
M121A1 Proj., 155MM	VX	259	---	---	---	635.25	---
M121A1/M122 Proj., 155MM	GB	136	---	---	---	374	---
M426 Proj., 8-inch	GB	59	---	---	---	416.1	---
M360 Proj., 105MM	GB	300	---	---	---	337	---
M2/M2A1 Proj., 4.2-inch[3]	HD/HT	2150	---	---	---	632[2]	---
M60 Proj., 105MM[3]	HD	1680	---	---	---	591[2]	---
M110 Proj., 155MM[3]	HD	1600	---	---	---	658[2]	---
M23 Landmines	VX	44	---	4.48	---	58	---
Explosive Contaminated Solids	---	---	---	4.48	149.8	123.5	767.7
Explosive Contaminated Sludges	---	---	---	4.48	105.8	123.5	767.7

Footnotes:
(1) 17 rockets per hour if drain is greater than 93%; if not, 10 rockets per hour if drain is less than 93% (see Conditions VII.D.3.d. to g.).
(2) TNT equivalent
(3) Mustard agents HD/HT are not fed to the DFS during normal operations. As a result, mustard agent feed rates to the DFS have not been established. Should mustard agent contaminated energetic components be encountered, they will be treated within the DFS kiln at sufficient time and temperature requirements as to ensure 5X decontamination is achieved in accordance with VII.D.4.c and VII.D.4.k.

Abbreviations:
--- ..... not applicable
DFS ..... Deactivation Furnace System
sec ..... seconds
ATB ..... agent trial burn
lbs/hr ..... pounds per hour
TNT ..... trinitrotoluene

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-01	TAHH-182	Rotary Kiln Temperature High-High	1,650°	1,650°	1,650°F
DFS-02	TALL-182	Rotary Kiln Temperature Low-Low	965°	965°	950°F
DFS-03	TAHH-92	Afterburner Temperature High-High	2,160°F	2,160°F	2,160°F
DFS-04	TALL-92	Afterburner Temperature low-low	1,850°F	1,850°F	1,850°F
DFS-05	PSHH-204	Rotary Kiln Pressure High-High	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay	-0.1 inwc with 5 second delay
DFS-06	PAH-65	Afterburner Pressure High	-0.1 inwc	-0.1 inwc	-0.1 inwc
DFS-07	PDAH-813	Afterburner Flue Gas Flow Rate High	1.0 inwc	1.0 inwc	1.0 inwc
DFS-08	AAHH-59C	Exhaust Blower Duct Flue Gas CO Level High-High	100 ppm 7% O_2 dry basis ROHA	100 ppm 7% O_2 dry basis ROHA	100 ppm 7% O_2 dry basis ROHA
DFS-09	AAHH-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration High-High	15% dry basis	15% dry basis	15% dry basis
DFS-10	AALL-175A/B	Exhaust Blower Duct Flue Gas O_2 Concentration Low-Low	3% dry basis	3% dry basis	3% dry basis
DFS-11	TALL-184	DC (Upper) Temperature Low-Low	Not Applicable [3]	1,000°F	1,000°F
DFS-12	TALL-42	DC (Lower) Temperature Low-Low	Not Applicable [3]	1,000°F	1,000°F

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-13	PLC software	Munitions Feed Rate High-High	See Table 7-8	31 rockets/hr 4.48 lbs/hr agent 44 landmines/hr 4.48lbs/hr agent	34 rockets/hr - 12lbs/hr agent (drainable) or 17 rockets/hr if drain ≥93% 10 rockets/hr if drain < 93% (gelled)
DFS-14	PDALL-08	Venturi Scrubber Pressure Differential Low-Low	25 inwc	25 inwc	25 inwc
DFS-15	FAL-06	Venturi Scrubber Brine Flow Rate Low	300 gpm with 10 second delay	300 gpm with 10 second delay	300 gpm with 10 second delay
DFS-16	DAHH-33	Venturi Scrubber Brine Density High-High	1.20 sgu	1.20 sgu	1.20 sgu
DFS-17	FALL-30	Scrubber Tower Clean Liquor Flow Rate Low-Low	1,635 gpm	1,635 gpm	1,635 gpm
DFS-18	AALL-34	Scrubber Tower pH Low-Low	7.48	7.48	7.48
DFS-19	TAHH-51A/B/C/D/E	Rotary Kiln Shell Temperature High-High	1,600°F	1,600°F	1,600°F
DFS-20	SAHH-602	Rotary Kiln Rotational Speed High-High	2 rpm	2 rpm	2 rpm
DFS-21	SALL-602	Rotary Kiln Rotational Speed Low-Low	0.33 rpm	0.33 rpm	0.33 rpm
DFS-22	XS-58/821	DC Operation (jam)	Not Applicable [3]	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-23	SAL-57	DC Operation (no motion)	Not Applicable [3]	No motion	No motion
DFS-24	XS-207/209	Feed Chute Operation	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay	Sensor blocked with 10 second delay
DFS-25	TSHH-01	Quench Tower Flue Gas Temperature High-High	215°F	215°F	215°F
DFS-26	PALL-344	Scrubber Tower Clean Liquor Pressure Low-Low	25 psig	25 psig	25 psig
DFS-27	LSHH-02/06	Brine Surge Tanks Level High-High	219 inches	219 inches	219 inches
DFS-28	ACAM-297	Chemical Agent Emissions High-High Instantaneous (Cyclone Enclosure)	0.006 mg/m^3 HD/HT	0.00006 mg/m^3 VX	0.00006 mg/m^3 GB
DFS-29	ACAM-183 ACAM-910SC	Chemical Agent Emissions High-High Instantaneous (Exhaust Blower Duct)	0.03 mg/m^3 HD/HT	0.0003 mg/m^3 VX	0.0003 mg/m^3 GB
DFS-30	ACAM-183 ACAM-910SC	Chemical Agent Emissions High-High ROHA (Exhaust Blower Duct)	0.006 mg/m^3 HD/HT	0.00006 mg/m^3 VX	0.00006 mg/m^3 GB

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Item No.	Tag Number	Process Data Description	AWFCO[1] Setpoints		
			HD/HT	VX	GB
DFS-31[4]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	NA	0.0003 mg/m^3 GB
	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	NA	0.0003 mg/m^3 VX	NA
	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High Instantaneous (Common Stack)	0.03 mg/m^3 HD/HT	NA	NA
DFS-32[4]	ACAM-129 ACAM-223 ACAM-225	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	NA	0.00006 mg/m^3 GB
	ACAM-904SC ACAM-905SC ACAM-906SC	Chemical Agent Emissions High-High ROHA (Common Stack)	NA	0.00006 mg/m^3 VX	NA
	ACAM-923SC ACAM-924SC ACAM-925SC	Chemical Agent Emissions High-High ROHA (Common Stack)	0.006 mg/m^3 HD/HT	NA	NA
DFS-33	TAHH-430	PFS Carbon Filter Exhaust Gas Temperature High-High	180°F	180°F	180°F

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

DFS-34(2)	PDAHH-436B PDAHH-438B PDAHH-440B PDAHH-442B PDAHH-487B	PFS HEPA Filter Inlet Pressure Drop High	5 inwc	5 inwc	5 inwc
DFS-35(2)	PDAHH-436E PDAHH-438E PDAHH-440E PDAHH-442E PDAHH-487E	PFS HEPA Filter Outlet Pressure Drop High	5 inwc	5 inwc	5 inwc
DFS-36	ACAM-365	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area)	0.03 mg/m^3 HD/HT	0.0003 mg/m^3 VX	0.0003 mg/m^3 GB

Footnotes:

(1) All values instantaneous unless otherwise noted.

(2) Stop feed parameters only apply to the on-line PFS unit. PDAHH-440B and E and PDAHH-442B and E are installed within PFS-FILT-111 and -112 and will be the primary monitoring devices. ANCDF configuration allows for ducting of combustion gases from the DFS through any of the PFS units. As such, PDAHH-436B and E, PDAHH-438B and E, or PDAHH-487B and E will be the units of measure in the event that the exhaust from the DFS is being channeled through any of the other filter units.

(3) The Discharge Conveyor will not be heated during the mustard campaign, but shall remain heated during both the GB and VX campaigns. Mustard contaminated components will be processed within the kiln for greater than 15 minutes at 1000° F.

(4) Common stack ACAMS must remain operational until the requirements of Section 4.10 of the ANCDF LAMP and permit condition VII.E have been met.

Abbreviations:

%.....percent
AAHH .....analyzer alarm high-high
AIT .....analyzer indicator transmitter
AWFCO.....automatic waste feed cut-off
FAHH .....flow alarm high-high
gpm.....gallons per minute
HEPA.....high efficiency particulate air
°F ..... degrees Fahrenheit
AALL..... analyzer alarm low-low
ANCDF..... Anniston Chemical Agent Disposal Facility
CO..... carbon monoxide
FALL ..... flow alarm low-low
DC..... Discharge Conveyor
inwc..... inches of water column

Table 7-9: DFS AWFCO Parameters during Normal Agent Operations (Continued)

Abbreviations (continued):

lbs/hr.....pounds per hour
LSHH.....level switch high-high
MPF.....Metal Parts Furnace
PALL.....pressure alarm high-high
PDAH.....pressure differential alarm high
PDALL.....pressure differential alarm low-low
ppm.....parts per million
psig.....pounds per square inch gauge
PSLL.....pressure switch low-low
ROHA.....rolling hourly average
sgu.....specific gravity unit
TSLL.....temperature switch low-low
LIC..... Liquid Incinerator
mg/m^3..... milligrams per cubic meter
O_2..... oxygen
PAS..... Pollution Abatement System
PDAH..... pressure differential alarm high
PFS..... PAS Filtration System
PSHH..... pressure switch high-high
PSL..... pressure switch low
RCRA..... Resource Conservation and Recovery Act
SDS..... spent decontamination solution
TAHH..... temperature alarm high-high

Table 7-10: DFS System Instrument and Process Parameters

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
1 [a,b]	Rotary Kiln Temperature 16-TIT-182/244	DFS-01/02	Thermocouple	0 to 2,300°F	±1.0% of Range
2 [a,b]	Afterburner Temperature 16-TIT-92	DFS-03/04		32 to 2,400°F	
3 [a,b]	Rotary Kiln Pressure 16-PIT-18	DFS-05	Diaphragm	-20 to 5 inwc	
4 [a]	Rotary Kiln Pressure 16-PSHH-204	DFS-05		-0.07 to –0.15 inwc	±3.0% of Range
5 [a,b]	Afterburner Pressure 16-PIT-65	DFS-06	D/P Cell	-20 to 5 inwc	±1.0% of Range
6 [a,b]	Afterburner Flow Rate 16-PDIT-813	DFS-07	Orifice and D/P Cell	0 to 3.0 inwc	
7 [a,b]	Exhaust Blower Duct CO Level 16-AIT-59A/B	DFS-08	Non-Dispersive Infrared Cell Analyzer	0 – 200 to 0 - 3,000 ppm	Refer to ANCDF CEMS Certification Plan
8 [a,b]	Exhaust Blower Duct O_2 Concentration 16-AIT-175A/B	DFS-09/10	Zirconium Oxide Cell Analyzer	0 to 25%	
9 [a,b]	DC Temperature 16-TIT-42/184	DFS-11/12	Thermocouple	0 to 1,600°F	±1.0% of Range

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
10 [a,b]	Venturi Scrubber Pressure Differential 24-PDIT-08	DFS-14	D/P Cell	0 to 50 inwc	±1.0% of Range
11 [a,b]	Venturi Scrubber Brine Flow Rate 24-FIT-06	DFS-15	Electromagnetic flow meter	0 to 500 gpm	
12 [a,b]	Venturi Scrubber Brine Density 24-DIT-33	DFS-16	Magnetically Vibrated Tube (PAS-PUMP-106/107 Discharge to Suction)	0.6 to 1.4 sgu	±2.0% of Range
13 [a,b]	Scrubber Tower Clean Liquor Flow Rate 24-FIT-30	DFS-17	Electromagnetic flow meter	0 to 3,000 gpm	±1.0% of Range
14 [a,b]	Scrubber Tower pH 24-AIT-34A/B	DFS-18	Electrodes (PAS-PUMP-138/139 Discharge to Suction)	0 to 14 pH units	±3.0% of pH unit
15 [a,b]	Rotary Kiln Shell Temperature 16-TIT-51-A/B/C/D/E	DFS-19	Photometric	800 to 1,800°F	±1.0% of Range
16 [a]	Rotary Kiln Rotational Speed 16-SS-602	DFS-20/21	Ferromagnetic sensor	Not Applicable	
17 [a]	DC Operation Jam 16-XS-58 16-XS-821	DFS-22	Position Switches		Not Applicable
18 [a]	DC Operation No Motion 16-SSL-57	DFS-23	Proximity Switches	0 to 4 rpm	±1.0% of Range

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
19 [a]	Feed Chute Operation Jam 16-XS-207/209	DFS-24	Position Switches	Not Applicable	Not Applicable
20 [a]	Quench Tower Flue Gas Temperature 24-TSHH-01	DFS-25	Filled System Temperature Switch	95 to 219.65°F	±3.0% of Range
21 [a,b]	Quench Tower Flue Gas Temperature 24-TIT-374	DFS-25	Thermocouple	0 to 300°F	±1.0% of Range
22 [a,b]	Scrubber Tower Clean Liquor Pressure 114-PIT-344	DFS-26	D/P Cell	0 to 100 psig	±1.0% of Range
23 [a,b]	Brine Surge Tanks Level 23-LIT-03/07	DFS-27	Ultrasonic	0 to 216 inches	
24 [a]	Brine Surge Tanks Level 23-LSHH-02/06	DFS-27	Level Switch	On or Off	Function Tested
25 [a,b]	Chemical Agent Emissions Cyclone Enclosure ACAM-297	DFS-28 AIT-297	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	
26 [a,b]	Chemical Agent Emissions Exhaust Blower Duct ACAM-183	DFS-29/30 AIT-183			
27 [a,b]	Chemical Agent Emissions Common Stack ACAM-129	DFS-31/32 AIT-129			

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Item No.	Control Parameter	AWFCO Number	Measuring Device	Instrument Range	Accuracy
28 [a]	PFS Carbon Filter Exhaust Gas Temperature 114-TSHH-430	DFS-33	Temperature Switch	68 to 203°F	±3.0% of Range
29 [a,b]	PFS HEPA Filter Inlet Pressure drop 114-PDIT-440B 114-PDIT-442B 114-PDIT-436B 114-PDIT-438B 114-PDIT-487B	DFS-34	D/P Transmitter	0 to 6 inwc	±1.0% of Range
30 [a,b]	PFS HEPA Filter Outlet Pressure drop 114-PDIT-440E 114-PDIT-442E 114-PDIT-436E 114-PDIT-438E 114-PDIT-487E	DFS-35			
31 [a,b]	Chemical Agent Emissions High-High Instantaneous (DC Bin Enclosure Area) ACAM-365	DFS-36 AIT-262	Gas Chromatograph (Extractive)	See Appendix III D-2-2 of the Application	

Footnotes:
a Continuous monitoring
b Continuous recording

Table 7-10: DFS System Instrument and Process Parameters (Continued)

Abbreviations:

%.....percent
ACAMS.....automatic continuous air monitoring system
ANCDF .....Anniston Chemical Agent Disposal Facility
CEMS .....Continuous Emission Monitoring System
D/P.....differential pressure
DIT .....density indicating transmitter
FIT.....flow indicating transmitter
DC .....discharge conveyor
inwc .....inches of water column
LSHH.....level switch high-high
PAS.....pollution abatement system
PFS .....PAS Filtration System
ppm.....parts per million
psig .....pounds per square inch gauge
rpm.....revolutions per minute
SS.....speed switch
TSHH.....temperature switch high-high
XS.....position switch
±.....plus or minus
AIT .....analyzer indicating transmitter
AWFCO.....automatic waste feed cut off
CO .....carbon monoxide
DFS.....Deactivation Furnace System
°F .....degrees Fahrenheit
gpm.....gallons per minute
HEPA.....high efficiency particulate
LIT.....level indicating transmitter
O_2 .....oxygen
PDIT .....pressure differential indicating transmitter
PIT.....pressure indicating transmitter
PSHH.....pressure switch high-high
RCRA .....Resource Conservation and Recovery Act
sgu.....specific gravity unit
SSL .....speed switch low
TIT.....temperature indicating transmitter

MODULE VIII
CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

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MODULE VIII

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

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MODULE VIII

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

VIII.A. SOLID WASTE MANAGEMENT UNITS

1. The Conditions of this module apply to the solid waste management units (SWMUs) and areas of concern (AOCs) identified in Table 8-1 of this Permit, which require a RCRA Facility Investigation (RFI).

2. The Conditions of this module apply to the SWMUs identified in Table 8-2 of this Permit, which require no further investigation under this permit at this time.

3. The Conditions of this module apply to the SWMUs and AOCs identified in Table 8-3 of this Permit which are RCRA regulated units under this permit.

4. The Conditions of this module apply to the SWMUs and AOCs identified in Table 8-4 of this Permit which are remediated by other programs.

5. The Conditions of this module apply to any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; As used in this Part of the Permit, the terms "discover", "discovery", or "discovered" refer to the date on which the Permittee either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified release of hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment.

6. For all SWMUs identified in both the Conditions VIII.A.1. through VIII.A.4 of this Permit and the Federal Facility Agreement (FFA), dated June 13, 1990, all requirements of Conditions VIII.D., VIII.E.,VIII.G. and VIII.H. of this Permit will be met in accordance with the terms, conditions, and schedules of the FFA. Should interim measures be required at any of these SWMUs, requirements for such measures will be complied with in accordance with Condition VIII.F. of this Permit.

7. For all SWMUs and AOCs not identified in Condition VIII.A.6. of this Permit, the Permittee shall comply with all applicable terms, conditions, and schedules of this Permit. Also, for those SWMUs and AOCs which are identified in Condition VIII.A.6. of this Permit, if additional activities are required to comply with the terms of this permit beyond the requirements of the FFA, then those additional activities shall be in accordance with the terms, conditions, and schedules of this permit.

8. The Conditions of this module apply to contamination which has migrated beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied. On-site measures to address such releases shall be determined on a case-by-case basis.

VIII.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUS AND AOCS

1. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Condition VIII.A.5. of this Permit. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). If the Department determines that further investigation of an AOC is required, the permit shall be modified in accordance with ADEM Admin. Code R. 335-14-8-.04(2).

2. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any additional SWMU as discovered under Condition VIII.A.5. of this Permit.

3. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition VIII.B.1. of this Permit. At a minimum, the SAR shall provide the following information:

   a. Location of unit(s) on a topographic map of appropriate scale such as required under ADEM Admin. Code R. 335-14-8-.02(5)(b)19.

   b. Designation of type and function of unit(s).

c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

d. Dates that the unit(s) was operated.

e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

4. Based on the results of the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Conditions VIII.D.1. of this Permit.

VIII.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SWMUS OR AOCS

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Condition VIII.A.2 of this Permit or SWMU or AOCs identified in Condition VIII.A.5 of this Permit for which further investigation was not required.

2. If the Department determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall initiate an investigation as outlined in Permit condition VIII.D immediately upon receiving notification of the Department's determination.

VIII.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform a RCRA Facility Investigation (RFI) for any SWMU or AOC identified by the Department in Permit Conditions VIII.A.1., VIII.B.4., or VIII.C.2. of this Permit.

2. The RFI must completely identify the concentration of hazardous constituents released from each SWMU and AOC and fully delineate the area where such hazardous constituents have come to be located.

3. The RFI must fully characterize the nature and extent of contamination released from each SWMU or AOC under investigation.,

4. The RFI must be performed in a manner consistent with the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

5. Except as provided by Permit Condition VIII.D.6, the RFI must be completed within 180 calendar days from the effective date of this permit, or for SWMUs or AOCs identified pursuant to Permit Condition VIII.B. and VIII.C., within 180 calendar days from the receipt of notification from the Department that an RFI is required. If, prior to the effective date of this permit, the Department has approved a work plan that includes a schedule for completing the RFI, the RFI shall be completed in accordance with the approved schedule.

6. RFI Schedule of Compliance

   a. For RFIs expected to require greater than 180 calendar days to complete, the Permittee may submit a schedule of compliance subject to Department approval and/or modification.

   b. Submittal of a RFI Schedule of Compliance does not delay or otherwise postpone the Permittee's obligation to initiate the RFI.

   c. The Schedule of Compliance must include:

      i. A detailed narrative discussion, which explains why the RFI cannot be completed within 180 days; and,

      ii. A detailed and chronological listing of milestones with estimated durations that provides sufficient information to track the progress of the investigation.

   d. The RFI Schedule of Compliance shall be reviewed by the Department in accordance with Permit Condition VIII.G.

   e. The Permittee shall complete the RFI in accordance with the approved RFI Schedule of Compliance.

7. RFI Progress Reports

   a. For an RFI being conducted in accordance with the approved RFI Schedule of Compliance, the Permittee must submit progress reports on a monthly basis.

   b. The RFI Progress Reports must include:

i. A description of the portion RFI activities completed during the reporting period;

ii. Summaries of any problems or potential problems encountered during the reporting period;

iii. Actions taken to rectify problems;

iv. Changes in relevant personnel;

v. Projected work for the next reporting period;

vii. Any proposed revisions to the RFI Schedule of Compliance. Modifications of the RFI Schedule of Compliance are subject to approval by the Department; and,

vii. A summary of any data collected during the reporting period, including:

A. The location of each sampling point identified on a site map;

B. The concentration of each hazardous constituent detected at each sampling point; and,

C. Submittal of RFI Progress Reports, work plans, or other documents during the RFI does not alter the approved RFI Schedule of Compliance.

8. RFI Reports

a. The Permittee shall prepare and submit to the Department an RFI Report within 60 calendar days from the completion of investigation activities in accordance with the approved RFI Schedule of Compliance, if applicable.

b. The RFI Report must provide a detailed description of all required elements of the investigation as described in the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

c. The RFI Report shall be reviewed by the Department in accordance with Permit VIII.G.

VIII.E. SELECTION OF CORRECTIVE MEASURES AND PERMIT MODIFICATION

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1. The Permittee shall develop and submit to the Department a Corrective Measures Implementation (CMI) Plan for any areas of the Permittee's site where hazardous constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMI Plan must include all applicable elements of the proposed remedy pursuant to the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

2. The CMI Plan shall be submitted to the Department within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.

3. The CMI Plan shall be submitted along with a request for permit modification pursuant to ADEM Admin. Code R. 335-14-8-.04(2), and shall include any applicable fees pursuant to ADEM Admin. Code R. 335-1-6. This modification will serve to incorporate the proposed final remedy, including all procedures necessary to implement and monitor the remedy, into this permit.

4. Within 120 calendar days after this Permit has been modified in accordance with Permit Condition VIII.E.3., the Permittee shall demonstrate financial assurance for completing the approved remedy.

VIII.F. INTERIM MEASURES (IM)

1. IM Work Plan(s)

   a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Department determines is necessary. IM are necessary in order to minimize or prevent further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in VIII.F.1.b. Such IM may be conducted concurrently with investigations required under the terms of this Permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Permit Condition VIII.F.

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b. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

c. The IM Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan.

d. The IM Report shall be reviewed by the Department in accordance with Permit Condition VIII.G.

2. IM Implementation

a. The Permittee shall implement the IM in accordance with the approved IM Work Plan.

b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan.

c. Final approval of corrective action required under ADEM Admin. Code R. 335-14-5-.06(12), which is achieved through IM, shall be in accordance with ADEM Admin. Code R. 335-14-8-.04(2) and Permit Condition VIII.E.

3. IM Reports

a. If the time required for completion of IM is greater than one year, the Permittee shall provide the Department with progress reports at intervals specified in the approved work plan. The Progress Reports shall, at a minimum, contain the following information:

i. A description of the portion of the IM completed;

ii. Summaries of <u>any</u> deviations from the IM Work Plan during the reporting period;

iii. Summaries of <u>any</u> problems or potential problems encountered during the reporting period; and

iv. Projected work for the next reporting period.

v. Copies of laboratory/monitoring data.

b. The Permittee shall prepare and submit to the IM Report to the Department within ninety (90) calendar days of completion of IM conducted under Permit Condition VIII.F. The IM Report shall, at a minimum contain the following information:

i. A description of IM implemented;

ii. Summaries of results;

iii. Summaries of all problems encountered;

iv. Summaries of accomplishments and/or effectiveness of IM; and,

v. Copies of all relevant laboratory/monitoring data, *etc.* in accordance with Permit Condition I.E.11.

VIII.G. SUBMITTALS

1. All work plans, reports, schedules, and other documents ("submittals") required by this permit shall be subject to approval by the Department to assure that such submittals and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as directed by the Department.

2. The Department will review all submittals in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. If the Department disapproves a submittal, the Department shall: (1) notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal, (2) revise the submittal and notify the Permittee of the revisions, or (3) conditionally approve the submittal and notify the Permittee of the conditions. Permit Condition VIII.H. shall apply only to submittals that have been disapproved and revised by the Department, or that have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.

3. All submittals shall be submitted within the time frame specified by the Department and in accordance with the approved schedule of compliance. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.

4. All submittals required by this permit shall be signed and certified in accordance with ADEM Admin. Code Rule 335-14-8-.02(2).

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5. Two (2) copies of all submittals shall be provided by the Permittee to the Department in accordance with Permit Condition I.H.

VIII.H. DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by the permit, the following may, at the Permittee's discretion apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within thirty (30) calendar days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth:

    a. The specific matters in dispute;

    b. The position the Permittee asserts should be adopted as consistent with the requirements of the permit;

    c. The basis for the Permittee's position; and,

    d. Any matters considered necessary for the Department's determination.

2. The Department and the Permittee shall have an additional thirty (30) calendar days from Department's receipt of the notification provided for in Condition VIII.H.1. of this Permit to meet or confer to resolve any disagreement.

3. In the event agreement is reached, the Permittee shall submit the revised submittal and implement the same in accordance with and within the time frame specified in such agreement.

4. If agreement is not reached within the 30-day period, the Department shall notify the Permittee in writing of its decision concerning the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Land Division Chief.

5. 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 the permit that the Department determines are not affected by the dispute.

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TABLE 8-1 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REQUIRING A RCRA FACILITY INVESTIGATION (RFI)

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 65	Burning Ground #2	RCRA- regulated Unit (interim status) – non operating. RCRA Closure plan necessary.	Soil
SWMU 69	Abandoned Phenol Basin at Industrial Wastewater Treatment Plant	RFI required for confirmatory sampling and/or remediation of possible contamination.	Groundwater, Soil
AOC B	Underground Storage Tanks in Chemical Limited Area	Brine contents were removed and tanks taken out of service. RFI should address closure of these tanks.	Groundwater, Soil
AOC J	Defense National Stockpiles	RFI required for confirmatory sampling and/or remediation of possible contamination.	Soil
AOC K	Underground Pipe Release at Building 504	RFI required for confirmatory sampling and/or remediation of possible contamination.	Groundwater

TABLE 8-2 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REQUIRING NO FURTHER ACTION AT THIS TIME

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 6	Valve Disposal Pit	SIA – Phase II RI, May 1998	
SWMU 14	Laundry Waste Leaching Facility	ASA – OU-3 final ROD, July 2006	
SWMU 26	North TNT Burial Pit	ASA – OU-3 final ROD, July 2006	
SMWU 36	Drill and Transfer System Site (Toxic Demilitarization Site)	ASA – Site Expansion Report, 1994	
SWMU 39	Dynamometer Wastewater Treatment System	SIA – Phase I RI ,1995	
SWMU 44	Dry Creek	SIA – OU-1 IROD	
SWMU 45	Building 410 former UST	SIA - GW Code R335-6-15.26-.29/2005 ARBCA Evaluation	
SWMU 47	Building 385 former UST	Approved UST Removal March 28, 1996	
SWMU 66	Less than 90 Day Storage Areas (SWMU 16, millvans OB/OD, Buildings 114, 129, 130, 409, 431, 433, 432, 503, 512, 520	RCRA Regulated Units	
SWMU 67	Building 129 Test Range for M16	RCRA Regulated Units	
SWMU 68	Building 129 Test Range for Handguns	RCRA Regulated Units	
AOC C	Tank 77 Release	GW Sampling 2004-2005. Re-mediation complete , 5/2006.	

TABLE 8-3 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REGULATED BY THIS PERMIT

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 16	Burning Ground #1	RCRA-permitted Unit (interim status)	Groundwater, Soil
SWMU 17	Demolition Pit	RCRA-permitted Unit (interim status)	Groundwater, Soil
SWMU 32	Hazardous Waste Storage Building 512	RCRA-permitted Unit	Soil
SWMU 33	Hazardous Waste/Roll-off Box Storage Building 466	RCRA-permitted Unit	Soil
SWMU 34	Chemical Storage Igloos (Total of 155)	RCRA-permitted Unit	Soil
SWMU 48	Hazardous Waste Storage Building (Building 527)	RCRA-permitted Unit	Soil
SWMU 49	Conventional Waste Munitions/Components Storage Igloos (Total of 3)	RCRA-permitted Unit	Soil
SWMU 50	Brine Evaporation System	RCRA- permitted Unit	Groundwater, Soil
SWMU 51	Container Handling Building	RCRA- permitted Unit	Groundwater, Soil
SWMU 52	Brine Surge Tank System	RCRA- permitted Unit	Groundwater, Soil
SWMU 53	Toxic Maintenance Area	RCRA- permitted Unit	Groundwater, Soil
SWMU 54	Upper Munitions Corridor	RCRA- permitted Unit	Groundwater, Soil
SWMU 55	Buffer Storage Area	RCRA- permitted Unit	Groundwater, Soil
SWMU 56	Liquid Incinerator	RCRA- permitted Unit	Groundwater, Soil
SWMU 57	Deactivation Furnace System	RCRA- permitted Unit	Groundwater, Soil
SWMU 58	Brine Drum Dryers	RCRA- permitted Unit	Groundwater, Soil
SWMU 59	Agent Collection Tank System	RCRA- permitted Unit	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 60	Waste Transfer Facility	RCRA- permitted Unit	Groundwater, Soil
SWMU 61	Lower Munitions Corridor	RCRA- permitted Unit	Groundwater, Soil
SWMU 62	Spent Decontamination Holding Tank System	RCRA- permitted Unit	Groundwater, Soil
SWMU 63	Metal Parts Furnace	RCRA- permitted Unit	Groundwater, Soil
SWMU 64	HDC Bin Lay Down Area – Container Handling Building	RCRA- permitted Unit	Groundwater, Soil

TABLE 8-4 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REMEDIATED BY OTHER PROGRAMS, I.E. CERCLA, MMRP.

Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 26, 2007. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 1	Chemical Sludge Waste Pits	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 2	Sanitary Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD and LUCs as specified by Interim Status Post Closure Care (Code R335-14.5.07 and R335-13.4.20) pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 3	Old Industrial Wastewater Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 4	New Industrial Wastewater Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 5	Sink Hole Disposal Area	ASA – Requires monitoring and maintenance approved in the final OU-3 ROD	Groundwater
SWMU 7	Chemical Waste Burial Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 8	Acid Disposal Pit	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 9	Calcium Hypochlorite Burial Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 10	TNT Washout Facility	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 11	Sedimentation Leaching Bed-TNT Washout Facility	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 12	Facility 414 (Old Lagoon)	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 13	SIA Acid Chemical Waste Pit	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 15	Propellant Disposal Facility	ASA – OU-3 final ROD, July 2006. Continue SI to determine extent of NDMA contamination	Groundwater, Soil
SWMU 18	WIA Old Sewage Treatment Plant	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
SWMU 19	SIA Old Sewage Treatment Plant and Drying Beds	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 20	New Sewage Treatment Plant	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil

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SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 21	Abrasive Dust Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 22	A-Block Lagoon	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 23	Asbestos Waste Disposal Trench	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 24	Old Sanitary Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 25	Building 130 Sump	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 27	South TNT Burial Pit	ASA – Requires monitoring and maintenance of LUCs approved in the final OU-3 ROD	Groundwater, Soil
SWMU 28	Waste Wood Landfill	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 29	Old Lumber Disposal Yard	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil
SWMU 30	Northeast Lagoon Area	SIA – Requires monitoring and remediation provided in the OU-1 IROD, and interim status LUCs pending finalization of the OU-2 ROD	Groundwater, Soil

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 31	Building 114 Metal Plating Shop	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 35	Deactivation Furnace/Popping Furnace	ASA – Requires monitoring and remediation approved in the final OU-3 ROD	Groundwater, Soil
SWMU 37	Vehicle Wash Rack (Building 45)	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
SWMU 38	Air Emission Baghouses (Buildings 5, 111, 114, 127, 129, 130, 145, 147, 186, 409, 410, 413, 431, 432, 433, PUB)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 40	Oil-Water Separator Building 501 and 501 UST Site	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 41	Steam Cleaning Buildings (Buildings 128A, 129, 130,409, 421, 503)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 42	Paint Booths (Buildings 8, 74A, 113, 117, 128A, 129, 130, 143, 409, 433, 501, 652)	Requires monitoring and remediation provided in the OU-1 IROD (only applies to units in SIA)	Groundwater
SWMU 43	Cyanide Pretreatment System Building 506	SIA – Requires monitoring and remediation provided in the OU-1 IROD	Groundwater
SWMU 46	Building 6 former UST	WIA – OU-5, Requires completion of Site Investigation (SI)	Groundwater, Soil
AOC A	Western Industrial Area	OU-5, Requires completion of Site Investigation	Groundwater, Soil
AOC D	Recoilless Rifle Range	MMRP Proposed RI	Groundwater, Soil
AOC E	Pistol Range	RI/FS	Groundwater, Soil
AOC F	Burning Ground Buffer Zone	RI/FS	Groundwater, Soil
AOC G	Competition Pistol Range	MMRP Phase II Remediation	Groundwater, Soil
AOC H	Tank Howitzer and Small Arms Range	MMRP Phase II Remediation	Groundwater, Soil
AOC I	Pyrotechnics Range	MMRP Phase II Remediation	Groundwater, Soil

MODULE IX
MANAGEMENT IN CONTAINERS AT THE ANAD HAZARDOUS WASTE STORAGE FACILITIES

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MODULE IX

MANAGEMENT IN CONTAINERS AT THE ANAD HAZARDOUS WASTE STORAGE FACILITY

IX.A. WASTE IDENTIFICATION

1. In the Hazardous Waste Storage Buildings listed in Table 9-1, the Permittee may store, in containers at the facility, the Industrial/Process hazardous wastes listed in Table II.C-1 of the facility permit application, subject to the terms of this permit. Storage of any waste not listed in Table II.C-1 of the facility permit application of this permit is prohibited.

2. In the Conventional Waste Munitions Igloos listed in Table 9-2 the Permittee may store, in containers at the facility, the Conventional Munitions hazardous waste listed in Table II.C-1 of the facility permit application, subject to the terms of this permit. Conventional Munitions hazardous waste may consist of conventional munitions related waste and/or conventional waste munitions. Storage of any waste not listed in Table II.C-1 of the facility permit application is prohibited.

3. In the Chemical Agent Igloos listed in Table 9-3 the Permittee may store Chemical Agent Munitions or Chemical Agent Related wastes generated by ANAD chemical agent munitions storage, reconfiguration operations and/or the ANCDF operations. Chemical Agent Munitions and Chemical Agent related wastes will not be stored in the same igloos at the same time. Storage of any waste not listed in Table III.C-1 of the facility permit application is prohibited.

4. The maximum total storage capacity for the 3 conventional waste munitions igloos is 180,249 gallons. Individual igloo storage limits for conventional waste munitions storage are specified in Table 9-2. The maximum total storage capacity of the 3 industrial hazardous waste storage buildings is 182,543 gallons. Individual building storage limits for industrial hazardous waste are specified in Table 9-1. The maximum total storage capacity of the 155 igloos for chemical agent munitions and chemical agent related waste is 7,552,687 gallons. Individual igloo storage limits for chemical agent storage are as specified in Table 9-3. For containers, these maximum storage capacities are based on the capacity of the containers stored therein; for munitions, these maximum storage capacities are based on the volume occupied by the munitions as they are packaged for storage.

IX.B. STORAGE IN CONTAINERS

1. The Permittee shall comply with the container storage capacity restrictions listed in Part IX.A of this permit.

2. The maximum combined quantity of hazardous and non-hazardous waste (excluding Waste Chemical Agent Munitions) stored in a given area shall not exceed ten times the capacity of the containment system for that area.

3. No individual container may be stored in a given area if the volume exceeds the capacity of the containment system for that area.

4. In addition to the other requirements of Module IX, storage of Waste Chemical Agent Munitions shall comply with all the requirements of ADEM Admin. Code R. 335-14-5-.31.

5. A minimum of 30 inches of aisle space will be maintained at all times within the hazardous waste storage igloos and storage buildings (excluding Waste Chemical Agent Munitions) to provide adequate access for emergency equipment and inspection.

6. Containers (excluding Waste Chemical Agent Munitions) having a capacity greater than or equal to 30 gallons shall not be stacked over two containers high at any time.

7. In addition to the other requirements of Module IX, storage of Conventional Waste Munitions shall comply with all of the requirements of ADEM Admin. Code R. 335-14-7-.13(6)(a)1. and (b).

8. In order to meet the requirement of ADEM Admin. Code R. 335-14-9-.05(1), each container of hazardous waste must be marked with the words, "Hazardous Waste," the applicable EPA hazardous waste number(s), and the date each period of accumulation begins.

IX.C. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, upon discovery the Permittee shall immediately transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this permit, as required in ADEM Admin. Code R. 335-14-5-.09(2).

IX.D. COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittee shall assure that the ability of the container to contain the waste is not impaired, as required by ADEM Admin. Code R. 335-14-5-.09(3).

IX.E. MANAGEMENT OF CONTAINERS

1. The Permittee shall manage containers as required by ADEM Admin. Code R. 335-14-5-.09(4).

2. A container holding hazardous or non-regulated waste must always be closed during storage, except when it is necessary to add, remove, sample, or inspect the waste.

3. A container holding hazardous or non-regulated waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

IX.F. CONTAINMENT

1. The Permittee shall maintain the containment systems for those hazardous waste storage areas listed in Table 9-1 in accordance with the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b).

2. The Permittee shall maintain an impervious coating for those hazardous waste storage areas listed in Table 9-1 that is free of cracks, gaps, or other deterioration on all containment system surfaces which may be exposed to hazardous wastes or hazardous constituents (or releases of hazardous wastes or hazardous constituents).

3. The Permittee shall provide secondary containment in the storage igloos listed in Table 9-3 for any container containing free liquids (excluding chemical agent munitions). The secondary containment must meet the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b). Employments of drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirement.

4. The Permittee shall provide secondary containment in the storage igloos listed in Table 9-2 for any container containing free liquids. The secondary containment must meet the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b). Employments of drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirement.

IX.G. INSPECTIONS

The Permittee shall inspect areas where containers are stored or handled. The purpose of this inspection is to detect leaking containers and deterioration of containers or containment systems and to ensure that containers having a capacity greater than 30 gallons are not stacked over two containers high. The Permittee shall adhere to the inspection requirements of ADEM Admin. Code R. 335-14-5-.09(5).

IX.H. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

The Permittee shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line as required by ADEM Admin. Code R. 335-14-5-.09 (7).

IX.I. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTE

1. The Permittee shall separate containers of incompatible wastes as specified in Section II.F-5 of the facility permit application.

2. The Permittee shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material.

3. The Permittee must document compliance with Conditions IX.I.1. and IX.I.2. of this permit as required by ADEM Admin. Code R. 335-14-5-.05(4) and place this documentation in the operating record.

4. The Permittee shall separate containers of incompatible wastes as required by ADEM Admin. Code R. 335-14-5-.09(8)(c).

IX.J. CLOSURE

The Permittee shall close the container storage area in accordance with the requirements of the Closure Plan, Section I of the ANAD Part B Application, and Rules 335-14-5-.07(2) and 335-14-5-.09(9) of the ADEM Administrative Code.

IX.K PERMITTED HAZARDOUS WASTE STORAGE FACILITIES

The Permittee may operate the hazardous waste storage facility storage units described in Table 9-1, Table 9-2, and Table 9-3 of Part IX of this permit, subject to the terms of this permit. Operation of any process or unit not listed in Part IX of this permit, operation of any process in a unit or area other than that for which the process is listed, or exceedance of any capacity listed therein, for the storage of hazardous waste is prohibited.

IX.l SAMPLING OF CONTAINERS WITHIN WASTE STORAGE FACILITIES

1. The Permittee shall sample all unknown waste located in any of the Hazardous Waste Storage Facilities listed in Table 9-1. The waste shall be sampled within five (5) days of arrival in the Waste Storage Facility.

2. The results of the sampling of unknown wastes within the Waste Storage Facility must be determined in a period not to exceed seventy-five (75) days from the date of the original sampling event.

3. The date waste was placed into storage, the sampling date, and the date and results of the sampling event must be documented by the Permittee. This documentation shall be maintained for a period of no less than three (3) years.

TABLE 9-1

INDUSTRIAL/PROCESS HAZARDOUS WASTE STORAGE BUILDINGS*

Storage Building	Storage Dimensions	Max. Volume (gallons)**
466–A Side	100′ x 50′	27720
466-B Side	100′ x 60′	69300
512	40′ x 60′	25440
527	50′ x 80′	60083
Roll-off Box Storage Building	36′ x 60′	4 roll-off boxes; 132 cubic yards

Note: (*) Non-regulated waste includes solid and universal waste, used oil, etc.
(**) Max. Volume includes all waste stored (regulated and non-regulated)

TABLE 9-2

CONVENTIONAL WASTE MUNITIONS/CONVENTION WASTE MUNITIONS COMPONENTS STORAGE IGLOOS

Igloo	Storage Dimensions	Max. Volume (gallons)**
I-103	23′6″ x 80	60083
F-704A	23′6″ x 80	60083
F-405	23′6″ x 80	60083

Note: (**) Max. Volume includes all waste stored (regulated and non-regulated)

TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS*

Igloo	Dimensions	Max.Volume (gallons)	Igloo	Dimensions	Max.Volume (gallons)
G101	23'6"X60'	45945	G302	23'6"X60'	45945
G102	23'6"X60'	45945	G303	23'6"X60'	45945
G102A	23'6"X80'	60083	G303A	23'6"X80'	60083
G103	23'6"X60'	45945	G304	23'6"X60'	45945
G104	23'6"X60'	45945	G304A	23'6"X80'	60083
G105	23'6"X60'	45945	G305	23'6"X60'	45945
G106	23'6"X60'	45945	G306	23'6"X60'	60083
G107	23'6"X60'	45945	G306A	23'6"X80'	60083
G108	23'6"X60'	45945	G307	23'6"X60'	45945
G108A	23'6"X60'	45945	G307A	23'6"X80'	60083
G109	23'6"X60'	45945	G308	23'6"X60'	45945
G110	23'6"X60'	45945	G308A	23'6"X80'	60083
G200A	23'6"X60'	45945	G309	23'6"X60'	45945
G201	23'6"X60'	45945	G310	23'6"X60'	45945
G202	23'6"X60'	45945	G311	23'6"X60'	45945
G202A	23'6"X80'	60083	G312	23'6"X60'	45945
G203	23'6"X60'	45945	G313	23'6"X60'	45945
G203A	23'6"X80'	60083	G401	23'6"X60'	45945
G204	23'6"X60'	45945	G402	23'6"X60'	45945
G205	23'6"X60'	45945	G403	23'6"X60'	45945
G206	23'6"X60'	45945	G404	23'6"X60'	45945
G206A	23'6"X80'	60083	G404A	23'6"X80'	60083
G207	23'6"X60'	45945	G405	23'6"X60'	45945
G208	23'6"X60'	45945	G405A	23'6"X80'	60083
G208A	23'6"X80'	60083	G406	23'6"X60'	45945
G209	23'6"X60'	45945	G407	23'6"X60'	45945
G209A	23'6"X80'	60083	G408	23'6"X60'	45945
G210	23'6"X60'	45945	G408A	23'6"X80'	60083
G211	23'6"X60'	45945	G409	23'6"X60'	45945
G211A	23'6"X80'	60083	G410	23'6"X60'	45945
G212	23'6"X60'	45945	G411	23'6"X60'	45945
G213	23'6"X60'	45945	G501	23'6"X60'	45945
G301	23'6"X60'	45945	G502	23'6"X60'	45945

TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS, continued

Igloo	Dimensions	Max.Volume (gallons)	Igloo	Dimensions	Max.Volume (gallons)
G502A	23'6"X80'	60083	G610	23'6"X60'	45945
G503	23'6"X60'	45945	G611	23'6"X60'	45945
G503A	23'6"X80'	60083	G612	23'6"X60'	45945
G504	23'6"X60'	45945	G1001	23'6"X40'	28274
G504A	23'6"X80'	60083	G1002	23'6"X40'	28274
G505	23'6"X60'	45945	C701	23'6"X60'	45945
G505A	23'6"X80'	60083	C702	23'6"X60'	45945
G506	23'6"X60'	45945	C703	23'6"X60'	45945
G506A	23'6"X80'	60083	C704	23'6"X60'	45945
G507	23'6"X60'	45945	C705	23'6"X60'	45945
G507A	23'6"X80'	60083	C706	23'6"X60'	45945
G508	23'6"X60'	45945	C707	23'6"X60'	45945
G508A	23'6"X80'	60083	C707A	23'6"X80'	60083
G509	23'6"X60'	45945	C708	23'6"X60'	45945
G510	23'6"X60'	45945	C801	23'6"X60'	45945
G511	23'6"X60'	45945	C802	23'6"X60'	45945
G512	23'6"X60'	45945	C803	23'6"X60'	45945
G601	23'6"X60'	45945	C804	23'6"X60'	45945
G601A	23'6"X80'	60083	C805	23'6"X60'	45945
G602	23'6"X60'	45945	C806	23'6"X60'	45945
G602A	23'6"X80'	60083	C807	23'6"X60'	45945
G603	23'6"X60'	45945	C808	23'6"X60'	45945
G603A	23'6"X80'	60083	C808A	23'6"X80'	60083
G604	23'6"X60'	45945	C809	23'6"X60'	45945
G604A	23'6"X80'	60083	C901	23'6"X60'	45945
G605	23'6"X60'	45945	C902	23'6"X60'	45945
G605A	23'6"X80'	60083	C903	23'6"X60'	45945
G606	23'6"X60'	45945	C904	23'6"X60'	45945
G607	23'6"X60'	45945	C905	23'6"X60'	45945
G607A	23'6"X80'	60083	C906	23'6"X60'	45945
G608	23'6"X60'	45945	C907	23'6"X60'	45945
G609	23'6"X60'	45945	C907A	23'6"X80'	60083
G609A	23'6"X80'	60083	C908	23'6"X60'	45945

TABLE 9-3

CHEMICAL AGENT STORAGE IGLOOS, continued

Igloo	Dimensions	Max.Volume (gallons)
C1001	23'6"X60'	45945
C1002	23'6"X60'	45945
C1003	23'6"X60'	45945
C1004	23'6"X60'	45945
C1005	23'6"X60'	45945
C1006	23'6"X60'	45945
C1007	23'6"X60'	45945
C1008	23'6"X60'	45945
C1009	23'6"X60'	45945
C1101	23'6"X60'	45945
C1102	23'6"X60'	45945
C1103	23'6"X60'	45945
C1104	23'6"X60'	45945
C1105	23'6"X60'	45945
C1106	23'6"X60'	45945
C1107	23'6"X60'	45945
C1108	23'6"X60'	45945
C1201	23'6"X60'	45945
C1202	23'6"X60'	45945
C1203	23'6"X60'	45945
C1204	23'6"X60'	45945
C1205	23'6"X60'	45945
C1206	23'6"X60'	45945

* The storage volume of the Chemical Agent Storage Igloos was calculated by determining the maximum volume occupied by the M55 rockets as they are packaged for storage. Waste Chemical Agent Munitions shall be stored in accordance with ADEM Admin. Code R. 335-14-5-.31. Chemical Agent Related Waste must be stored in accordance with Condition IX.B of this Permit.

MODULE X: GROUNDWATER MONITORING AND CORRECTIVE ACTION

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MODULE X
GROUNDWATER MONITORING AND CORRECTIVE ACTION

X.A REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition X.B and the Detection Monitoring Program contained in Permit Condition X.C.

2. The Permittee shall commence groundwater monitoring as required by this permit not later than 120 calendar days after the effective date of this permit.

X.B. GENERAL GROUNDWATER MONITORING PROGRAM

1. Well Location, Installation, and Construction

The Permittee shall install and/or maintain a groundwater monitoring system to comply with the requirements of ADEM Admin. Code Rules 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11) as applicable and as specified below:

a. The Permittee shall maintain all groundwater monitoring wells at the facility as identified in Table 10-1 of this permit, at the locations specified on Figure IV.E-1 and Figure IV.E-2 of the facility permit application.

i. All groundwater monitoring wells shall be maintained in accordance with the plans and specifications presented in Section IV.F of the facility permit application and in accordance with ADEM Admin. Code Rule 335-14-5-.06.

ii. A groundwater monitoring well shall not be removed from any monitoring program specified in this permit without an approved permit modification pursuant to Permit Condition I.K.3.

iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, to include a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. Within 30 calendar days after the well is repaired, the Permittee shall submit a written notification to the Department that the well repair activities were conducted in accordance with the approved procedures.

iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit in accordance with Permit Conditions X.B.1.a.i and I.K.3., it shall be abandoned within 90 calendar days after deletion in accordance with the most recent version of the Alabama Environmental Investigation and Remediation Guidance (AEIRG). Within 30 calendar days after the well is abandoned, the Permittee shall submit a written notification to the Department that the well

abandonment activities were conducted in accordance with the approved procedures.

b. Groundwater monitoring wells 05CW16-1, 05CW16-2, 05CW16-3, and 05CW16-4 shall define the points of compliance for the OB unit. Groundwater monitoring wells 05CW17-1, 05CW17-2, 91B18 and 91B19 shall define the points of compliance for the OD unit.

c. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in migration and contaminant levels of any plume or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code Rules 335-14-5-.06(6), 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11), as applicable. A plan in the form of a permit modification request specifying the design, location and installation of any additional monitoring wells should be submitted to the Department within 90 calendar days prior to installation. At a minimum, the plan shall include:

i. Well construction techniques including casing depths and proposed total depth of well(s);

ii. Well development method(s);

iii. A complete description of well construction materials;

iv. A schedule of implementation for construction; and,

v. Provisions for determining the lithologic characteristics, hydraulic conductivity, grain size distribution, and porosity for the applicable aquifer unit(s) at the location of the new well(s).

2. General Groundwater Monitoring Requirements

a. The Permittee shall determine the groundwater surface elevation from all monitoring wells listed in Table 10-1 of this permit at least semi-annually and each time a sampling event is conducted. The results of these determinations should be submitted in accordance with Permit Condition X.B.6. Elevation data should be recorded and reported as mean sea level (MSL) and referenced to an appropriate national geodetic vertical datum (NGVD) benchmark.

b. The Permittee shall determine the groundwater flow rate and direction in the underlying aquifer(s) at least annually and submit the results in accordance with Permit Condition X.B.6.

c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit in accordance with Section IV.E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(g).

3. Groundwater Protection Standard

a. The groundwater protection standard, as required under ADEM Admin. Code Rule 335-14-5-.06(3), shall consist of Table 10-2 of this permit which lists the hazardous constituents and their respective concentration limits.

b. The groundwater protection standard applies to all hazardous waste or hazardous constituent releases as deemed appropriate by the Department to protect human health and the environment.

4. Compliance Period

a. The compliance period, during which the groundwater protection standard specified in Permit Condition X.B.3 applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition X.D.) or the corrective action monitoring program (Permit Condition X.E.), whichever is earlier.

b. The compliance period shall continue (after beginning pursuant to Permit Condition X.B.4.a.) until the groundwater protection standard as defined by Permit Condition X.B.3.a. has not been exceeded for a period of three consecutive years.

c. If the Permittee is engaged in a corrective action program pursuant to Permit Condition X.E., then the compliance period shall continue as required by ADEM Admin. Code Rule 335-14-5-.06(7)(c) until the groundwater protection standard has not been exceeded for a period of three consecutive years after corrective action has been terminated and this permit has been modified, in accordance with Permit Condition I.K., to implement a compliance monitoring program pursuant to Permit Condition X.D. or a detection monitoring program pursuant to Permit Condition X.C as required by ADEM Admin. Code Rule 335-14-5-.06(11)(f).

5. Sampling and Analysis Procedures

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition X.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code Rules 335-14-5-.06(8)(d), (e), and (g):

a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Section IV.E of the facility permit application.

b. Samples shall be analyzed according to the procedures specified in Section IV.E of the facility permit application, the most recent edition of SW-846 or other appropriate methods approved by the Department. Analytical method detection limits shall be less than or equal to the concentration limits specified in Table 10-2, unless otherwise approved in writing by the Department.

c. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section IV.E of the facility permit application.

d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Section IV.E of the facility permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(h).

e. All samples taken in accordance with this permit shall not be filtered prior to analysis.

6. Recordkeeping and Reporting

a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions X.B., X.C., X.D., and X.E. as required by Permit Condition I.E.11.

b. The Permittee shall submit to the Department a written report to include all analytical sampling data, established background values, statistical evaluations, groundwater elevations, associated potentiometric maps, and the annual groundwater flow rate and direction determinations. The analytical method and the method detection limit (MDL) for each constituent must be integrated into all reports of analysis. The report shall be submitted within 60 calendar days after the first sampling event and on an annual basis thereafter. Copies of this report shall be kept at the facility in accordance with Permit Condition I.E.11.

c. The Permittee shall submit progress reports to the Department describing implementation of groundwater monitoring and/or corrective action activities at the site as required by Part V of this permit on a quarterly basis. The progress reports shall continue until such time as the required monitoring and/or corrective action systems and activities required by this permit are fully constructed and operational. In the event that additional monitoring and/or corrective action requirements are imposed through a permit modification, the quarterly reporting requirement shall resume, commencing upon the effective date of the permit modification and continuing until the required monitoring and/or corrective action systems and activities are again fully constructed and operational.

X.C. DETECTION MONITORING PROGRAM

The requirements of this Condition are applicable to OB and OD units. Except as specified otherwise in this permit, the Detection Monitoring Program shall be implemented in accordance with Section IV.E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(9).

1. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition X.B.2., the Permittee shall:

a. Sample all point of compliance wells and background wells and analyze for the constituents listed in Table 10-2 of this permit, on a semi-annual basis in accordance with Permit Condition X.B.5.

b. Sample all background and point of compliance monitoring wells and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled in accordance with Permit Condition X.B.5. The data obtained should be submitted as raw data in the reports required by Permit Condition X.B.6.

c. Sample all designated background monitoring wells and analyze, in accordance with Permit Condition X.B.2, for the constituents listed in Table 10-2 of this permit in all monitoring events.

2. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition X.B.6:

a. The Permittee shall determine whether there is statistically significant evidence of contamination above background levels at each monitoring well within 45 calendar days after completion of each sampling event. The statistical evaluation of monitoring well analytical data shall be performed pursuant to Permit Condition X.B.5 and ADEM Admin. Code Rule 335-14-5-.06(9)(f).

b. If the Permittee determines, pursuant to Permit Condition X.C.2.a, that there is statistically significant evidence of contamination above background levels for any chemical parameters or hazardous constituents listed in Table 10-2 of this permit at any monitoring well at the point of compliance, he or she must comply with ADEM Admin. Code R. 335-14-5-.06(10)(g).

X.D. COMPLIANCE MONITORING PROGRAM

If statistically significant evidence of contamination is found during the baseline sampling monitoring program, in compliance with AAC 335-14-5-.06(10)(h)(2) and (3), the groundwater shall be sampled in all monitoring wells to determine whether constituents in the list of Appendix IX of AAC 335-14-5 are present and, if so, at what concentration. For any Appendix IX compounds found, the analysis may be repeated in1 month. If the analysis is repeated and the results of the second analysis confirm the initial results, then these constituents will form the basis of compliance monitoring. Alternatively, the Permittee may elect to have the hazardous constituents found in the initial Appendix IX monitoring serve as the basis for compliance monitoring. Within 90 days after the discovery of statistically significant evidence of contamination, ANAD shall submit to ADEM an application for a permit modification. The permit modification application will include the following information:

1. Identification of the concentration of any Appendix IX constituent detected in the groundwater at each monitoring well at the point of compliance. [AAC 335-14-5-.06(10)(h)].

2. Any proposed changes to the groundwater monitoring system at the OB and OD units necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].

3. Any proposed corrective actions, additions or changes to the monitoring frequency,

sampling and analysis procedures or methods, or statistical methods used at the facility necessary to meet the requirements of AAC 335-14-5-.06(11) [AAC 335-14-5-.06(10)(h)(2)].

X.E. CORRECTIVE ACTION MONITORING PROGRAM (RESERVED)

TABLE 10-1: MONITORING WELL DESIGNATIONS FOR THE OB/OD UNITS

WELL NUMBER	WELL TYPE[2]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft btoc)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE
05CW16-1[1]	POC	85° 59' 48.10"	33° 39' 56.50"	OB	23	713.75	10.0-20.0	Residuum
05CW16-2	POC	85° 59' 55.80"	33° 40' 06.10"	OB	18	688.09	5.0-15.0	Residuum
05CW16-3	POC	85° 59' 55.00"	33° 40' 04.00"	OB	18	693.36	4.5-14.5	Residuum
05CW16-4	POC	85° 59' 53.00"	33° 40' 04.60"	OB	22	695.81	9.5-19.5	Residuum
05CW17-1	POC	86° 00' 00.40"	33° 40' 59.63"	OD	23	616.04	1.0-20.0	Residuum
05CW17-2	POC	85° 59' 53.00"	33° 40' 55.35"	OD	18	623.91	5.0-15.0	Residuum
91B18[1]	POC	85° 59' 30.50"	33° 40' 47.77"	OD	18	652.00	5.0-15.0	Residuum
91B19	POC	85° 59' 52.52"	33° 40' 56.72"	OD	23	621.57	10.0-20.0	Residuum

Footnootes:

1 – Background Wells
2 - POC – Point of Compliance Wells

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	MAXIMUM CONCENTRATION LIMIT (mg/L)	GROUNDWATER REFERENCE
Inorganics (metals)			
Aluminum	OB and OD	3.60E+00	a
Antimony	OB and OD	6.00E-03	a
Arsenic	OB and OD	1.00E-02	a
Barium	OB and OD	2.00E+00	a
Beryllium	OB and OD	4.00E-03	a
Cadmium	OB and OD	5.00E-03	a
Chromium	OB and OD	4.00E-01	a
Cobalt	OB and OD	7.30E-02	a
Copper	OB and OD	1.30E+00	a
Iron	OB and OD	1.10E+00	a
Lead	OB and OD	1.50E-02	a
Manganese	OB and OD	8.80E-02	a
Mercury	OB and OD	2.00E-03	a
Nickel	OB and OD	1.00E-01	a
Selenium	OB and OD	5.00E-02	a
Silver	OB and OD	1.80E-02	a
Thallium	OB and OD	2.00E-03	a
Vanadium	OB and OD	3.60E-03	a
Zinc	OB and OD	1.10E+00	a
Explosives			
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	OB and OD	6.10E-04	a
HMX (Octahydro-,3,5,7- tetranito-1,3,5,7-tetrazocine)	OB and OD	1.80E-01	a
1,3,5-Trinitrobenzene	OB and OD	1.10E-01	a
1,2-Dinitrobenzene	OB and OD	3.70E-03	b
1,3-Dinitrobenzene	OB and OD	3.70E-03	b
1,4-Dinitrobenzene	OB and OD	3.70E-03	b
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	OB and OD	3.60E-02	a
2-Amino-4,6-dinitrotoluene	OB and OD	7.30E-02	b
4-Amino-2,6-dinitrotoluene	OB and OD	7.30E-02	b
Nitrobenzene	OB and OD	3.40E-04	a
2,4,6-Trinitrotoluene	OB and OD	2.20E-03	a
2,4-Dinitrotoluene	OB and OD	7.30E-03	a
2,6-Dinitrotoluene	OB and OD	3.60E-03	a
2-Nitrotoluene	OB and OD	3.10E-04	b
3-Nitrotoluene	OB and OD	7.30E-01	b
4-Nitrotoluene	OB and OD	4.20E-03	b
Nitroglycerin	OB and OD	3.70E-03	b
Semi-Volatile Organic Compounds (SVOCs)			
1,2,4-Trichlorobenzene	OB and OD	7.00E-02	a
1,2-Dichlorobenzene	OB and OD	6.00E-01	a
1,3-Dichlorobenzene	OB and OD	1.80E-02	a
1,4-Dichlorobenzene	OB and OD	7.50E-02	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	MAXIMUM CONCENTRATION LIMIT (mg/L)	GROUNDWATER REFERENCE
2,4,5-Trichlorophenol	OB and OD	3.60E-01	a
2,4,6-Trichlorophenol	OB and OD	3.60E-04	a
2,4-Dimethylphenol	OB and OD	7.30E-02	a
2,4-Dichlorophenol	OB and OD	1.10E-02	a
2,4-Dinitrotoluene	OB and OD	7.30E-03	a
2,6-Dinitrotoluene	OB and OD	3.60E-03	a
2-Chloronaphthalene	OB and OD	4.90E-02	a
2-Chlorophenol	OB and OD	3.00E-03	
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	OB and OD	3.70E-03	b
2-Methylnaphthalene	OB and OD	6.26E-03	a
2-Methylphenol (o-Cresol)	OB and OD	1.80E-01	a
2-Nitroaniline	OB and OD	1.10E-02	a
3,3'-Dichlorobenzidine	OB and OD	1.50E-04	a
3-Methylphenol (m-Cresol)	OB and OD	1.80E-01	a
4-Methylphenol (p-Cresol)	OB and OD	1.80E-02	a
3-Nitroaniline	OB and OD	1.10E-02	a
4-Chloro-3-methylphenol	OB and OD	1.41E-02	a
4-Chloroaniline	OB and OD	1.50E-02	a
4-Nitroaniline	OB and OD	3.40E-03	b
4-Nitrophenol	OB and OD	1.25E-02	a
Acenaphthene	OB and OD	3.70E-02	a
Anthracene	OB and OD	1.80E-01	a
Benzo(a)anthracene	OB and OD	9.20E-05	a
Benzo(a)pyrene	OB and OD	2.00E-04	a
Benzo(b)fluoranthene	OB and OD	9.20E-05	a
Benzo(g,h,i)perylene	OB and OD	4.69E-02	a
Benzo(k)fluoranthene	OB and OD	9.20E-04	a
Benzoic acid	OB and OD	1.50E+01	a
Benzyl alcohol	OB and OD	1.10E+00	a
Bis(2-chloroethoxy)methane	OB and OD	1.10E-01	a
Bis(2-chloroethyl)ether	OB and OD	1.00E-05	a
Bis(2-chloroisopropyl)ether	OB and OD	2.70E-04	a
Bis(2-ethylhexyl)phthalate (DEHP)	OB and OD	6.00E-03	a
Butyl benzyl phthalate	OB and OD	7.30E-01	a
Chrysene	OB and OD	9.20E-03	a
Dibenzo(a,h)anthracene	OB and OD	9.20E-06	a
Dibenzofuran	OB and OD	1.20E-03	a
Diethyl phthalate	OB and OD	2.90E+00	a
Dimethyl phthalate	OB and OD	3.60E+01	a
Di-n-butyl phthalate	OB and OD	3.60E-01	a
Di-n-octyl phthalate	OB and OD	1.50E-01	a
Fluoranthene	OB and OD	1.50E-01	a
Fluorene	OB and OD	2.40E-02	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	MAXIMUM CONCENTRATION LIMIT (mg/L)	GROUNDWATER REFERENCE
Hexachlorobenzene	OB and OD	1.00E-03	a
Hexachlorobutadiene	OB and OD	8.60E-04	b
Hexachlorocyclopentadiene	OB and OD	5.00E-02	a
Hexachloroethane	OB and OD	4.80E-03	a
Indeno(1,2,3-cd)pyrene	OB and OD	9.20E-05	a
Isophorone	OB and OD	7.10E-02	a
Nitrobenzene	OB and OD	3.40E-01	a
N-Nitrosodimethylamine	OB and OD	1.30E-06	a
n-Nitroso-di-n-propylamine	OB and OD	9.60E-06	a
N-Nitrosodiphenylamine/Diphenylamine	OB and OD	1.40E-06	a
Pentachlorophenol	OB and OD	1.00E-03	a
Phenanthrene	OB and OD	4.69E-02	a
Phenol	OB and OD	1.10E+00	a
Pyrene	OB and OD	1.80E-02	a
Volatile Organic Compounds (VOCs)			
Acetone	OB and OD	5.50E-01	a
Benzene	OB and OD	5.00E-03	a
Bromobenzene	OB and OD	2.00E-02	b
Bromodichloromethane	OB and OD	8.00E-02	a
Bromoform	OB and OD	8.00E-02	a
Bromomethane	OB and OD	8.70E-04	a
2-Butanone (Methyl Ethyl Ketone)	OB and OD	7.00E-01	a
sec-Butylbenzene	OB and OD	2.40E-02	a
tert-Butylbenzene	OB and OD	2.40E-02	a
Carbon disulfide	OB and OD	1.00E-01	a
Carbon tetrachloride	OB and OD	5.00E-03	a
Chlorobenzene	OB and OD	1.00E-01	a
Chloroethane	OB and OD	4.60E-03	a
Chloroform	OB and OD	8.00E-02	a
Chloromethane	OB and OD	1.60E-03	a
2-Chlorotoluene	OB and OD	1.20E-02	a
4-Chlorotoluene	OB and OD	2.60E+00	b
Dibromochloromethane	OB and OD	8.00E-02	a
1,2-Dibromo-3-chloropropane	OB and OD	2.00E-04	a
1,2-Dibromoethane (EDB)	OB and OD	5.00E-05	a
1,2-Dichlorobenzene	OB and OD	6.00E-01	a
1,3-Dichlorobenzene	OB and OD	1.80E-02	a
1,4-Dichlorobenzene	OB and OD	7.50E-02	a
Dichlorodifluoromethane	OB and OD	3.90E-02	a
1,1-Dichloroethane	OB and OD	8.10E-02	a
1,2-Dichloroethane	OB and OD	5.00E-03	a
1,1-Dichloroethene	OB and OD	7.00E-03	a
cis-1,2-Dichloroethene	OB and OD	7.00E-02	a
trans-1,2-Dichloroethylene	OB and OD	1.00E-01	a

TABLE 10-2: GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT	MAXIMUM CONCENTRATION LIMIT (mg/L)	GROUNDWATER REFERENCE
1,2-Dichloropropane	OB and OD	5.00E-03	a
1,3-Dichloropropane	OB and OD	7.30E-01	b
cis-1,3-Dichloropropene	OB and OD	4.00E-04	a
trans-1,3-Dichloropropene	OB and OD	4.00E-04	a
Ethylbenzene	OB and OD	7.00E-01	a
Hexachlorobutadiene	OB and OD	8.60E-04	a
Isopropylbenzene	OB and OD	6.60E-01	a
Methylene chloride (Dichloromethane)	OB and OD	5.00E-03	a
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	OB and OD	2.00E-01	a
Naphthalene	OB and OD	6.20E-04	a
Styrene	OB and OD	1.00E-01	a
1,1,1,2-Tetrachloroethane	OB and OD	4.30E-04	a
1,1,2,2-Tetrachloroethane	OB and OD	5.50E-05	a
Tetrachloroethene	OB and OD	5.00E-03	a
Toluene	OB and OD	1.00E+00	a
1,2,4-Trichlorobenzene	OB and OD	7.00E-02	a
1,1,1-Trichloroethane	OB and OD	2.00E-01	a
Trichloroethene	OB and OD	5.00E-03	a
Trichlorofluoromethane	OB and OD	1.30E-01	a
1,2,3-Trichloropropane	OB and OD	5.60E-06	a
1,2,4-Trimethylbenzene	OB and OD	1.20E-03	a
1,3,5-Trimethylbenzene	OB and OD	4.10E-02	a
Vinyl chloride	OB and OD	2.00E-03	a
Total Xylenes	OB and OD	1.00E+01	a
Other Analytes			
Cyanide	OB and OD	2.00E-01	a
Perchlorate	OB and OD	2.45E-02	a
Nitrate	OB and OD	1.00E+00	a
Nitrite	OB and OD	1.00E+01	a

Groundwater References:
- a Alabama Risk Based Corrective Action Guidance Manual
- b EPA Regional Screening

ATTACHMENT 1:

RESERVED

(Part A found in Section I of Part B Application)

PART 1 OF ATTACHMENT 2:

RESERVED

PART 2 OF ATTACHMENT 2:

RESERVED

Part 1 of Attachment 3:

RESERVED

Part 2 of Attachment 3

RESERVED

ATTACHMENT 4

RESERVED

ATTACHMENT 5

RESERVED

ATTACHMENT 6

RESERVED

ATTACHMENT 7:

RESERVED

ATTACHMENT 8:
WASTE MINIMIZATION CERTIFICATION OBJECTIVES

The Waste Minimization Program should include the following elements:

1. Top Management Support

   a. Dated and signed policy describing management support for waste minimization and for implementation of a waste minimization plan.

   b. Description of employee awareness and training programs designed to involve employees in waste minimization planning and implementation to the maximum extent feasible.

   c. Description of how a waste minimization plan has been incorporated into management practices so as to ensure ongoing efforts with respect to product design, capital planning, production operations, and maintenance.

2. Characterization of Waste Generation

   Identification of types, amounts, and hazardous constituents of waste streams, with the source and date of generation.

3. Periodic Waste Minimization Assessments

   a. Identification of all points in a process where materials can be prevented from becoming a waste, or can be recycled.

   b. Identification of potential waste reduction and recycling techniques applicable to each waste, with a cost estimate for capital investment and implementation.

   c. Description of technically and economically practical waste reduction/recycling options to be implemented, and a planned schedule for implementation.

   d. Specific performance goals, preferably quantitative, for the source reduction of waste by stream. Whenever possible, goals should be stated as weight of waste generated per standard unit of production, as defined by the generator.

4. Cost Allocation System

   a. Identification of waste management costs for each waste, factoring in liability, transportation, recordkeeping, personnel, pollution control, treatment, disposal, compliance, and oversight costs to the extent feasible.

b. Description of how departments are held accountable for the wastes they generate.

c. Comparison of waste management costs with costs of potential reduction and recycling techniques applicable to each waste.

5. Technology Transfer

Description of efforts to seek and exchange technical information on waste minimization from other parts of the company, other firms, trade associations, technical assistance programs, and professional consultants.

6. Program Evaluation

a. Description of types and amounts of hazardous waste reduced or recycled.

b. Analysis and quantification of progress made relative to each performance goal established and each reduction technique to be implemented.

c. Amendments to waste minimization plan and explanation.

d. Explanation and documentation of reduction efforts completed or in progress before development of the waste minimization plan.

e. Explanation and documentation regarding impediments to hazardous waste reduction specific to the individual facility.

References:

"Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program", 54 FR 25056, June 12, 1989.

"Waste Minimization Opportunity Assessment Manual", EPA/625/7-88/003, July 1988.