Anniston Army Depot
Anniston, Alabama
EPA I.D. Number ALD AL3 210 020 027

FACT SHEET

A draft modification to the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) permit has been prepared for the Anniston Army Depot (ANAD) facility. This hazardous waste facility is located in Anniston, Alabama. This fact sheet has been prepared to briefly advise the public of the principal permitting, legal and policy issues of the draft permit.

I. PERMIT PROCESS

The purpose of the permitting process is to allow the State and the public to evaluate ANAD's ability to comply with the hazardous waste management requirements of the AHWMMA, as amended. ANAD must comply with hazardous waste management conditions set forth in the permit during the effective period of the permit, which is ten (10) years from the last permit renewal (September 21, 2021).

II. PROCEDURES FOR REACHING A FINAL DECISION

ADEM Admin. Code r. 335-14-8-.08(6)(b)1. requires that the public be given a 45-day comment period for each draft permit. The comment period will begin on June 17, 2026, which is the date of publication of the public notice in major local newspaper(s) of general circulation and will end on August 3, 2026. The public notice will also be broadcast over local radio station(s).

Any person interested in commenting on the application or draft permit must do so within the 45-day comment period discussed above.

All persons wishing to comment on any of the draft permit modification conditions or the permit modification application should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, 1400 Coliseum Blvd. (zip 36110-2059), P.O. Box 301463 (zip 36130-1463) Montgomery, Alabama, ATTENTION: Mr. Russell A. Kelly.

ADEM will consider all written comments received during the comment period while making a permit decision for this facility. When the Department makes its final permit decision, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final permit decision.

III. FACILITY DESCRIPTION

ANAD is the designated Center of Industrial and Technical Excellence for combat vehicles (tracked and wheeled), towed and self-propelled artillery, assault bridging systems, individual and crew served small caliber weapons, locomotives, rail equipment, and non-tactical generators. Major components of each vehicle are also overhauled and returned to stock. Additionally, worldwide distribution of stocks and the maintenance, storage, and demilitarization of conventional ammunition and missiles are significant parts of ANAD's overall mission and capabilities. Key tenant organizations on ANAD include Defense Distribution Anniston Alabama (DDAA), Defense Logistics Agency Disposition Services, Anniston Munitions Center (ANMC), and the Center of Military History Clearing House.

As a result of its U.S. Department of Defense (DoD) mission, ANAD generates a variety of hazardous industrial and process waste streams such as waste solvents, laboratory wastes, off-specification hazardous materials, filter media, and sludge from the industrial waste treatment plant (hereinafter referred to as industrial wastes). The ANAD waste streams additionally include conventional munitions deemed a hazardous waste per the Military Munitions Rule (MMR) (hereinafter, referred to as waste military munitions [WMM]) and secondary wastes related to thermal treatment/disposal of these WMM at the open burn (OB), open detonation (OD), Rocket Motor Fire Units (RMF) stands, Thermal Treatment Closed Disposal Process (TTCDP)
or Energetic Treatment Unit (ETU) units.

Additional provisions have been included in the permit as a result of the changes made to AHWMMA to incorporate the requirements of the 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA). These requirements are included in accordance with ADEM Admin. Code r. 335-14-5-.06(12), which addresses corrective action for solid waste management units (SWMUs). This rule requires a RCRA Facility Assessment (RFA) of all SWMUs to be conducted at the facility. The RFA for ANAD has been completed and SWMUs have been identified. All SWMUs are recommended for further sampling and corrective action, if necessary.

IV. SUMMARY OF PROPOSED MODIFICATIONS

ANAD's proposed permit modification is to remove the SDC facility from the application and permit. The SDC processed non-chemical agent contaminated munition components. Upon completion of operations, and because there are no further mission requirements, the Anniston SDC was closed and demolished in accordance with the approved closure plan as demonstrated in the Closure Report, dated August 14, 2025. This permit modification also incorporates planned changes to the Open Detonation Sediment Pond. The sediment pond is being redeveloped to improve the existing drainage of the site by removing the existing sediment pond and reinstalling a newly designed sediment pond. The 60-inch drainage structure along the east side of the detonation pit near the site entrance will be removed and replaced with two 48-inch structures to increase flow capacity. Grading and erosion control matting will be installed to reduce site erosion. In addition to the removal of the SDC Facility and the OD sediment pond, the Corrective Measures Work Plan, Burning Ground #2, Solid Waste Management Unit 65 Revision 2, dated May 20, 2025, will be incorporated into the Facility's permit. The CMIP, at a minimum, requires that no access or use of groundwater shall be allowed at the site, public access shall be restricted to prevent potential unauthorized contact with shallow groundwater or disturbance to soil, ANAD shall install, inspect, and maintain land use control (LUC) that shall restrict the land use to industrial use only, and implement a Notice of Environmental Use Restrictions (NEUR) as specified in ADEM Administrative Code r. 335-5.

V. CHANGES TO THE EXISTING PERMIT

The specific changes to the permit are explained below.

Permit Part	**Reason**
Cover Page	Updated to include the current modification and request dates.
Introduction Pages ii-iv	Updated pages to include the current modification date and number. Added the modification submittal dates.
Part I	Removed references to the SDC and updated page numbers
Part II	Removed reference to the AFO SDC and updated page numbers
Part III	Removed reference to Section IV J of the Application and removed G Block Igloos.
Part IV	Removed treatment language associated with the SDC and updated page numbers.
Part VI	Updated the SWMU Identification Tables to incorporate new SWMUs and update Corrective Action Requirements.
Part VII	Updated well associated with Burning Ground#2 and OD well that require removal and updated page numbers.
Part VIII	Incorporated Corrective Measures for SWMU 65 Burning Ground #2 and updated page numbers
Application Section	
Section I	Updated the Part A information: The Site Contact Information was revised to add John Rogers and remove Bruce Williams. Removed reference to the Anniston SDC and associated co-operators, permits and waste streams.
Section II B	Sections have been updated to reflect the final closure of the SDC by removing references to SDC process, closure and storage.
Section II C	
Section II F	
Section II G	
Section II H	
Section II I	
Section IV D	Description of erosion control features and redesign of sediment pond. Include figures with the proposed pond design. Included figures with proposed monitoring well locations

Section IV E	Description of the new erosion control features and removal and reinstallation of monitoring wells.
Section IV J	Sections have been updated to reflect the final closure of the SDC by removing references to SDC process, closure and storage.
Section V A	
Section VI	

VI. TECHNICAL CONTACT

Renee Blackburn
Facilities Engineering Section
Governmental Hazardous Waste Branch, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd (zip 36110-2059)
P.O. Box 301463 (zip 36130-1463)
Montgomery, Alabama
(334) 274-4236

ADEM
Alabama Department of Environmental Management

HAZARDOUS WASTE FACILITY PERMIT

PERMITTEE: United States Department of the Army, Anniston Army Depot
United States Department of the Army, Anniston Munitions Center

ADDRESS: Anniston, Calhoun County

EPA ID/PERMIT NUMBER: AL3 210 020 027

UNITS PERMITTED:
3 ANMC Conventional Waste Munitions Storage Igloos (I-103, F-704A, F-405)
3 ANAD Industrial Waste Storage Buildings (BLDG 466, BLDG 512, BLDG 527)
1 Roll-off Storage Building
1 Open Burning Unit
1 Open Detonation Unit

1 Thermal Treatment Closed Disposal Process (TTCDP)
1 Energetic Treatment Unit (Flash Furnace)
3 Rocket Motor Fire Units

ISSUANCE DATE:

September 21, 2021	
May 8, 2024	**Modification 1, Minor**
July 23, 2025	**Modification 2, Major**
August XX , 2026	**Modification 3, Major**

EXPIRATION DATE: **September 20, 2031**

*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

7 Frankford Avenue
Anniston, Alabama 36201-4199

Permit Number: AL3 210 020 027
Identification Number: AL3 210 020 027

Permit Modification: 3

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 or the Department), 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)); 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.

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 utilizing pans or rocket motor fire stands, open detonation, thermal treatment including grenade closed disposal process and flashing of energetic residue. ANMC also controls the storage of waste within permitted igloos for these operations.

The Permittee must comply with all terms and conditions of this Permit, which consists of the conditions set forth herein (including those in any attachments), and the regulations applicable to the Permittee's facility 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 of Regulations (hereinafter referred to as the "ADEM Admin. Code Rule"). Applicable regulations are those which are in effect on the date of issuance of this Permit.

This permit is based on the assumption that the information submitted in the permit application attached to the Permittee's letter dated May 11, 2017, as modified by subsequent amendments dated October 15, 2018, March 19, 2024, March 21, 2024, January 27, 2025, March 18, 2026, May 12, 2025, September 16, 2025, February 18, 2026, March 25, 2026, April 20, 2026, May 11, 2026, and May 13, 2026 (hereby incorporated by reference and hereafter referred to as the Application) is accurate and that the facility will be constructed and operated as specified in the Application. Any inaccuracies found in this information could lead to the termination or modification of this permit in accordance with ADEM Admin. Code Rules 335-14-8-.04(2), 335-14-8-.04(3), and 335-14-8-.04(4) and could lead to potential enforcement action. The Permittee must inform ADEM of any deviation from or changes in the information provided in the Application that would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This Permit is effective as of September 21, 2021, as amended May 8, 2024, July 23, 2025, and August XX, 2026 and shall remain in effect until September 20, 2031 unless revoked and reissued, or terminated under ADEM Admin. Code Rules 335-14-8-.04(2) and 335-14-8-.04(4) or continued in accordance with ADEM Admin. Code Rule 335-14-8-.05(2).

Alabama Department of Environmental Management	Date Signed

TABLE OF CONTENTS

DOCUMENTS INCORPORATED BY REFERENCE:

1. Part A and B Permit Application submitted on May 11, 2017, as modified by subsequent amendments dated October 15, 2018, March 19, 2024, March 21, 2024, January 27, 2025, March 18, 2026, May 12, 2025, September 16, 2025, February 18, 2026, March 25, 2026, April 20, 2026, May 11, 2026, and May 13, 2026
2. ANCDF SDC Emissions Test Plan (October 14, 2009, revised on February 18, 2010, August 12, 2010, November 2, 2010, and May 9, 2011)
3. Final SDC Emissions Test Report for Conditions 1, 2 and 3 (May 9, 2011)
4. Final SDC Emissions Test Report for Condition 4a (August 19, 2011)
5. Final SDC Emissions Test Report for Condition 4b (October 31, 2011)
6. Risk Assessment for SDC Condition 4b (February 12, 2012)
7. SDC 5-year Emissions Test Plan, Revision 0 (September 15, 2015)
8. SDC Emissions Test Plan (Conditions 1 and 2) (April 14, 2016, revised August 10, 2016)
9. Final SDC Condition 2 Emissions Test Report (June 26, 2017)
10. SDC CEMS Certification Plan (most recent version)
11. Air Modeling and Risk Assessment in Support of the Renewal Part B Application October 25, 2017, revised August 2018)
12. Interim Record of Decision for Southeast Industrial Area Operable Unit 1 (September 2004)
13. Final Record of Decision (ROD) for Ammunition Storage Area (July 2006)
14. Final Record of Decision (ROD) for Southeast Industrial Area Soil Operable Unit 2 (July 2008)
15. Final Interim Record of Decision Amendment for Southeast Industrial Area OU-1 (October 2014)
16. Final Southeast Industrial Area Remedial Design and Remedial Action Work Plan (September 2005)
17. Final Ammunitions Storage Area Remedial Design and Remedial Action Work Plan (September 2005)
18. Final Remedial Action Work Plan for Interim Remedial Action, Comprehensive Groundwater Operable Unit -1 (August 8, 2018)
19. Final Southeast Industrial Area Remedial Action Post-Construction Report and Operation and Maintenance Plan (September 2008)
20. Land Use Control Implementation Plan (LUCIP) (September 2017)
21. Remedial Design Work Plan for the Interim Remedial Action of Operable Unit 1 (May 2019)
22. Corrective Measures Work Plan, Burning Ground #2, Solid Waste Management Unit 65 Revision 2, dated May 20, 2025

23. SDC Closure Report, dated August 14, 2025

PART I

STANDARD FACILITY CONDITIONS

I.A. EFFECT OF PERMIT

1. (Reserved)

2. Within the Anniston Army Depot (ANAD), the Permittee is allowed to thermally treat conventional waste military munitions (WMM) hazardous waste by the energetic treatment unit (ETU), open burning (OB), open detonation (OD), rocket motor firing (RMF), and the thermal treatment closed disposal process (TTCDP), IAW ADEM Admin. Code Rule 335-14-5-.24 in the designated ETU, OB, OD, RMF, and TTCDP units. Any treatment, storage, or disposal (TSD) of hazardous waste not authorized in this 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.), and conventional WMM IAW the conditions of this Permit and IAW ADEM Admin. Code Rule 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.

3. Issuance of this Permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any action brought under the AHWMMA, 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. (ADEM Admin. Code Rule 335-14-8-.01(4)).

I.B. 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.C. 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 the AHWMMA, and is grounds for enforcement action, permit termination, revocation and re-issuance, modification, or denial of a permit renewal application.

2. Duty to Reapply

   a. Operating Units

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. The application for a new permit must be submitted at least 180 calendar days before the expiration of this permit, as required by ADEM Admin. Code Rule 335-14-8-.03(1)(b)2.

b. SWMU Corrective Action Requirements

The Permittee must submit an application for a new permit for both post-closure and Solid Waste Management Unit (SWMU) corrective measures at least 180 calendar days before the expiration of this permit. The Permittee must reapply in order to fulfill the 30-year post-closure care period required by ADEM Admin. Code Rule 335-14-5-.07(8)(a)1. The Department may shorten or extend the post-closure care period applicable to the hazardous waste facility in accordance with ADEM Admin. Code Rules 335-14-5-.07(8)(a)2. and 335-14-8-.03(1)(b).

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit (ADEM Admin. Code Rule 335-14-8-.03(1)(c)).

4. 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 (ADEM Admin. Code Rule 335-14-8-.03(1)(d)).

5. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) 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 (ADEM Admin. Code Rule 335-14-8-.03(1)(e)).

6. Permit Actions

This Permit may be modified, revoked and reissued, or terminated for cause as specified in ADEM Admin. Code Rule 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 (ADEM Admin. Code Rule 335-14-8-.03(1)(f)).

7. Property Rights

Issuance of this permit does not convey any property rights of any sort, nor any exclusive privilege.

8. 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 (ADEM Admin. Code Rule 335-14-8-.03(1)(h)).

9. 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 an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter at reasonable times the Permittee's premises where a 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, for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMA, any substances or parameters at any location. The Permittee shall have the opportunity to split samples during sampling.

10. 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 waste to be analyzed must be the appropriate method from ADEM Admin. Code Rule 335-14-2 Appendix I, or the methods specified in the Waste Analysis Plan (WAP) [see Sections II C-2(permitted storage), IV C-2 (OB, OD, and RMF), IV K C-2(TTCDP), and IV L C-2(ETU) of the 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), the methods specified in sections II C-2, IV C-2, IV J C-2, IV K C-2 and IV L C-2 of the permit application or an alternative method approved by ADEM Admin. Code Rule 335-14-8-.03(1)(j)1.

b. The Permittee shall maintain, at the facility, records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentations, the certification required by ADEM Admin. Code Rule 335-14-5-.05(4)(b)9, records of all data used to prepare documents required by this permit, and records of all data used to complete the application for this permit for a period of at least three (3) years from the date of the certification, application, sample, measurement, report or record, or until corrective action is completed, whichever date is later. This period may be extended by the Department at any time and is automatically extended during the course of any unresolved enforcement action regarding this facility. [ADEM Admin Code Rule 335-14-5-.05(5)(b)) and 335-14-8-.03(1)(j)2.]

c. The Permittee shall maintain, at the facility, records of all groundwater monitoring wells, piezometers, and associated groundwater surface elevations throughout the term of this permit. These records shall include the surveyed location, surveyed elevation, surveyed elevation reference point, total depth, screened interval, construction details, well log, and all other pertinent information for each well and piezometer.

d. Records of monitoring information shall include:

i. The date(s), exact place, and time of sampling or measurements;

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

iii. The date(s) analyses were performed;

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

v. The analytical techniques or methods used; and

vi. The results of such analyses.

e. The following documents and information shall be maintained throughout the term of this permit at the Facility:

i. Complete copy of this permit and the permit application.

ii. Operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4) and this permit.

iii. Copies of all plans, reports, inspection schedules, inspection logs as required by ADEM Admin. Code Rule 335-14-5 and this permit.

11. Signatory Requirements

All applications, reports or information required by this permit and submitted to the Department shall be signed and certified in accordance with ADEM Admin. Code Rules 335-14-8-.02(2) and 335-14-8-.03(1)(k).

12. Reporting Requirements

a. Planned Changes

The Permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility and any solid waste management units identified under Part VI of this permit.

b. Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

c. Transfer of Permit

This Permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to ADEM Admin. Code Rules 335-14-8-.04(1) and 335-14-8-.03(a)1.(vii). Before transferring ownership or operation of the facility during the term of this permit, the Permittee shall notify the new owner or operator, in writing, of the requirements of ADEM Admin. Code Rules 335-14-5 and 335-14-8 and this permit.

d. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

e. 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 to the Department no later than 14 calendar days following each schedule date.

f. Twenty-Four Hour Reporting

i. The Permittee shall report to the Department any noncompliance with this permit that may endanger human health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include, but is not limited to, the following:

(I) Information concerning the release of any hazardous waste which may endanger public drinking water supplies; and,

(II) Information concerning the release or discharge of any hazardous waste, or hazardous waste constituents, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility.

ii. The description of the occurrence and its cause shall include:

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

(II) Name, address, telephone number, and EPA Identification Number of the facility;

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

(IV) Name and quantity of material(s) involved;

(V) The extent of injuries, if any;

(VI) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and,

(VII) Estimated quantity and disposition of recovered material that resulted from the accident.

iii. A written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times); whether the noncompliance has been corrected, and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

g. Other Noncompliance

The Permittee shall report to the Department all instances of noncompliance not otherwise required by Permit Conditions I.C.12.d., I.C.12.e., or I.C.12.f. at the time any other reports required by this permit are submitted. The reports shall contain the information required by Permit Condition I.C.12.f.

h. Other Information

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with this permit.

13. Obligation for Corrective Action

Owners or operators of hazardous waste management units must have permits during the active life (including the closure and post-closure period) of the unit, and for any period necessary to comply with the SWMU corrective action requirements (Part VI) of this permit. Therefore, the Permittee must reapply in accordance with Condition I.C.2 of this permit unit this obligation is fulfilled.

14. Certification of Construction

The Permittee may not commence treatment, storage or disposal of hazardous waste or contaminated media in any new unit or modified portion of the facility until the Permittee has submitted to the Department, by certified mail or hand-delivery, a letter (together with the certification by the Construction Quality Assurance (CQA) officer required by ADEM Admin. Code Rule 335-14-5-.02(10)(d) and any other certifications required by this permit or ADEM Admin. Code Rule 335-14) signed by the Permittee and a registered Professional Engineer (State of Alabama) stating that the facility has been constructed or modified in compliance with this permit where appropriate; and

a. The Department has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the permit; or

b. The Department has either waived the inspection or has not notified the Permittee, within 15 calendar days of the notification from the Permittee, of its intent to inspect. [ADEM Admin. Code Rule 335-14-8-.03(1)(l)2.]

15. The Permittee shall assure that all measures necessary to maintain and/or achieve compliance with all applicable requirements of ADEM Admin. Code Rules 335-14 are taken during the active life of the facility, post-closure care period, corrective action period, and throughout the term of this permit.

16. In the event that circumstances beyond the Permittee's control arise to prevent achievement of any deadline set forth by this permit, the Permittee may immediately, upon the occurrence thereof, request an extension by sending a written request to the Department explaining the need for the extension. The Department may, after consideration of the circumstances, grant the extension. Requests for extensions may require a permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2) or (3).

I.D. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any information required to be submitted by this permit if the information is protected under the Code of Alabama 1975, §22-30-18, as amended. The term "trade secret" as used in §22-30-18 is defined in the Code of Alabama 1975, §22-30-2(12).

I.E. DEFINITIONS

For the purpose of this Permit, terms used herein shall have the same meaning as those in ADEM Admin. Code Rules 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.

"Alternative Concentration Limit" (ACL), for the purposes of this permit, refers to a groundwater concentration limit which is established pursuant to ADEM Admin. Code Rule 335-14-5-.06(5)(b).

"Area of concern" (AOC) for purposes of this permit includes any area having a probable release of a hazardous waste 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 Resource Conservation and Recovery Act and ADEM Admin. Code Rule 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, but is not limited to, the nerve agents VX or GB (Sarin) and the blister agent mustard (HD, HN, HT, or Lewisite, dependent upon the 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 less than (<) 1 Short-Term Limit (STL) for non-porous waste or < 1 Waste Control Level (WCL) for porous wastes.

"Chemical munitions" for the purposes of this permit refers to military munitions containing chemical agent.

"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 ADEM Admin. Code Rule 335-14-1-.02 as “military munitions”, and are not chemical munitions.

“Corrective action” for purposes of this permit is the sum of all corrective measures necessary to protect human health and the environment for all releases of hazardous constituents from any SWMU at the facility, regardless of the time at which waste was placed in the unit, as required by ADEM Admin. Code Rule 335-14-5-.06(11) and/or 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 ADEM Admin. Code Rule 335-14-5-.19 for the purpose of implementing corrective action requirements under ADEM Admin. Code Rule 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 waste pursuant to implementing such corrective action requirements at the facility.

“Corrective measures” for purposes of this permit, include all individual measures taken and/or necessary to remedy releases and to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any SWMU at the facility, regardless of the time at which waste was placed in the unit, as required under ADEM Admin. Code Rule 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater. The sum of all individual corrective measures is known as corrective action.

“DDESB” means the Department of Defense Explosive Safety Board.

“Decontamination” means the application of a solution to any waste, equipment or facilities for the purposes of reducing contamination.

“Emissions test period” shall refer to the period of time required to complete an emissions test, from the first run until the final run of the emissions test, as described in the emissions test plan.

“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.

“Fill material” for the purposes of this Permit may be a liquid or solid material such as colored smokes, white phosphorous, red phosphorous, hexachloroethane, riot control agents, etc. that does not meet the definition of a chemical munition.

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

“Hazardous constituents” for purposes of this Permit are those substances listed in ADEM Admin. Code Rule 335-14-2- Appendix VIII and/or ADEM Admin. Code Rule 335-14-5-Appendix IX and include hazardous constituents released from solid waste, hazardous waste, and hazardous waste constituents that are reaction by-products.

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

“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 ADEM Admin. Code Rule 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.

"Land Use Controls", for the purposes of this permit, is as defined by ADEM Admin. Code Rule 335-15-1-.02.

A "maximum concentration limit" (MCL), for the purposes of this permit, refers to a groundwater concentration limit in Table 1 of ADEM Admin. Code Rule 335-14-5-.06(5), or which is listed in ADEM Admin. Code Rule 335-7-2 (Primary Drinking Water Standard) or ADEM Admin. Code Rule 335-7-3 (Secondary Drinking Water Standards) or analogous Federal safe drinking water regulations (40 CFR 141). In cases where a constituent is listed in multiple sources (ADEM Admin. Code Rule 335-14 and/or ADEM Admin. Code Rule 335-7, and /or 40 CFR 141), the most stringent standard shall apply.

"Method detection limit" (MDL), for the purposes of this permit, means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

"Mixed waste", for the purposes of this permit, means a solid waste that is a mixture of hazardous waste (as defined in ADEM Admin. Code Rule 335-14-2-.01(3)) and radioactive waste (as defined in 10 CFR 61.2). The radioactive component of mixed waste is subject to regulation by the Atomic Energy Act (AEA)/Nuclear Regulatory Commission (NRC). The non-radioactive chemically hazardous component of mixed waste is subject to regulation by the AHWMMA and ADEM Admin. Code Rule 335-14.

"Miscellaneous unit", for the purposes of this permit, means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 146, containment building, corrective action management unit, unit eligible for a research, development and demonstration permit under 335-14-8-.06(4); or staging pile.

"Munitions Debris" for purposes of this permit means remnants of munitions (*e.g.*, fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

"Net Explosive Weight (NEW)", for the purposes of this permit, represents the combined explosives weight of all energetics contained in a munition item

"Non-regulated waste", for the purposes of this permit, means waste that is not otherwise regulated as RCRA listed and/or characteristic hazardous waste. In this case, non-regulated includes, but it not limited to, solid and universal waste, used oil, PCB, etc. Universal waste and used oil are subject to ADEM Admin. Code Rule 335-14-11, Standards for Universal Waste Management and ADEM Admin. Code Rule 335-14-17, Standards for the Management of Used Oil, respectively.

“Normal operating period” for a unit for the purposes of this permit shall begin when all requirements provided in Part IV for that unit have been met by the Permittee and approved by the Department, the emissions test results and the health risk assessment have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Part IV have been established. The normal operating period lasts until the unit re-enters a pre-emissions test, emissions test, or post-emissions test period or until the unit treats the last batch of waste prior to beginning closure operations.

“Notice of Environmental Use Restriction (NEUR)” for the purpose of this permit as defined in ADEM Admin. Code Rule 335-5-1-.02(3) is a notice required in lieu of an environmental covenant for properties or sites owned by the federal government where a response action does not return contaminated property to unrestricted use. An environmental covenant shall be filed at such time as the property is transferred to a non-federal owner.

Open burning” (OB), for the purposes of this permit, means the combustion of any material without the control of combustion air to maintain adequate temperature for efficient combustion, containment of the combustion-reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and control of emission of the gaseous combustion products.

“Open detonation” (OD), for the purposes of this permit, means the explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level) and which produces the uncontrolled emission of the gaseous detonation products.

“Operating day” for the purposes of this permit, means any day on which hazardous waste is treated, stored, or disposed of in a unit. For example, each day that a hazardous waste storage unit contains hazardous waste is an operating day; as is each day that a disposal unit contains or receives hazardous waste, or each day that hazardous waste is treated in a treatment unit.

“Operational range” for the purpose of this permit, as defined in Section 1019(e) of the United States Code means a range that is under the jurisdiction, custody, or control of the Secretary of a military department and (a) that is used for range activities, or (b) although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

“Post-emissions test period” shall refer to the period of time extending from the completion of the final run of an emissions test as described in the emissions test plan for that unit until all requirements provided in Part IV for that unit have been met by the Permittee and approved by the Department, the emissions test results and health risk assessment have been evaluated and approved by the Department, and the applicable numerical values in the conditions and tables of Part IV have been established.

“Practical quantitation limits” (PQL), for the purposes of this permit, are the lowest concentrations of analytes in groundwater that can be reliably determined within specified limits of precision and accuracy by a given method under routine laboratory operating conditions, as listed in ADEM Admin. Code Rule 335-14-5-Appendix IX.

“Recovered Waste Military Munitions” refers to military munitions recovered from sites such as Formerly Used Defense Sites (FUDS), CERCLA/MMRP remediation sites, burial pits, range clearing operations, etc. and may include items such as explosives, propellant, chemical agent, chemical munitions, or fill material as defined above.

"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 hazardous waste or hazardous constituent.

"Remediation waste" for the purposes of this permit includes all SWMUs 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 ADEM Admin. Code Rule 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.

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

"Short Term Exposure Limit (STEL)" is the maximum exposure concentration of a chemical substance not to be exceeded in a 15-minute period. Exposure to the STEL concentration shall not occur more than four (4) times per day and at least 60 minutes should elapse between successive exposures, with the exception for VX, which shall not occur more than once per day.

"Short Term Level (STL) refers to the standard for agent vapor monitoring of non-porous materials defined as 0.0001 milligrams per cubic meter (mg/m^3) for GB, 0.00001 mg/m^3 for VX, and 0.003 mg/m^3 for HD/HT. The STL is used in locations that require monitoring for an environmental release, engineering controls (i.e. filters), process upset conditions or vapor decontamination classification (headspace monitoring). The STL is the STEL equivalent which is adjusted from a 15-minute period to an ACAMS cycle time period.

"Solid waste", for the purposes of the permit, 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. It 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 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).

"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.

"Storm event", for the purposes of this permit, is defined as a 1-year, 24-hour storm event or rainfall that measures 1 inch or greater in 1 hour or less. Rainfall measurements may be taken at the site, or the closest official weather monitoring station may be used.

"Temporary Unit" (TU), for the purposes of this permit, includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Department, such units must conform to specific standards and may only be in operation for a period of time as specified in this permit.

"Toxic containing material" for the purposes of this permit refers to fill material in a conventional military munition that may include compounds such as FS Smoke (a mixture of sulfur trioxide and chlorosulfonic acid), CNB (a mixture of chloroacetophenone, carbon tetrachloride and benzene), FM (titanium tetrachloride), WP (white phosphorous), etc. or toxic materials such as arsenic, barium, cadmium, lead, etc. that are not considered chemical agents.

"Thermal treatment", for the purposes of this permit, includes open burning and open detonation of hazardous energetics and energetic contaminated waste.

"Unit" for the purposes of this permit includes any contiguous discernable area used for the management of hazardous waste (or non-hazardous waste in the case of a SWMU) and may include, 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.

"Waste Control Limit (WCL)" is a control standard for monitoring porous waste material, such as concrete, and is represented by 20 nanograms per gram (ng/g) or parts per billion (ppb) for GB and VX, and 200 ng/g (ppb) for HD/HT. Energetic materials such as explosives, bursters, fuzes, etc. are not considered porous material.

I.F. EXPIRATION AND CONTINUATION OF PERMIT

This permit and all conditions herein will remain in effect beyond this permit's expiration date if the Permittee has submitted a new application as required by Permit Condition I.C.2. and, through no fault of the Permittee, the Department has not issued a new permit (ADEM Admin. Code Rule 335-14-8-.05(1) and 335-14-8-.05(2)).

I.G. WASTE MINIMIZATION

1. Certification Requirements

   Pursuant to ADEM Admin. Code Rule 335-14-5-.05(4)(b)9, 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 treatment, storage, or disposal is the most practicable method available to the Permittee and that it minimizes the present and future threat to human health and the environment.

2. Recording Requirements

   a. The Permittee shall maintain copies of this certification in the facility operating record as required by ADEM Admin. Code Rules 335-14-5-.05(4)(b)9.

   b. The Waste Minimization Program required under I.G.1. should at a minimum address the following topics:

i. Identity of each hazardous waste stream and the source of generation.

ii. Types and amount of hazardous waste that is generated at the facility.

iii. Present and proposed method of treatment, storage, or disposal that is available to the Permittee.

iv. Description of techniques implemented in the past for hazardous waste reduction and their effectiveness.

v. An evaluation of technically and economically feasible hazardous waste reduction techniques.

vi. A program and schedule for implementing the selected hazardous waste reduction technique.

3. Solid Waste Minimization Objectives

If Condition I.G. of this permit is applicable, the Waste Minimization program required under Condition I.G. above should address the objectives listed in Appendix A of this permit.

I.H. COST ESTIMATES

1. The Permittee shall maintain detailed written cost estimates, in current dollars, at the location specified in Permit Condition I.C.10.e. and on file with ADEM in accordance with ADEM Admin. Code Rules 335-14-5-.08(3), (5), and (10).

2. All cost estimates must be updated annually as required by ADEM Admin. Code Rules 335-14-5-.08(3)(b), 335-14-5-.08(5)(b), and 335-14-5-.08(10)(b).

3. The cost estimate shall be maintained and submitted in the form designated by the Department.

4. The Permittee must update the cost estimate no later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate.

I.I. FINANCIAL ASSURANCE (RESERVED)

I.J. PERMIT MODIFICATIONS

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.

I.K. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

All reports, notifications, or other submissions that are required by this permit should be sent via certified mail or delivered as described below:

1. Two (2) hard copies and one (1) electronic copy in a standard text-searchable format (e.g., portable document format) acceptable to the Department shall be provided to the Chief of the Land Division using the following mailing address:

   Chief, Land Division
   Alabama Department of Environmental Management
   PO Box 301463 (Zip 36130-1463)
   1400 Coliseum Boulevard (Zip 36110-2059)
   Montgomery, Alabama

2. Upon request by the Department, the Permittee shall also provide 1 hard copy and/or 1 electronic copy to the Director of the Land, Chemical, and Redevelopment Division using the following mailing address:

   Director, Land, Chemical and Redevelopment Division
   USEPA, Region 4
   Atlanta Federal Center
   61 Forsyth Street SW
   Atlanta, GA 30303-3104

PART 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 facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of 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 Hazardous Waste Management Units (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.C.14.
3. The Permittee shall ensure that all waste shipped from the facility for offsite treatment has been appropriately characterized in accordance with Sections II C and III K C of the permit application. Decontamination of items identified for offsite shipment is allowed.

II.B. RECEIPT OF OFF-SITE WASTE

1. (Reserved)
2. The Permittee may receive hazardous waste conventional munitions or conventional munition components from chemical munitions which have been verified agent free 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 operations, and/or treatment and disposal.
3. Recovered waste military munitions (WMM), which were both recovered and received from locations within the State of Alabama and have been declared as hazardous waste, may also be received.
4. Hazardous industrial wastes (i.e. waste solvents, waste paint, waste sludges, waste blast media, waste filter media, etc) shall not be received from off-site industrial processes.

II.C. GENERAL WASTE ANALYSIS

1. The Permittee shall comply with all requirements set forth under ADEM Admin. Code Rule 335-14-5-.02(4) and shall follow the procedures in the WAP described in section II C-2 of the permit application.
2. The Permittee shall utilize the methods specified in section II C-2 of the permit application for the analysis of any of any wastes listed in the Table II C-1 of the

permit application. Modification of the WAP shall require a modification of this permit pursuant to ADEM Admin. Code Rule 335-14-8-.04(2).

3. The Permittee shall subject samples from incoming waste shipments to the fingerprint parameters identified in Table II C-4 of the permit application.

4. The Permittee shall classify waste as non-conforming when the receiving analysis does not match the information contained in the accompanying manifest, profile, and/or equivalent information described in Section II.C of the permit application

5. Before storing, treating, or disposing of a hazardous waste stream, the Permittee shall obtain a detailed chemical and physical analysis of a representative sample of the waste, as described in Section II.C of the permit application.

II.D. SECURITY

1. The Permittee shall comply with the security provisions set forth under ADEM Admin. Code Rule 335-14-5-.02(5) and as described in Section II F-1 of the permit application.

2. In order to comply with ADEM Admin. Code Rule 335-14-5-.02(5), the hazardous waste storage areas and all miscellaneous treatment units of the facility shall remain fenced with at least a six-foot high chain link fence. The fence shall be kept in good repair. All entrances to the permitted hazardous waste management areas shall be closed and locked when security and/or operations personnel are not present. The map depicting the location of fencing and gates for the entire ANAD facility is located in Figures II B-2 and II B-4 of the permit application.

3. The Permittee shall maintain signs along the perimeter fence of the permitted hazardous waste management areas and all miscellaneous treatment units. The signs shall read "Danger – Unauthorized Personnel Keep Out". At least one sign must be legible from a distance of at least 25 feet from any approach to each area (ADEM Admin. Code Rule 335-14-5-.02(5)(c)).

II.E. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall comply with all requirements under ADEM Admin. Code Rule 335-14-5-.02(6), and 335-14-5-.09(5).

2. The Permittee shall follow the inspection procedures and schedules, as described in section II F-2 and III K F of the permit application.

3. The Permittee shall remedy any deterioration or malfunction (of equipment or structure(s)) discovered during any inspection as required by ADEM Admin. Code Rule 335-14-5-.02(6)(c).

4. Records of inspections shall be maintained at the facility as required by ADEM Admin. Code Rule 335-14-5-.02(6)(d).

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training as required by ADEM Admin. Code Rule 335-14-5-.02(7). This training program shall follow the procedures and outline described in Section II H and Section IV H of the permit application. The Permittee shall maintain training documents and records at the facility as required by ADEM Admin. Code Rule 335-14-5-.02(7)(d) and (e).

II.G. GENERAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

1. The Permittee shall comply with all requirements for ignitable, reactive, or incompatible wastes set forth under ADEM Admin. Code Rule 335-14-5-.02(8).

2. "No Smoking" signs must be conspicuously placed wherever there is a potential hazard from ignitable waste.

II.H. LOCATION STANDARDS AND UNIT MAINTENANCE

1. The Permittee shall comply with all locations standards set forth under ADEM Admin. Code Rule 335-14-5-.02(9).

2. If changes are made to the design or operation of a hazardous waste management or treatment unit, these changes must receive approval by the Department before they are implemented, and may require permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2).

II.I. PREPAREDNESS AND PREVENTION

1. Required Equipment

   The Permittee shall comply with ADEM Admin. Code Rule 335-14-5-.03(3) and, at a minimum, shall equip the facility with the equipment set forth in the ANAD Integrated Contingency Plan (ICP). The ICP is incorporated by reference into this Permit and Sections II D, IV D, IV J D, IV K D, and IV L D of the permit application.

2. Testing and Maintenance of Equipment

   The Permittee shall test and maintain the equipment specified in the ANAD ICP, as necessary to assure its proper operation in time of emergency as required by ADEM Admin. Code Rule 335-14-5-.03(4).

3. Access to Communication or Alarm System

   The Permittee shall maintain access to the communications or alarm system as required by ADEM Admin. Code Rule 335-14-5-.03(5).

4. The Permittee shall maintain arrangements with state and local authorities as required by ADEM Admin. Code Rule 335-14-5-.03(8). The Permittee shall develop and maintain a Preparedness and Prevention Plan providing information on the type, approximate quantities and locations of hazardous wastes within the facility. The Plan shall be provided to state and local authorities in both written paper format and in appropriate electronic format that is most useful to emergency responders. Updated copies of the Plan shall be provided to reflect significant changes in operations (*e.g.*, significant changes in waste streams

and/or volumes, facility design changes, etc.). A copy of the Plan and documentation that the Plan has been submitted to all local police departments, fire departments, hospitals and local emergency response teams that may be called upon to provide emergency services, shall be submitted to the Department within 45 calendar days from the effective date of this permit. 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.

5. Required Aisle Space

The Permittee shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency (ADEM Admin. Code Rule 335-14-5-.03(6)).

II.J. CONTINGENCY PLAN

1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Core Plan (Section 2) of the ANAD ICP, and follow the emergency procedures as required by ADEM Admin. Code Rule 335-14-5-.04(2) whenever there is a fire, explosion, or release of hazardous waste or hazardous constituents which threatens or could threaten human health or the environment.

2. Copies of Plan

A copy of the ANAD ICP and all current revisions to the plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services, as described in the ANAD ICP and as required by ADEM Admin. Code Rule 335-14-5-.04(4).

3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the ANAD ICP, as required by ADEM Admin. Code Rule 335-14-5-.04(5).

4. Emergency Coordination

The Permittee shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.04(6) concerning the emergency coordinator(s) as specified in Table B-1 of the ANAD ICP.

II.K. RECORDKEEPING AND REPORTING

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

1. Operating Record

The Permittee shall maintain a written operating record at the facility, IAW with ADEM Admin. Code Rule 335-14-5-.05(4).

2. Availability, Retention, and Disposition of Records

The Permittee shall comply with the availability, retention, and disposition of records at the facility in accordance with ADEM Admin. Code Rule 335-14-5-.05(5).

3. Biennial Report

The Permittee shall comply with the biennial report requirements of ADEM Admin. Code Rule 335-14-5-.05(6).

II.L. CLOSURE

1. Performance Standard

The Permittee shall close the permitted hazardous waste management areas, as required by ADEM Admin. Code Rules 335-14-5-.07(2), 335-14-5-.09(9), 335-14-5-.10(8), and in accordance with the Closure Plan, Sections II I and Section IV I of the permit application.

2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan as required by ADEM Admin. Code Rule 335-14-5-.07(3)(c).

3. Notification of Closure

As required by ADEM Admin. Code Rule 335-14-5-.07(3)(d), the Permittee shall notify the Department at least 60 calendar days prior to the date closure activities are initiated at either unit.

4. Time Allowed for Closure

The Permittee shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.07(4). After receiving or treating the final volume of hazardous waste, the Permittee shall complete closure activities in accordance with the schedule specified in the Closure Plan, Section II I and Section IV I of the permit application.

5. Disposal or Decontamination of Equipment

The Permittee shall decontamination or dispose of all facility equipment as required by ADEM Admin. Code Rules 335-14-5-.07(5), 335-14-5-.09(9), 335-14-5-.10(8), 335-14-5-.11(9), and 335-14-5-.12(9) and as specified in the Closure Plan, Section II I and Section IV I of the permit application.

6. Certification of Closure

The Permittee shall certify that each individual unit has been closed in accordance with the specification presented in the Closure Plan, Section II I and Section IV I of the permit application, and as required by ADEM Admin. Code

Rule 335-14-5-.07(6). The Permittee shall maintain copies of this closure certification in the facility operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4).

II.M. POST-CLOSURE

If at closure not all waste and contaminated structures and soils at a unit can be removed or decontaminated, the Permittee shall close the unit as a landfill and perform post-closure care as specified in ADEM Admin. Code Rules 335-14-5-.09(9)(b) and 335-14-5-.14(11).

1. Post-Closure Care Period

   The Permittee shall begin post-closure care at all units, where closure by removal is not achieved, after completion of unit closure and shall continue for the duration of the post-closure period. The post-closure care shall continue for a period of 30 years after the closure of each hazardous waste management unit, unless shortened or extended pursuant to ADEM Admin. Code Rule 335-14-5-.07(8). Each post-closure care period is initiated upon certification by a registered Professional Engineer (State of Alabama) and upon acceptance by the Department pursuant to ADEM Admin. Code Rule 335-14-5-.07(6), that closure has been completed and waste has been left in place. The post-closure care period shall automatically extend through the end of the compliance period specified in Condition VII.B.4 of this permit.

2. Post-Closure Security

   The Permittee shall maintain security at the facility during post-closure care period in accordance with the post-closure plan included in the permit application.

3. Amendment to Post-Closure Plan

   The Permittee shall amend the Post-Closure Plan in accordance with ADEM Admin. Code Rule 335-14-5-.07(9), whenever necessary.

4. The Permittee shall maintain continuous compliance with the following:

   a. Post closure care of property. (ADEM Admin. Code Rule 335-14-5-.07(8))

   b. Notice to local land authority and notice on deed to property. (ADEM Admin. Code Rule 335-14-5-.07(10))

II.N. LAND DISPOSAL RESTRICTIONS

1. General Restrictions

   ADEM Admin. Code Rule 335-14-9 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances in which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage or disposal unit. The Permittee shall maintain compliance with the requirements of ADEM Admin. Code Rule 335-14-9. Where the Permittee has applied for an extension, waiver, or variance under ADEM Admin. Code Rule 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 a land disposal permit application.

2. Land Disposal Prohibitions and Treatment Standards

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

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

II.O. ORGANIC AIR EMISSION REQUIREMENTS

1. General Introduction

a. Process Vents and Equipment

Phase I Organic Air Emission Standards consist of ADEM Admin. Code Rule 335-14-5-.27 and 335-14-5.28 for hazardous waste treatment, storage and disposal (TSD) facilities. ADEM Admin. Code Rule 335-14-5-.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 with an annual average total organic concentration of at least 10 parts per million by weight (ppmw). ADEM Admin. Code Rule 335-14-5-.28 contains emission standards that address leaks from specific equipment (i.e., pumps, valves, compressors, etc.) containing or contacting hazardous waste with a total organic concentration of at least ten-percent by weight.

b. Tanks, Containers, Surface Impoundments and Miscellaneous Units

Phase II Organic Air Emission Standards consist of ADEM Admin. Code Rule 335-14-5-.29 for hazardous waste TSD facilities, including certain hazardous waste generator standards for 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 ADEM Admin. Code Rule 335-14-5-.29(4), except as specifically exempted under ADEM Admin. Code Rule 335-14-5-.29(1) and (3).

2. Notification of New Units

a. Prior to constructing any equipment subject to the requirements of ADEM Admin. Code Rule 335-14-5-.27, or installing any additional equipment subject to the requirements of ADEM Admin. Code Rule 335-

14-5-.28, or prior to modifying the current process such that existing equipment previously not subject to the requirement of ADEM Admin. Code Rule 335-14-5-.28 the Permittee shall supply the specific Part B information required pursuant to ADEM Admin. Code Rule 335-14-8-.02(15) and 335-14-8-.02(16) as applicable, and shall obtain a permit modification in accordance with the requirements of ADEM Admin. Code Rule 335-14-8-.04(3) and Condition I.J of this permit.

b. Tanks, Containers, Surface Impoundments, Miscellaneous Units

Prior to installing any tank, container, surface impoundment or miscellaneous unit subject to ADEM Admin. Code Rule 335-14-5-.29, or modifying an existing process waste handling or tank or container such that the unit(s) will become subject to ADEM Admin. Code Rule 335-14-5-.29, the Permittee shall obtain a permit modification IAW ADEM Admin. Code Rule 335-14-8-.04(3), and provide specific Part B application information required IAW ADEM Admin. Code Rules 335-14-8-.02(5) thru (8) and 335-14-8-.02(18), as applicable with the modification request.

II.P. MANIFEST SYSTEM

The Permittee shall comply with the requirements of ADEM Admin. Code Rules 335-14-5-.05(2), 335-14-5-.05(3), and 335-14-5-.05(7).

II.Q CONSTRUCTION COMPLIANCE SCHEDULE FOR PROPOSED UNITS

All proposed units, whether simultaneously constructed or not, are subject to the following conditions:

1. Actual, physical onsite construction of all proposed units must be initiated within two (2) years of the date of the issuance of this permit;

2. Detailed construction drawings of all proposed units must be submitted for the Department’s review at least 60 calendar days before the initiation of construction;

3. The Permittee must meet all “Certification of Construction” requirements of Permit Condition I.C.14.;

4. The Permittee must meet all cost estimate requirements of Permit Conditions I.H.

PART III

MANAGEMENT IN CONTAINERS

III.A. PERMITTED OPERATIONS

The Permittee may store hazardous waste in the storage buildings/igloos described in Table III.1 and Table III.2 of this permit, subject to the terms of this permit. Operation of any other storage area not listed in Table III.1 and Table III.2 of this permit, operation of any process in a unit or area other than that for storage, or exceedance of any capacity listed therein, for the storage or disposal of hazardous waste is prohibited.

III.B. WASTE IDENTIFICATION

1. In the Hazardous Waste Storage Buildings listed in Table III.1, the Permittee may store, in containers at the facility, the Industrial/Process hazardous wastes listed in Part A or Table II C-1 of Part B of the facility permit application, subject to the terms of this permit. Storage of any waste not listed in Part A or Table II C-1 of Part B of the facility permit application is prohibited.

2. In the Conventional WMM Igloos listed in Table III.2, the Permittee may store, in containers at the facility, the hazardous waste conventional military munitions listed in Table II C-1 of the facility Part B permit application, subject to the terms of this permit. Conventional WMM hazardous waste may consist of conventional munitions related waste (secondary waste) and/or conventional waste munitions. Storage of any conventional munitions waste not listed in Part A or Table II C-1 of Part B of the facility permit application is prohibited.

3. The maximum total storage capacity of the industrial hazardous waste storage buildings (Buildings 466, 512, and 527) is 182,543 gallons. The maximum storage capacity for the Roll-off Box Storage Building is 132 cubic yards (4 roll-off boxes). Individual building storage limits for industrial hazardous waste are specified in Table III.1. The total maximum storage for 37 igloos and 3 service magazines is 2,266,858 gallons. Individual igloo maximum storage limits for conventional waste munitions are specified in Table III.2. 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.

III.C STORAGE IN CONTAINERS

1. The Permittee shall maintain and operate the container storage buildings, and igloos in accordance with the procedures specified in Section II B and of the permit application.
2. The container and munitions storage capacities are distributed through the storage buildings and igloos as shown in Table III.I and Table III.2 of this permit, and as described in Section II B of the permit application. The maximum quantity of hazardous

and non-hazardous waste stored in each storage building, igloo, and service magazine shall not exceed the capacities listed in Table III.1 and Table III.2 of this permit.

3. The maximum combined quantity of hazardous and non-hazardous waste stored in a given area shall not exceed ten times the capacity of the containment system for that area. Individual containers shall not be stored in a given area with a volume that exceeds the capacity of the containment system for that area.

4. The sampling and staging of drums shall not exceed 72 hours. All containers that are to be fingerprinted or are awaiting analysis shall be segregated from other containers in the container storage area. Each container shall be marked with the date of receipt.

5. In addition to the other requirements of Part III of this permit, the Permittee shall comply with all of the requirements for military munitions in accordance with ADEM Admin. Code r. 335-14-7-.13.

III.D. TREATMENT IN CONTAINERS (RESERVED)

III.E. 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).

III.F. 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).

III.G. MANAGEMENT OF CONTAINERS

1. The Permittee shall manage containers as required by ADEM Admin. Code r. 335-14-5-.09(4) and Section II B of the permit application.

2. A container holding hazardous 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 waste must not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.

4. Adequate aisle space will be maintained at all times, as shown in Section II B-3 of the permit application and as necessary to provide adequate access for emergency equipment and inspection.

5. Containers having a capacity greater than or equal to 30 gallons shall not be stacked over two containers high at any time.

III.H. CONTAINMENT

1. The Permittee shall maintain the containment systems for those hazardous waste storage areas listed in Table III.1 and Table III.2 in accordance with the requirements of ADEM Admin. Code r. 335-14-5-.09(6)(b) and as specified in Section II B of the permit application.

2. Reserved

3. The Permittee shall provide secondary containment in the storage igloos listed in Table III.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). Drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirement.

III.I. INSPECTIONS

1. The Permittee shall conduct weekly inspections of the storage buildings in Table III.1, as required by Section II F-2b and Table II F-1 in the facility permit application, to detect leaking containers or containment systems and to ensure stacking is no more than two containers high as specified in Permit Condition III.G.5 and as required by ADEM Admin. Code r. 335-14-5-.09(5). The Permittee shall note the number and capacity of hazardous waste containers present.

2. The Permittee shall conduct inspections of igloos weekly, quarterly, semi-annually, annually, or biennially, as required in Section II F-2b according to the inspection frequencies listed in Table II F-1 of the permit application.

III.J. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

1. 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).

2. The Permittee shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste and follow the procedures specified in Section II F-5 of the permit application and as required by ADEM Admin. Code r. 335-14-5-.02(8).

III.K. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTE

The Permittee shall separate containers of incompatible wastes as specified in Section II.F-5 and of the facility permit application.

1. Incompatible wastes, or incompatible wastes and materials, must not be placed in the same container unless the Permittee is in compliance with ADEM Admin. Code r. 335-14-5-.02(8)(b)

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 III.K.1 and III.K.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).

III.L. CLOSURE

1. Following the receipt of the final volume of hazardous wastes, the Permittee shall close the container storage areas and igloos in accordance with the requirements of the Closure Plans, Section II I and Section IV J I of the permit application and of ADEM Admin Code r. 335-14-5-.07(2) and 335-14-5-.09(9).

2. If at closure not all waste and contaminated structures and soils at a unit can be removed or decontaminated, the Permittee shall close the container storage or treatment unit as a landfill and perform post-closure care as specified in ADEM Admin. Code r. 335-14-5-.09(9)(b) and 335-14-5-.14(11).

TABLE III.1: INDUSTRIAL/PROCESS HAZARDOUS WASTE STORAGE BUILDINGS*

Part I – Standard Facility Conditions	*Part I – Standard Facility Conditions*	**Maximum Volume**[**]
466–A Side	100' x 50'	27,720 gallons
466–B Side	100' x 60'	69,300 gallons
512	40' x 60'	25,440 gallons
527	50' x 80'	60,083 gallons
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 III.2: CONVENTIONAL WASTE MUNITIONS/CONVENTIONAL WASTE MUNITIONS COMPONENTS STORAGE IGLOOS

Igloo	Storage Dimensions	Max. Volume (gallons)**
I-103	23’6” x 80’	60,083
F-704A	23’6” x 80’	60,083
F-405	23’6” x 80’	60,083

Note: (**) Max. Volume includes all waste stored (regulated and non-regulated)

PART IV

MISCELLANEOUS TREATMENT UNITS (SUBPART X)

IV.A. MISCELLANEOUS TREATMENT UNIT REQUIREMENTS

1. This Part allows the thermal treatment of conventional WMM, disassembled explosive components removed from both conventional WMM and chemical munitions that have been verified chemical agent free, including hazardous energetic and energetic-contaminated wastes, recovered WMM from inside the State of Alabama (which may include recovered liquid filled munitions), 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 listed in Permit Condition IV.C.5 as described in the Section IV of the facility permit application. The thermal treatment units described in this part are regulated under ADEM Admin. Code r. 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. (Reserved)

    d. Thermal Treatment Closed Disposal Process (TTCDP) – SWMU 74

    e. Energetic Treatment Unit (ETU) – SWMU 75

    f. Rocket Motor Fire (RMF) Stands – SWMU 92

2. All thermal treatment operations shall be accomplished by trained explosives personnel IAW Department of Defense (DoD) Standard Operating Procedures (SOPs), Sections IV H (OBOD, RMF), IV K H (TTCDP), and IV L H (ETU) 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 each pan of the OB unit, each detonation pit for the OD unit, each unit for the TTCDP, each basket, strongbox or tray for the ETU, and each stand for the RMF.

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

    c. Date of thermal treatment,

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

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

f. Meteorological conditions during each treatment (OB, OD, or RMF) as listed in Permit Condition IV.D,

g. All information to characterize waste including information to support Permit Condition IV.B,

h. Copies of all inspection records for each unit,

i. Copies of all employee training records IAW Sections IV H, IV J H, IV K H, and IV L H of the facility permit application,

j. All groundwater monitoring reports required by Permit Condition IVI.B.6.

k. For TTCDP 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.

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

m. For the ETU, the Data Record printout showing the temperature history for each feed event from the data logging device must be maintained in the operating record. This record must include the necessary information to describe items treated in the ETU [i.e. scrap metal weight, scrap metal type (origin)], the date and the time of each feed event.

IV.B. DESCRIPTION OF THERMAL TREATMENT UNITS

1. Open Burning (OB) and Rocket Motor Fire (RMF) Stands:

a. The OB unit, including the RMF stands, 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 and three vertical Static Fire Stands within the designated open burn unit encompassing an area of soil approximately 400 x 800 feet. All burn pans and lids shall be constructed, as shown in Figure IV B-3 or Figure IV B-3a of the facility permit application. The general arrangement of the OB and RMF units within the facility boundary is located in Figure IV B-1 of the facility permit application. The general arrangement of the OB pans and RMF stands within the OB unit is shown in Figure IV B-7 of the permit application. A photograph of one of the burn pans is located in Figure IV B-12 of the facility permit application. Design drawings for the RMF stands are located in Figures IV B-4a, IV B-4b, and IV B-4c of the permit application.

b. The OB unit is dedicated to the thermal destruction of Hazard Class 1 explosives including propellants, WMM, obsolete rocket motors (including but not limited to Honest John, Little John and Nike Hercules motors with double based propellants) 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.

c. Open burning shall not be conducted in the OB pans and the RMF stands at the same time.

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 x 300 foot area designated for digging of pits that 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 (BD) are allowed. The general arrangement of the OD unit within the facility boundary is located in Figure IV B-1 of the facility permit application. Photographs of the detonation pit are located in Figure IV B-5 and IV B-6 of the facility 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. (Reserved)

4. Thermal Treatment Closed Disposal Process (TTCDP)

a. The TTCDP is located in the ALA at Building 670 within the Multi-Launch Rocket System (MLRS) Recycling Facility. The TTCDP interfaces with the Warhead Disassembly and Grenade Removal System, which are used for MLRS demilitarization. An overview of the TTCDP within and adjacent to Building 670 is provided in Figure IV K D-1 of the facility permit application.

b. The TTCDP consists of three operations for the purpose of thermally treating M77 grenade submunitions from the MLRS recycling operation. These processes include a Grenade Treatment Unit (GTU) which uses a thermal conveyor system to treat fuze-less grenade bodies and copper cones, a Munitions Destruction System (MDS) which thermally treats fuze assemblies within a small detonation chamber and an Off-gas Treatment (OGT) system with HEPA filtration. A detailed description of these systems can be found in Section IV K D of the facility permit application and TTCDP photographs are located in Figures IV K D-5 through IV K D-9 of the facility permit application.

c. The TTCDP may process WMM grenade submunitions including fuze-less grenades, fuze assemblies/remnants, and copper cones from the demilitarization of the MLRS. Energetically contaminated materials, which are derived from the demilitarization processes of cone and fuse removal and the cleaning of process equipment, may also be treated at the TTCDP. The TTCDP may treat MLRS submunitions that are obtained from offsite DoD facilities. No recovered munitions or chemical munitions/ chemical munitions components may be treated at the TTCDP.

5. Energetic Treatment Unit (ETU)

a. The ETU is located within the ALA in a cleared area near Building 300 west of Elwood Avenue. F block storage igloos are to the north and E block storage igloos are to the south of the ETU. Figure IV L B-3 of the facility permit application shows the location of the ETU within the ALA.

b. The ETU, also referred to as a flash furnace, is manufactured by El Dorado Engineering (EDE). Engineering drawings of the ETU are located in Appendix A of Section IV L of the facility permit application. The ETU uses propane burners to heat munitions-related scrap metal and metal fragments to temperatures above the flashpoint of potential residual energetic material. Flashing of these materials is necessary for the purpose of documenting this material as safe prior to release outside of DoD control.

c. The ETU is limited to processing munitions-related scrap metal that has undergone previous physical, chemical or thermal separations or treatment to remove the bulk of energetics, has undergone initial visual inspection by qualified personnel, and is not known to contain sufficient quantities of energetic material, which could result in a detonation or explosion within the ETU.

IV.C. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. The majority of WMM treated by OB, OD, RMF, and TTCDP at ANAD require disposal because munitions have exceeded the shelf life and/or the Designated Disposition Authority (DDA) has determined that they cannot be reused or recycled. For OB and OD operations, military munitions become hazardous waste when they are removed from the munitions storage igloos IAW the Military Munitions Rule (ADEM Admin. Code r. 335-14-7-.13). For TTCDP operations, the M77 grenade submunitions from the MLRS become hazardous waste once they enter the MDS/GTU processing room within Building 670.

2. WMM treated at the OB, OD, and RMF units may exhibit the ignitability (D001) and reactivity (D003) hazardous waste characteristics as defined in ADEM Admin. Code r. 335-14-2-.03(4) and include small arms ammunition (hazard class 1.4). In addition, the OB and RMF WMM may also exhibit the eleven toxicity characteristics of D004, D005, D006, D007, D008, D009, D010, D011, D030, D032, or D039 and the U-listed waste code, U098. The munitions related scrap metal treated in the ETU exhibits the same characteristic and toxicity waste codes as the OB and OD units. WMM treated at the TTCDP may exhibit the D003 as well as the D008 characteristics. All waste codes are listed in the current Part A or Table II C-1 of Part B of the facility permit application.

3. The wastes treated at the ETU, OB, OD, and RMF units shall not contain pesticides, herbicides, dioxins, or polychlorinated biphenyls (PCBs). Conventional waste types and waste characteristics are detailed in Section IV C of the facility permit application. All WMM must be identified using the procedures in Section IV C of the facility permit application. Only the Munitions Items Disposition Action System (MIDAS) classifications listed in Table IVC-9 of the facility 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. Conventional WMM exhibiting waste codes described in Permit Condition IV.C.2 may be treated at the ETU, OB, OD, RMF, and TTCDP. Recovered WMM, components of recovered liquid filled munitions, recovered liquid fill-contaminated explosive components and recovered chemical munitions/ components or recovered waste chemical munitions are prohibited to be processed at the ETU, OB, OD, RMF and TTCDP units.

5. Items containing depleted uranium, either loaded or expended, are prohibited at all locations.

6. 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.

7. (Reserved)

8. (Reserved)

9. (Reserved)

10. (Reserved)

11. (Reserved)

12. Treatment of WMM end items (i.e., intact unused/unexpended munitions items with known energetic fillers) are prohibited to be processed in the ETU. The ETU is limited to processing munitions-related scrap metal described in Section IV.B.5.c of this permit.

IV.D. THERMAL TREATMENT OPERATIONS

1. Open Burning (OB)/Rocket Motor Fire (RMF) Stands

   a. Meteorological Restrictions

      The listed meteorological restrictions are applicable to OB 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 < 80 % and ceilings greater than (>) 2,000 feet, and

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

b. Other Restrictions

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

ii. OB 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 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) Pans: Shall not exceed 2,000 pounds (lbs) NEW per pan or a maximum daily total limit of 20,000 lbs NEW for 10 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.

ii. Rocket Motor Fire (RMF) vertical stands: Shall not exceed a total daily maximum of 10,000 lbs NEW for the three stands collectively. Each stand is limited to a maximum of 5000 lbs NEW per stand at any time. Up to three rocket motors may be secured and ignited consecutively.

d. Residue Control

The OB 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). All containers must be managed IAW the conditions set forth in Part III 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 IAW ADEM Admin. Code r. 335-14-3-.03(5)(c). All waste in containers shall be characterized IAW Section IV C-2 (Waste Analysis Plan) of the facility permit application. Wind dispersal of ash shall be controlled by limiting burns IAW Permit Condition IV.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 OB

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 an 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 OD treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

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

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

iii. Cloud cover < 80 % and ceilings > 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. OD are limited to the hours between 8:00am and 4:00pm Monday through Saturday, and

ii. OD is limited to no more than 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 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 lbs NEW per detonation and a maximum daily limit of 240 lbs 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 lbs NEW per detonation station and a maximum daily limit of 16,000 lbs NEW for the eight detonation stations. No more than 16 detonations may be conducted per operating day, which is twice daily per station. BD shall not occur at depths below 14 feet or above 1 foot below ground surface.

d. Residue Control

i. The OD operation may generate unexploded ordnance (UXO), munitions components containing energetic material, and metal fragments ejected from the OD area. Residue must be managed IAW the procedures in Section IV F-6 of the facility permit application. The OD Unit has been defined by three areas – the Active Area, the Validation Area, and the Assessment Area. Figure IV F-5 of the facility 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 IAW Permit Condition I.J.

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 ADEM Admin. Code r. 335-14-9. Any sediment disposed of off-site must be properly characterized and disposed of IAW the ANAD Waste Analysis Plan.

3. (Reserved)

4. Thermal Treatment Closed Disposal Process (TTCDP)

a. Meteorological Restrictions

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

b. Hours of Operation

The TTCDP has no restriction on the hours of operation.

c. Treatment Quantities and Maximum Limits

The following quantity of material may be treated at the TTCDP, expressed as NEW. NEW represents the combined explosives weight of all energetics contained in the M77 grenade submunitions and their components (i.e. fuze-less grenades, fuze assemblies/remnants, and copper cones).

i. The overall feedrate to the TTCDP shall not exceed 192 lbs NEW per hour, which is equivalent to 2,880 M77 grenades per hour x 0.0665 lb NEW per grenade. Grenades include fuze-less grenades bodies, copper cones, fuze assemblies and sheared remnants.

ii. Non-Mass Detonating Explosives shall not be treated in the unit, and

iii. Mass Detonating Explosives shall be less than 192 lbs NEW/hr.

d. Maintenance

i. All RCRA required process instrumentation shall be equipped with visual indicators or audible alarms to warn of deviation from the limits specified in Table IV-3.

ii. Modifications to the design plans, specifications, and operating conditions in the facility permit application for the TTCDP shall be allowed only IAW Permit Condition II.A.2.

iii. Prior to treating hazardous waste in the TTCDP units, the Permittee shall install and test all process control instrumentation specified in Table IV-3 according to manufacturer specifications.

iv. The Permittee shall not process hazardous waste in the TTCDP 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.

v. The OGT and associated filters shall be maintained and operated so as to minimize the emissions of air contaminants. This equipment shall be properly operated and maintained IAW Section IV.K of the facility permit application. Filter disposal shall be managed IAW Section IV K C-2a and Table IV K C-5 of the facility permit application. Filters shall be changed out IAW the inspection schedule located in Table IV K F-1 of the facility permit application.

e. Limitations on Waste Feed

i. The Permittee shall treat only the hazardous wastes that meet the requirements listed in Permit Condition IV.D.4.c.

ii. The Permittee shall verify that the waste feed is within the physical and chemical composition limits specified in Section IV K of the facility permit application and this permit. The waste treated in the TTCDP are limited to the MLRS M77 submunitions fuze-less grenades, fuze assemblies including sheared remnants, and copper cones.

iii. Any other wastes not listed in Permit Condition IV.D.4.e.ii above are prohibited from treatment in the TTCDP.

iv. The use of explosive donor or counter charges shall not be used in the TTCDP.

v. All safety doors must be closed while the TTCDP equipment is in operation.

vi. There shall be no more than 30 reject grenades at any one time in the reject box within the grenade reject station during operation of the GTU.

vii. The feed rates of metals to the TTCDP shall not exceed the calculated limits in Table IV-4.

f. Operating Conditions

i. The Permittee shall operate the TTCDP in order to maintain the FPI System and process instrumentation listed in Table IV-3.

ii. The Permittee shall operate the FPI System to automatically prohibit waste feed to the GTU and MDS units when the monitored operating conditions deviate from the setpoints specified in Table IV-3.

g. Monitoring Requirements

i. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table IV-3 while treating hazardous waste in the TTCDP.

ii. The Permittee shall not treat any hazardous waste in the TTCDP at any time if any of the monitoring instruments listed in Table IV-3 fail to operate properly.

h. Feed Prohibitive Interlock (FPI) Requirements

i. The Permittee shall operate the systems, specified in Table IV-3, to automatically prohibit hazardous waste feed to the TTCDP when the monitored operating conditions deviate from the setpoints specified in Table IV-3. 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.

iii. In the event of a malfunction of the FPI System listed in Table IV-3 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.

5. Energetic Treatment Unit

a. Meteorological Restrictions

There are no meteorological restrictions for the ETU, except that operations are suspended in the event of a thunderstorm or electrical storm.

b. Hours of Operation

ETU operations are limited to the hours between 8:00am and 4:00pm Monday through Saturday

c. Treatment Quantities and Daily Maximum Limits

The following quantity of material may be treated at the ETU unit, expressed as NEW. NEW represents the combined explosives weight of all energetics contained in munitions related scrap metal. Explosive limits have been established for the ETU and these limits shall not be exceeded at any time. The operating limits are as follows:

i. Energetic Treatment Unit (ETU): Shall not exceed 5 pounds (lbs) NEW per load (tray, basket or strongbox). The ETU is limited to 12 loads per day with a maximum of 60 lbs NEW per day.

d. Operating Conditions

i. The ETU shall be operated in accordance with the procedures outlined in ANAD SOP Number AN-0000-K-027. Control limits shall be maintained and burners shut down as indicated in Appendix A of this SOP.

ii. For each feed event to the ETU, the internal temperature must be recorded and maintained at 1000°F. Process retention time for explosives (including HMX, TNT only, tritonal, cyclotol, and propellants) shall be set at 30 minutes per load and for range scrap metal shall be set at 45 minutes per load. Temperature and retention times shall be maintained as part of the operating record for the ETU as required by Permit Condition IV.A.3.m.

IV.E. INSPECTION

The Permittee is required to conduct routine inspections at the ETU, OB, OD, RMF, and TTCDP 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 IV F-1, IV K F-1, and IV L F-1 of the facility permit application.

1. 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 ETU, OB, OD, RMF, or TTCDP 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 IAW the reporting requirements of Permit Conditions I.17 and I.18.

2. OB, OD, and RMF inspections shall be performed IAW Section IV.F-2 of the facility permit application. OB, OD, and RMF inspections shall be documented IAW Figure IV.F-1 (inspection log sheet) of the facility permit application.

3. (Reserved)

4. TTCDP inspections shall be performed IAW Section IV K F and Table IV K F-2 (TTCDP inspection log) of the facility permit application.

5. ETU inspections shall be performed IAW Section IV L F and Table IV L F-1 (ETU inspection schedule) of the facility permit application.

IV.F. GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program shall be established for the OB and OD units IAW the requirements in Part VII.

IV.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 HHRA and Ecological Risk Assessment (ERA) based upon operational limits of the thermal treatment units in Permit Condition IV.C.

2. A cumulative assessment of cancer risk to off-site receptors posed by ANAD's ETU, OB, OD, RMF, and TTCDP 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 Permit Condition IV.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 Permit Condition I.J.

5. (Reserved)

6. (Reserved)

7. Either a new risk assessment and air modeling evaluation or a complete emissions test protocol and test plan, depending upon the munitions chosen for future processing, must be completed and submitted to the Department and approval obtained prior to treating any WMM in the TTCDP other than the M77 grenade submunitions from the MLRS recycling operation.

IV.H. CLOSURE AND POST-CLOSURE PLAN

The Permittee shall close the ETU, OB, OD, RMF, and TTCDP units IAW ADEM Admin. Code R. 335-14-5-.07 and Sections IV I, , IV K I, and IV L 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 IAW Permit Condition I.J.

1. Closure Procedures

    a. All untreated reactive hazardous wastes, contaminated ash residue, 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 IAW all State and Federal regulations governing hazardous waste handling and disposal. Sediments within the OD retention basin shall be sampled, removed, and managed IAW Permit Condition IV.D.2.d.ii.

    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 TTCDP, and ETU equipment shall be decontaminated or disposed of as required by ADEM Admin. Code r. 335-14-5-.07(5) and as described in Sections , IV K I, and IV L 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 IAW Permit Condition IV.H.1.a.

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

e. If the ETU, OB, OD, and TTCDP units cannot be clean-closed and certified for unrestricted use pursuant to the Uniform Environmental Covenant Act (UECA)[ADEM Admin. Code r. 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 IAW 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 IV-1: (Reserved)

Table IV-2:(Reserved)

Table IV-3: FPI Conditions for the TTCDP [(1)]

Grenade Treatment Unit (GTU)[(2)]				
Item No.	**Instrument Tag Number**	**Process Data Description**	**Range**	**Parameter**
TTCDP-FPI-01	TBD	Munitions Feed Rate[(3)]	MAX	2,880 Grenades/hr
TTCDP-FPI-02	TBD	All Electric Coils (igniters)	N/A	Operational
TTCDP-FPI-03	TBD	OGT Fan Motor On	N/A	On
Munitions Destruction System (MDS)[(4)]				
Item No.	**Instrument Tag Number**	**Process Data Description**	**Range**	**Parameter**
TTCDP-FPI-04	TBD	Munitions Feed Rate[(5)]	MAX	2,880 Fuzes/hr
TTCDP-FPI-05	TBD	Detonation Chamber Temperature	MIN	662ºF
TTCDP-FPI-06	TBD	Detonation Chamber Temperature	MAX	1112ºF
TTCDP-FPI-07	TBD	Discharge Flap	N/A	Closed/locked
TTCDP-FPI-08	TBD	Differential Pressure Across Fan Inlet and Outlet	MAX	17.0 inwc
TTCDP-FPI-09	TBD	Pre-Filter Differential	MIN	0.1 inwc
TTCDP-FPI-10	TBD	Pre-Filter Differential	MAX	6.0 inwc
TTCDP-FPI-11	TBD	HEPA Filter Differential	MIN	0.1 inwc
TTCDP-FPI-12	TBD	HEPA Filter Differential	MAX	12.0 inwc
TTCDP-FPI-13	TBD	Air Filter Inlet Temperature	MAX	350ºF

Table IV-3: FPI Conditions for the TTCDP [1] (Continued)

Footnotes:

1. The operational parameter(s) interlock will prohibit the transfer of grenades into the TTCDP until all parameters are met for the units listed (GTU, MDS, and OGT). If any set point is triggered, the feed will stop and the OGT will continue to operate. Any already ignited grenades and fuzes in the MDS and on the GTU conveyor may continue to be processed.

2. The GTU is a thermal treatment conveyor system which is used for treating grenade bodies.

3. The grenades to the GTU will be counted and will determine the overall feed rate. Approximately 99% of the NEW feed rate to the TTCDP system is comprised of fuze-less grenade bodies which will be processed in the GTU.

4. The MDS is a 0.2 Dynasafe Detonation Chamber which is used for processing fuze assemblies.

5. The fuze assemblies fed to the MDS will not be counted separately from the grenades; however, when fuze assemblies are present in the feed, there is a 1 to 1 ratio of grenades to fuzes. Therefore, the fuze count will equal the grenade count. If the GTU feed stops when the maximum feed rate is achieved, then the feed to the MDS will automatically stop. Fuze assemblies comprise about 1% of the overall NEW feed rate and will be processed in the MDS.

Abbreviations:

°F	degrees Fahrenheit	inwc	inches water column
GTU	Grenade Treatment Unit	MAX	maximum
MDS	Munitions Destruction System	MIN	minimum
TBD	to be determine	TTCDP	Thermal Treatment Closed Disposal Process

Table IV-4: Metal Feed Rates for the ANMC TTCDP [(1)]

Metal	Total Feed Rate (lbs/hr)
Antimony	5.14E-03
Barium	1.01E-02
Lead	2.60E-01

Footnote:

1. Metal feed rates were calculated using the metal composition of the M77 grenades located in the Munitions Items Disposition Action System (MIDAS) and assuming a maximum feed rate of 2,880 grenades per hour.

PART VI

SOLID WASTE MANAGEMENT UNIT (SWMU) AND AREA OF CONCERN (AOC) IDENTIFICATION AND EVALUATION

VI.A. APPLICABILITY

The Conditions of this Part apply to the solid waste management units (SWMUs) and/or areas of concern (AOCs) listed in Part VI.A.1 through VI.A.8 below. SWMUs were identified either by the RCRA Facility Assessment (RFA) dated September 21, 2018, the CERCLA process in coordination with the Army and EPA under the conditions of the 1990 Federal Facility Agreement (FFA), or by subsequent reporting and investigations. All SWMU's/AOC's that have been, or are being addressed pursuant to the FFA are notated in the respective tables of this Part. All actions taken on such SWMU's/AOC's pursuant to the FFA that achieve, or have already achieved, concurrence by the Department (as a party to the FFA) will be deemed to also have satisfied the respective permit requirement. Furthermore, regarding those SWMUs/AOCs being addressed pursuant to the FFA, which are also required to be addressed pursuant to this permit, ANAD must follow the approved schedules agreed upon by the parties of the FFA. Failure to address SWMUs/AOCs in accordance with the timelines and procedures set forth in the approved CERCLA documents will, consistent with the FFA, including Sections XXV, XXVI, XXVIII, and XXXIV, result in addressing the respective SWMUs/AOCs in accordance with the timelines and procedures outlined in this permit. Approved CERCLA decision documents have been incorporated into this permit by reference and are listed below the Table of Contents of this permit. The CERCLA coordination process also applies to Parts VII and VIII of this permit.

1. The SWMUs and AOCs identified in Table VI.1 of this Permit.

2. The SWMUs and AOCs identified in Table VI.2 of this Permit, which require investigation and/or remediation;

3. The SWMUs and AOCs identified in Table VI.3 of this Permit, which require no further investigation under this permit at this time;

4. The SWMUs and AOCs identified in Table VI.4 of this Permit, which are miscellaneous treatment units and storage units regulated by Parts I-IV and VII-IX of this permit.;

5. The SWMUs and AOCs identified in Table VI.5 of this Permit, which require interim measures and/or source removal;

6. The SWMUs and AOCs identified in Table VI.6 of this Permit, which require corrective measures implementation;

7. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means identified by section VI. B of this permit, and

8. Contamination 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 will be determined on a case-by-case basis.

VI.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 Permit Condition VI.A.7. 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 Permit Condition VI.A.7.

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 Permit Condition VI.B.2. 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 initiate an investigation as outlined in Permit Condition VI.D.1. immediately upon receiving notification of the Department's determination.

VI.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT PREVIOUSLY IDENTIFIED 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 15 calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Permit Condition VI.A.3 or SWMU or AOCs identified in Permit Condition VI.A.7 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 VI.D immediately upon receiving notification of the Department's determination.

VI.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform a RFI for any SWMU or AOC identified by the Department in Permit Conditions VI.A.2., VI.B.4., or VI.C.2.

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 VI.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 Conditions VI.B. and VI.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 VI.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 VI.G.

VI.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. The CMI Plan shall be submitted for the SWMUs and AOCs listed in Table VI.6 within 120 days from permit issuance.

VI.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 VI.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 VI.F.

   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 are 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 VI.G.

   e. The Permittee shall submit IM Work Plans for the SWMUs and AOCs listed in Table VI.5 of this permit to the Department for review and approval. The IM Work Plans shall be submitted within 180 days from the effective date of this permit.

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 VI.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 any deviations from the IM Work Plan during the reporting period;

iii. Summaries of any 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 VI.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.

VI.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 VI.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 r. 335-14-8-.02(2).

5. Two (2) copies of all submittals shall be provided by the Permittee to the Department in accordance with Permit Condition I.H.

VI.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 VI.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 IAW 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.

TABLE VI.1 MASTER LIST OF KNOWN SWMUS/AOCS AT THE ANNISTON ARMY DEPOT

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 21, 2018. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	SWMU/AOC Location
SWMU 1*	Chemical Sludge Waste Pits	Southeast Industrial Area (SIA)
SWMU 2*	Sanitary Landfill	Southeast Industrial Area (SIA)
SWMU 3*	Old Industrial Wastewater Treatment Plant	Southeast Industrial Area (SIA)
SWMU 4*	New Industrial Wastewater Treatment Plant	Southeast Industrial Area (SIA)
SWMU 5*	Sink Hole Disposal Area	Ammunition Storage Area (ASA)
SWMU 6*	Valve Disposal Pit	Southeast Industrial Area (SIA)
SWMU 7*	Chemical Waste Burial Pit	Southeast Industrial Area (SIA)
SWMU 8*	Acid Disposal Pit	Ammunition Storage Area (ASA)
SWMU 9*	Calcium Hypochlorite Burial Pit	Southeast Industrial Area (SIA)
SWMU 10*	TNT Washout Facility	Ammunition Storage Area (ASA)
SWMU 11*	Sedimentation Leaching Bed TNT Washout Facility	Ammunition Storage Area (ASA)
SWMU 12*	Facility 414 (Old Lagoon)	Southeast Industrial Area (SIA)
SWMU 13*	SIA Acid Chemical Waste Pit	Southeast Industrial Area (SIA)
SWMU 14*	Laundry Waste Leaching Facility	Ammunition Storage Area (ASA)
SWMU 15*	Propellant Disposal Facility	Ammunition Storage Area (ASA)
SWMU 16*	Burning Ground #1	Ammunition Storage Area (ASA)
SWMU 17*	Demolition Pit	Ammunition Storage Area (ASA)
SWMU 18*	WIA Old Sewage Treatment Plant	Western Industrial Area (WIA)
SWMU 19*	SIA Old Sewage Treatment Plant and Drying Beds	Southeast Industrial Area (SIA)
SWMU 20*	New Sewage Treatment Plant	Southeast Industrial Area (SIA)
SWMU 21*	Abrasive Dust Landfill	Southeast Industrial Area (SIA)
SWMU 22*	A-Block Lagoon	Southeast Industrial Area (SIA)
SWMU 23*	Asbestos Waste Disposal Trench	Southeast Industrial Area (SIA)
SWMU 24*	Old Sanitary Landfill	Southeast Industrial Area (SIA)
SWMU 25*	Building 130 Sump	Southeast Industrial Area (SIA)
SWMU 26*	North TNT Burial Pit	Ammunition Storage Area (ASA)
SWMU 27*	South TNT Burial Pit	Ammunition Storage Area (ASA)
SWMU 28*	Waste Wood Landfill	Southeast Industrial Area (SIA)
SWMU 29*	Old Lumber Disposal Yard	Southeast Industrial Area (SIA)
SWMU 30*	Northeast Lagoon Area	Southeast Industrial Area (SIA)
SWMU 31*	Building 114 Metal Plating Shop	Southeast Industrial Area (SIA)

SWMU/AOC Number	SWMU/AOC Name	SWMU/AOC Location
SWMU 32*	Hazardous Waste Storage Building 512	Bill Nichols Industrial Complex
SWMU 33*	Hazardous Waste/Roll-off Box Storage Building 466	Bill Nichols Industrial Complex
SWMU 34*	Chemical Storage Igloos (Total of 155)	Ammunition Storage Area (ASA)
SWMU 35*	Deactivation Furnace/Popping Furnace	Ammunition Storage Area (ASA)
SMWU 36*	Drill and Transfer System Site (Toxic Demilitarization Site)	Ammunition Storage Area (ASA)
SWMU 37*	Vehicle Wash Rack (Building 45)	Western Industrial Area (WIA)
SWMU 38*	Air Emission Baghouses (Buildings 5, 31, 74A, 103113, 114, 117, 127, 129, 130, 133, 145, 147, 186, 409, 413, 431, 432, 433, 474, 475, 652, CD-020)	Southeast Industrial Area (SIA)
SWMU 39*	Dynamometer Wastewater Treatment System	Southeast Industrial Area (SIA)
SWMU 40*	Oil-Water Separator Building 501 and 501 UST Site	Southeast Industrial Area (SIA)
SWMU 41*	Steam Cleaning Buildings (Buildings 128A, 129, 130, 409, 414, 421, 475 and 503)	Southeast Industrial Area (SIA)
SWMU 42*	Paint Booths (Buildings 8, 31, 58, 74A, 105, 113, 117, 128A, 129, 130, 143B, 167, 409, 433, 474, 475, 499, 501, 652 and 680)	Southeast Industrial Area (SIA)
SWMU 43*	Cyanide Pretreatment System Building 506	Southeast Industrial Area (SIA)
SWMU 44**	Dry Creek	Southeast Industrial Area (SIA)
SWMU 45	Building 410 former UST	Southeast Industrial Area (SIA)
SWMU 46**	Building 6 former UST	Western Industrial Area (WIA)
SWMU 47	Building 385 former UST	Ammunition Storage Area (ASA)
SWMU 48	Hazardous Waste Storage Building (Building 527)	Bill Nichols Industrial Complex
SWMU 49	Conventional Waste Munitions/Components Storage Igloos (F-405, F-704A, I-103, 34 G-Block Igloos for SDC Storage Closed 2025)	Ammunition Storage Area (ASA)
SWMU 50	Brine Evaporation System	Former ANCDF
SWMU 51	Container Handling Building	Former ANCDF
SWMU 52	Brine Surge Tank System	Former ANCDF
SWMU 53	Toxic Maintenance Area	Former ANCDF
SWMU 54	Upper Munitions Corridor	Former ANCDF

SWMU/AOC Number	SWMU/AOC Name	SWMU/AOC Location
SWMU 55	Buffer Storage Area	Former ANCDF
SWMU 56	Liquid Incinerator	Former ANCDF
SWMU 57	Deactivation Furnace System	Former ANCDF
SWMU 58	Brine Drum Dryers	Former ANCDF
SWMU 59	Agent Collection Tank System	Former ANCDF
SWMU 60	Waste Transfer Facility	Former ANCDF
SWMU 61	Lower Munitions Corridor	Former ANCDF
SWMU 62	Spent Decontamination Holding Tank System	Former ANCDF
SWMU 63	Metal Parts Furnace	Former ANCDF
SWMU 64	HDC Bin Lay Down Area – Container Handling Building	Former ANCDF
SWMU 65	Burning Ground #2	Ammunition Storage Area (ASA)
SWMU 66	Less than 90 Day Storage Areas (SWMU 1, SWMU 4, Buildings 114, 129, 130, 133, 145, 147, 162, 431/432, 433, 466, 474, 475, 512, 520, and 652, CD-020, MILVANs 3-9, and Storage Magazines 385 and 386)	Southeast Industrial Area (SIA) and Ammunition Storage Area (ASA)
SWMU 67	Building 129 Test Range for M16	Western Industrial Area (WIA)
SWMU 68	Building 129 Test Range for Handguns	Western Industrial Area (WIA)
SWMU 69	Abandoned Phenol Basin at Industrial Wastewater Treatment Plant	Southeast Industrial Area (SIA)
SWMU 70	Static Detonation Chamber	Ammunition Storage Area (ASA)
SWMU 71	Western Area – Clean Fill Site	Western Industrial Area (WIA)
SWMU 72	Building 409	Southeast Industrial Area (SIA)
SWMU 73	SDC Service Magazines (712, 713, and 714)	Ammunition Storage Area (ASA)
SWMU 74	Thermal Treatment Closed Disposal Process (TTCDP)	Ammunition Storage Area (ASA)
SWMU 75	Energetic Treatment Unit	Ammunition Storage Area (ASA)
SWMU 76	Building 114: CC-ANAD-10	Southeast Industrial Area (SIA)
SWMU 77	Building 117: CC-ANAD-11	Southeast Industrial Area (SIA)
SWMU 78	Building 136: CC-ANAD-12	Southeast Industrial Area (SIA)
SWMU 79	Building 524: CC-ANAD-13	Southeast Industrial Area (SIA)
SWMU 80	Building 634: CC-ANAD-14	Southeast Industrial Area (SIA)
SWMU 81**	Baseball Field	Main Gate Area
SWMU 82	Building 128 Manhole ST-3A	Southeast Industrial Area (SIA)
SWMU 83	Building 133	Southeast Industrial Area (SIA)
SWMU 84	Building 414 Lift Station	Southeast Industrial Area (SIA)

SWMU/AOC Number	SWMU/AOC Name	SWMU/AOC Location
SWMU 85	Building 432 Spinner Hanger	Southeast Industrial Area (SIA)
SWMU 86	Lance Missile Spill Site	Ammunition Storage Area (ASA)
SWMU 87***	Former Open Detonation Buffer Area	Ammunition Storage Area (ASA)
SWMU 88	Building 31 Test Fire Tunnels 1-3	Southeast Industrial Area (SIA)
SWMU 89	Building 186 Pistol Range	Cantonment Area
SWMU 90	Linear Projectile Mortar Disassembly	Ammunition Storage Area (ASA)
SWMU 91	Lift Station GW-12 at Building 114	Southeast Industrial Area (SIA)
SWMU 92	Rocket Motor Fire Stands	Ammunition Storage Area (ASA)
SWMU 93	Steam Cleaning Lift Station, Building 105	Southeast Industrial Area (SIA)
AOC A**	Western Industrial Area	Western Industrial Area (WIA)
AOC B	Underground Storage Tanks in Chemical Limited Area	Chemical Limited Area (CLA)
AOC C	Tank 77 Release	Southeast Industrial Area (SIA)
AOC D***	Recoilless Rifle Range	Northeast Corner of Depot
AOC E***	Pistol Range	Cantonment Area
AOC F***	Former Burning Ground Buffer Area	Ammunition Storage Area (ASA)
AOC G	Small Arms (Competition Pistol) Range	Northwestern Corner of Depot
AOC H	Tank Howitzer Range	Ammunition Storage Area (ASA)
AOC I	Pyrotechnics Range	Northwestern Corner of Depot
AOC J	Defense National Stockpiles	Ammunition Limited Area (ALA)
AOC K	Underground Pipe Release at Building 504	Southeast Industrial Area (SIA)

*SWMUs 1 – 43 are listed in Appendix 2 of the 1991 Federal Facilities Agreement and are being addressed pursuant to the FFA. The SIA SWMUs are listed on the USEPA National Priorities List (NPL) collectively as the Southeast Industrial Area. Since the signing of the FFA SWMUs 16, 17, 32, 33, and 34 have been identified as RCRA TSD units subject to the requirements of Parts I-IV and VII-IX of this permit.

** Some SWMUs have been included as part of the FFA since its signing in 1990. SWMU 44 was approved for FFA inclusion in the OU-1 Phase I Remedial Investigation Report (Jacobs, 1994). SWMU 46 was approved for FFA inclusion in the OU-5 Remedial Investigation (AECOM, 2019). SWMU 81 was approved for FFA inclusion in the Preliminary Assessment Report for the Ball Field Construction and Demolition Debris Site (URS, 2008). AOC A was approved for FFA inclusion in the OU-5 Site Investigation (J.J. Sosa, 2004).

***SWMU 87, AOC D, AOC E and AOC F are classified as Munitions Response Sites and are being addressed under the Military Munitions Response Program (MMRP) pursuant to the FFA.

TABLE VI.2 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 21, 2018. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 15*	Propellant Disposal Facility	Requires site investigation to determine extent of NDMA contamination	Groundwater, Soil
SWMU 37*	Vehicle Wash Rack (Building 45)	Remedial investigation (RI) pending within the Western Industrial Area (WIA)	Groundwater, Soil
SWMU 46*	Building 6 Former UST	Remedial investigation (RI) pending within the Western Industrial Area (WIA)	Groundwater, Soil
SWMU 72	Building 409	RFI required for confirmatory sampling and/or remediation of possible contamination.	Groundwater, Soil
SWMU 77	Building 117: CC-ANAD-11	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 78	Building 136: CC-ANAD-12	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 79	Building 524: CC-ANAD-13	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 80	Building 634: CC-ANAD-14	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 82	Building 128 Manhole ST-3A	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 83	Building 133	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 84	Building 414 Lift Station	2018 RFA recommendation – proceed with completion of RFI	Groundwater, Soil
SWMU 87*	Former Open Detonation Buffer Area	MMRP RI/FS	Groundwater, Soil
AOC A*	Western Industrial Area	Remedial investigation (RI) pending	Groundwater, Soil
AOC D*	Recoilless Rifle Range	MMRP RI/FS	Groundwater, Soil
AOC E*	Pistol Range	MMRP RI/FS	Groundwater, Soil
AOC F*	Burning Ground Buffer Zone	MMRP RI/FS	Groundwater, Soil

*Note: See footnotes for Table VI.1 for those SWMUs that are being addressed pursuant to the FFA and MMRP.

TABLE VI.3 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs) REQUIRING NO FURTHER ACTION (NFA) 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 21, 2018. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 2	Sanitary Landfill	Solid Waste Landfill Closure, 1994. ADEM approved May 5, 1995.	
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 18	WIA Old Sewage Treatment Plant	ASA – OU-3 Final ROD, July 2006	
SWMU 26	North TNT Burial Pit	ASA – OU-3 Final ROD, July 2006	
SWMU 34	Chemical Storage Igloos (Total of 155)	Former ANCDF – Clean Closure Certification September 30, 2014	
SMWU 36	Drill and Transfer System Site (Toxic Demilitarization Site)	ASA – Site Expansion Report, 1994	
SWMU 38	Air Emission Baghouses (Buildings 5, 31, 74A, 103, 113, 114, 117, 127, 129, 130, 133, 145, 147, 186, 409, 413, 431, 432, 433, 474, 475, 652, CD-020)	SIA – OU-2 Final ROD, July 2008; SIA – Phase II RI, May 1998	
SWMU 39	Dynamometer Wastewater Treatment System	SIA – Phase I RI ,1995	
SWMU 40*	Oil-Water Separator Building 501 and 501 UST Site	SIA – OU-2 Final ROD, July 2008; SIA – Phase II RI, May 1998	
SWMU 42*	Paint Booths (Buildings 8, 31, 58, 74A, 105, 113, 117, 128A, 129, 130, 143B, 167, 409, 433, 474, 475, 499, 501, 652 and 680)	SIA – OU-2 Final ROD, July 2008; SIA – Phase II RI, May 1998	
SWMU 43*	Cyanide Pretreatment System Building 506	SIA – OU-2 Final ROD, July 2008; SIA – Phase II RI, May 1998	
SWMU 44	Dry Creek	SIA – OU-1 Comprehensive Groundwater RI – Phase III, January 2008	
SWMU 45	Building 410 former UST	SIA - GW Code R335-6-15.26-.29/2005 ARBCA Evaluation	

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 47	Building 385 former UST	Approved UST Removal March 28, 1996	
SWMU 50	Brine Evaporation System	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 51	Container Handling Building	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 52	Brine Surge Tank System	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 53	Toxic Maintenance Area	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 54	Upper Munitions Corridor	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 55	Buffer Storage Area	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 56	Liquid Incinerator	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 57	Deactivation Furnace System	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 58	Brine Drum Dryers	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 59	Agent Collection Tank System	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 60	Waste Transfer Facility	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 61	Lower Munitions Corridor	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 62	Spent Decontamination Holding Tank System	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 63	Metal Parts Furnace	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 64	HDC Bin Lay Down Area – Container Handling Building	Former ANCDF- Clean Closure Certification September 30, 2014	
SWMU 66	Less than 90 Day Storage Areas (SWMU 1, SWMU 4, Buildings 114, 129, 130, 133, 145, 147, 162, 431/432, 433, 466, 474, 475, 512, 520, and 652, CD-020, MILVANs 3-9, and Storage Magazines 385 and 386)	RCRA Regulated Units – Satellite Accumulation	
SWMU 67	Building 129 Test Range for M16	RCRA Regulated Units – Satellite Accumulation	
SWMU 68	Building 129 Test Range for Handguns	RCRA Regulated Units – Satellite Accumulation	

SWMU/AOC Number	SWMU/AOC Name	Unit Comment	Potentially Affected Media
SWMU 69	Abandoned Phenol Basin at Industrial Wastewater Treatment Plant	Approved NFA on October 21, 2009 following completion of RFI	
SWMU 70	Static Detonation Chamber	Closure Approval; August XX 2026	
SWMU 73	SDC Service Magazines (712, 713, and 714)	Closure Approval; August XX 2026	
SWMU 81*	Baseball Field	Draft Final Preliminary Assessment on the Ball Field, August 2008	
SWMU 86	Lance Missile Spill Site	Preliminary Assessment, June 2008	
SWMU 88	Building 31 Test Fire Tunnels 1-3	2018 RFA recommendation – No Further Action	
SWMU 89	Building 186 Pistol Range	2018 RFA recommendation – No Further Action	
SWMU 90	Linear Projectile Mortar Disassembly	LPMD Closure Report, October 2011, Approved July 2013	
AOC B	Underground Storage Tanks in Chemical Limited Area	Approved NFA on October 21, 2009 following completion of RFI	
AOC C	Tank 77 Release	GW Sampling 2004-2005. Re-mediation complete, 5/2006.	
AOC G	Small Arms (Competition Pistol) Range	2018 RFA recommendation – No Further Action	
AOC H	Tank Howitzer Range	2018 RFA recommendation – No Further Action	
AOC I	Pyrotechnics Range	2018 RFA recommendation – No Further Action	

*Note: See footnotes for Table VI.1 for those SWMUs that are being addressed pursuant to the FFA and MMRP.

TABLE VI.4 LIST OF TREATMENT OR STORAGE SOLID WASTE MANAGEMENT UNITS (SWMUs) REGULATED BY PARTS I – IV AND VII OF 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 21, 2018. 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	Air, Groundwater, Soil
SWMU 17	Demolition Pit	RCRA-permitted Unit	Air, 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 48	Hazardous Waste Storage Building (Building 527)	RCRA-permitted Unit	Soil
SWMU 49	Conventional Waste Munitions/Components Storage Igloos (F-405, F-704A, I-103, 34)	RCRA-permitted Unit (G Block Igloos were closed April 2025 IAW approved closure plan and received NFA on August, XX 2026)	Soil
SWMU 65	Burning Ground #2	Currently conducting RCRA closure according to closure plan.	Soil
SWMU 74	Thermal Treatment Closed Disposal Process (TTCDP)	Ammunition Limited Area (ALA)	Air, Groundwater, Soil
SWMU 75	Energetic Treatment Unit (ETU	RCRA-permitted Unit	Air, Groundwater, Soil
SWMU 92	Rocket Motor Fire Stands	RCRA-permitted Unit	Air, Groundwater, Soil

TABLE VI.5 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs) REQUIRING INTERIM MEASURES (IM) AND/OR SOURCE REMOVAL/REDUCTION

There are currently no SWMUs/AOCs identified at this time that require IM and or source removal/reduction.

(RESERVED)

TABLE VI.6 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOCS) REQUIRING A CORRECTIVE MEASURES IMPLEMENTATION (CMI) PLAN

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 21, 2018. Where discrepancies exist, the permit shall take precedence.

SWMU/AOC Number	SWMU/AOC Name	Unit Comment
AOC J	CC-ANAD-04 Defense National Stockpiles	CMIP Required
AOC K	Underground Pipe Release at Building 504	Tank removed and closed. CMIP in progress.
SWMU 65	Burning Ground #2	CMIP required for soil and groundwater contamination
SWMU 71	Western Area – Clean Fill Site	CMIP required for contamination.
SWMU 76	Building 114: CC-ANAD-10	CMIP required for soil and groundwater contamination
SWMU 85	Building 432 Spinner Hanger	CMIP required for contamination.
SWMU 91	Lift Station GW-12 at Building 114	CMIP required for soil and groundwater contamination

PART VII

GROUNDWATER MONITORING AND CORRECTIVE ACTION

VII.A. REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition VII.B., the Detection Monitoring Program contained in Permit Condition VII.C., the Compliance Monitoring Program contained in Permit Condition VII.D., and the Corrective Action Monitoring Program contained in Permit Condition VII.E.

2. The Permittee shall commence groundwater monitoring as required by this permit no later than 120 calendar days after the effective date of this permit.

VII.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 r. 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 VII.1. of this permit, at the locations specified on Figures IV E-9 and IV E-10 of the permit application, Figure 1.1 of the Remedial Pre-Design Report Addendum for Interim Remedial Action of the Comprehensive Groundwater Operable Unit (dated September 2017), Figure 3-1 of the CMI Plan and Site Summary Report for Building 504 (dated April 2018), Figure 5 of SWMU 65 Burning Ground #2 (BG#2) CMIP (dated May 20, 2025), and any other groundwater monitoring wells specified by Permit Conditions VII.B.1.d.

      i. All groundwater monitoring wells shall be maintained IAW the plans and specifications presented in Section IV.E of the permit application or the specific CMI Plan and IAW ADEM Admin. Code r. 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.J.

      iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, which includes 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 IAW the approved procedures.

iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit IAW Permit Conditions VII.B.1.a.ii. and I.J., it shall be abandoned within 90 calendar days after deletion using procedures to be approved by the Department. 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 IAW the approved procedures.

b. Groundwater monitoring wells 05CW16-2, 05CW16-3, and 05CW16-4 shall define the point of compliance (POC) for the OB unit. Groundwater monitoring wells 05CW17-1, 05CW17-2, and 91B19 shall define the POC for the OD unit. Groundwater monitoring wells MW8-21 and MW 8-27 shall define the POC for Building 504 UST site. Monitoring wells 06-S05-U01, 97-S05-U01, 98-S05-B02, 98-S05-B03, and W2-17 shall define the POC for ASA SWMU 5. Groundwater monitoring wells 06-S11-U01, 06-S11-U02, 98-S11-B01, MW-1-97, MW-2-97, and MW-3-97 shall define the POC for ASA SWMUs 10 and 11. Groundwater monitoring wells 06-S27-U01, 91B22, 91B23, and 97-S27-U01 shall define the POC for ASA SWMU 27. Groundwater wells 91B24, 97-S35-U02, 97-S35-U03, and 98-S35-B01 shall define the POC for ASA SWMU 35. Groundwater monitoring wells 98-SB01, 98-S08-B02, and 98-S08-B03 shall define the POC for the ASA SWMU 8. The Cooper Well and Coldwater Spring shall define the POC for the SIA. Groundwater monitoring wells 10-BG2-02, 10-BG2-03, and 10-BG2-04 shall define the POC for SWMU 65 BG #2

c. The Permittee shall maintain groundwater monitoring well wells 05CW16-1 and 91B18 as the background monitoring well(s) for Open Burning (OB) and Open Detonation (OD), respectively. The Permittee shall maintain groundwater monitoring well 03-CGW-B01S as background monitoring for the SIA. The Permittee shall maintain groundwater monitoring well 10-BG2-01 as background monitoring for SWMU 65 BG #2

d. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of any plume of contamination or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code r. 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 at least 90 calendar days prior to installation which, at a minimum, 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 VII.1. of this permit at least annually and each time a sampling event is conducted. The results of these determinations should be submitted IAW Permit Condition VII.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 IAW Permit Condition VII.B.6.

c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit IAW Section IV.E of the permit application and ADEM Admin. Code r. 335-14-5-.06(8)(g).

3. Groundwater Protection Standard

a. The groundwater protection standard, as required under ADEM Admin. Code r. 335-14-5-.06(3), shall consist of Table VII.3. 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 VII.B.3. applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition VII.D.), or the corrective action monitoring program (Permit Condition VII.E.), whichever is earlier.

b. The compliance period shall continue (after beginning pursuant to Permit Condition VII.B.4.a.) until the groundwater protection standard as defined by Permit Condition VII.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 VII.E., then the compliance period shall continue as required by ADEM Admin. Code r. 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, IAW Permit Condition I.J., to implement a compliance monitoring program pursuant to Permit Condition VII.D. or a detection monitoring program pursuant to Permit Condition VII.C., as required by ADEM Admin. Code r. 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 VII.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code r. 335-14-5-.06(8)(d), (e), and (g):

a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) IAW the procedures specified in Section IV E of the permit application.

b. Samples shall be analyzed according to the procedures specified in Section IV E of the 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 VII.3, 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 permit application.

d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Section IV E of the permit application and ADEM Admin. Code r. 335-14-5-.06(8)(h).

e. No samples taken IAW this permit shall be filtered prior to analysis.

6. Recordkeeping and Reporting

a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained IAW Permit Conditions VII.B., VII.C., VII.D., and VII.E. as required by Permit Condition I.C.10.

b. The Permittee shall submit to the Department a 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 90 calendar days after the first sampling event and on an annual basis thereafter. Copies of this report shall be kept at the facility IAW Permit Conditions I.C.10.c and I.C.10.e.

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 VII of this permit on a quarterly basis. The first progress report shall be submitted to the Department within 90 calendar days after the effective date of this permit. 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, IAW Permit Condition I.J., 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.

VII.C. DETECTION MONITORING PROGRAM

The requirements of this Condition are applicable to the OB and OD units. Except as specified otherwise in this permit, the Detection Monitoring Program shall be implemented IAW Section IV E of the permit application and ADEM Admin. Code r. 335-14-5-.06(9).

1. Monitoring Requirements

   In addition to the general groundwater monitoring requirements specified in Permit Condition VII.B.2., the Permittee shall:

   a. Sample all point of compliance wells and background wells for the OB and OD units and analyze for the constituents listed in Table VII.2. of this permit, on a semi-annual basis IAW Permit Condition VII.B.5.

   b. Sample all background and point of compliance monitoring wells for the OB and OD units and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled IAW Permit Condition VII.B.5. The data obtained should be submitted as raw data in the reports required by Permit Condition VII.B.6.

   c. Sample all designated background monitoring wells for the OB and OD units and analyze, IAW Permit Condition VII.B.5., for the constituents listed in Table VII.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 VII.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 of completing each sampling event. The statistical evaluation of monitoring well analytical data shall be performed pursuant to Permit Condition VII.B.5. and ADEM Admin. Code r. 335-14-5-.06(9)(f).

   b. If the Permittee determines, pursuant to Permit Condition VII.C.2.a., that there is statistically significant evidence of contamination above background levels for any chemical parameters or hazardous constituents listed in Table VII.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).

VII.D. COMPLIANCE MONITORING PROGRAM (RESERVED)

VII.E. CORRECTIVE ACTION MONITORING PROGRAM

The requirements of this Condition are applicable to SIA Groundwater Source Area SWMUs, the ASA SWMUs, SWMU 65 BG #2 and AOC K (Building 504 UST site). Except as specified otherwise in this permit, the Corrective Action Monitoring Program shall be implemented IAW approved CMI Plans (or equivalent documents) listed in Table VIII.1 of this permit and ADEM Admin. Code r. 335-14-5-.06(11). The monitoring protocol for SIA and ASA wells shall follow the recommendations of the most recently approved annual Monitored Natural Attenuation Report for the respective operable units (i.e. monitoring for year 13 shall follow the recommendations listed in the report for year 12).

1. Monitoring Systems

In addition to the point of compliance and background well monitoring systems identified in Permit Conditions VII.B.1.b. and VII.B.1.c., the Permittee shall:

a. Maintain groundwater monitoring wells 00-X03-B06D, 00-X03-B06S, 00-X04-B09D, and 00-X04-B09S as boundary wells for the ASA as specified in Table VII.1. of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006, and Figures 4-2 through 4-7 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

b. Maintain groundwater monitoring wells MW-5, MW-8, 00-GOU-B02, and 02-CGW-BO5-4 as boundary wells for the SIA as specified in Table VII.1 of this permit and as shown on Figure 1.1 of the Remedial Pre-Design Report Addendum for Interim Remedial Action of the Comprehensive Groundwater Operable Unit, dated September 2017.

c. Maintain groundwater monitoring wells MW 8-2, MW 8-4, MW 8-5, MW 8-6, MW 8-8, MW 8-10, MW 8-11, MW 8-13, MW 8-14, MW8-15, MW 8-17, MW 8-29, MW 8-35, MW 8-36, MW 8-37, and MW 8-38 as effectiveness wells for Building 504 as specified in Table VII.1. of this permit and as shown on Figure 3-1 of the CMIP and Site Summary Report for Building 504, dated January 2016.

d. Maintain groundwater monitoring wells 91B11, 97-S10-U01, 97-S10-U02, 06-S11-U03, 06-S11-U04, 91B12, 98-S11-B02, MW-4-97, MW-5-97, WAAD-13 as effectiveness wells for the ASA downgradient as specified in Table VII.1 of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 and Figures 4-2 through 4-7 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

e. Maintain groundwater monitoring wells SWMU12-01, 00-GOU-B05, 88EWLF-1, 15PDLB-01, 15PDLB-02, 01-CGW-U11, 15PDNB-01, 15PDNB-02, 82B09, 95-GOU-U06, OO-GOU-B03, MW-410-13, 81B27, 83B19, 88EWNE-5, 95-SO1-UO1, 81B04, 15PDTB-01, and 15PDBT-02 as effectiveness wells for the SIA as specified in Table VII.1 of this permit and as shown on Figure 1.1 of the Remedial Pre-Design Report Addendum for Interim Remedial Action of the Comprehensive Groundwater Operable Unit, dated September 2017.

f. **RESERVED for future recovery wells.**

g. Maintain groundwater monitoring wells MW 8-21 and MW 8-27 as point of compliance wells for Building 504 UST site as specified in Table VII.1 of this permit and as shown on Figure 3-1 of the CMI Plan and Site Summary Report for Building 504, dated January 2016.

h. Maintain groundwater monitoring wells 06-S05-U01, 97-S05-U01, 98-S05-B02, 98-S05-B03, and W2-17 as the points of compliance for ASA SWMU 5 as specified in Table VII.1 of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 and Figures 4-2 through 4-7 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

i. Maintain groundwater monitoring wells 98-S0B1, 98-S08-B02, and 98-S08-B03 as the point of compliance wells for the ASA SWMU 8 as specified in Table VII.1 of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 and Figure 4-3 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

j. Maintain groundwater monitoring wells 06-S11-U01, 06-S11-U02, 98-S11-B01, MW-1-97, MW-2-97, and MW-3-97 as the point of compliance for ASA SWMUs 10 and11 as specified in Table VII.1 of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 and Figure 4-4 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

k. Maintain groundwater monitoring wells 06-S27-U01, 91B22, 91B23, and 97-S27-U01 as the point of compliance wells for ASA SWMU 27 as specified in Table VII.1. of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 Figure 4-5 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

l. Maintain groundwater wells 91B24, 97-S35-U02, 97-S35-U03, and 98-S35-B01 as the point of compliance wells for ASA SWMU 35 as specified in Table VII.1 of this permit and as shown on Figure 2-2 of the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, dated July 2006 and Figure 4-6 of the Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012.

m. Maintain groundwater monitoring well “Cooper Well” and monitor “Coldwater Spring” as the points of compliance for the SIA as specified in Table VII.1 of this permit and as shown on Figure 1.1 of the Remedial Pre-Design Report Addendum for Interim Remedial Action of the Comprehensive Groundwater Operable Unit, dated September 2017.

n. Groundwater data from the downgradient wells (10-BG2-02, 10-BG2-03, and 10-BG2- 04; Figure 5 of the SWMU #65 CMIP) will be compared to RSLs and/or data from the upgradient well (10-BG2-01; Figure 5 of the CMIP) as part of the monitoring program. This will be done to determine whether there is statistically significant evidence of contamination present at the Burning Ground # 2 (SWMU # 65).

2. Corrective Action Program

a. The Permittee shall conduct a Corrective Action Program, as described in the approved CMI Plans listed in Table VIII.1, to remove or treat in place all hazardous constituents that exceed their respective groundwater protection standards as described in Table VII.3. of this permit at the point of compliance, between the point of compliance and the down-gradient facility property boundary, and beyond the facility boundary IAW ADEM Admin. Code r. 335-14-5-.06(11)(e)2.

b. Pursuant to ADEM Admin. Code r. 335-14-5-.06(11)(c) and 335-14-5-.06(11)(e)3., the Permittee shall continue to implement the corrective action program as described in the approved CMI Plans listed in Table VIII.1 within 120 calendar days after the effective date of this permit. Corrective action equivalent programs under the CERCLA process must continue the current monitoring program frequencies agreed upon by the Army, EPA and ADEM (i.e. groundwater monitoring, LUC inspections, etc).

c. The Permittee shall handle/treat groundwater IAW the approved CMI Plans and with the applicable requirements of this permit.

3. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition VII.B.2., the Permittee shall:

a. Sample all background, point of compliance and effectiveness monitoring wells shown in Table VII.1. of this permit and analyze for the constituents listed in Table VII.2 of this permit on a semi-annual basis for SIA and Building 504 wells and annually for ASA wells beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.

b. Sample all background, point of compliance, effectiveness, and boundary monitoring wells shown in Table VII.1. of this permit and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled. The data obtained should be submitted as raw data in the reports required by Permit Condition VII.B.6. Additionally, all ASA wells shown in Table VII.1 must be sampled and analyzed for the Monitored Natural Attenuation (MNA) parameters listed in Table VII.4.

c. When evaluating the monitoring results to determine the effectiveness of the corrective measures, IAW Permit Condition VII.E.4., the Permittee shall:

i. Determine if the corrective action system effectively addresses the entire plume of contamination;

ii. Determine if the concentration of the hazardous constituents are decreasing (pH increasing or decreasing toward neutrality, as applicable) in the effectiveness wells specified in Permit Condition VII.A.1.;

iii. Determine if hazardous waste or hazardous constituents are being released into the environment; and,

iv. Determine if hazardous constituents have been detected in the boundary wells specified in Permit Condition VII.A.1.

4. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition VII.B.6.:

a. The Permittee shall report the effectiveness of the corrective action program annually, as required under ADEM Admin. Code r. 335-14-5-.06(11)(g). These reports shall be submitted to the Department within 60 calendar days of each annual anniversary of this permit after corrective action is initiated and continue until corrective action is completed. The Permittee must provide data from groundwater monitoring along with an analysis of that data and any conclusions regarding the effectiveness of the program IAW Permit Condition VII.E.3.d. If the analysis of the data warrants any change to the corrective action program, the Permittee must include these revisions in the annual report which will be followed up within 90 calendar days with an application for permit modification IAW Permit Condition I.J.

b. If corrective action is terminated under Permit Condition VII.B.4.c., the Permittee must sample all background, point of compliance, effectiveness and boundary sampling locations for the compounds listed in ADEM Admin. Code r. 335-14-5-Appendix IX. Based upon the sampling results, the Permittee may petition the Department, IAW Permit Condition I.J, for a permit modification to implement either a detection monitoring program or a compliance monitoring program.

TABLE VII.1

MONITORING WELL DESIGNATIONS

WELL NUMBER	WELL TYPE[1]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft. btoc)	GROUND ELEVATION (ft. MSL)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE[2]
05CW16-1	BKG	33° 39’ 56.17”N	85° 59’ 48.42”W	OB	22.9	711.07	713.75	10.0-20.0	Residuum
05CW16-2	POC	33° 40’ 05.96”N	85° 59’ 56.04”W	OB	17.7	685.82	688.09	5.0-15.0	Residuum
05CW16-3	POC	33° 40’ 03.60”N	85° 59’ 55.21”W	OB	18.0	690.22	693.36	4.5-14.5	Residuum
05CW16-4	POC	33° 40’ 04.41”N	85° 59’ 52.34”W	OB	22.0	693.55	695.81	9.5-19.5	Residuum
05CW17-1	POC	33° 40’ 57.77”N	85° 59’ 58.67”W	OD	22.0	612.79	616.04	1.0-20.0	Residuum
*05CW17-2	POC	33° 40’ 55.22”N	85° 59’ 53.68”W	OD	18.0	621.80	623.91	5.0-15.0	Residuum
91B18	BKG	33° 40’ 47.77”N	85° 59’ 30.44”W	OD	17.5	650.39	651.89	5.0-15.0	Residuum
*91B19	POC	33° 40’ 56.73”N	85° 59’ 52.34”W	OD	22.0	620.98	621.57	10.0-20.0	Residuum
MW 8-2	EFF	33° 38’ 09.60”N	85° 55’ 39.74”W	Building 504	21.8	622.20	622.01	6-21.5	Residuum
MW 8-4	EFF	33° 38’ 09.54”N	85° 55’ 40.57”W	Building 504	21.0	623.30	623.03	5.9-20.9	Residuum
MW 8-5	EFF	33° 38’ 09.49”N	85° 55’ 41.32”W	Building 504	16.0	623.10	622.96	6-15.8	Residuum
MW 8-6	EFF	33° 38’ 09.49”N	85° 55’ 40.94”W	Building 504	17.0	623.80	623.62	6.9-16.5	Residuum
MW 8-8	EFF	33° 38’ 09.63”N	85° 55’ 39.34”W	Building 504	15.7	622.20	622.03	5.9-15.7	Residuum
MW 8-10	EFF	33° 38’ 08.93”N	85° 55’ 40.39”W	Building 504	15.3	622.20	622.04	5.5-15.3	Residuum
MW 8-11	EFF	33° 38’ 09.63”N	85° 55’ 39.79”W	Building 504	75.5	622.20	621.92	70-75.4	Bedrock
MW 8-13	EFF	33° 38’ 09.92”N	85° 55’ 39.54”W	Building 504	19.6	621.80	621.61	9.8-19.6	Residuum
MW 8-14	EFF	33° 38’ 09.70”N	85° 55’ 39.15”W	Building 504	16.8	622.50	622.18	6.8-16.6	Residuum
MW 8-15	EFF	33° 38’ 09.47”N	85° 55’ 38.96”W	Building 504	20.0	622.60	622.28	10.2-20	Residuum
MW 8-17	EFF	33° 38’ 08.99”N	85° 55’ 37.43”W	Building 504	17.0	621.80	621.54	7.2-17	Residuum
MW 8-21	POC	33° 38' 07.57"N	85° 55' 37.04"W	Building 504	21.5	NA	622.76	11-21.5	Residuum
MW 8-27	POC	33° 38' 07.25"N	85° 55' 40.47"W	Building 504	23.0	NA	622.68	13-23	Residuum

WELL NUMBER	WELL TYPE[1]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft. btoc)	GROUND ELEVATION (ft. MSL)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE[2]
MW 8-29	EFF	33° 38’ 08.99”N	85° 55’ 38.90”W	Building 504	23.0	623.13	622.78	8-23	Residuum
MW 8-35	EFF	33° 38’ 09.72”N	85° 55’ 40.90”W	Building 504	22.5	624.68	623.68	7.5-22.5	Residuum
MW 8-36	EFF	33° 38’ 10.03”N	85° 55’ 40.94”W	Building 504	21.0	624.85	623.85	6-21	Residuum
MW 8-37	EFF	33° 38’ 10.26”N	85° 55’ 41.16”W	Building 504	19.0	623.99	622.99	4-19	Residuum
MW 8-38	EFF	33° 38’ 10.83”N	85° 55’ 40.50”W	Building 504	17.0	623.21	622.21	7-17	Residuum
06-S05-U01	POC	33° 39’ 21.29”N	85° 56’ 05.70”W	ASA SWMU 5	109.5	745.85	748.05	101.8-111.8	Bedrock
97-S05-U01	POC	33° 39’ 21.64”N	85° 56’ 03.77”W	ASA SWMU 5	48.8	739.35	741.30	35-45	Residuum
98-S05-B02	POC	33° 39’ 23.74”N	85° 56’ 01.86”W	ASA SWMU 5	103.3	736.27	738.67	91.5-101.2	Bedrock
98-S05-B03	POC	33° 39’ 21.23”N	85° 56’ 01.79”W	ASA SWMU 5	109.2	733.22	735.52	105-106.8	Bedrock
W2-17	POC	33° 39’ 22.10”N	85° 56’ 00.42”W	ASA SWMU 5	39.3	730.02	731.20	28-38	Residuum
98-S08-B01	POC	33° 40’ 20.02”N	85° 56’ 53.04”W	ASA SWMU 8	86.1	720.92	723.18	74-84	Bedrock
98-S08-B02	POC	33° 40’ 19.21”N	85° 56’ 51.16”W	ASA SWMU 8	104.6	708.57	710.98	88.8-98.8	Bedrock
98-S08-B03	POC	33° 40’ 18.49”N	85° 56’ 52.27”W	ASA SWMU 8	84.8	716.13	718.53	72.3-82.3	Interface
91B11	EFF	33° 39' 32.88"	85° 58' 50.97"	ASA SWMU-10	38.0	NA	793.92	28-38	Residuum
97-S10-U01	EFF	33°39'31.47"N	85°58'49.74"W	ASA SWMU-10	17.0	NA	791.82	6.4-16.4	Residuum
97-S10-U02	EFF	33°39'32.88"N	85°58'49.55"W	ASA SWMU-10	85.0	NA	790.54	73.9-83.9	Bedrock
06-S11-U01	POC	33° 39’ 34.30”N	85° 58’ 43.24”W	ASA SWMU 11	98.9	784.39	786.69	86.5-96.5	Interface
06-S11-U02	POC	33° 39' 38.03"N	85° 58' 41.75"W	ASA SWMU 11	114.0	NA	782.11	101.5-111.5	Bedrock
06-S11-U03	EFF	33°39'31.84"N	85°58'44.70"W	ASA SWMU 11	120.0	NA	792.77	108.72-118.72	Bedrock
06-S11-U04	EFF	33° 39' 28.28"N	85° 58' 45.10"W	ASA SWMU 11	75.6	NA	794.09	65.23-75.23	Bedrock
91B12	EFF	33°39'31.11"N	85°58'48.60"W	ASA SWMU 11	52.3	NA	792.51	42-52	Residuum
98-S11-B01	POC	33° 39’ 32.72”N	85° 58’ 45.87”W	ASA SWMU 11	55.1	786.69	788.53	42.3-52.3	Bedrock
98-S11-B02	EFF	33° 39’ 32.99”N	85° 58’ 44.01”W	ASA SWMU 11	125.2	787.93	790.35	112.3-122.3	Bedrock

WELL NUMBER	WELL TYPE[1]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft. btoc)	GROUND ELEVATION (ft. MSL)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE[2]
MW-1-97	POC	33° 39' 29.12"N	85° 58' 48.82"W	ASA SWMU 11	34.3	790.44	793.00	10.6-30.6	Residuum
MW-2-97	POC	33° 39' 27.83"N	85° 58' 47.67"W	ASA SWMU 11	18.8	777.46	780.00	6.5-16.5	Residuum
MW-3-97	POC	33° 39' 29.12"N	85° 58' 47.05"W	ASA SWMU 11	13.0	776.09	779.00	5-10	Residuum
MW-4-97	EFF	33° 39' 31.02"N	85° 58' 46.74"W	ASA SWMU 11	18.8	779.49	782.20	5-15	Residuum
MW-5-97	EFF	33° 39' 32.31"N	85° 58' 46.88"W	ASA SWMU 11	13.8	779.34	782.00	6-11	Residuum
WAAD-13	EFF	33° 39' 32.49"N	85° 58' 48.46"W	ASA SWMU 11	31.4	790.28	792.23	20-30	Residuum
06-S27-U01	POC	33° 41' 00.51"N	85° 57' 57.56"W	ASA SWMU 27	24.3	702.9	705.1	11.6-21.6	Residuum
91B22	POC	33° 40' 59.09"N	85° 57' 53.20"W	ASA SWMU 27	27.4	701.60	703.60	15-25	Residuum
91B23	POC	33° 40' 58.40"N	85° 57' 52.24"W	ASA SWMU 27	42.6	704.81	707.06	30-40	Residuum
97-S27-U01	POC	33° 40' 58.37"N	85° 57' 53.25"W	ASA SWMU 27	52.4	702.48	704.75	40-50	Interface
91B24	POC	33° 40' 22.96"N	85° 59' 24.23"W	ASA SWMU 35	46.4	694.98	696.18	34-44	Residuum
97-S35-U02	POC	33° 40' 21.41"N	85° 59' 22.69"W	ASA SWMU 35	57.0	693.43	695.62	44-54	Residuum
97-S35-U03	POC	33° 40' 24.73"N	85° 59' 21.77"W	ASA SWMU 35	46.8	696.57	698.80	34-44	Residuum
98-S35-B01	POC	33° 40' 23.05"N	85° 59' 21.32"W	ASA SWMU 35	43.8	697.46	699.89	32-42	Bedrock
00-X03-B06D	BDY	33° 37' 22.17"N	85° 57' 40.53"W	ASA Downgradient	221.5	625.70	626.95	208.7-218.7	Unweathered Bedrock
00-X03-B06S	BDY	33° 37' 22.17"N	85° 57' 40.53"W	ASA Downgradient	136.5	625.72	626.95	123.7-133.7	Unweathered Bedrock
00-X04-B09D	BDY	33° 37' 11.05"N	85° 59' 25.84"W	ASA Downgradient	295.2	619.13	621.15	283-293	Unweathered Bedrock
00-X04-B09S	BDY	33° 37' 11.05"N	85° 59' 25.84"W	ASA Downgradient	111.4	619.09	621.15	89-109	Unweathered Bedrock
03-CGW-B01S	BKG	33° 39' 26.29"N	85° 55' 18.56"W	SIA Upgradient Sentinel Well	262.5	676.13	678.53	250-260	Unweathered Bedrock
SWMU12-01	EFF	33° 37' 46.12"N	85° 55' 52.68"W	SIA Landfill Area	32.7	NA	630.64	75 (estimated total depth)	Residuum
00-GOU-B05	EFF	33° 37' 46.82"N	85° 55' 43.38"W	SIA Landfill Area	191.0	619.50	621.40	175-185	Unweathered Bedrock
88EWLF-1	EFF	33° 37' 46.73"N	85° 55' 52.77"W	SIA Landfill Area	62.4	NA	628.91	51.8-61.8	Weathered Bedrock
15PDLB-01	EFF	NA	NA	SIA Landfill Area	64.0	NA	632.47	51.3-61.3	Weathered Bedrock

WELL NUMBER	WELL TYPE[1]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft. btoc)	GROUND ELEVATION (ft. MSL)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE[2]
15PDLB-02	EFF	NA	NA	SIA Landfill Area	63.0	NA	631.10	50.6-60.6	Weathered Bedrock
01-CGW-U11	EFF	33° 38’ 26.89”N	85° 55’ 02.28”W	SIA Northeast Area	39.0	NA	629.91	28.4-38.4	Residuum
15PDNB-01	EFF	NA	NA	SIA Northeast Area	64.4	NA	631.99	51.6-61.6	Weathered Bedrock
15PDNB-02	EFF	NA	NA	SIA Northeast Area	63.6	NA	635.90	51-61	Weathered Bedrock
82B09	EFF	33° 38’ 24.46”N	85° 55’ 16.11”W	SIA Industrial Area	28.1	NA	624.07	12-27	Residuum
95-GOU-U06	EFF	33° 38’ 10.04”N	85° 55’ 22.76”W	SIA Industrial Area	24.5	NA	619.51	12.1-21.6	Residuum
00-GOU-B03	EFF	33° 38’ 02.02”N	85° 55’ 18.66”W	SIA Industrial Area	114.0	NA	622.69	95-105	Unweathered Bedrock
MW-410-13	EFF	33° 38’ 21.17”N	85° 55’ 10.42”W	SIA Industrial Area	116.0	620.30	619.84	105-115	Unweathered Bedrock
81B27	EFF	33° 37’ 51.50”N	85° 55’ 29.43”W	SIA Industrial Area	85.9	618.10	622.20	83-93	Weathered Bedrock
83B19	EFF	33° 38’ 24.46”N	85° 55’ 16.11”W	SIA Industrial Area	29.9	NA	621.94	16.7-27	Weathered Bedrock
88EWNE-5	EFF	33° 38’ 20.20”N	85° 55’ 10.84”W	SIA Northeast Area	37.0	NA	619.80	27-37	Weathered Bedrock
95-SO1-U01	EFF	33° 38’ 28.35”N	85° 55’ 45.27”W	SIA Trench Area	67.0	622.10	686.78	55-65	Residuum
81B04	EFF	33° 38’ 28.66”N	85° 55’ 44.02”W	SIA Trench Area	105.0	NA	690.21	100.2-105	Unweathered Bedrock
15PDTB-01	EFF	NA	NA	SIA Trench Area	103.8	NA	688.71	91.9-101.1	Weathered Bedrock
15PDBT-02	EFF	NA	NA	SIA Trench Area	79.7	NA	689.86	68.1-78.1	Weathered Bedrock
MW-5	BDY	33° 37’ 33.50”N	85° 55’ 25.36”W	SIA Offsite Sentinel Well	76.4	NA	655.47	56.7-76.4	Weathered Bedrock
MW-8	BDY	33° 37’ 22.79”N	85° 55’ 54.48”W	SIA Downgradient Sentinel Well	70.8	609.50	614.54	50-70	Weathered Bedrock
00-GOU-B02	BDY	33° 37’ 57.23”N	85° 55’ 17.93”W	SIA Downgradient Sentinel Well	119.1	639.60	642.05	106-116	Unweathered Bedrock
COOPER WELL	POC	33° 37’ 34.94”N	85° 55’ 33.02”W	SIA Downgradient Sentinel Well	86.2	622.60	623.42	Open, total depth = 86	Bedrock
02-CGW-B05-4	BDY	33° 37’ 23.61”N	85° 55’ 54.94”W	SIA Downgradient Sentinel Well	390.4	NA	609.82	380-390	Unweathered Bedrock
Coldwater Spring	POC	33° 36’ 12.85”N	85° 55’ 31.96”W	Offsite Drinking Water Source	NA	595.00	NA	NA	Spring
10-BG2-01	BKG	33° 40’ 22.92”N	85° 59’ 57.77”W	SWMU 65 BG 2	11.57	NA	670.91	8.2-11.57	Residuum
10- BG2-02	POC	33° 40’ 23.36”N	85° 59’ 57.26”W	SWMU 65 BG 2	13.95	NA	667.35	3.95-13.95	Residuum

WELL NUMBER	WELL TYPE[1]	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft. btoc)	GROUND ELEVATION (ft. MSL)	TOP-OF-CASING ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE[2]
10-BG2-03	POC	33° 40’ 24.59”N	85° 59’ 56.96”W	SWMU 65 BG 2	15.08	NA	665.45	5-15	Residuum
10- BG2- 04	POC	33° 40’ 25.65”N	85° 59’ 57.34”W	SWMU 65 BG 2	15.04	NA	664.92	5.04-15.04	Residuum

Footnotes:

1 Well Type:
POC - Point of Compliance Wells
EFF - Effectiveness Monitoring Wells
BDY - Boundary Monitoring Wells
BKG - Background Wells
UPG - Upgradient Well

2 Monitored Zone:
Residuum – Unconsolidated saturated zone overlying bedrock
Weathered Bedrock – Lithified zone exhibiting dissolution and erosional features underlying the residuum
Unweathered Bedrock – Deeper lithified zone of consolidated rock underlying weathered bedrock
Interface – Well screened across the residuum and bedrock
FLUTe – Flexible Liner Underground Technologies, multi-screened well in a single borehole
NA – Not applicable

*Monitoring wells at the OD Unit to be removed as part of the redevelopment of the sediment pond. An abandonment and installation plan should be submitted to the Department for review and approval prior to removal. Upon completion of the sediment basin, two new wells shall be installed and developed in accordance with the Department’s guidance.

TABLE VII.2

GROUNDWATER QUALITY MONITORING CONSTITUENTS

UNIT[1]	HAZARDOUS CONSTITUENT
OB and OD	Energetics[2]
	TAL Metals[3]
	SVOCs[4]
	Perchlorate
	VOCs[5]
ASA Boundary Wells	Arsenic
	Chromium, total
	Chromium (VI)
	Lead
	Manganese
	Thallium
	Vanadium
	Bis(2-ethylhexyl)phthalate (BEHP)
	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
	Trinitrotoluene (TNT)
	2,4-Dinitrotoluene (DNT)
	2,6- Dinitrotoluene (DNT)
	2-Amino-4,6-dinitrotoluene (DNT)
	4-Amino-2,6-dinitrotoluene (DNT)
SWMU 5	Lead
	Manganese
	BEHP
SWMU 8	Manganese
	BEHP
SWMU 10/11	Arsenic
	Chromium, total
	Chromium (VI)
	Lead
	Manganese
	Vanadium
	Bis(2-ethylhexyl)phthalate (BEHP)
	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
	Trinitrotoluene (TNT)
	2,4-Dinitrotoluene (DNT)
	2,6- Dinitrotoluene (DNT)
	2-Amino-4,6-dinitrotoluene (DNT)
	4-Amino-2,6-dinitrotoluene (DNT)
SWMU 27	Lead

UNIT[1]	HAZARDOUS CONSTITUENT
SWMU 35	Arsenic
	Chromium, total
	Chromium (VI)
	Manganese
	Thallium
	Vanadium
SWMU 65	Acetone
	Manganese
	Naphthalene
	N- nitrosodimethylamine
SIA	Methylene Chloride
	Tetrachloroethene
	Trichloroethene
	cis-1,2-Dichloroethene
	Bis(2-ethylhexyl)phthalate (BEHP)
	Arsenic
	Chromium
	Lead
	Manganese
Building 504	Benzene
	Toluene
	Ethylbenzene
	p,m-Xylene
	o-Xylene
	Methyl-tertiary-butyl-ether (MTBE)
	Anthracene
	Benzo(a)anthracene
	Benzo(a)pyrene
	Benzo(b)fluoranthene
	Benzo(g,h,i)perylene
	Benzo(k)fluoranthene
	Benzo(k)fluoranthene
	Fluoranthene
	Fluorene
	Naphthalene
	Phenanthrene
	Pyrene Building 504

Footnotes:

1 Identifies the unit(s) at which the given constituent must be monitored.

2 Energetics shall include RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine), HMX (Octahydro-,3,5,7- tetranito-1,3,5,7-tetrazocine), 1,3,5-Trinitrobenzene, 1,2-Dinitrobenzene, 1,3-Dinitrobenzene, 1,4-Dinitrobenzene, Methyl-2,4,6-trinitrophenylnitramine (Tetryl), 2-Amino-4,6-dinitrotoluene, 4-Amino-2,6-

dinitrotoluene, Nitrobenzene, 2,4,6-Trinitrotoluene. 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Nitrotoluene, 3-Nitrotoluene, 4-Nitrotoluene, Nitroglycerin

[3] TAL Metals shall include Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc

[4] SVOCs shall include 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dimethylphenol, 2,4-Dichlorophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol), 2-Methylnaphthalene, 2-Methylphenol (o-Cresol), 2-Nitroaniline, 3,3'-Dichlorobenzidine, 3-Methylphenol (m-Cresol), 4-Methylphenol (p-Cresol), 3-Nitroaniline, 4-Chloro-3-methylphenol, 4-Chloroaniline, 4-Nitroaniline, 4-Nitrophenol, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Benzoic acid, Benzyl alcohol, Bis(2-chloroethoxy)methane, Bis(2-chloroethyl)ether, Bis(2-chloroisopropyl)ether, Bis(2-ethylhexyl)phthalate (BEHP), Butyl benzyl phthalate, Chrysene, Dibenzo(a,h)anthracene, Dibenzofuran, Diethyl phthalate, Dimethyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isophorone, Nitrobenzene, N-Nitrosodimethylamine, n-Nitroso-di-n-propylamine, N-Nitrosodiphenylamine/Diphenylamine, Pentachlorophenol, Phenanthrene, Phenol, Pyrene

[5] VOCs shall include Acetone, Benzene, Bromobenzene, Bromodichloromethane, Bromoform, Bromomethane, 2-Butanone (Methyl Ethyl Ketone), sec-Butylbenzene, tert-Butylbenzene, Carbon disulfide, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromochloromethane, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane (EDB), 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropane, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, Methylene chloride (Dichloromethane), 4-Methyl-2-pentanone (Methyl Isobutyl Ketone), Naphthalene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, Trichloroethene, Trichlorofluoromethane, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Vinyl chloride, Total Xylenes

TABLE VII.3

GROUNDWATER PROTECTION STANDARD

UNIT[1]	HAZARDOUS CONSTITUENT	CONCENTRATION LIMIT (mg/L)
OB and OD	Energetics[2]	EPA RSLs[6]
	TAL Metals[3]	EPA RSLs/MCLs[7]
	SVOCs[4]	EPA RSLs[6]
	Perchlorate	EPA RSLs[6]
	VOCs[5]	EPA RSLs[6]
ASA Boundary[9]Wells	Arsenic	0.01
	Chromium, total	0.1
	Chromium (VI)	NE[9]
	Lead	0.015
	Manganese	0.05
	Thallium	0.002
	Vanadium	0.011
	Bis(2-ethylhexyl)phthalate (BEHP)	0.006
	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.0008
	Trinitrotoluene (TNT)	0.0008
	2,4-Dinitrotoluene (DNT)	NE[8]
	2,6- Dinitrotoluene (DNT)	NE[8]
	2-Amino-4,6-dinitrotoluene (DNT)	NE[8]
	4-Amino-2,6-dinitrotoluene (DNT)	NE[8]
SWMU 5[9]	Lead	0.015
	Manganese	0.05
	Bis(2-ethylhexyl)phthalate (BEHP)	0.006
SWMU 8	Manganese	0.05
	Bis(2-ethylhexyl)phthalate (BEHP)	0.006
SWMU 10/11[9]	Arsenic	0.01
	Chromium, total	0.1
	Chromium (VI)	NE[9]
	Lead	0.015
	Manganese	0.05
	Bis(2-ethylhexyl)phthalate (BEHP)	0.006
	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.0008
	Trinitrotoluene (TNT)	0.0008
	2,4-Dinitrotoluene (DNT)	NE[8]
	2,6- Dinitrotoluene (DNT)	NE[8]
	2-Amino-4,6-dinitrotoluene (DNT)	NE[8]
	4-Amino-2,6-dinitrotoluene (DNT)	NE[8]
SWMU 27[9]	Lead	0.015

UNIT[1]	HAZARDOUS CONSTITUENT	CONCENTRATION LIMIT (mg/L)
SWMU 35[9]	Arsenic	0.01
	Chromium, total	0.1
	Chromium (VI)	0.0035
	Lead	0.015
	Manganese	0.05
	Thallium	0.002
	Vanadium	0.011
SWMU 65	Acetone	EPA RSLs[6]
	Manganese	EPA RSLs[6]
	Naphthalene	EPA RSLs[6]
	N- nitrosodimethylamine	EPA RSLs[6]
Building 504	Benzene	MCL
	Toluene	MCL
	Ethylbenzene	MCL
	p,m-Xylene	MCL
	o-Xylene	EPA RSLs[6]
	Methyl tertiary-Butyl Ether (MTBE)	EPA RSLs[6]
	Poly Aromatic Hydrocarbons (PAHs):	
	~Anthracene	EPA RSLs[6]
	~Benzo(a)anthracene	EPA RSLs[6]
	~Benzo(a)pyrene	EPA RSLs[6]
	~Benzo(b)fluoranthene	EPA RSLs[6]
	~Benzo(g,h,i)perylene	EPA RSLs[6]
	~Benzo(k)fluoranthene	EPA RSLs[6]
	~Benzo(k)fluoranthene	EPA RSLs[6]
	~Fluoranthene	EPA RSLs[6]
	~Fluorene	EPA RSLs[6]
	~Naphthalene	EPA RSLs[6]
	~Phenanthrene	EPA RSLs[6]
	~Pyrene	EPA RSLs[6]
SIA	Methylene Chloride	NPDWS MCL[10]
	Tetrachloroethene	NPDWS MCL[10]
	Trichloroethene	NPDWS MCL[10]
	cis-1,2-Dichloroethene	NPDWS MCL[10]
	Bis(2-ethylhexyl)phthalate (BEHP)	NPDWS MCL[10]
	Arsenic	NPDWS MCL[10]
	Chromium	NPDWS MCL[10]
	Lead	NPDWS MCL[10]
	Manganese	NSDWR SMCL[10]

Footnotes:

1 Identifies the unit(s) at which the given constituent must be monitored.

2 Refer to Footnote 2 of Table VII.2

[3] Refer to Footnote 3 of Table VII.2

[4] Refer to Footnote 4 of Table VII.2

[5] Refer to Footnote 5 of Table VII.2

[6] EPA RSLs are the values listed for Tap Water in the most recent US EPA Regional Screening Level (RSL) Table, using a Hazard Quotient (HQ) of 0.1.

[7] The MCL found on the most recent US EPA Regional Screening Level (RSL) Table is used as the concentration limit where available for metals. All others metals shall reference the values listed for Tap Water in the most recent US EPA RSL table, using a Hazard Quotient (HQ) of 0.1.

[8] Although screening levels were not initially established for these constituents as part of the final ROD, the US EPA Regional Screening Level (RSL) Table, using a Hazard Quotient (HQ) of 0.1, shall be the standard for evaluating hexavalent chromium and dinitrotoluene compounds.

[9] The standards listed in this table for the Ammunition Storage Area (ASA) operable unit including Boundary wells, SWMUs 5, 8, 10, 11, 27, and 35, are those approved in Final Work Plan Addendum to the ASA Long-Term Groundwater Monitoring Plan dated May 2013 (Tables 5-6 and 5-7).

[10] The cleanup goals established for the SIA were approved in the Interim Record of Decision Amendment for the Southeast Industrial Area (Operable Unit 1). The National Primary and Secondary Drinking Water Regulations (NPDWRs and NSDWRs) were utilized to establish these goals. Listed here are the Maximum Contaminant Levels (MCLs) from the NPDWRs and the Secondary Maximum Contaminant Levels (SMCLs) from the NSDWRs

Table VII.4

Monitored Natural Attenuation (MNA) Parameters for the ASA

UNIT[1]	Parameter[1]	Unit of Measure
All ASA Monitoring Wells (SWMUs 5, 8, 10, 11, 27, 35 and downgradient boundary wells)	Conductivity[2]	Mhos/cm
	Dissolved Oxygen (DO)[2]	Milligrams/liter (mg/L)
	Oxidation-reduction potential (ORP)[2]	Millivolts (mV)
	pH[2]	Standard Units (S.U.)
	Temperature[2]	Degrees (°F or °C)
	Turbidity	Nephelometric Turbidity Units (NTU)
SWMUs 10/11	Calcium	mg/L or µg/L
	Chloride	mg/L or µg/L
	Iron, total	mg/L or µg/L
	Iron (II)	mg/L or µg/L
	Magnesium	mg/L or µg/L
	Methane	mg/L or µg/L
	Nitrate + Nitrite	mg/L or µg/L
	Total Organic Carbon (TOC)	mg/L or µg/L
SWMU 65	Conductivity[2]	Mhos/cm
	Dissolved Oxygen (DO)[2]	mg/L
	Oxidation-reduction potential (ORP)[2]	mV
	pH[2]	S.U.
	Temperature[2]	°F or °C
	Turbidity	NTU

Notes:

[1] In accordance with the RA Work Plan for OU-3 (EMR, 2014), the Final ANAD OU-3 Groundwater Monitoring Work Plan Addendum for Year 10 (EMR, 2015), and with the agreement of the ANAD Tier I Partnering Team members, the MNA field parameters have been revised from the original ASA RA/RD Work Plan of 2005.

[2] Field parameters required.

PART VIII

CORRECTIVE MEASURES IMPLEMENTATION

VIII.A. APPLICABILITY

The Conditions of this Part apply to SWMUs and/or AOCs identified in Table VIII.1. These SWMUs have reached the final remedy phase and the remedial design has been approved by the Department and implemented by the Army. The final remedies detailed in the Remedial Design/Remedial Action (RD/RA) Work Plans and/or Land Use Control Remedial Design (LUC RD) Work Plans have been incorporated into this Part of the permit. See permit condition VI.A for additional applicability for the CERCLA process.

VIII.B. GENERAL CONDITIONS

1. The Permittee is required to perform corrective measures for the SWMUs and AOCs identified in Condition VIII.A. The approved remedy for these defined units, waterway areas, or land parcels, includes any and all actions set forth in this permit and in the approved Interim Measures Plans, Corrective Measures Implementation (CMI) Plans, Remedial Design and Remedial Action (RD/RA) Work Plans, and Land Use Control Remedial Design (LUC RD) Work Plans approved by the Department, as noted in Table VIII.1.

2. Remedial Cleanup Levels

   Upon approval of the CMI Plan (or comparable document listed in Table VIII.1), the cleanup level(s) for the areas specific to the CMI Plan will be deemed to be a condition of this permit.

3. Groundwater Monitoring and Remediation

   Where required pursuant to Permit Conditions VIII.B.1. and VII.C., the Permittee shall comply with the general groundwater monitoring requirements of Part VII of this permit.

4. Land Use Controls

   Where required pursuant to Conditions VIII.B.1. and VIII.C. of this permit, the Permittee shall establish appropriate land use controls to achieve protection of human health and the environment. The Permittee shall comply with Conditions VIII.B.5. and VIII.B.6. of this permit when implementing corrective measures requiring land use controls. In the event an off-site property owner will not allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 calendar days of receipt of such written notification of the refusal by the off-site property owner. If the off-site property owner does not provide a written refusal of the request to allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 days of delivery of the request to the off-site property owner. In such cases, the Department may allow the Permittee to propose an alternate area-specific land use control IAW ADEM Admin. Code Rule 335-5-1-.02(i) subject to the Department's review and approval.

5. Survey Plat

For corrective measures where residual concentrations of contaminants will remain in-place at levels greater than those appropriate for unrestricted land use, or for corrective measures that rely on land use controls, the Permittee must:

a. No later than the submission of the certification of closure of each hazardous waste disposal unit, the Permittee shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected. This plat must be prepared and certified by a professional land surveyor registered in the State of Alabama. The plat must be filed with the local zoning authority or the authority with jurisdiction over local land use and must contain a note, prominently displayed, which states the Permittee's obligation to limit the property to the specified restricted uses.

b. Maintain the survey plat as described in Condition VIII.B.5.a of this permit and in the CMI Report, until the Permittee has demonstrated, to the satisfaction of the Department that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

6. Environmental Covenant

No later than the submission of the survey plat required in Permit Condition VIII.B.5., the Permittee must:

a. Record in the Calhoun County probate judge's office an environmental covenant in accordance with ADEM Admin. Code R. 335-5 [or Notice of Environmental Use Restriction (NEUR) pursuant to ADEM Admin. Code R. 335-5-1-.02(3)] that will in perpetuity notify any potential purchaser of the property that:

i. The land is contaminated with hazardous constituents in concentrations that exceed unrestricted use standards;

ii. The use of the property is restricted by this permit for certain residential, municipal, or industrial purposes and may lead to an increased risk of exposure to hazardous constituents depending upon the activities initiated at the site. Such activities may yield an increased level of human health risk to the owner;

iii. The potential purchaser or entity that desires to work in the contaminated area should notify the Permittee before mobilizing to the area covered by the land use control.

b. Submit to the Department a certification, signed by the Permittee in accordance with Permit Condition I.C.11. that the environmental covenant (or NEUR pursuant to ADEM Admin. Code R. 335-5-1-.02(3)) specified in this part has been performed. This certification must include a copy of the covenant (or NEUR pursuant to ADEM Admin. Code R. 335-5-1-.02(3)) and of the document in which the notation has been placed.

c. Maintain the environmental covenant (or NEUR pursuant to ADEM Admin. Code R. 335-5-1-.02(3)) described in Permit Condition VIII.B.6. until the Permittee has demonstrated, to the satisfaction of the Department, that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

7. Security

Security measures, where required by Conditions VIII.B.1. and VIII.C. of this permit, will be conducted in accordance with ADEM Admin. Code R. 335-14-5-.02(5) and as prescribed in the approved CMI Plan.

8. Inspection

Where corrective measures addressed in Permit Condition VIII.B.1. include provisions to cap in place or partially remediate properties or land areas, whether owned or not owned by the Permittee, the Permittee shall specify inspection protocols on a scheduled basis to ensure continued integrity of the remedy and to ensure that land use remains appropriately restricted per the environmental covenant (or NEUR pursuant to ADEM Admin. Code R. 335-5-1-.02(3)) established pursuant to Permit Condition VIII.B.6. Inspection provisions shall be as prescribed in the approved CMI Plan.

VIII.C. AREA SPECIFIC CONDITIONS

The Permittee shall implement the actions and conditions as described in the referenced CMI Plans identified in Table VIII.1 and this Permit; the current area specific conditions are as follows:

1. The following area specific conditions apply collectively to including SWMUs 1, 5, 7, 8, 9, 10, 11, 12, 13, 19, 20, 21, 22, 23, 24, 27, 28, 29, 30, 35, and 65 within the ASA and SIA.

   a. No access or use of groundwater shall be allowed at the site.

   b. Public access shall be restricted. The Permittee shall patrol the existing chain-link fence bordering the entire installation as a security measure to prevent unauthorized entry into the area. Entrance into the facility shall be authorized only with a badge or pass.

   c. The Permittee shall install, inspect, and maintain land use control (LUC) visible warning signs prohibiting unauthorized excavation and entry. The Permittee shall install, inspect, and maintain the signs along the boundary of each SWMU, leveled and positioned facing outward from the SWMU boundary, legible from a distance of 25 feet. The Permittee shall place the signs at entry locations and SWMU boundaries spaced approximately every 200 feet at locations to be seen from any approach. The Permittee shall space signs closer together at smaller SWMUs, targeting locations that are visible near roads or access points.

   d. The Permittee shall monitor the sites for land use restriction violations and promptly report any LUC restriction violations to the facility Installation Restoration Program (IRP) manager and/or the appropriate Permittee organizations. The Permittee shall take action to restore the integrity of the LUC and prevent future violations.

   e. The Permittee shall conduct an annual inspection to ensure the effectiveness of LUC mechanisms and to identify LUC restriction violations. The Permittee shall prepare an annual inspection report and submit the report to ADEM. The Permittee shall use the inspection checklist located in Appendix E of the Permittee's Remedial Design Work Plan for Land Use Controls (Appendix A of the RA/RD WP) to support this annual review.

   f. The Permittee shall provide a LUC training course for designated supervisors in all directorates, tenants, contractors, all personnel associated with the Permittee's environmental, security, safety, and public works organizations, and for new employees during new employee orientation. The LUC training course shall provide an overview of the Permittee's land use restrictions and procedures for preventing and reporting land use restriction violations. The Permittee shall maintain a list of personnel who have received training and the date of completion of training.

g. The Permittee shall review the placement of new facilities and equipment on the installation to ensure that construction projects will not violate the Permittee's land use restrictions.

h. The Permittee shall record and annually update all LUCs on its Geographical Information System (GIS).

i. The Permittee shall maintain the LUCs until concentrations of contaminants of concern are at levels to allow unrestricted use/unrestricted exposure (UU/UE) and a permit modification, in accordance with Permit Condition I.K.3., to remove the LUCs is submitted to the Department for review and approval.

j. The Permittee shall restrict the land use to industrial land use only; residential, commercial, and agricultural land uses shall not be permitted.

k. Well installation, except for monitoring or investigation wells, shall be prohibited. All proposed well installations shall be approved by ADEM.

2. SWMU 1 – Landfill Z-1 (Chemical Waste Pits) (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

3. SWMU 5 – Sink Hole Disposal Area (ASA):

a. No excavation greater than 14 feet deep shall be conducted without the approval of the facility IRP manager.

b. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII.3 of this permit and in accordance with Part VII of this permit.

c. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

4. SWMU 7 – Chemical Waste Burial Pit (SIA):

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

k. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

5. SWMU 8 – Acid Disposal Pit (ASA):

a. At SWMU 8, no excavation greater than 35 feet deep shall be conducted without the approval of the facility IRP manager.

b. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII. 3 of this permit and in accordance with Part VII of this permit.

c. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

6. SWMU 9 – Calcium Hypochlorite Burial Pit (SIA)

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

k. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

7. SWMU 10 – TNT Washout Facility (ASA):

a. No excavation greater than 5 feet deep shall be conducted without the approval of the facility IRP manager.

b. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII.3 of this permit and in accordance with Part VII of this permit.

c. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

8. SWMU 11 (Sediment Leaching Bed – TNT Washout Facility (ASA):

a. No excavation greater than 5 feet deep shall be conducted without the approval of the facility IRP manager.

b. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII.3 of this permit and in accordance with Part VII of this permit.

c. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

9. SWMU 12- Facility 414 (Old Lagoon) (SIA):

a. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

b. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

c. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

d. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

f. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

g. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

h. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

i. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

10. SWMU 13 – SIA Acid Chemical Waste Pit (SIA):

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

k. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

11. SWMU 19 – SIA Old Sewage Treatment Plant and Drying Beds:

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

12. SWMU 20 – New Sewage Treatment Plant (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

13. SWMU 21 – Abrasive Dust Landfill (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

14. SWMU 22 – A-Block Lagoon (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

c. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

15. SWMU 23 – Asbestos Waste Disposal Trench (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

16. SWMU 24 – Old Sanitary Landfill (SIA):

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

17. SWMU 27 – South TNT Burial Pit (SIA):

a. No Excavation greater than 1 foot shall be conducted without the approval of the facility IRP manager.

b. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII.3 of this permit and in accordance with Part VII of this permit.

c. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

18. SWMU 28: - Waste Wood Landfill (SIA)

a. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

b. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

c. The Permittee shall surround the SWMU 28 site with a fence that is sufficient to prevent unauthorized entry into the SWMU.

19. SWMU 29 – Old Lumber Disposal Yard (SIA):

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-Construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The

Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

k. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

20. SWMU 30 – Northeast Lagoon Area (SIA):

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-Construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. Any excavated soils shall not be transported outside the SWMU boundary without the approval of the facility IRP manager.

k. No disturbance of the cap shall occur without the approval of the facility IRP manager. Upon approval, no disturbance of the cap shall occur without the use of proper protective equipment.

21. SWMU 35 – Deactivation Furnace/Popping Furnace (ASA):

a. The Permittee shall conduct barrier inspections on a quarterly basis.

b. The Permittee shall check drainage structures and cover integrity after severe storms.

c. The Permittee shall document inspection and maintenance activities on a Maintenance/Inspection Checklist and an Action Item Log (Tables 1 and 2, respectively, of Appendix F of the Final Southeast Industrial Area Remedial Action Post-construction Report and Operation and Maintenance Plan, Anniston Army Depot, September 2008). The Permittee shall ensure that barrier inspection and maintenance activity documentation is readily accessible for review at all times. The Permittee shall include barrier inspection and maintenance activity information in the annual LUC inspection report submitted to ADEM.

d. The Permittee shall examine the gravel barrier to determine if settlement, erosion, or other disturbances affecting either the quality or line and grade of the final cover have occurred. If settlement, erosion, or other disturbances are observed, the Permittee shall perform repairs in a timely manner (i.e., not to exceed 30 days) by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

e. The Permittee shall record observations documenting the presence or absence of standing water on the areas protected by gravel barriers on the Maintenance/Inspection Checklist.

f. The Permittee shall inspect the site for signs of erosion. If erosion or other disturbance has occurred to an extent that is determined to be potentially detrimental to barrier effectiveness, the Permittee shall repair the barrier by adding geotextile fabric and/or gravel, or by re-grading, as appropriate.

g. The Permittee shall inspect drainage structures to verify that these structures are intact and undisturbed and that swales are clear to permit unimpaired movement of surface runoff. Typical maintenance may involve silt removal and removal of obstructions found in swales. If berms are damaged or incapable of retaining internal drainage, the Permittee shall make repairs as necessary to restore proper operation.

h. The Permittee shall exercise extreme care when operating vehicles or moving equipment on the gravel barriers to ensure that the integrity of the barrier is not compromised; the Permittee shall minimize vehicle speed and avoid sharp turns when driving over the barriers.

i. No excavation greater than 8 feet shall be conducted without the approval of the facility IRP manager.

j. The Permittee shall conduct monitored natural attenuation (MNA) in accordance with the Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan (ASA RD/RA WP) (June 21, 2006) for the constituents listed in Table VII.3 of this permit and in accordance with Part VII of this permit.

k. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit.

22. SIA Groundwater Source Areas

The Permittee shall install and implement the remedies for the SIA Groundwater as specified in the Remedial Design Report for the Interim Remedial Action of Operable Unit 1, dated February, 2018, and the Remedial Action Work Plan for Interim Remedial Action for Operable Unit 1, dated August 8, 2018. Figure 1-1 of the Remedial Action Work Plan shows the four designated source areas:

a. Industrial Area – includes SWMUs 3, 4, 25, 31, and 41. Selected groundwater remedies for the industrial area include:

i. Point of use treatment (POUT) at Coldwater Spring
ii. Enhanced groundwater interceptor system (eGWIS) consisting of a pump and treat system for the entire SIA with extraction wells placed in the source zones and a centralized treatment facility to treat the extracted water.
iii. Long term monitoring (LTM)
iv. Land use control implementation

b. Landfill Area – includes SWMUs 9, 12, 13, 19, 20, 22, and 24. Selected groundwater remedies for the industrial area include:

i. Point of use treatment (POUT) at Coldwater Spring by air strippers.
ii. Aggressive bioremediation for partial source mass removal by introduction of carbon substrate into an injection well network.
iii. Enhanced groundwater interceptor system (eGWIS) consisting of a pump and treat system for the entire SIA with extraction wells placed in the source zones and a centralized treatment facility to treat the extracted water.
iv. Long term monitoring (LTM)
v. Land use control (LUC) implementation

c. Northeast Area – includes SWMUs 7, 28, 29, and 30. Selected groundwater remedies for the northeast area include:

i. Point of use treatment (POUT) at Coldwater Spring by air strippers.
ii. Aggressive bioremediation for partial source mass removal by introduction of carbon substrate into an injection well network.
iii. Enhanced groundwater interceptor system (eGWIS) consisting of a pump and treat system for the entire SIA with extraction wells placed in the source zones and a centralized treatment facility to treat the extracted water.
iv. Long term monitoring (LTM)
v. Land use control (LUC) implementation

d. SIA Trench Area – includes SWMUs 1, 2, 21, and 23. Selected groundwater remedies for the trench area include:

i. Point of use treatment (POUT) at Coldwater Spring by air strippers.
ii. Aggressive bioremediation for partial source mass removal by introduction of carbon substrate into an injection well network.
iii. Enhanced groundwater interceptor system (eGWIS) consisting of a pump and treat system for the entire SIA with extraction wells placed in the source zones and a centralized treatment facility to treat the extracted water.
iv. Long term monitoring (LTM)
v. Land use control (LUC) implementation

23. SWMU 65 Burning Ground #2

a. No access or use of groundwater shall be allowed at the site to prevent contact or consumption of contaminants of concern. The area of land use control (LUC) restrictions shall be the 0.2-acre area defined as Burning Ground #2 (SWMU 65) as shown on Figure 5 of the CMIP. This area is a rectangle of approximately 35 ft wide by 250 ft long, with the northeast comer at N33° 40'24.76", W85° 59' 57.01", the southeast comer at N33° 40' 22.57", W85° 59' 57.43", the southwest corner at N33° 40' 22.57", W86° 00' 00.72", and the northwest corner at N33° 40' 24.76", W85° 59' 57.58".

b. Public access shall be restricted to prevent potential unauthorized contact with shallow groundwater or disturbance to soil containing groundwater resource protection (GRP) contaminants of concern. ANAD shall patrol the existing chain- link fence bordering the entire installation as a security measure to prevent unauthorized entry into the area. Entrance into the facility shall be authorized only with a badge or pass.

c. ANAD shall install, inspect, and maintain land use control (LUC) visible warning signs prohibiting unauthorized excavation and entry by both the public and unauthorized ANAD personnel so as to prevent potential contact with shallow groundwater or disturbance to soil containing GRP contaminants of concern. The signs shall read "Hazardous Soil and Groundwater Area-Unauthorized Access Beyond this Point is Prohibited," ANAD shall install, inspect, and maintain the signs along the boundary of Burning Ground #2 (SWMU 65), leveled and positioned facing outward from the SWMU boundary (Figure 5 of the CMIP), legible from a distance of 25 feet. ANAD shall place the signs at entry locations and the Burning Ground #2 boundaries spaced approximately every 100 feet at locations to be seen from any approach, targeting locations that are visible near roads, or access points.

d. ANAD shall monitor the Burning Ground #2 (SWMU 65) for land use restriction violations and promptly report any LUC restriction violations to the facility Installation Restoration Program (IRP) manager and/ or the appropriate organizations. ANAD shall take immediate action to restore the integrity of the LUC and prevent future violations.

e. ANAD shall conduct an annual inspection of Burning Ground #2 (SWMU 65) to ensure the effectiveness of LUC mechanisms and to identify LUC restriction violations. ANAD shall prepare an annual inspection report and submit the report to ADEM. ANAD will use their existing inspection checklist developed for use at the Depot to ensure consistent reporting of LUCs. A copy of the LUC checklist is provided as Appendix A of the CMIP.

f. ANAD shall provide a LUC training course for designated supervisors in all directorates, tenants, contractors, all personnel associated with the Depot's environmental, security, safety, and public works organizations, and for new employees during new employee orientation. The LUC training course shall provide an overview of the current land use restrictions and procedures for preventing and reporting land use restriction violations. ANAD shall maintain a list of personnel who have received training and the date of completion of training.

g. ANAD shall review the placement of new facilities and equipment planned for installation within 1,000-feet of the Burning Ground #2 (SWMU 65) to ensure that construction projects will not violate the land use restrictions.

h. ANAD shall record and update the LUCs for Burning Ground #2 (SWMU 65) on its Geographical Information System (GIS).

i. ANAD shall maintain the LUCs at Burning Ground #2 (SWMU 65) until concentrations of contaminants of concern remain at levels to allow unrestricted use/ unrestricted exposure (UU/ UE) for three consecutive monitoring events and a petition to remove the LUCs is submitted to ADEM for review and approval.

j. ANAD shall restrict the land use to industrial land use only; no other (residential, commercial, agricultural, etc.) land uses shall be permitted.

k. Well installation, except for monitoring or investigation wells, shall be prohibited at Burning Ground #2 (SWMU 65). All proposed well installations shall be approved by ADEM.

l. ANAD shall implement a Notice of Environmental Use Restrictions (NEUR) as specified in ADEM Administrative Code r. 335-5.

VIII.D. CORRECTIVE MEASURES IMPLEMENTATION (CMI) REPORTS

1. CMI Progress Reports

If the time required to complete implementation of a specific set of corrective measures, as described in the Department-approved CMI Plan, is greater than 180 calendar days, the Permittee shall provide ADEM with progress reports according to the approved schedule in the

CMI Plan. If no schedule has been approved as part of the associated plan, progress reports shall be submitted at least quarterly. The progress reports shall, at a minimum, contain the following information:

a. A description of the portion of CMI completed;

b. Summaries of and deviations from the approved CMI Plan during the reporting period;

c. Summaries of current and potential problems, including recommended solutions and alternatives as well as corrective actions undertaken;

d. Any monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and,

e. Projected work for the next period and impacts to the approved schedule.

2. Final CMI Reports

Upon completion of construction of corrective measures systems, implementation of land use controls, interim removal actions, or other short-term activities required by this permit and/or the approved CMI Plan, the Permittee shall submit to the Department a Final CMI Report containing, at a minimum, the following:

a. A description of activities completed;

b. For cap and cover remedies, as-built construction drawings presenting the final in-place three-dimensional location of contaminated material. A plan view of the remediated areas shall be presented in addition to a cross section of the in-place capped areas;

c. Hazardous waste manifests indicating the handling of any excavated material that has been shipped off-site to a Department-approved, certified landfill;

d. For remedies involving land use controls, a copy of the survey plat and environmental covenant (or NEUR pursuant to ADEM Admin. Code R. 335-5-1-.02(3) required by Condition VIII.B. of this permit;

e. Monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and

f. Certification, prepared in accordance with ADEM Admin. Code Rule 335-14-8-02 (2)(d) by the Permittee and a professional engineer registered in the State of Alabama, that the corrective measures implementation phase (*i.e.,* construction) required by this permit is complete and that the approved system and/or facilities are ready for operation in accordance with the intended design (*i.e.,* CMI Plan).

3. Corrective Measures (CM) Effectiveness Reports

a. For corrective measures that have been fully implemented and where the corrective measures system must operate for a period of time to achieve cleanup goals or levels, the Permittee shall submit an overall CM Effectiveness Report (addressing all Corrective Measures systems at the facility which are subject to this permit condition) annually, unless otherwise approved by the Department, beginning 180 calendar days following the Department's approval of the Final CMI Report for the initial Corrective Measures system subject to this permit condition. The overall CM Effectiveness Report shall include, at a minimum, the following information for each SWMU and/or AOC included in the report:

i. A detailed narrative presenting an evaluation of the effectiveness of the selected remedy;

ii. Summaries of compliance with and progress toward achieving cleanup goals;

iii. Any significant revisions, adjustments, or proposed modifications to the selected remedy;

iv. Tabulated environmental sampling and monitoring data including, but not limited to, groundwater quality, elevation data, and a graphical representation of all constituents detected during each sampling event from recovery wells, monitoring wells, drinking water wells, and other locations;

v. Chain of custody, field reports, and laboratory data sheets to include the date of collection, the date the sample was extracted, and the date of sample analysis for samples collected during the reporting period;

vi. Any monitoring data (soil, air, dust, water) collected for any reason during the post-construction period for the purposes of monitoring potential for human and ecological exposure;

vii. Isoconcentration maps depicting the distribution of parameters for each sampling event;

viii. Time versus concentration plots for each monitoring parameter for each recovery well and a representative number of effectiveness wells;

ix. Tabulated volumetric data on groundwater pumped and pumping rates (monthly and cumulative) for each recovery well;

x. Records of any groundwater recovery system operation time, including shutdown periods, not including any minor (less than 24 hours) shutdowns for repairs, maintenance, etc.;

xi. Potentiometric surface maps;

xii. Description of land use during the reporting period at the designated area requiring corrective measures; and,

xiii. Findings of the Permittee's investigation into the continued effectiveness of land use controls per Condition VIII.B.

b. If, at any time, the Permittee determines that any remedy selection specified in Condition VIII.B or VIII.C. of this permit no longer satisfies the applicable requirements of ADEM Admin. Code R. 335-14-5-.06(12) or this permit for releases of hazardous waste or hazardous constituents originating from SWMUs or AOCs, the Permittee must, within 90 calendar days, submit an application for a permit modification, pursuant to Permit Condition I.K., to make any appropriate changes to the CMI Plan.

c. The application for changes in the CMI Plan, including changes in inspection and monitoring provisions of the CMI Plan, shall be submitted as an application for a permit modification pursuant to the requirements of ADEM Admin. Code R. 335-14-8-.04.

4. Final Report of Corrective Measures

Within 90 calendar days following attainment of cleanup levels or goals as outlined in this Permit and the approved CMI Plan(s), the Permittee shall submit to the Department a Final Report of Corrective Measures (FRCM). The FRCM shall contain a certification by the Permittee and an independent professional engineer registered in the State of Alabama that all remedial measures required by this permit and the approved CMI Plan has been completed. The FRCM shall outline any procedures and schedules for dismantling of corrective measures systems, groundwater monitoring or recovery systems, removal of land use controls, and any other remedial systems or controls required by this permit or the approved CMI Plan.

TABLE VIII.1 LIST OF SWMUs REQUIRING CORRECTIVE MEASURES IMPLEMENTATION

The following Solid Waste Management Unit(s) (SWMUs) and/or Area(s) of Concern (AOCs) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report dated September 21, 2018. Where discrepancies exist, the permit will take precedence.

Applicable SWMU/AOC*	CMI/RD/RA WP/LUC RD	Approval Date	Unit Comments
SIA SWMUs 1, 7, 9, 12, 13, 19, 20, 21, 22, 23, 24, 28, 29, and 30	Final Southeast Industrial Area Remedial Design and Remedial Action Work Plan, Anniston Army Depot, dated September 2005 Final Southeast Industrial Area Remedial Action Post-Construction Report and Operation and Maintenance Plan, dated September 2008 Land Use Control Implementation Plan (LUCIP), dated September 2017	06/21/2006 12/01/2009	The 2006 approved remedy addresses SIA soils only. Groundwater is addressed under the approved OU-1 Interim Record of Decision Amendment dated July 16, 2015.
ASA SWMUs 5, 8, 10, 11, 27, and 35	Final Ammunition Storage Area Remedial Design and Remedial Action Work Plan, Anniston Army Depot, dated September 2005 Work Plan Addendum to ASA Long-Term Groundwater Monitoring Plan, dated April 2012	06/21/2006 05/2/2012	Remedy addresses all media (groundwater and soils)
SIA Groundwater Source Areas (Industrial Area, Landfill Area, Northeast Area, and Trench Area)	Remedial Design Work Plan for the Interim Remedial Action of Operable Unit 1, dated May 2019	04/27/2018	Remedy addresses SIA Groundwater
SWMU 65	Corrective Measures Implementation Plan (CMIP) for BG #2 SWMU 65 Revision 2 dated May 20, 2025	Concurred 10/23/2025 Approval 08/XX/2026	Remedy addresses all media (groundwater and soils)

*Note: See footnote below Table VI.1 for reference to SWMUs addressed pursuant to the FFA. The SIA groundwater source areas are also being addressed pursuant to the FFA. Source areas contain the SWMUs listed in Permit Condition VIII.C.22.

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. The term OB includes Static Fire Stands (proposed in this application), where requirements are met. 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 and plans (upon approval of this permit application) to construct three (3) Static Fire Stands for the burning of obsolete rocket motors. As discussed below, for both the burn pans and the Static Fire Stands, the treatment process does not occur in contact with the soil. 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 treatment 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, 2017). 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. 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.

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 Static Fire Stands will be constructed within the current boundary of the OB unit as depicted on Figure IV B-8. The OB unit consists of approximately 17 acres. The building provides an administration and break area for Anniston Munitions Center (ANMC) personnel, a storage area for safety equipment and emergency response materials, telephone access, showers, water, etc., adjacent to the OB and OD units.

Figure IV B-8 shows the layout of the OB unit and the arrangement of the burn pans and the proposed Static Fire Stands. 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. Section IV B also has drawings of the Static Fire Stands. 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.

The Static Fire Stands will be vertically constructed, consisting of a steel sleeve embedded in a below ground rebar reinforced concrete foundation. The fire stands are equipped with adjustable lift assemblies to accommodate various rocket motors. The rocket motors are mounted on to the top of the fire stand for burning in place. Steel clamps assemblies hold the rocket motor in place during the burn cycle (see Figures IV B-4a, IV B-4b and IV B-4c)

[1] The Integrated Contingency Plan (ICP) is incorporated by reference into this Part B permit application and as a result, ICP updates will require a minor modification to the RCRA permit.

IV D-1c Leak Detection Provisions

The placement of the burn pans on top of steel I-beams that rest on a concrete pad 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 residue drums for disposal. Similar visual inspections will be conducted of the Static Fire Stands before and after each use. If there is visual evidence of damage or other loss of integrity, or evidence of residue from treatment, these issues will be addressed before the stand is put back into service. Section IV F contains the inspection schedule, which includes inspections for spills and for the integrity of the pans.

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. The lids overlap the burn pans 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.

The Static Fire Stands are constructed with a cover to prevent precipitation from entering the silo openings when the units are not in use.

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.

Static Fire Stands will also undergo pre-and-post-burn integrity inspections and visual checks for presence of any unreacted material or residues. Residues and unreacted materials will be removed and properly managed according to the WAP prior to the next burn. If visual inspection identifies integrity issues, the stand will be removed from service until the issue is corrected.

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.

The Static Fire Stands are designed and will be constructed of materials specifically selected to withstand the firing of the rockets without significant deterioration over time. The stands will undergo thorough pre-and-post-burn inspections to verify and document usability and conditions.

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 a high probability of precipitation (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 that any small amount of liquid precipitation that could possibly enter the pans would not leak out. 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.

The Static Fire Stands are constructed with a cover to prevent precipitation from entering the silo openings when the units are not in use.

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 and Static Fire Stands will be conducted whenever inspections show the need for maintenance. Any pans, lids or other components 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. 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 lids 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 and/or Team Leader 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 Supervisor and/or Team Leader), 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. Residue is not expected from Static Fire Stands.

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.

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 response procedures.

Personnel employed in the OB and OD treatment area are properly and thoroughly trained. Section I-V 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 service magazines 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 AMC Form 4508 (Figure IV B-11) and/or JMC Form 740-2. WMM are transported 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 using Elwood Road.

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. Addition of Static Fire Stands will not alter these limits. The rocket motors planned for OB on the stands are all less than 2,000 lbs NEW per motor.

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 a safe distance.

Static firing of missiles will be initiated by an electric firing system.

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 8 (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.

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 Logistics Agency Disposition Services 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 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 current sediment basin location is shown on Figure IV D-1

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 of the current stormwater basin are shown on Figures IV D-7 and D-8.

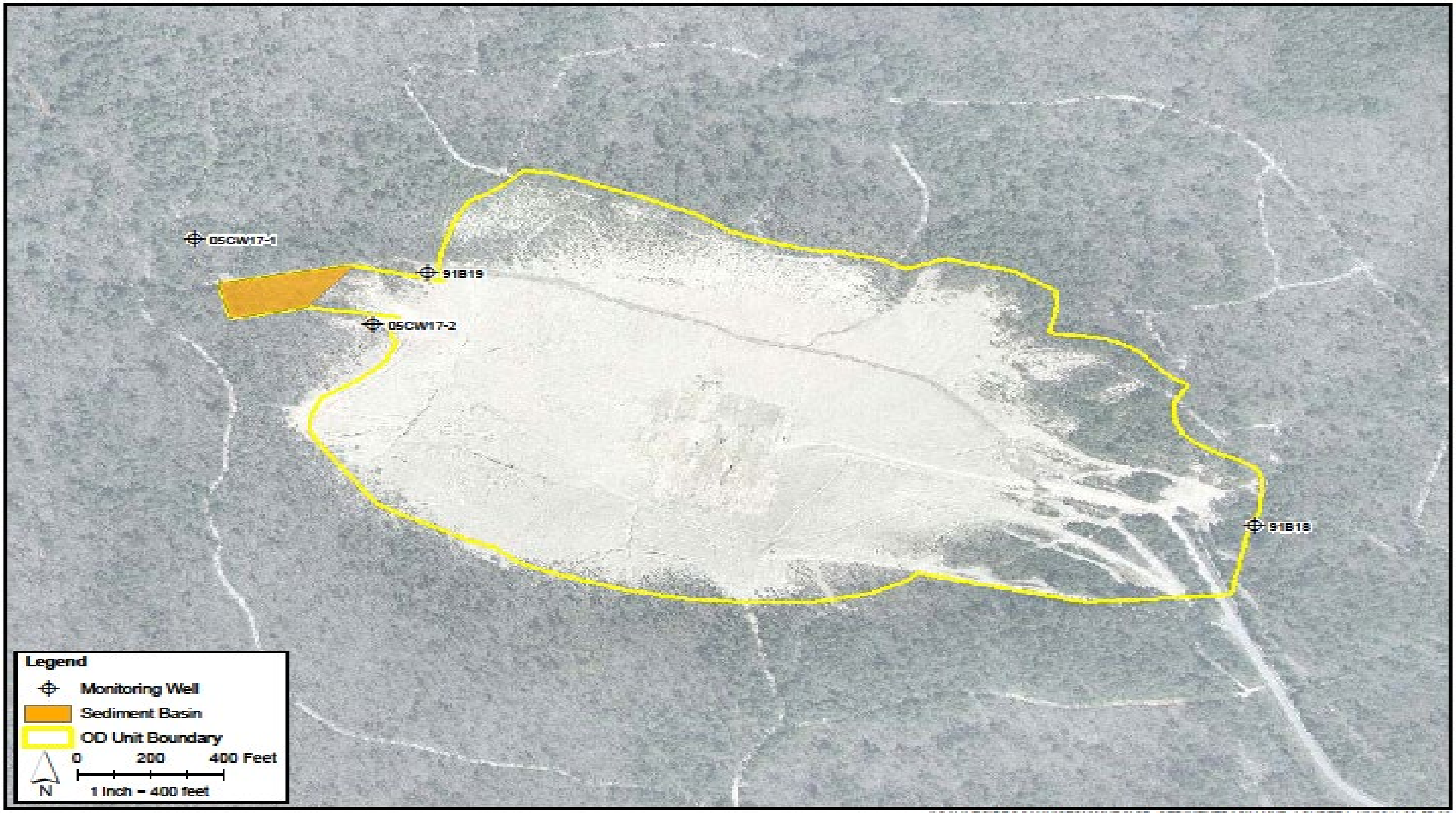
The sediment basin will be cleared of sediment build up on a yearly basis or as needed when indicated through diminished performance. Metal fragments will be separated from the sediment and the soils will remain within the permitted OD unit to be reused as fill or as cover for future detonations/operations. 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.

As an environmental improvement project and to facilitate sediment removal from the collection basin, ANAD will repair and improve the existing Holding/Detention Pond. The new design and installation will include slope tracking, installation of erosion control turf reinforcement mats, and seeding to decrease the flow rate of runoff down the slopes and reduce sediment transported during rainfall events.

The Sediment Control Basin will be designed for 10 year flood and intensity and frequency of seismic activities that occur at the site. The runoff directly from the site will drain to the redesigned sediment pond through ditches graded along the north and south sides of the site. Offsite drainage will be graded to drain into a bypass culvert and swales and bypass the OBOD.

Removal of the existing sediment pond will be required. A new redesigned sediment pond will replace the existing pond as illustrated on Figure IV D-4. Conceptual design of the basin improvements is illustrated in Figures IV D-5, IV D-6, and IV D-7.

As part of the sediment control basin construction, groundwater monitoring wells MW-91B19 and MW-05CW17-2 will require proper plugging and abandonment. These wells will be replaced by two new similarly constructed wells located west of the current wells in or near the wooded areas identified on Figure IV D 8. The new wells will be located, drilled and installed to monitor the same zone as the current wells. The wells are anticipated to be approximately 15-20 feet deep and will be constructed using 2” PVC with 10-foot slotted screen. Installation and construction of the new wells will conform to applicable ADEM rules and guidance.



\\GALILEO\PROJ\ANNISTON\MXDS\OD_SEDIMENTBASIN.MXD LSUBER1 4/6/2011 08:55:09

FIGURE IV D-1
Current Sediment Basin Location

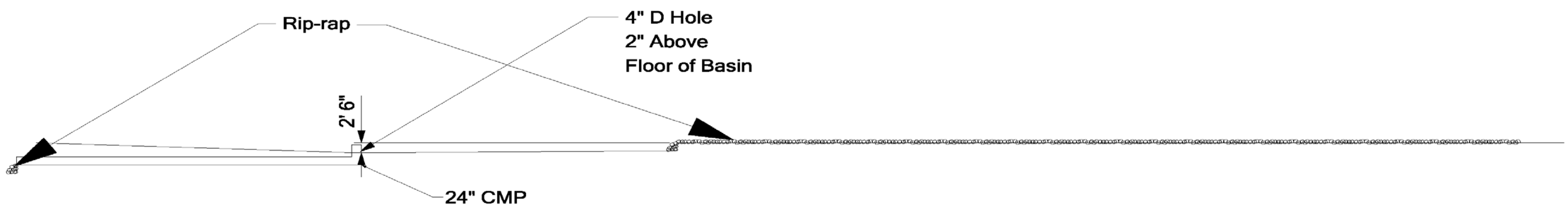


FIGURE IV D-2
Current Sediment Basin Design

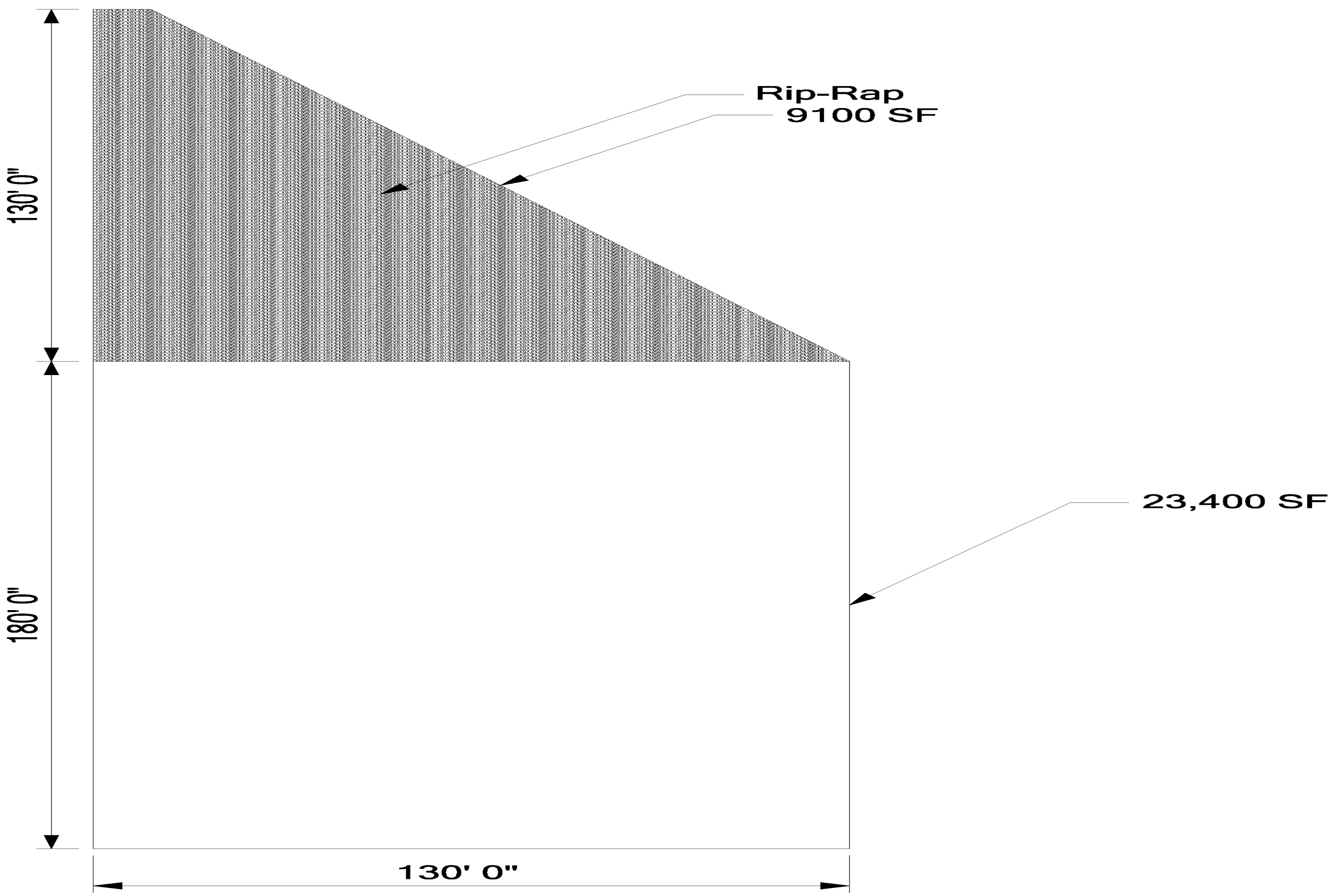


FIGURE IV D-3
Current Sediment Basin Dimensions

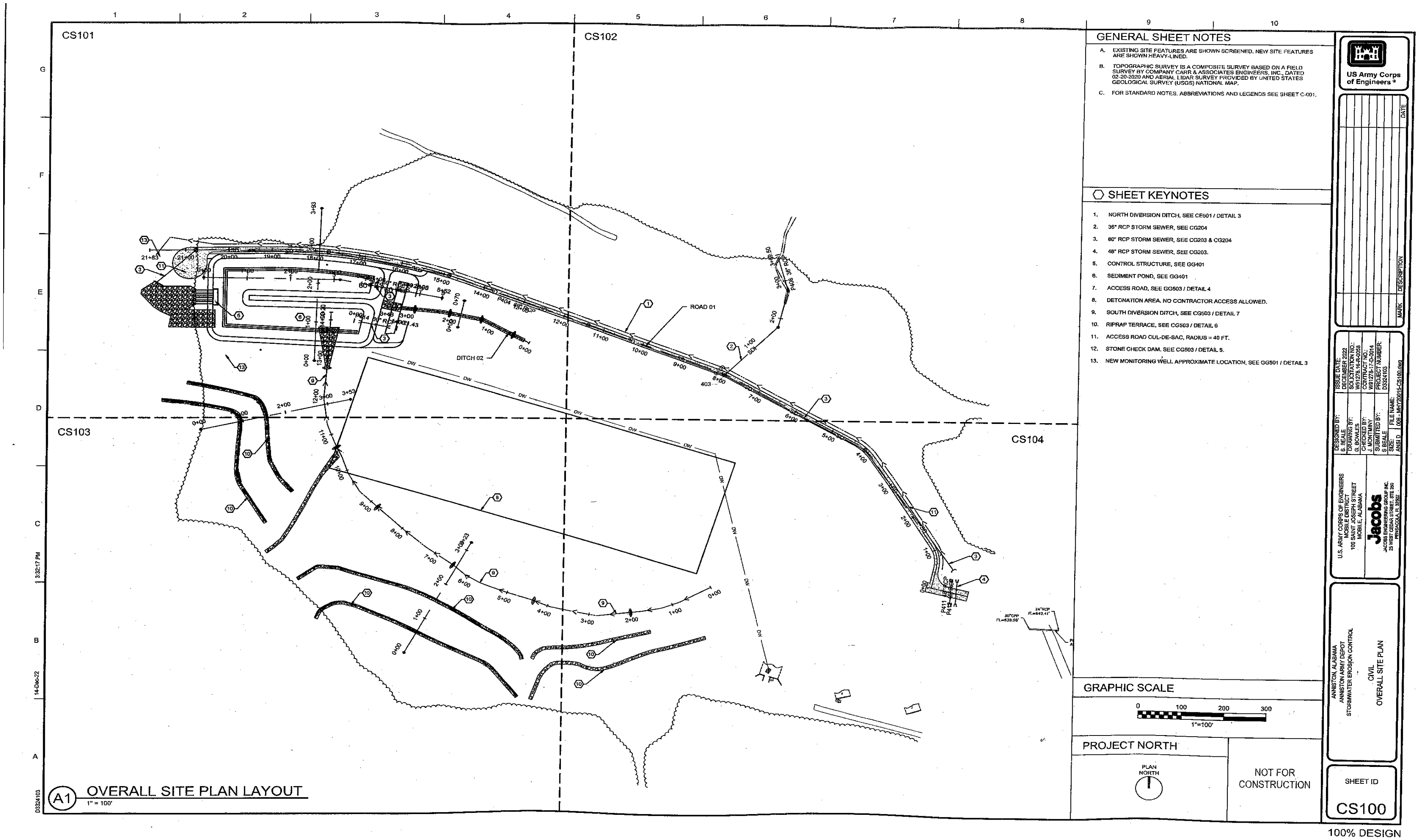


FIGURE IV D-4

Planned Location of Sediment Basin Improvements

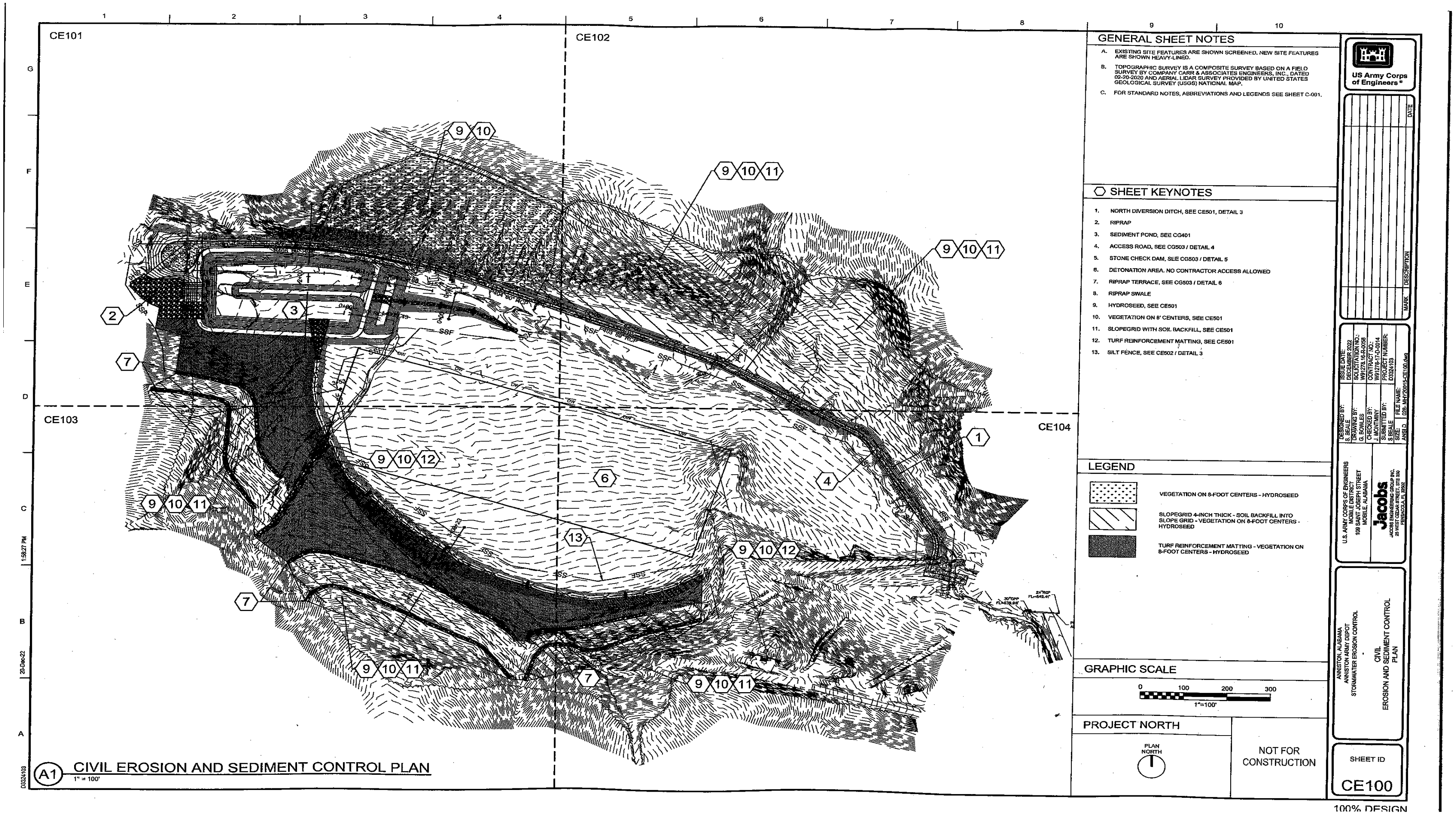


FIGURE IV D-5
Sediment Basin Conceptual Design

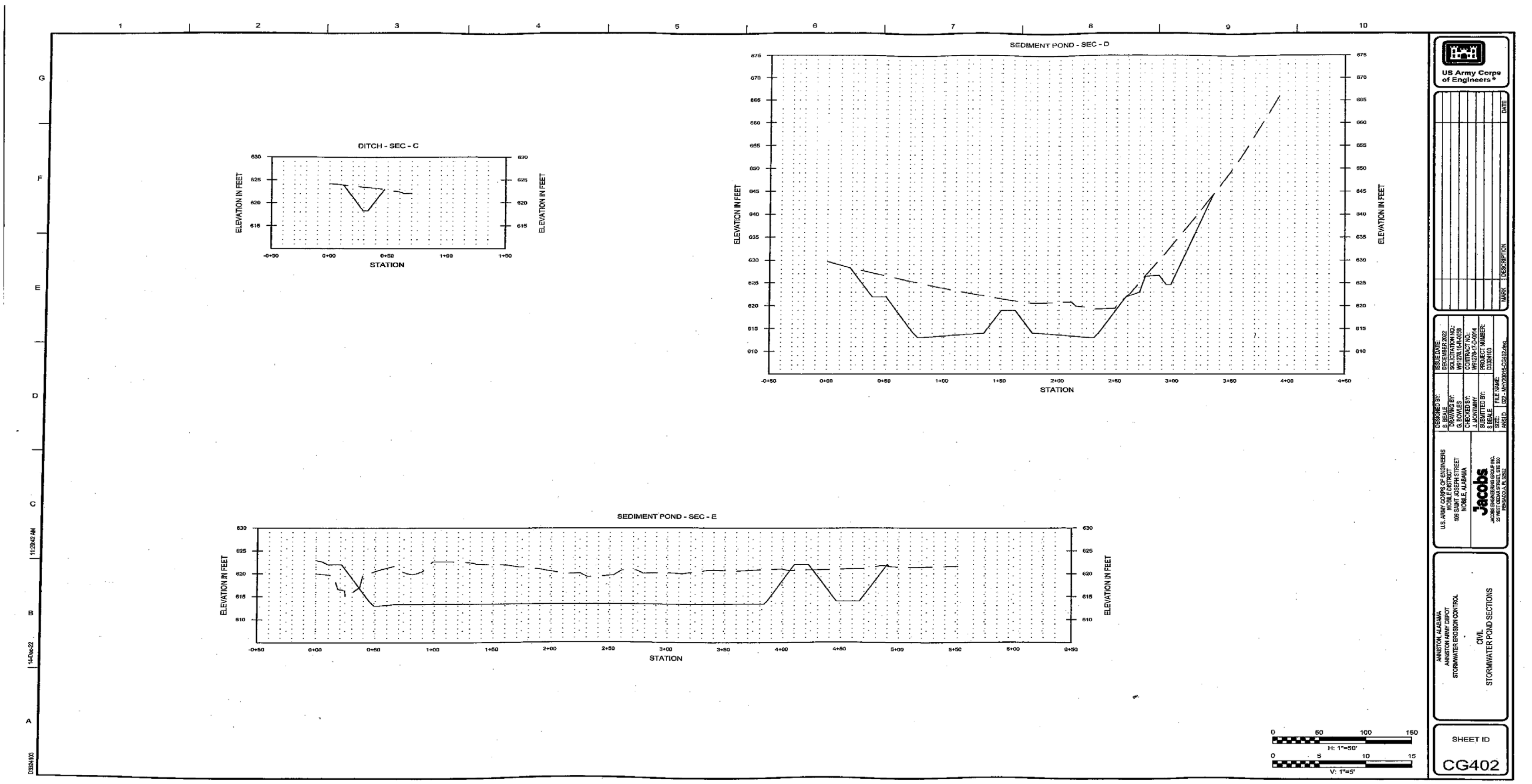


FIGURE IV D-6
Sediment Basin Conceptual Design Cross-Section

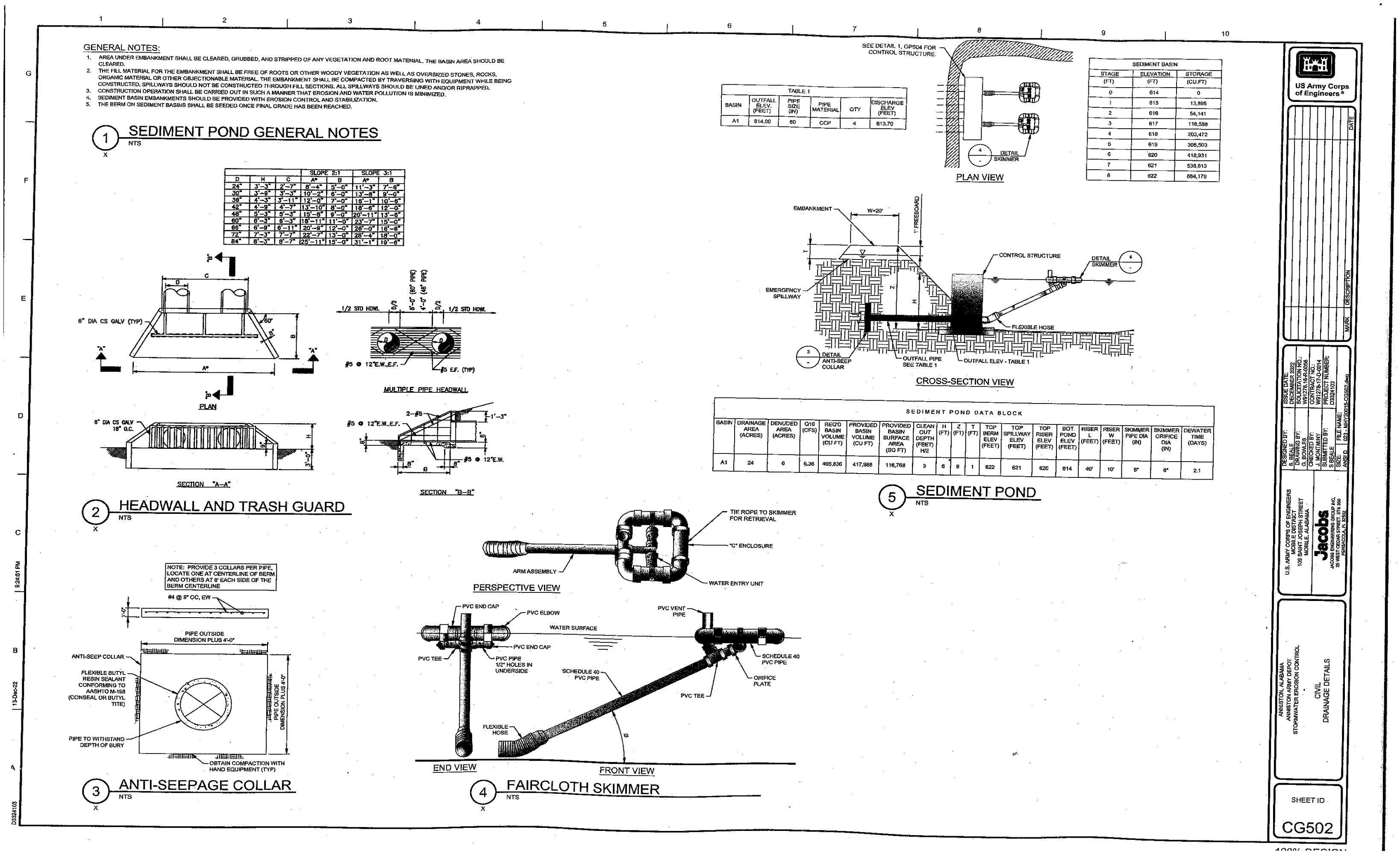


FIGURE IV D-7
Sediment Pond Design

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. 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 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 pits. 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 methods for initiating OD are electric and non-electric firing systems. The electric firing system consists of firing wire and electric blasting caps. The non-electric firing 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 QASAS 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 and/or heavy equipment as directed by the Supervisor. 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 detonation cord. Detonation cord will be tied into the main line to detonate all shots simultaneously.

E. All personnel will retire to a safe location, 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)

The ANAD Health Risk Assessment (HRA)(CH2MHill 2017), contains the detailed health and ecological risk assessments. The guidance documents for risk assessments at hazardous waste combustion facilities (see IV D-1a) contain information on the solubility in water of constituents of potential concern (COPCs). The HRA 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. The HRA 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. The ANAD HRA 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. The ANAD HRA 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. The ANAD HRA 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. The ANAD HRA 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 photodegradation rates of COPCs. The ANAD HRA contains information relative to photodegradation 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 the ANAD HRA 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 1 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 1 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 (10) burn pans and three (3) Static Fire Stands are dedicated to the thermal destruction (OB) of propellants, explosives, and energetic-contaminated wastes. 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. Pre-burn inspections are completed on the pans for integrity before the placement of waste into the pans. Also, post-burn 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.

Similar to the burn pans, the Static Fire Stands will be constructed in the same manner. The concrete stand and environmental cover prevents direct soil contact. Pre-and-post-burn inspections are conducted to assure complete combustion of the rocket motor materials. The use of Static Fire Stands is subject to the same operational restrictions and requirements as the burn pans.

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 management 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 1 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 potable (i.e., drinking water) 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 1, 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 1 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 ANAD Risk Assessment.

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 ANAD Risk Assessment. .

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 1 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 1 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 1 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 1 of Section IV.

ID-7l(2) Decontamination of Field Sampling Equipment

See Attachment 1, Section IV.

IV D-7l(3) Sample Identification System

See Attachment 1, Section IV.

IV D-7l(4) Sample Preservation and Handling

See Attachment 1, Section IV.

IV D-7l(5) Chain-of-Custody/Field Documentation

See Attachment 1, Section IV.

IV D-7l(6) Analyses/Detection Limits

See Attachment 1, Section IV.

IV D-7l(7) Investigation-Derived Waste Management

See Attachment 1, Section IV.

IV D-7l(8) Quality Assurance/Quality Control Samples

See Attachment 1, Section IV.

IV D-7l(9) Data Evaluation and Reporting

See Attachment 1, 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-9 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 and Dry Creek (subbasins of Choccolocco Creek). North of the divide, a series of small drainage ways exit the depot along the western-central boundary and continue westward via Blue Eye Creek 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 1 of Section IV. There are no wetlands immediately adjacent to or in the immediate vicinity of the OB and OD units.

FIGURE IV D-8
Proposed New Monitoring Well Locations

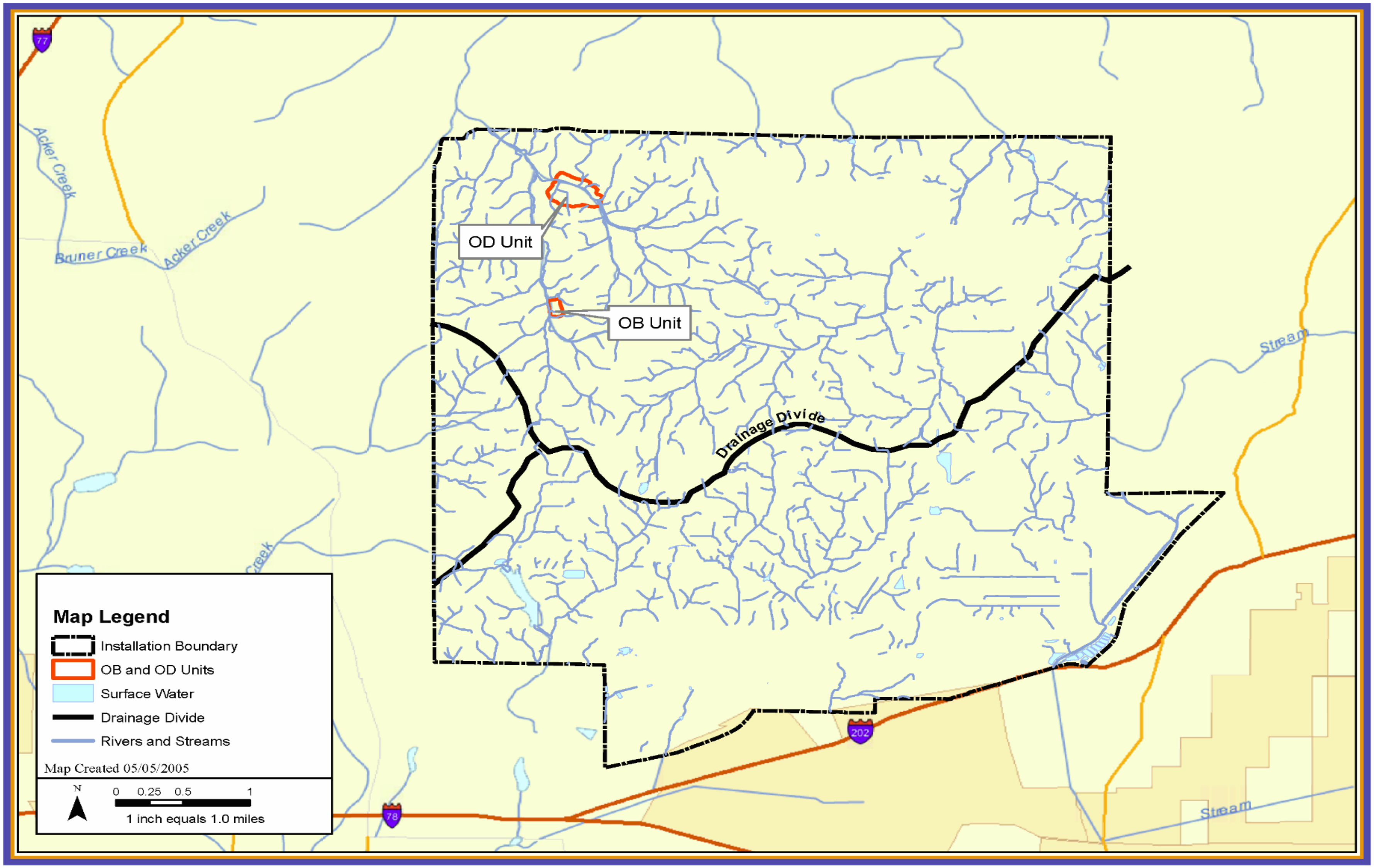


FIGURE IV -D9

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 the ANAD HRA.

Additional site-specific surface water and sediment data is provided in the "ANAD OB and OD Site Characterization Memorandum" (URS, October 2005), Attachment 1.

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-10 shows the daily precipitation for Anniston, Alabama from 1948 through 1998. Figure IV D-11 shows the average annual precipitation for Alabama. Figure IV D-12 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 1. 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 Ammunition Limited Area. These ponds, constructed specifically to be used for fire protection and watering cattle (cattle are no longer on site) 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 1, Section IV.

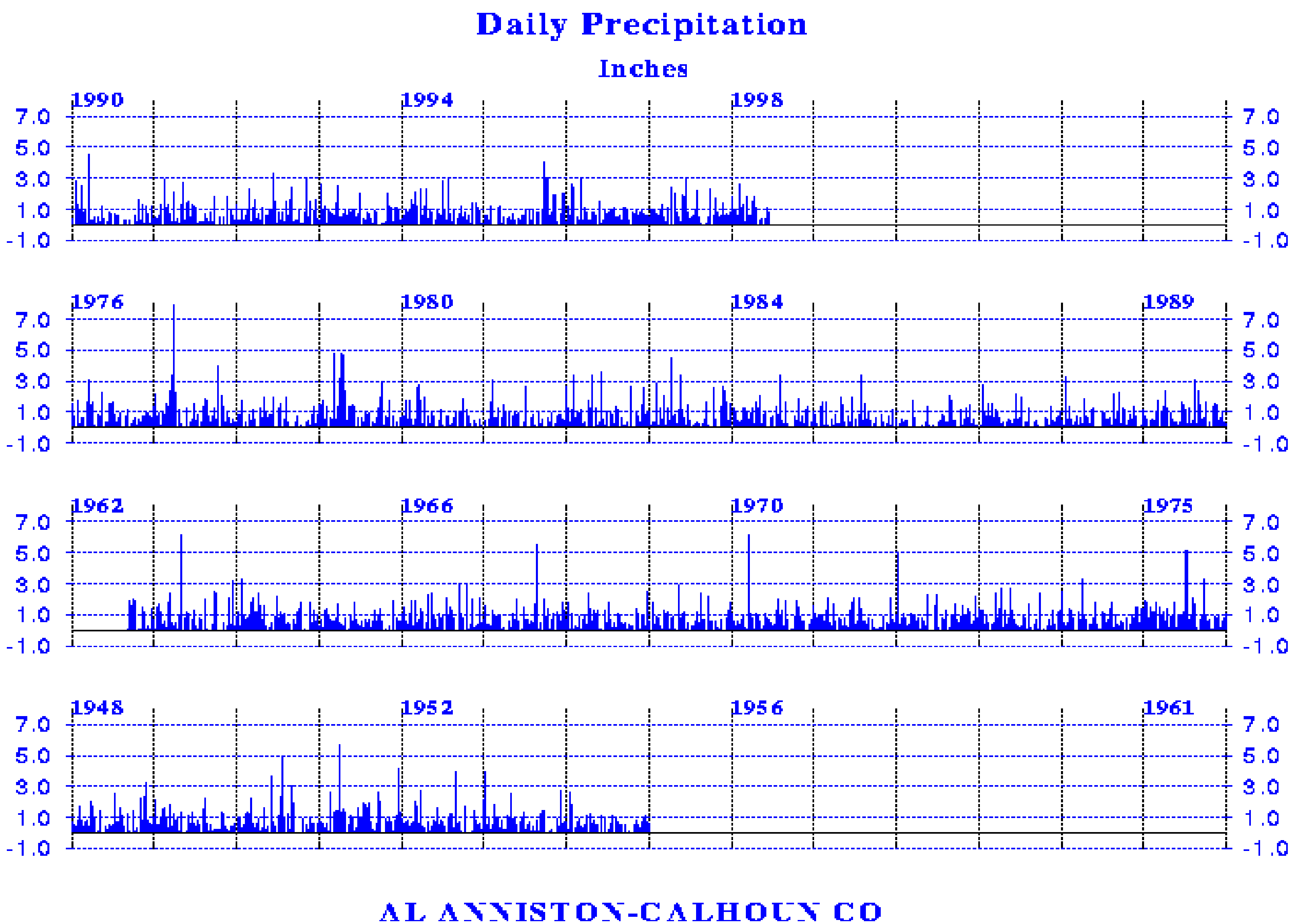


FIGURE IV D-10
Daily Precipitation

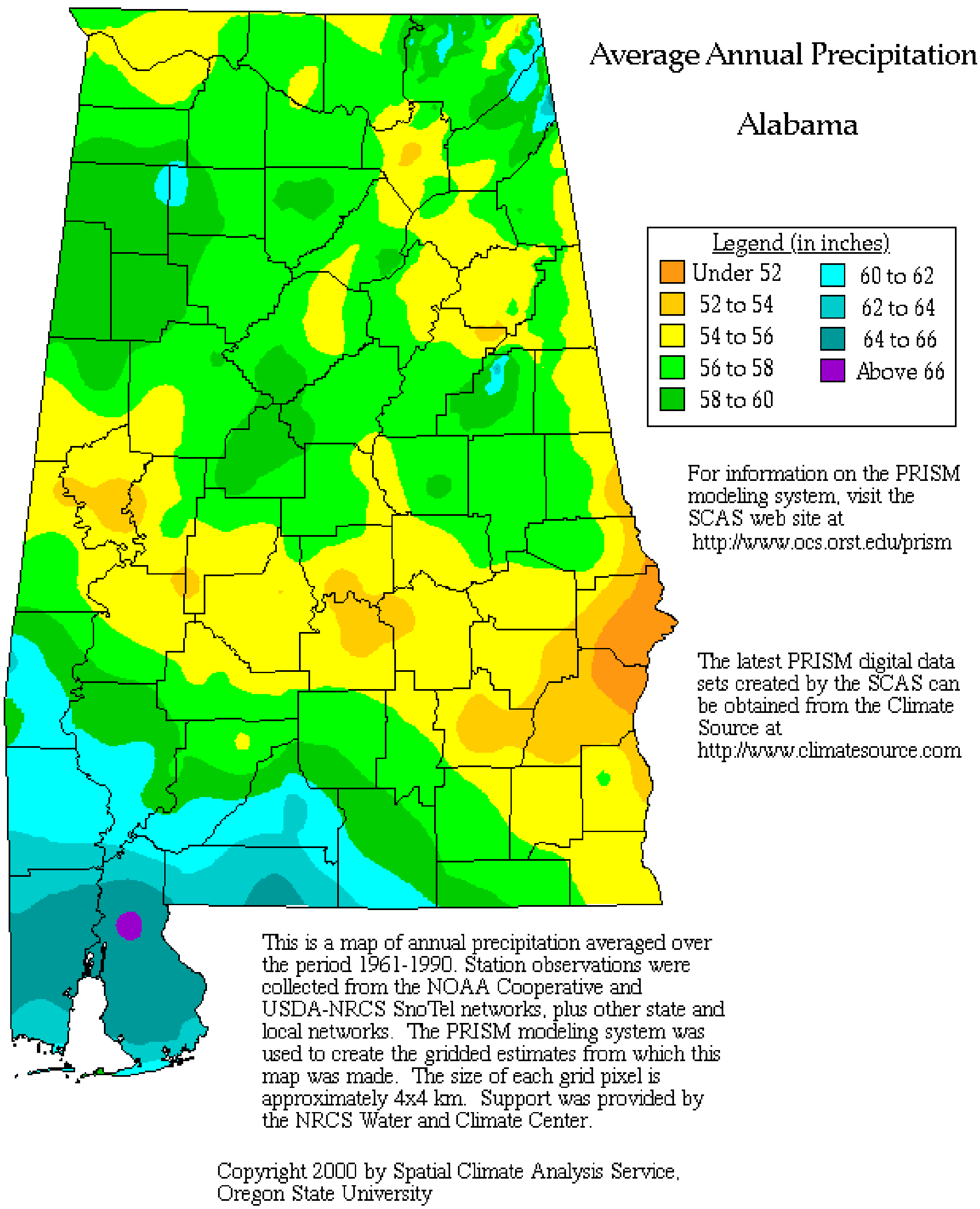


FIGURE IV D-11
Annual Precipitation

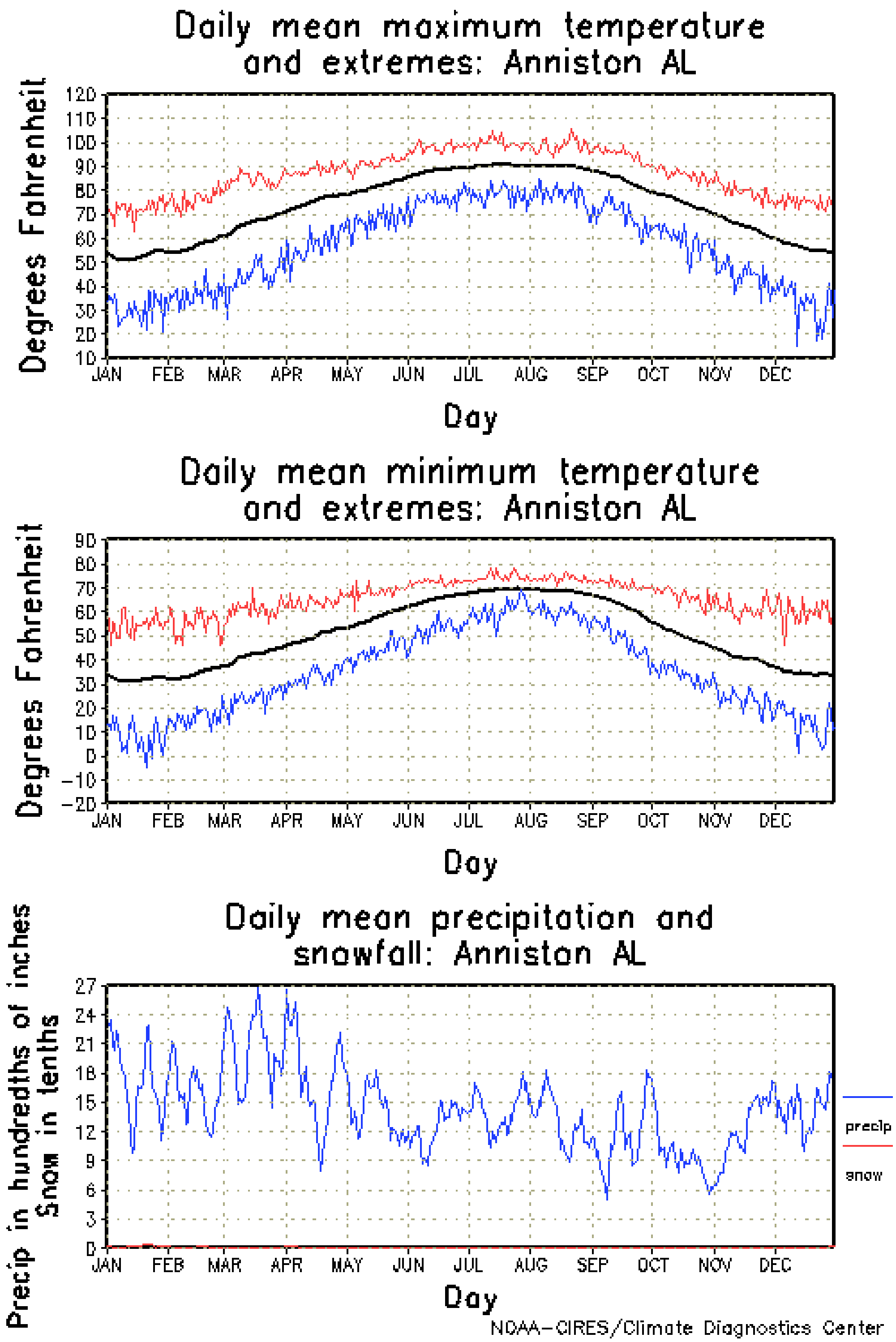


FIGURE IV D-12
Daily Mean Precipitation for Anniston

IV D-8e Previous Surface Soil Investigations at the OB and OD Units

Previous soil sampling information is provided in Attachment 1, 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 1 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 1 of Section IV. Preservation and handling are discussed in Attachment 1, 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 ANAD HRA.

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-13. 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.

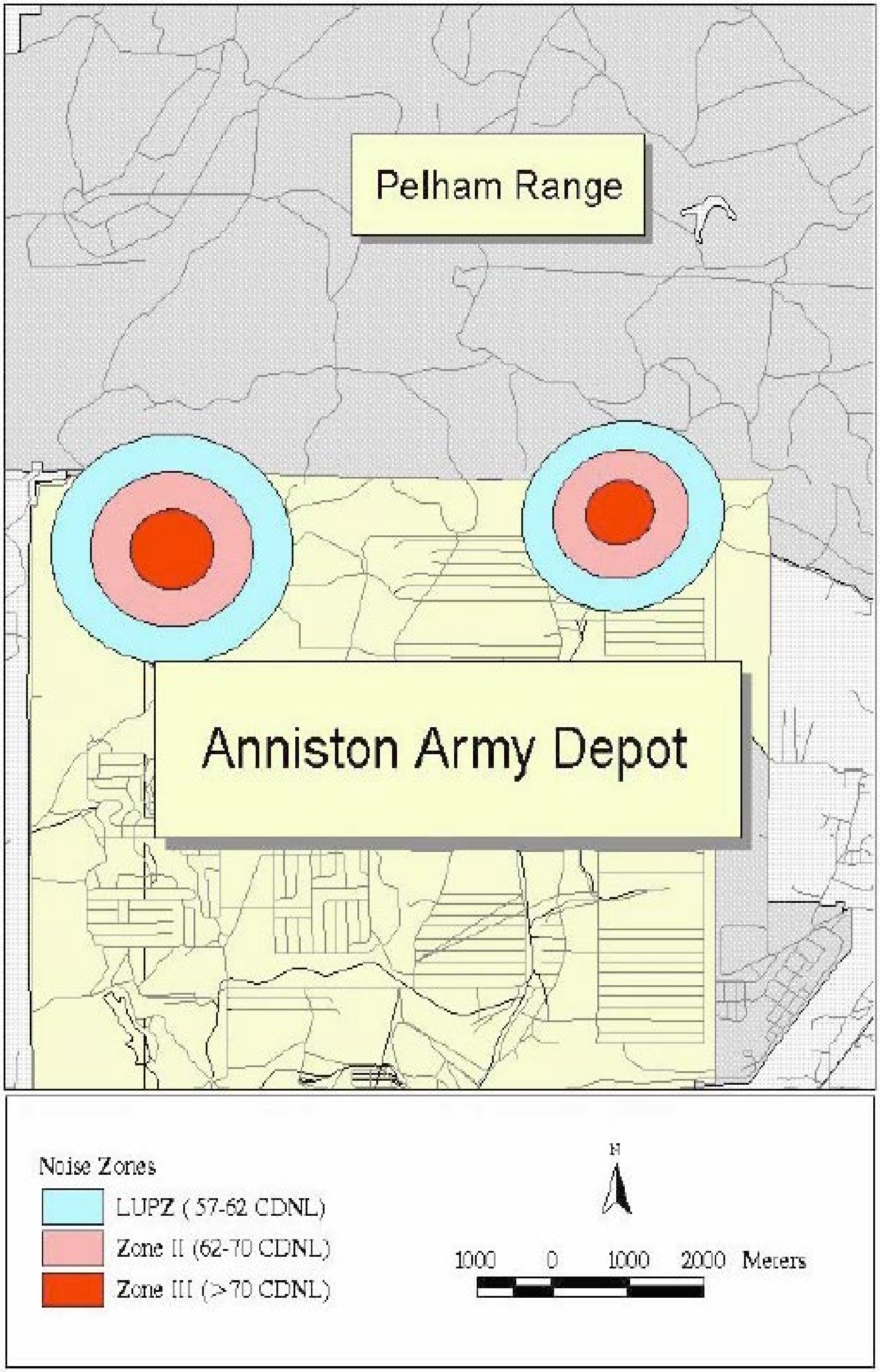


FIGURE IV D-13
ANAD Noise Zone Contour Map

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 Demo Pit Supervisor and/or Team Leader 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-3 would 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 coal mine 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:

$$W=(D/Ds)^2$$

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) 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

Wood products may be used to supplement OB pan process to ensure complete decontamination of WMM management process byproducts or treatment residues.

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.

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(5)(c) requires that specific information be provided by owners or operators of hazardous waste facilities containing a *regulated unit*. A *regulated unit* is defined as a surface impoundment, waste pile, and land treatment unit or landfill that receives hazardous waste. While not included within the definition of regulated units, the open burn (OB) and open detonation (OD) units are defined under RCRA as miscellaneous units. Such units are subject to appropriate permit terms and provisions per the miscellaneous unit environmental performance standards in 335-14-5-24 . The information contained in this section is provided in support of the Environmental Performance Standards for groundwater protection as detection monitoring is required for the OB/OD units.

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 since July 2005. In accordance with the current permit, ANAD operates a detection monitoring program. The monitoring well network is currently sampled semi-annually in conformance to the requirements of the permit and annual reports are submitted to ADEM for review. The Point of Compliance (POC) monitoring well network for the OB and OD units consists of one upgradient well located in an area not affected by the unit's operations and three wells downgradient of each unit. The monitoring wells are screened within the water table aquifer. The well locations are shown in Figures IV E-1 and IV E-2. Groundwater samples collected from each monitoring well are submitted for analysis of:

- Explosives (SW-846 Method 8330B and 8332).
- Total and dissolved metals (SW-846 Method 6010B).
- Total and dissolved mercury (SW-846 Method 7470A).
- Volatile organic compounds (VOCs) (SW-846 Method 8260B).
- Semivolatile organic compounds (SVOCs) (SW-846 Method 8270C).
- Nitrate/nitrite as N (EPA Method 353.2).
- Cyanide (EPA Method 335.4).
- Perchlorate analysis was performed using EPA Method 6850.

Constituents of Potential Concern (COPCs) are summarized in Table 4-1 of the Annual Groundwater Monitoring Report for 2016 (January-December) Open Burning & Open Detonation Units, included as Appendix A of this permit application. Appendix A also includes data reports for all analytes (Appendix C) and summary historical result tables including all data generated from 2011 through 2016 (Tables 6-1 through 6-6).

FIGURE IV E-1
Monitoring Well Locations for the OB Unit

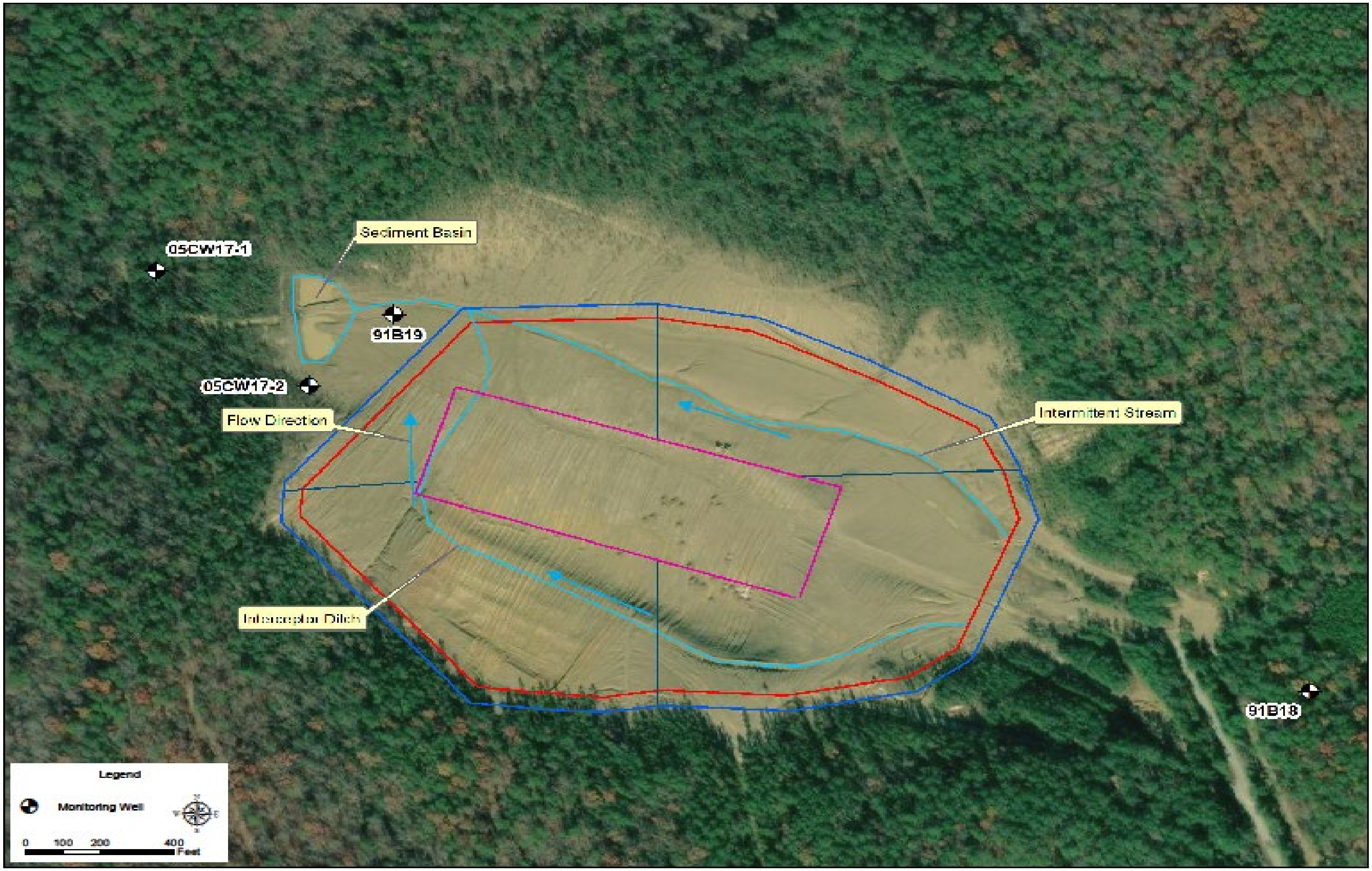


FIGURE IV E-2
Monitoring Well Locations for the OD Unit

The results from semi-annual groundwater monitoring at the OB and OD units are submitted to ADEM in an annual report. The most recent annual report, which summarizes the data and presents a statistical evaluation in accordance with permit requirements is included as Appendix A to Section IV E of this permit application. The annual reports include cumulative data tables depicting all exceedances of Preliminary Screening Values (PSVs) in the prior 12 year period. The report also presents graphs of analyte concentration trends from 2011 through 2016.

OB Unit

The analytical results from the monitoring program at the OB unit are summarized in the Annual Report (Appendix A to this Section). The tables present a historical summary of analytes with PSVs that were detected at the OB Unit in the last twelve (12) sampling events. Results are summarized for total metals, dissolved metals, SVOCs, VOCs, explosives, nitrate-nitrite, cyanide and perchlorate. For the most recently reported data (2016), iron and manganese were the only constituents that exceeded their maximum concentration limits in the May monitoring event and iron, manganese, aluminum, arsenic, and vanadium were the only constituents that exceeded their maximum concentration limits during the December 2016 monitoring event.

The annual report (Appendix A) states that "A statistical evaluation of the data, completed in accordance with the permit requirements (non-parametric, ANOVA test) indicates that iron and manganese are the only regulated compounds that had statistically higher concentrations in downgradient wells and also exceeded the maximum concentration limit at the OB unit."

OD Unit

The analytical results from the monitoring program at the OD unit are summarized in Tables 6-4 through 6-6 of the Annual Report (Appendix A to this Section). The tables present a historical summary of analytes with PSVs that were detected at the OD Unit in the last twelve (12) sampling events. Results are summarized for total metals, dissolved metals, SVOCs, VOCs, explosives, nitrate-nitrite, cyanide and perchlorate. For the most recent reported data (2016), only iron and manganese were the only constituents that exceeded their maximum concentration limits during the May monitoring event and only iron, manganese and vanadium were the only constituents that exceeded their maximum concentration limits during the December monitoring event.

The Annual Report (Appendix A) states that a statistical evaluation was conducted in accordance with permit requirements (non-parametric ANOVA test). Results of the statistical evaluation indicate that manganese is the only regulated constituent that has a statistically higher concentration in downgradient wells and also exceeds the maximum concentration limit.

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 1.

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 1, 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 area, of which the OB and OD units are a part, are the thickness of the unconsolidated zone, the secondary porosity of the underlying 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.

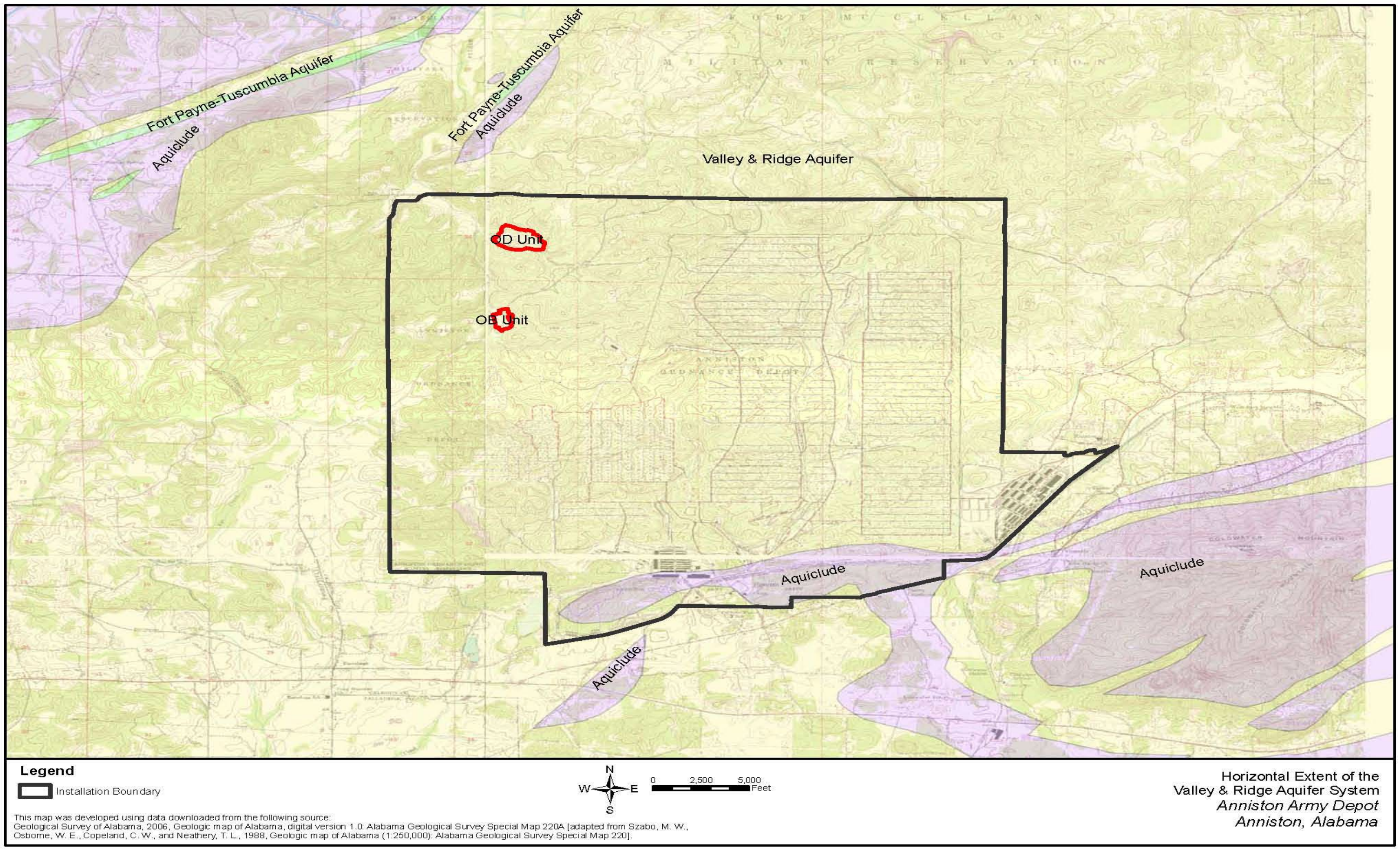


FIGURE IV E-3
Horizontal Extent

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 into saturated bedrock 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).
- A bedrock zone characterized by a fracture flow aquifer system with relatively impermeable dolostone matrix blocks.

IV E-3a Residuum Zone

Site-specific geology and hydrogeology data is available in the *ANAD OB and OD Site Characterization Memorandum* (URS, October 2005), Attachment 1.

The aquifer at ANAD consists of unconsolidated residuum in full to partial hydraulic communication with the fracture flow aquifer system in the underlying bedrock. 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 age bedrock 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 aquifer 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.

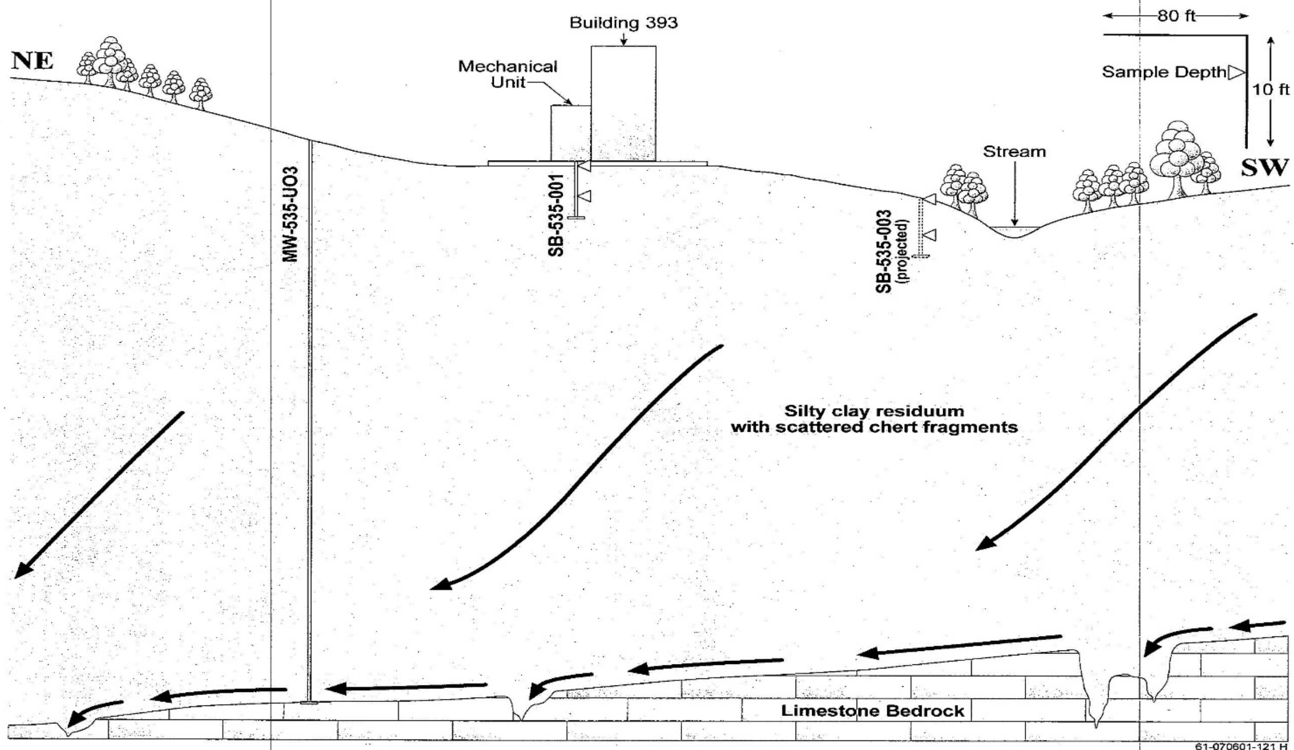


FIGURE IV E-4
Conceptual Cross-Section

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 1. The Knox Group carbonates make up the principal bedrock aquifer (Pritchett, 1995; Osborne and Szabo, 1984). Low primary porosity and permeability characterize the Paleozoic age 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 preparing 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 (i.e., between the water table aquifers in the residuum and the bedrock aquifer).

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 water table aquifer 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 water table aquifer 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.

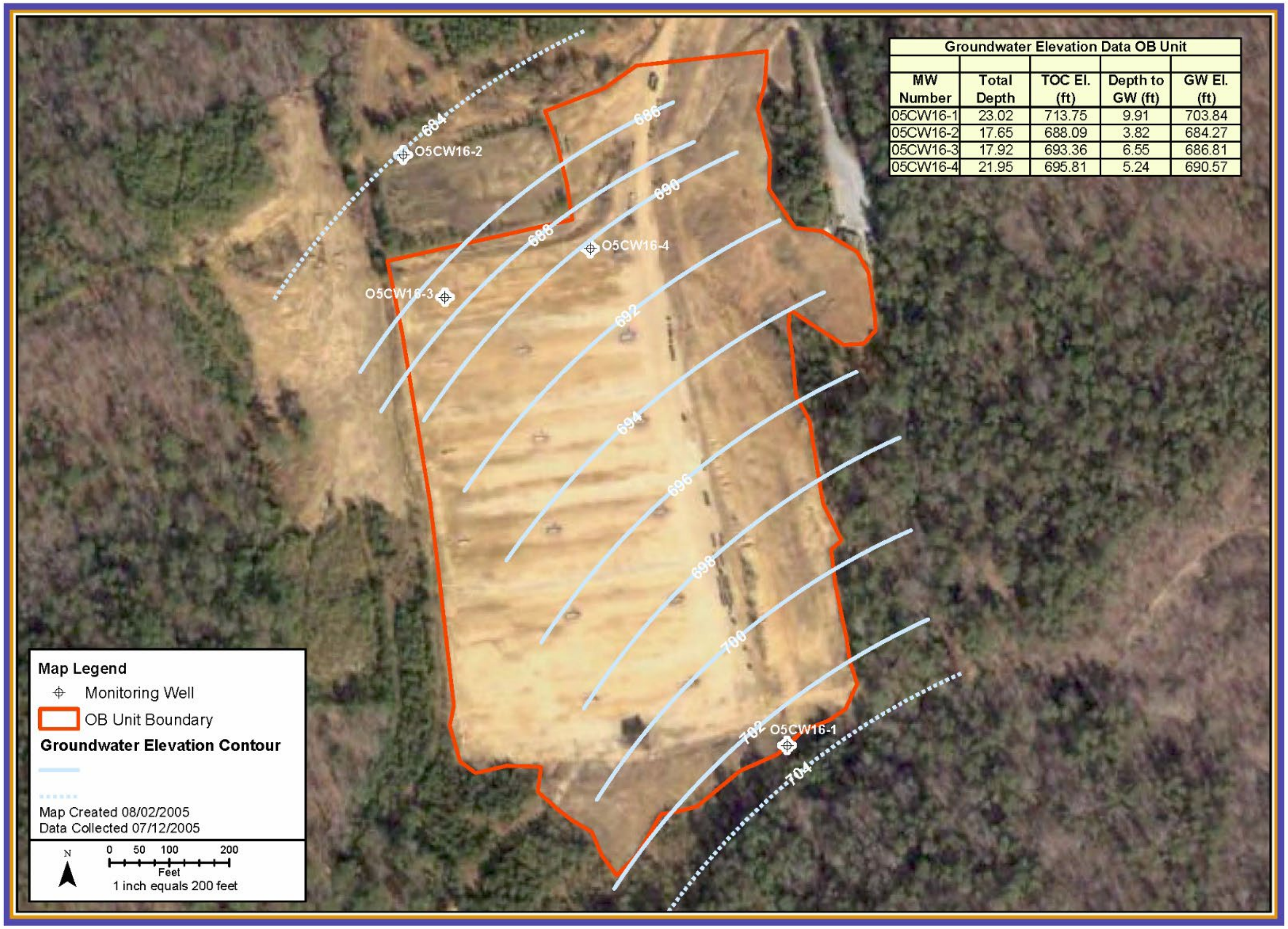
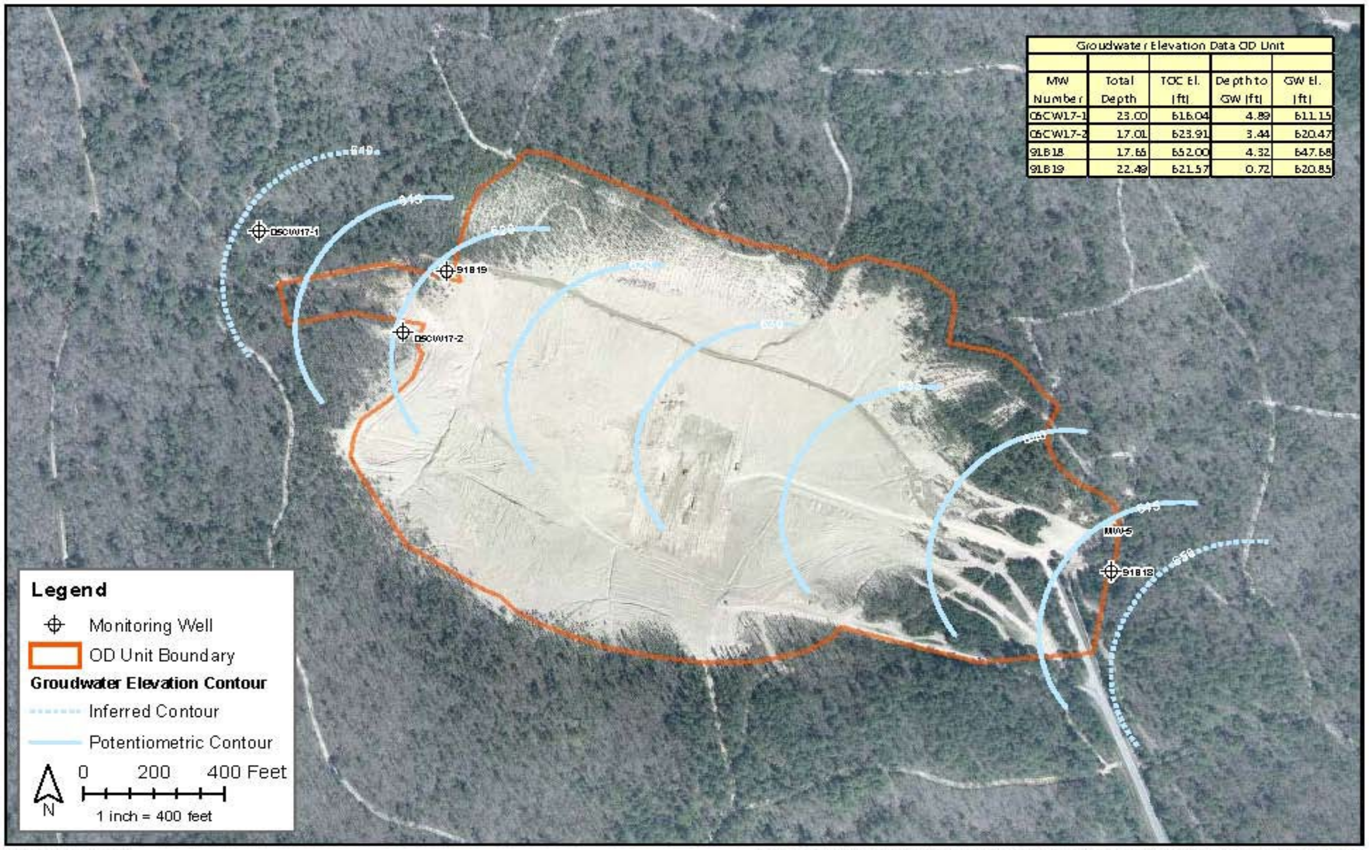


FIGURE IV E-5
Potentiometric Surface Elevation of the Uppermost Aquifer at the OB Unit



Groudwater Elevation Data OD Unit				
MW Number	Total Depth	TOC El. (ft)	Depth to GW (ft)	GW El. (ft)
O6CW17-1	23.00	616.04	4.89	611.15
O6CW17-2	17.01	623.91	3.44	620.47
91B18	17.65	652.00	4.32	647.68
91B19	22.49	621.57	0.72	620.85

FIGURE IV E-6
Potentiometric Surface Elevation of the Uppermost Aquifer at the OD Unit

\\GALILEO\PROJ\ANNISTON\MXDS\ODUNIT_POTENTIOMETRICSURFACES.MXD LSUBER1 4/6/2011 10:35:16

1

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)

Results of the most recent groundwater detection monitoring program are summarized in the annual report, included as Appendix A to this Section.

No clearly defined plume has been identified at the OB or OD units. Detections of some metals in excess of maximum concentration limits and at statistically significant concentrations have been detected since 2011. The following paragraphs summarize the current extent of detected constituents in excess of maximum concentration limits and is excerpted directly from the 2016 Annual Report (Appendix A).

The minimum detection limit was below the maximum concentration limits for all but two explosives, three VOCs and nine SVOCs analyzed in May and December 2016. ADEM requested in their comments on the First Quarter 2009 Groundwater Monitoring Report that the detection limit serve as the sample concentration in those cases where the detection limit exceeds the PSV. However, ANAD declined to follow this suggestion because doing so would result in the false reporting that certain constituents, unlikely to be associated with munitions operations, were above screening criteria. In the response to the ADEM request, ANAD alternately proposed to include columns containing the MDLs and PSVs for each analyzed parameter in the data summary tables and to highlight those parameters with MDL greater than the PSV.

The analytical results from the May and December 2016 sampling events were compared to the maximum concentration limits. This comparison indicated iron and manganese are COPCs that exceeded their maximum concentration limits at the OB unit in May 2016 and iron, manganese, aluminum, arsenic, and vanadium exceeded their respective MCLs at the OB Unit in December 2016. At the OD unit, iron and manganese exceeded their maximum concentration limit in May 2016 and iron, manganese, and vanadium exceeded their maximum concentration limits in December 2016.

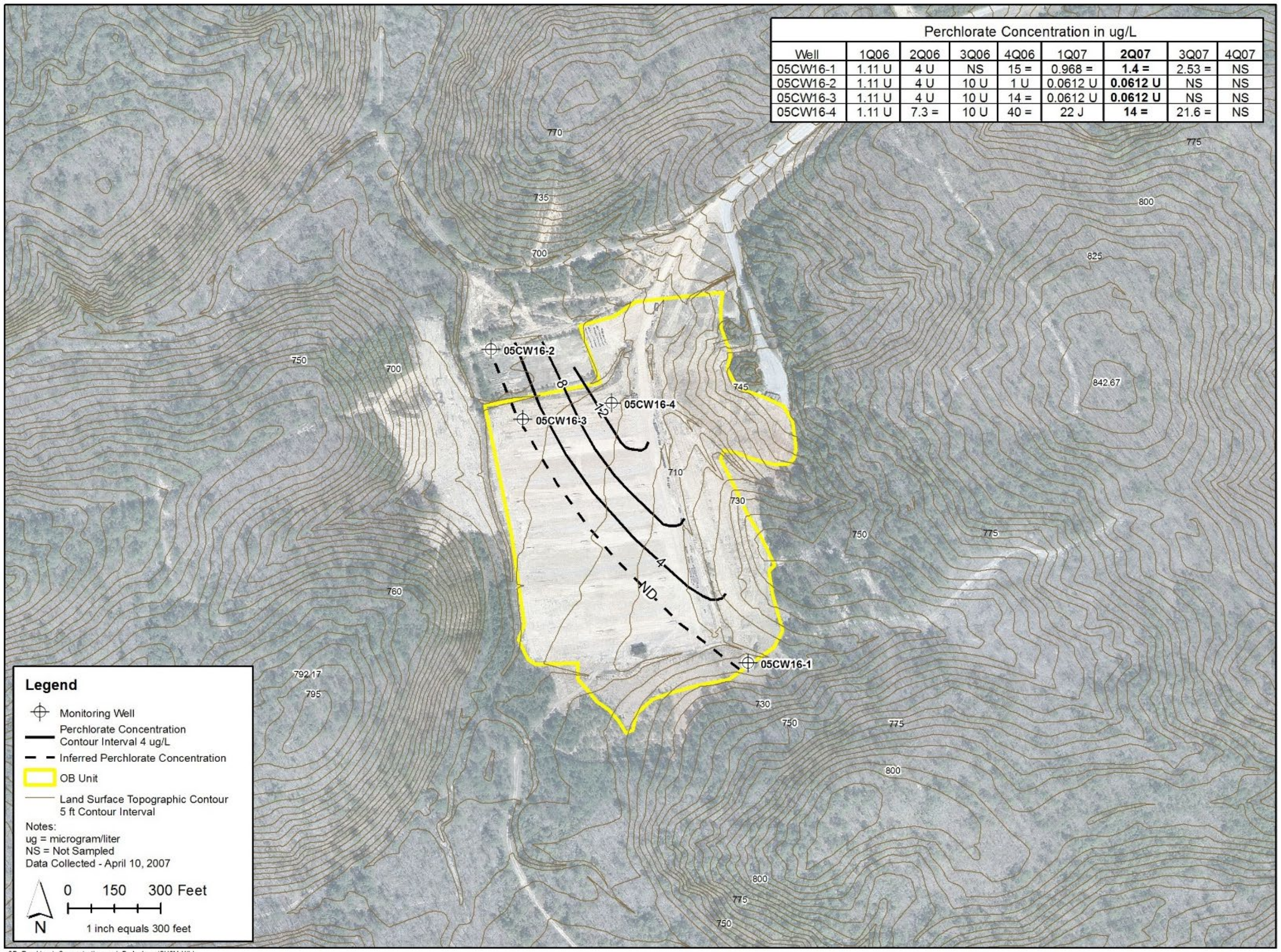
A statistical evaluation of data from the 12 most recent monitoring events at each unit was conducted to compare results from background wells to the downgradient wells. The nonparametric ANOVA test indicates that iron and manganese are the only regulated compounds that had statistically higher concentrations in downgradient wells and also exceeded the maximum concentration limits at the OB unit. At the OD unit, manganese is the only regulated compound that has a statistically higher concentration in downgradient wells and also exceeds the maximum concentration limit.

Total and dissolved manganese concentrations were greater than background in downgradient OB well 05CW16-3. The total manganese concentration trend in well 05CW16-3 shows a statistically significant increase since May 2011. As of December 2016, trend analysis indicates that there are no significant trends of total manganese concentrations in wells 05CW16-1, 05CW16-2 and 05CW16-4. The dissolved manganese concentration trend in upgradient well 05CW16-1 is significantly decreasing and there are no significant trends (stable concentrations) for dissolved manganese at the three downgradient OB Unit wells.

Downgradient iron (total) concentrations are statistically higher than upgradient concentrations at downgradient well 05CW16-3 and the concentration trend at this location shows a statistically significant increase since May 2011. Total iron concentrations are stable (no significant trend) at the upgradient well and downgradient OB wells 05CW16-2 and 05CW16-4. Downgradient iron (dissolved) concentrations are also statistically higher than upgradient concentrations at 05CW16-3; however, trend analysis indicates dissolved iron concentrations at all OB Unit wells are stable over the last 12 sample events.

Iron and manganese are naturally occurring metals. The general pattern of more detections and higher concentrations of total iron compared to dissolved iron indicates the turbidity of the samples is a significant factor, particularly when DO concentrations are greater than 1 mg/L (an indicator of aerobic conditions in the aquifer). DO concentrations are generally less than 1 mg/L in wells with manganese concentrations exceeding the maximum concentration limit. The similarity between the total and dissolved concentrations in wells with low DO concentrations indicates that the groundwater is naturally anaerobic and manganese concentrations are the result of dissolution of solid manganese minerals in the aquifer. An expanded demonstration that the concentrations of manganese are due to natural processes in the aquifer was provided in Attachment 2 of the 2009 annual groundwater monitoring report (CH2M HILL, 2010). Other than manganese and iron, metals exceeding their MCLs in May and December 2016 did not exhibit a significant difference between upgradient and downgradient concentrations. On the basis of the 2016 results, ANAD recommends continued detection monitoring at the OB and OD units.

The downgradient total and dissolved manganese concentrations are significantly higher than background concentrations only at 91B19, and the concentration trend is stable at that location. There is a statistically significant decreasing trend in total manganese concentrations at downgradient OD well 05CW17-1, with stable total manganese concentration trends at the other OD unit wells. There is a significantly increasing dissolved manganese concentration trend at downgradient well 05CW17-2 and a significantly decreasing trend in dissolved concentrations at upgradient well 91B18. The other OD wells do not show any statistically significant dissolved manganese concentration trends as of December 2016.



Perchlorate Concentration in ug/L

Well	1Q06	2Q06	3Q06	4Q06	1Q07	**2Q07**	3Q07	4Q07
05CW16-1	1.11 U	4 U	NS	15 =	0.968 =	**1.4 =**	2.53 =	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

IV E-5a Indication of the Extent of the Plumes on the Topographic Map

No plume is evident at the OB or OD Units therefore, this section is not applicable.

IV E-5b Concentration of Pollutants in the Plume

A complete list of constituents monitored under ANAD's permit-required detection monitoring program is provided in Table 4-1 of Appendix A to this section.

The concentrations of detected constituents are summarized in Tables 6-1 through 6-6 of Appendix A. The analytical results from the May and December 2016 sampling events were compared to the maximum concentration limits. This comparison indicated iron and manganese are COPCs that exceeded their maximum concentration limits at the OB unit in May 2016 and iron, manganese, aluminum, arsenic, and vanadium exceeded their respective maximum concentration limits at the OB Unit in December 2016. At the OD unit, iron and manganese exceeded their maximum concentration limits in May 2016 and iron, manganese, and vanadium exceeded their maximum concentration limits in December 2016.

Based on groundwater monitoring results for OB/OD through 2016, continuance of the current detection monitoring program is proposed. The nonparametric ANOVA test indicates that iron and manganese are the only regulated compounds that had statistically higher concentrations in downgradient wells and also exceeded the maximum concentration limit at the OB unit. At the OD unit, manganese is the only regulated compound that has a statistically higher concentration downgradient wells and also exceeds the maximum concentration limit.

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)

For this permit application, continuance of the current detection monitoring program is proposed since only manganese (a naturally occurring constituent) has been detected at a statistically higher concentration in downgradient wells at the OD unit. 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.

The existing four wells at the OB Unit and four wells at the OD Unit will continue to be sampled semi-annually. Concentrations from three down-gradient wells and one up-gradient well will be evaluated from each unit using methods currently approved under the existing permit and as described in the annual reports. Nondetects will be replaced by a proxy of ½ the detection limit. This evaluation followed guidance in ADEM Administrative Code Chapter 335-14-5 (ADEM, 2017).

The concentration data from the three downgradient monitoring wells is compared with the background data from the one background (upgradient) well using analysis of variance (ANOVA) techniques as required by the permit. Because the percentage of non-detected values is typically high for most of the parameters, it is 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, is 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 are 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 wells and constituents with a significant difference, a post hoc test (multiple comparison test) is employed to determine which downgradient wells, if any, exceed the background well. The results of the most recent tests are shown on Tables 5 and 6 within the Statistical Evaluation Report for the December 2016 results included as Appendix F-2 of Attachment 1 of this section (Annual Groundwater Monitoring Report for 2016, OBOD Units).

This evaluation method is consistent with methods authorized by the current permit. ANAD has previously identified manganese as a regulated constituents with concentrations greater than the maximum concentration limit and with statistically higher concentrations in downgradient wells as compared to upgradient wells at the OD unit. This same condition has also applied to both iron and manganese at the OB unit. Previous reports have concluded that the detections of iron and manganese are the result of natural processes in the aquifer. In 2010, a discussion was offered in lieu of permit modification as Attachment 2 of the 2009 Annual Groundwater Monitoring Report (CH2M Hill, 2010). Recent trends, including the 2016 report, support the conclusions of the discussion. 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 1.

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 (i.e., the water table aquifer in the residuum 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 first 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 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.

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. One groundwater monitoring well located at the southern end of the unit and 3 are located at the northern end are sampled as part of the monitoring program. Water level measurements at these and three other 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. Piezometers indicated on Figure V E-8 were installed and completed in 2009 to assess groundwater elevations but are not part of the groundwater sampling at this time.

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 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-8. 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 two additional monitoring wells at the OD unit in absence of installing piezometers. The current monitoring network at the OD unit consists of a total of four (4) wells.

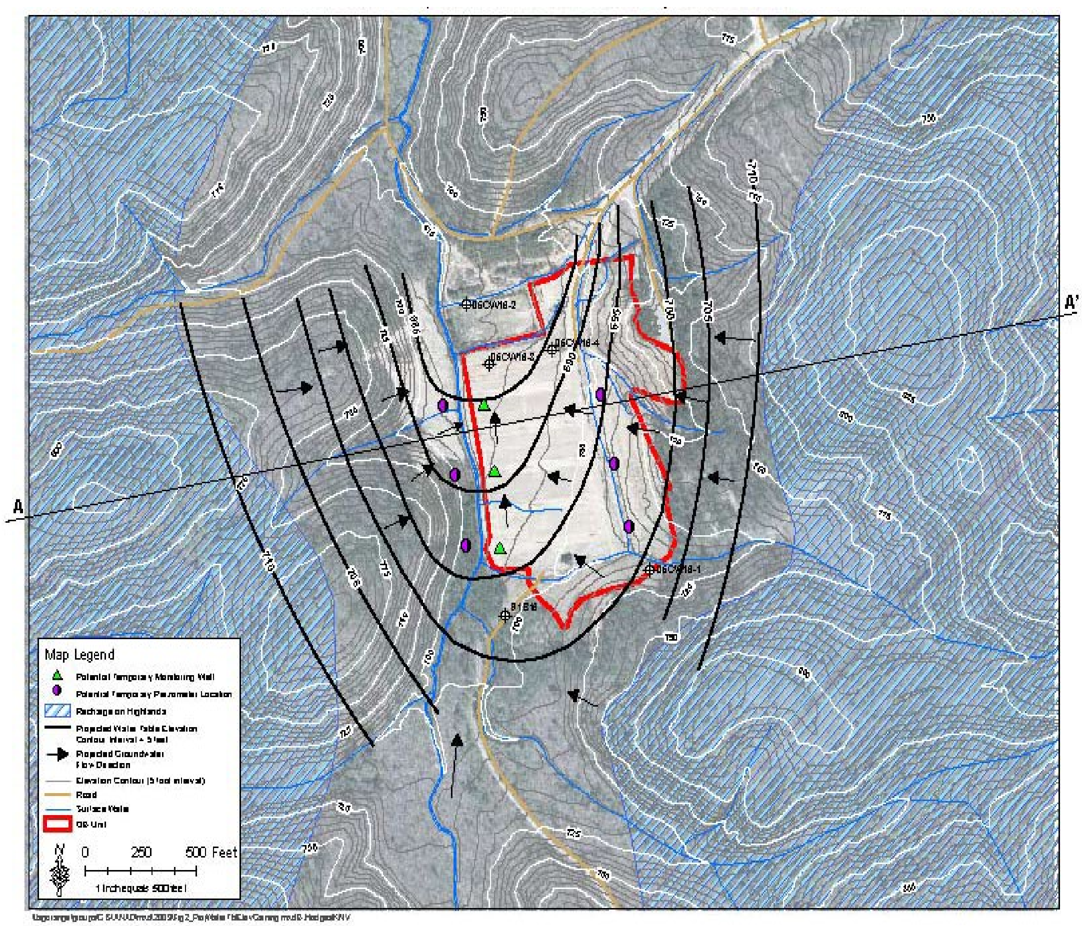


FIGURE IV E-8
Projected Water Table Elevations at the OB Unit Under Gaining Stream Conditions, Plan View

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-9 shows the current monitoring wells at the OB unit, while Figure IV E-10 shows the current well locations for the OD unit.

As part of a planned environmental improvement project, ANAD intends to repair and improve the existing holding/detention pond. The new design will include slope tracking, installation of erosion control turf reinforcement mats, and seeding to decrease the flow rate of runoff down the slopes and reduce sediment transported during rainfall events.

Locational information and conceptual design plans are included in Section IV D-3E of this application.

To complete the construction of the basin improvements requires removal of two (2) existing groundwater monitoring wells. Groundwater monitoring wells MW- 91B19 and MW-05CW17-2 will require proper plugging and abandonment. These wells will be replaced by two new similarly constructed wells located west of the current wells in or near the wooded areas identified on Figure IV E-11. The new wells will be located, drilled and installed to monitor the same zone as the current wells. The wells are anticipated to be approximately 15-20 feet deep and will be constructed using 2” PVC with 10-foot slotted screen, consistent with methods used in 2005 and as described in Section IV E-6a(2) and (3) of the renewal application. Installation and construction of the new wells will conform to applicable ADEM rules and guidance.

Replacement wells will be monitored in accordance with the requirements of this application and the subsequent ADEM issued renewal permit.

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, the 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 organic compounds. 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 aboveground lockable steel protective casing set into a concrete protective pad, and four 4-inch-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-11 through IV E-18.

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.

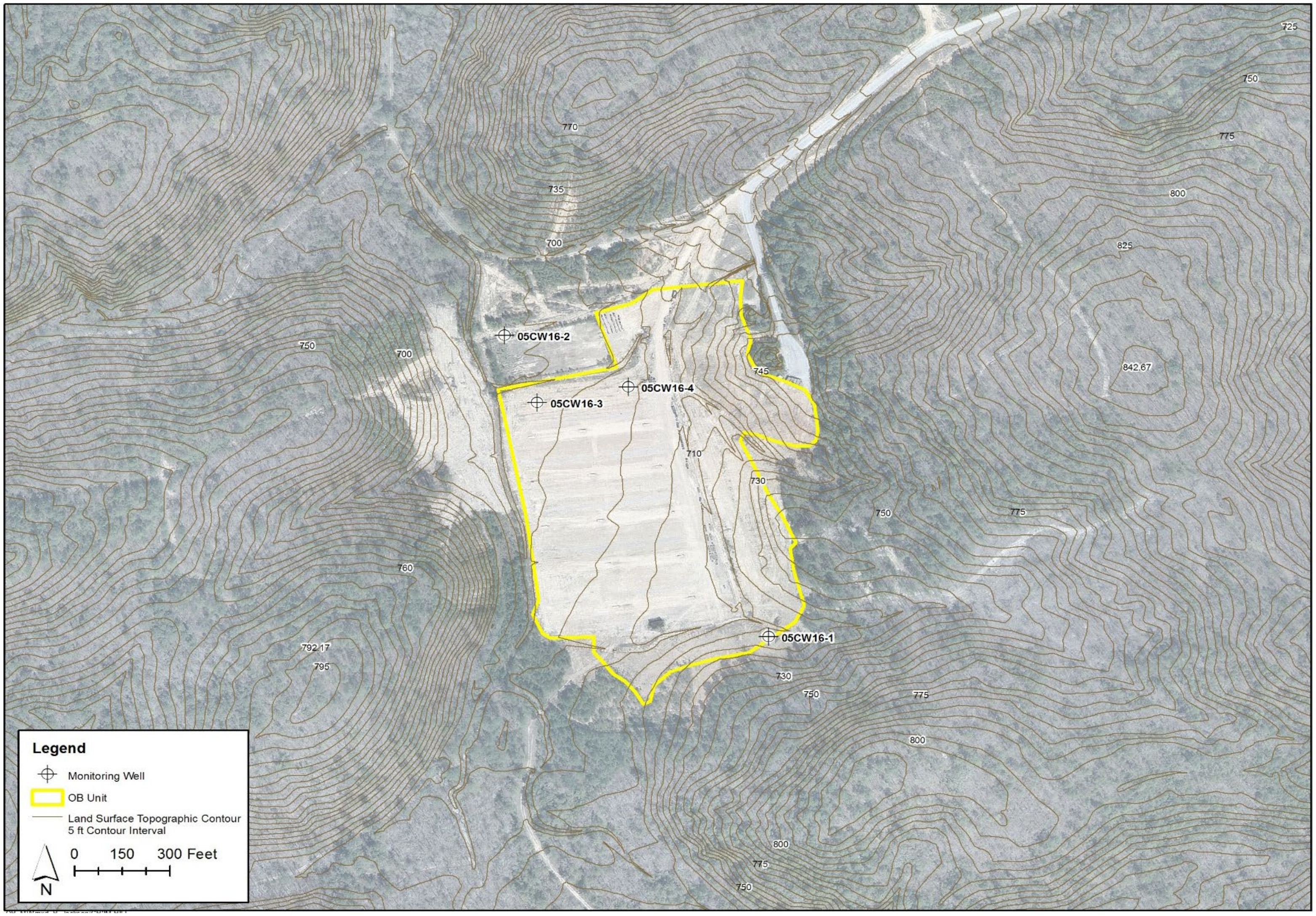


FIGURE IV E-9
Current ANAD Groundwater Monitoring Well Locations for the OB Unit

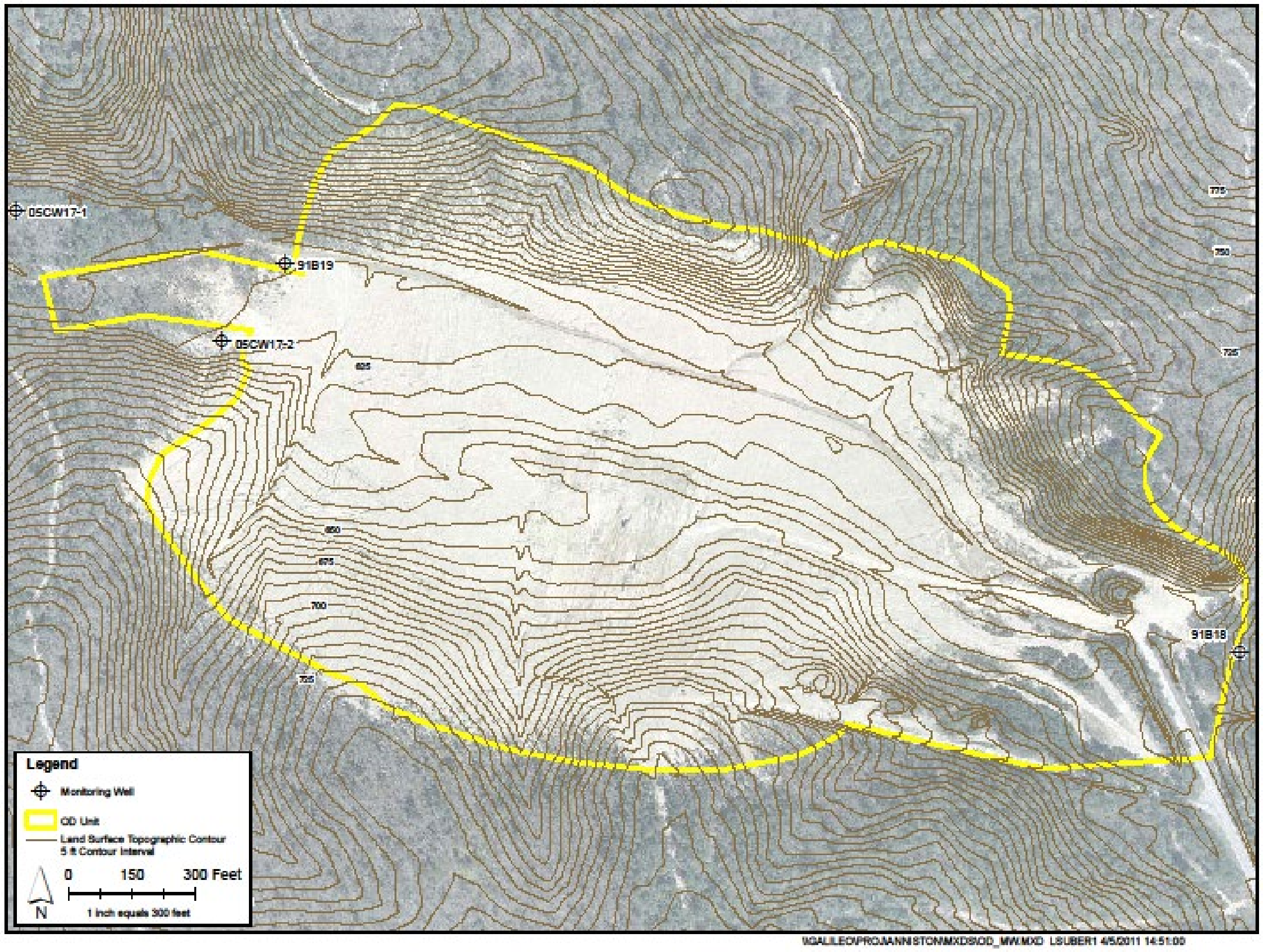
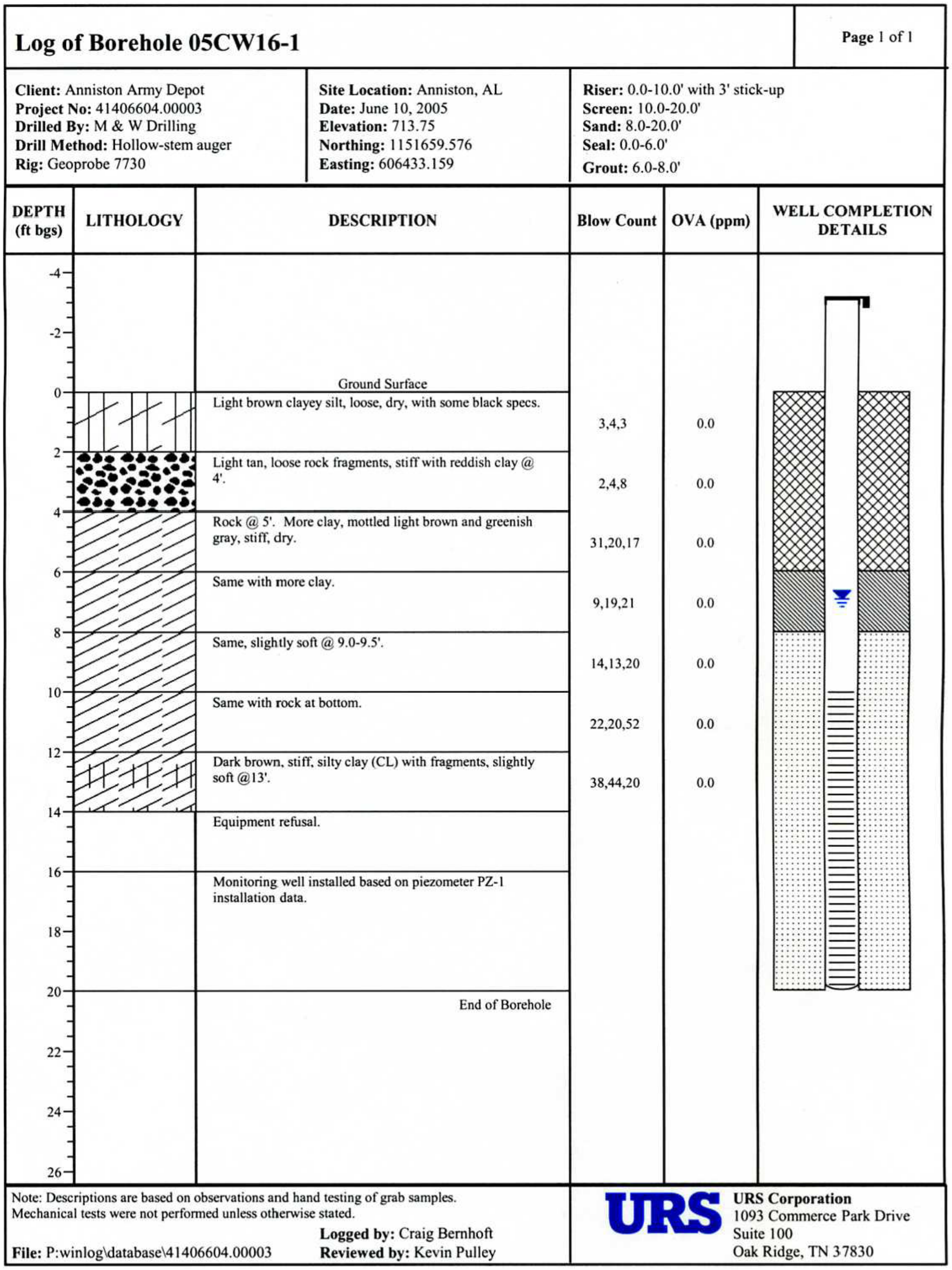


FIGURE IV E-10
Current ANAD Groundwater Monitoring Well Locations for the OD Unit

FIGURE IV E-11

Proposed Replacement Well Locations



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)	DESCRIPTION	Blow Count	OVA (ppm)
0	Ground Surface		
0–2	Light brown clayey silt, loose, dry, with some black specs.	3,4,3	0.0
2–4	Light tan, loose rock fragments, stiff with reddish clay @ 4'.	2,4,8	0.0
4–6	Rock @ 5'. More clay, mottled light brown and greenish gray, stiff, dry.	31,20,17	0.0
6–8	Same with more clay.	9,19,21	0.0
8–10	Same, slightly soft @ 9.0-9.5'.	14,13,20	0.0
10–12	Same with rock at bottom.	22,20,52	0.0
12–14	Dark brown, stiff, silty clay (CL) with fragments, slightly soft @13'.	38,44,20	0.0
14–16	Equipment refusal.		
16–20	Monitoring well installed based on piezometer PZ-1 installation data.		
20	End of Borehole		

Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003
Logged by: Craig Bernhoft
Reviewed by: Kevin Pulley

URS
URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-12
Monitoring Well 05CW16-1 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-2

Page 1 of 1

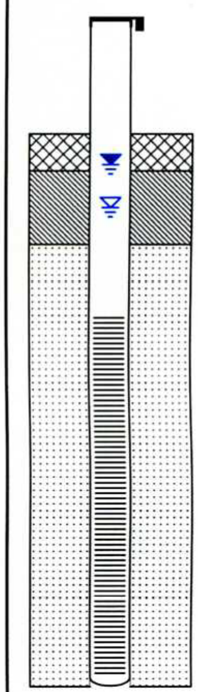
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-Stem Auger
Rig: Geoprobe 7730

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)	DESCRIPTION	Blow Count	OVA (ppm)
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 sitly 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).		
10–15	Same as above, 1' recovery.		
15–20	Same as above, 1' recovery.		
20	Monitoring well installed by overdrilling piezometer PZ-2. End of Borehole		

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003

Logged by: Craig Bernhoft
Reviewed by: Kevin Pulley

URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-13
Monitoring Well 05CW16-2 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-3

Page 1 of 1

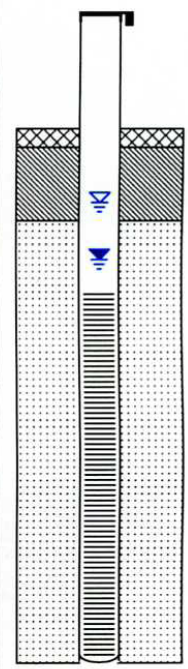
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

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)	DESCRIPTION	Blow Count	OVA (ppm)
0	Ground Surface		
0–2	Light brown silty clay, medium hard with black mottling. White silty rock layer @ 1'. Chert rock fragments throughout.		0.0
2–4	2-3' same as above. 3-4' Brown clayey silt, loose, wet with rock fragments.		0.0
4–6	4-5.5' same as above. 5.5-6.0' brown chert with sandy clay, dry.		0.0
6–8	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
8–10	Brown gravel chert layer, moist, with 6" weathered rock layrer @ 10'.		0.0
10–12	Brown silty clay with sand, dry, medium tight.		0.0
12–14	Brown silty clay with sand and chert fragments, dry, medium.		0.0
14			0.0
	End of Borehole		

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003
Logged by: Kevin Pulley
Reviewed by: Craig Berhoft

URS
URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-14
Monitoring Well 05CW16-3 Well Completion Diagram and Borehole Log

Log of Borehole 05CW16-4

Page 1 of 1

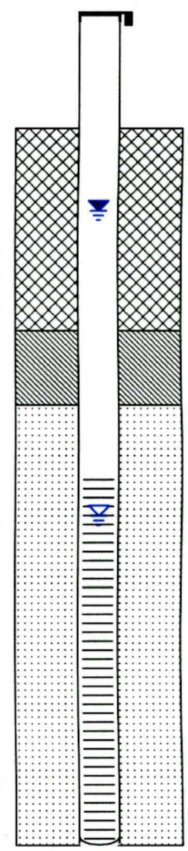
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

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)
-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
6		Light brown silty clay with chert and rock fragments, medium dry from 7-8'. Slight moist with more sand @ 7'.	12,14,12	0.0
8		8-9 same as above. Chert rock layer with sand @ 8'. 9-10' light brown clayey silt, medium, dry.	22,18,18	0.0
10		Same as above with wet sand/gravel layer and silty clay @ 10.5-11.0'.	10,11,13	0.0
12		No recovery.		0.0
14				
16		Light brown clayey silt with chert and sand loose, dry.	14,13,11	0.0
18		No recovery.		
20				
22		Light brown silty clay with chert/sand fragments, medium, dry.	0,0,0	0.0
24		End of Borehole		
26				

WELL COMPLETION DETAILS

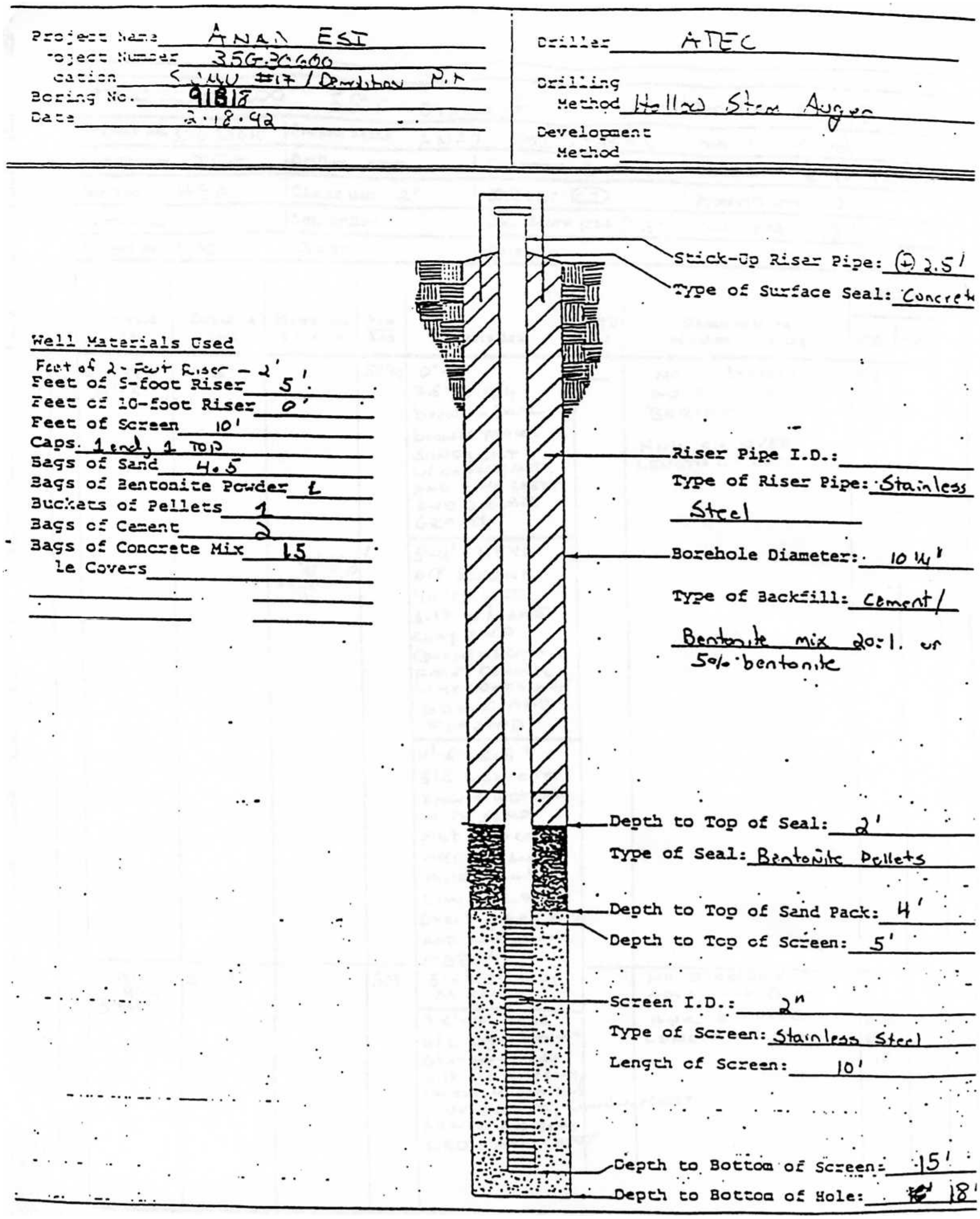


Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003
Logged by: Kevin Pulley
Reviewed by: Craig Berhoft

URS
URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-15
Monitoring Well 05CW16-4 Well Completion Diagram and Borehole Log



Project Name ANAD ESI
Project Number 35G-30600
Location SWMU #17 / Demolition Pit
Boring No. 91B18
Date 2.18.92

Driller ATEC
Drilling Method Hollow Stem Auger
Development Method

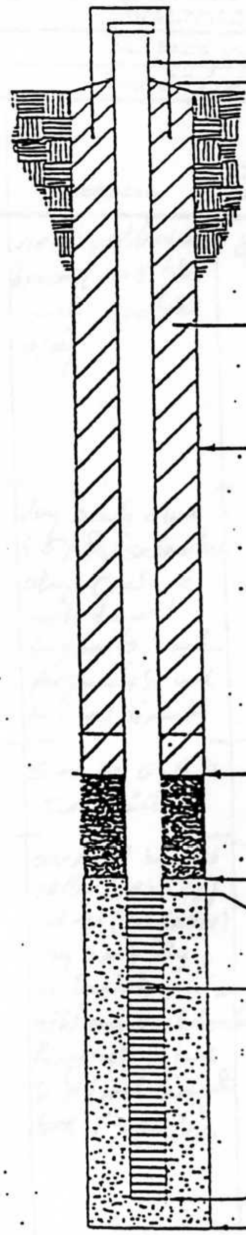
Well Materials Used
Feet of 2-Foot Riser – 2'
Feet of 5-foot Riser 5'
Feet of 10-foot Riser 0'
Feet of Screen 10'
Caps 1 end, 1 Top
Bags of Sand 4.5
Bags of Bentonite Powder 1
Buckets of Pellets 1
Bags of Cement 2
Bags of Concrete Mix 15
Hole Covers

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: ~~15~~ 18'

FIGURE IV E-16
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 ; E. Scott
Drilling Method HSA
Development Method



Stick-Up Riser Pipe: 2.5 ft
Type of Surface Seal: Concrete

Well Materials Used

Feet of 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 1½ (75 lb)
Bags of Cement 3
Bags of Concrete Mix
Hole Covers 5 ft protective steel casing with lock

Riser Pipe I.D.: 2 inch
Type of Riser Pipe: SS

Borehole Diameter: 10½ inch
Type of Backfill: Type II Cement grout

grout mix:
24 gal potable 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-17
Monitoring Well 91B19 Well Completion Diagram

Log of Borehole 05CW17-1

Page 1 of 1

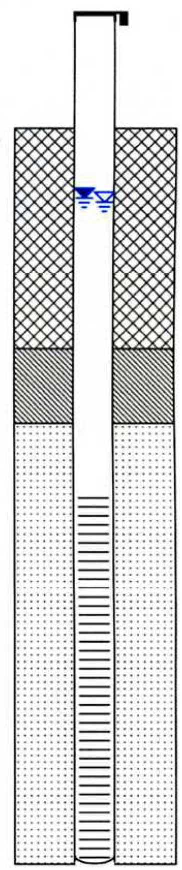
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

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)	DESCRIPTION	Blow Count	OVA (ppm)
0	Ground Surface		
0-2	Brown with red mottles, soft, silty clay with gravel fragments.	2,3,1	0.0
2-4	Gray soft silty clay with sand, gravel fragments, wet.	5,6,10	0.0
4-6	Gray sand, gravel with red, gray silty clay, wet, loose.	7,16,14	0.0
6-8	Brown, reddish silty clay, moist, loose with gravel fragments.	4,3,10	0.0
8-10	Reddish brown with black mottling silty clay with sand/cherty fragments, medium plastic.	3,4,4	0.0
10-12	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
14-15	No recovery, void.		
15-17	Gray sandy silt with chert rock @17'.	8,22,12	0.0
17-19	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
19-20.5	Angular cherty gravel (6-12mm) in gray silty clay.	12,35+	0.0
	End of Borehole		

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003
Logged by: Kevin Pulley
Reviewed by: Craig Berhoft

URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-18
Monitoring Well 05CW17-1 Well Completion Diagram and Borehole Log

Log of Borehole 05CW17-2

Page 1 of 1

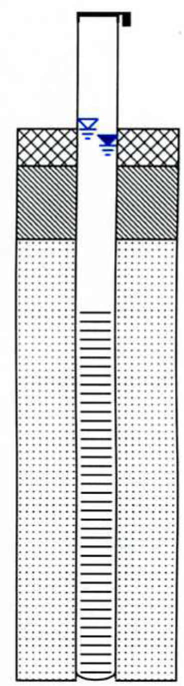
Client: Anniston Army Depot
Project No: 41406604.00003
Drilled By: M & W Drilling
Drill Method: Hollow-stem auger
Rig: Geoprobe 7730

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)	DESCRIPTION	Blow Count	OVA (ppm)
0	Ground Surface		
0-2	Light brown with medium-grained sandy silt with clay, wet.	0,0,1	0.0
2-4	Same as above.	0,0,3	0.0
4-6	Soft, wet, gray gravelly clay to red, dark brown, yellow gravel. Light medium cherty dolomite rock (GM)	14,52,64	0.0
6-8	Soft, wet gray sandy clay (GM), with cherty dolomite at bottom.	14,64,58	0.0
8-10	Same, less rock fragments, coarse silty sand and gravel (GC).	48,27,28	NA
10-12	Same, light brown gravelly sand with more clay, some reddish brown, loose black lignite? at 11.5.	12,12,17	NA
12-14	Same, light brown gravelly sand, becoming (SM).	21,22,19	NA
14-16	Same, becoming slightly stiff with yellowish brown clay at 16 (SM).	18,17,16	NA
16	End of Borehole		

WELL COMPLETION DETAILS



Note: Descriptions are based on observations and hand testing of grab samples. Mechanical tests were not performed unless otherwise stated.

File: P:winlog\database\41406604.00003
Logged by: Craig Bernhoft
Reviewed by: Kevin Pulley

URS

URS Corporation
1093 Commerce Park Drive
Suite 100
Oak Ridge, TN 37830

FIGURE IV E-19
Monitoring Well 05CW17-2 Well Completion Diagram and Borehole Log

- Monitoring wells were completed with secure, watertight caps and an aboveground lockable steel protective casing set into a concrete protective pad with four 4-inch-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.

Single well aquifer tests (slug tests) were conducted on the wells and data obtained from the tests 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 conductivities of the aquifer at the locations 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 the current 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 water-table 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 semi-annually. ANAD may propose an alternate sampling frequency through discussions with ADEM. The samples will be analyzed for constituents listed in Table 6-7. ANAD will monitor for indicator parameters, waste constituents, or reaction products that provide a reliable indication of the presence of hazardous constituents in groundwater.

Table IV E-7 Groundwater Analytes

Analyte	Maximum Concentration Limit - Groundwater (mg/L)	Groundwater Reference
Metals (Method 6010B)		
Aluminum	3.60E+00	a
Antimony	6.00E-03	a
Arsenic	1.00E-02	a
Barium	2.00E+00	a
Beryllium	4.00E-03	a
Cadmium	5.00E-03	a
Calcium	NP	NA
Chromium	1.00E-01	a
Cobalt	7.30E-02	a
Copper	1.30E+00	a
Iron	1.10E+00	a
Lead	1.50E-02	a
Magnesium	NP	NA
Manganese	8.80E-02	a
Mercury (Method 7470A)	2.00E-03	a
Nickel	1.00E-01	a
Potassium	NP	NA
Selenium	5.00E-02	a
Silver	1.80E-02	a
Sodium	NP	NA
Thallium	2.00E-03	a
Vanadium	3.60E-03	a
Zinc	1.10E+00	a
Explosives (Method 8330B)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	6.10E-04	a
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (H	1.80E-01	a
1,3,5-Trinitrobenzene	1.10E-01	a
1,2-Dinitrobenzene	1.50E-03	b
1,3-Dinitrobenzene	1.50E-03	b
1,4-Dinitrobenzene	1.50E-03	b
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	3.60E-02	a
2-Amino-4,6-dinitrotoluene	3.00E-02	b
4-Amino-2,6-dinitrotoluene	3.00E-02	b
Nitrobenzene	3.40E-04	a
2,4,6-Trinitrotoluene	2.20E-03	a
2,4-Dinitrotoluene	7.30E-03	a
2,6-Dinitrotoluene	3.60E-03	a
2-Nitrotoluene	2.70E-04	b
3-Nitrotoluene	1.30E-03	b
4-Nitrotoluene	3.70E-03	b

PETN	1.60E-02	b
Nitroglycerin	1.50E-03	b
SVOCs (Method 8270C)		
1,2,4-Trichlorobenzene	7.00E-02	a
1,2,3-Trichlorobenzene	5.20E-03	b
1,2-Dichlorobenzene	6.00E-01	a
1,3-Dichlorobenzene	1.80E-02	a
1,4-Dichlorobenzene	7.50E-02	a
2,4,5-Trichlorophenol	3.60E-01	a
2,4,6-Trichlorophenol	3.60E-04	a
2,4-Dimethylphenol	7.30E-02	a
2,4-Dichlorophenol	1.10E-02	a
2,4-Dinitrophenol	7.30E-03	a
2,4-Dinitrotoluene	7.30E-03	a
2,6-Dinitrotoluene	3.60E-03	a
2-Chloronaphthalene	4.90E-02	a
2-Chlorophenol	3.00E-03	a
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	1.20E-03	b
2-Methylnaphthalene	6.26E-03	a
2-Methylphenol (o-cresol)	1.80E-01	a
2-Nitroaniline	1.10E-02	a
2-Nitrophenol	NP	NA
3,3′-Dichlorobenzidine	1.50E-04	a
3-Methylphenol/4-Methylphenol(m&p-cresol)*	1.80E-02	a
3-Nitroaniline	3.40E-03	b
4-Bromophenyl phenyl ether	NP	NA
4-Chloro-3-methylphenol	1.41E-02	a
4-Chloroaniline	1.50E-02	a
4-Chlorophenyl phenyl ether	NP	NA
4-Nitroaniline	3.20E-03	b
4-Nitrophenol	1.25E-02	a
Acenaphthene	3.70E-02	a
Anthracene	1.80E-01	a
Benzo(a)anthracene	9.20E-05	a
Benzo(a)pyrene	2.00E-04	a
Benzo(b)fluoranthene	9.20E-05	a
Benzo(g,h,i)perylene	4.69E-02	a
Benzo(k)fluoranthene	9.20E-04	a
Benzoic acid	5.80E+01	a
Benzyl alcohol	1.10E+00	a
bis(2-Chloroethoxy)methane	4.70E-01	b
bis(2-Chloroethyl)ether	1.00E-05	a
bis(2-Chloroisopropyl)ether	2.70E-04	a
bis(2-Ethylhexyl)phthalate	6.00E-03	a
Butylbenzylphthalate	7.30E-01	a
Chrysene	9.20E-03	a
Dibenzo(a,h)anthracene	9.20E-06	a
Dibenzofuran	1.20E-03	a
Diethylphthalate	2.90E+00	a
Dimethylphthalate	3.60E+01	a
Di-n-butylphthalate	3.60E-01	a
Di-n-octylphthalate	1.50E-01	a

Fluoranthene	1.50E-01	a
Fluorene	2.40E-02	a
Hexachlorobenzene	1.00E-03	a
Hexachlorobutadiene	2.60E-04	b
Hexachlorocyclopentadiene	5.00E-02	a
Hexachloroethane	4.80E-03	a
Indeno(1,2,3-cd)pyrene	9.20E-05	a
Isophorone	7.10E-02	a
Naphthalene	6.20E-04	a
Nitrobenzene	3.40E-04	a
N-Nitrosodimethylamine	1.30E-06	a
n-Nitroso-di-n-propylamine	9.60E-06	a
N-Nitrosodiphenylamine/Diphenylamine	1.40E-02	a
Pentachlorophenol	1.00E-03	a
Phenanthrene	4.69E-02	a
Phenol	1.10E+00	a
Pyrene	1.80E-02	a
Volatile Organic Compounds (Method 8260B)		
Benzene	5.00E-03	a
Bromobenzene	2.00E-02	b
Bromochloromethane	8.30E-02	b
Bromodichloromethane (THM)*	8.00E-02	a
Bromoform (THM)*	8.00E-02	a
Bromomethane	8.70E-04	a
n-Butylbenzene	7.80E-01	b
sec-Butylbenzene	2.40E-02	a
tert-Butylbenzene	2.40E-02	a
Carbon tetrachloride	5.00E-03	a
Chlorobenzene	1.00E-01	a
Chloroethane	4.60E-03	a
Chloroform (THM)*	8.00E-02	a
Chloromethane	1.60E-03	a
2-Chlorotoluene	1.20E-02	a
4-Chlorotoluene	1.90E-01	b
Dibromochloromethane (THM)*	8.00E-02	a
Dibromomethane (methylene bromide)	7.90E-03	b
1,2-Dibromo-3-chloropropane	2.00E-04	a
1,2-Dibromoethane (EDB)	5.00E-05	a
1,2-Dichlorobenzene	6.00E-01	a
1,3-Dichlorobenzene	1.80E-02	a
1,4-Dichlorobenzene	7.50E-02	a
Dichlorodifluoromethane	3.90E-02	a
1,1-Dichloroethane	8.10E-02	a
1,2-Dichloroethane	5.00E-03	a
1,1-Dichloroethene	7.00E-03	a
cis-1,2-Dichloroethene	7.00E-02	a
trans-1,2-Dichloroethylene	1.00E-01	a
1,2-Dichloropropane	5.00E-03	a
1,3-Dichloropropane	2.90E-01	b
2,2-Dichloropropane	NP	NA
1,1-Dichloropropylene	NP	NA
cis-1,3-Dichloropropene	4.00E-04	a
trans-1,3-Dichloropropene	4.00E-04	a
Ethylbenzene	7.00E-01	a

Hexachlorobutadiene	8.60E-04	a
Isopropylbenzene (Cumene)	6.60E-01	a
p-Isopropyltoluene	NP	NA
Methylene chloride (Dichloromethane)	5.00E-03	a
Naphthalene	6.20E-04	a
n-butylbenzene	7.80E-01	b
n-propylbenzene	NP	NA
p-isopropyltoluene (p-cymene)	NP	NA
Styrene	1.00E-01	a
t-butylbenzene	2.40E-02	a
tert-butyl methyl ether (MTBE)	4.70E-02	a
1,1,1,2-Tetrachloroethane	4.30E-04	a
1,1,2,2-Tetrachloroethane	5.50E-05	a
Tetrachloroethene	5.00E-03	a
Toluene	1.00E+00	a
1,2,3-Trichlorobenzene	5.20E-03	b
1,2,4-Trichlorobenzene	7.00E-02	a
1,1,1-Trichloroethane	2.00E-01	a
1,1,2-Trichloroethane	5.00E-03	a
Trichloroethylene	5.00E-03	a
Trichlorofluoromethane	1.30E-01	a
1,2,3-Trichloropropane	5.60E-06	a
1,2,4-Trimethylbenzene	1.20E-03	a
1,3,5-Trimethylbenzene	1.20E-03	a
Vinyl chloride	2.00E-03	a
Total Xylenes	1.00E+01	a
Acetone	5.50E-01	a
2-Butanone (Methyl ethyl ketone)	7.00E-01	a
4-Methyl-2-pentanone (MIBK: methyl isobutlyl keto	2.00E-01	a
Carbon disulfide	1.00E-01	a
Other Analytes		
Cyanide (Method 335.4)	2.00E-01	a
Perchlorate (Method 6850)	2.45E-02	a
Nitrate/Nitrite as Nitrogen (Method 353.2)	1.00E+01	a

Notes:

Maximum concentration limit includes PSVs and RSLs
a = ARBCA preliminary screening values (PSV) (ALABAMA RISK BASED CORRECTIVE ACTION GUIDANCE MANUAL, Revision 2, April 2008)
b = EPA regional screening levels (RSLs) (Regional Screening Table, November 2015)

* This value is for 4-methylphenol with the lower PSV of the pair.
+ 1998 Final Rule for Disinfectants and Disinfection By-Products: The total for trihalomethanes (THMs) is 0.08 mg/L

mg/L = milligrams per liter
NP = not promulgated
NA = not applicable

SVOC = semivolatile organic compound
VOC = volatile organic compound

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-8.

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-8
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
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 pH <2	14 days until analysis

[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 4ºC 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 8330B).
- Metals (EPA Method 6010B); mercury EPA (Method 7470A).
- Perchlorates (EPA Method 6850).
- Nitrate/Nitrite (EPA Method 353.2).
- Cyanide (EPA Method 335.4).
- SVOCs (EPA Method 8270C).
- VOCs (EPA Method 8260B).

These constituents may potentially be contained within WMM. Results will be evaluated by comparison to ADEM's maximum concentration limits developed from Table 2-2 of the *Alabama Risk Guidance Manual* (ADEM, 2008). For constituents without Alabama Risk-Based Corrective Action (ARBCA) Preliminary Screening Values (PSVs), the maximum concentration limits will be selected from EPA Regional Screening Levels (RSLs) (EPA, most recently published values)

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.

The measurements will be used to calculate the well volumes required for purging. Casing volumes will be determined using the formula:

$$\pi r^2 h \times 7.48 \text{ gal/ft}^3$$
$$\text{Volume (gal)} = 1 \text{ ft}^3$$

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.

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.
- Electronic water level indicator.

These indicators were 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 (L/min), 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 maximum concentration limits (PSVs and RSLs) 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 (upgradient) 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 downgradient 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 maximum concentration limits (PSVs and RSLs) 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 continue implementation of a detection monitoring program as described below.

IV E-7a Indicator Parameters

No indicator parameters other than water quality parameters (e.g., 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 PSVs 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 PSVs. This indicates that the groundwater is anaerobic and manganese (total or dissolved) concentrations are greater than the maximum concentration limits (PSVs and RSLs) due to natural processes.

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 systems are installed at the point of compliances 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 units (i.e., 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 semi-annual sampling events implementing the detection monitoring program, semi-annual 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

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.

Synopsis for RCRA Modification Request Number 4 (MODR 4)

This permit modification addresses revisions to the Resource Conservation and Recovery Act (RCRA) Permit Application and the RCRA Permit. This permit modification is being submitted as a major modification request based on consultation with the Alabama Department of Environmental Management (ADEM) and as allowed under the Alabama Administrative Code as the purpose of the modification request is to remove permit and associated application information that is no longer applicable.

Basis of Proposed Modifications

This modification request is being submitted to remove information in the RCRA Permit and associated application that is related to the destruction of energetic waste military munitions and hazardous secondary waste which has been completed by the Anniston Static Detonation Chamber (SDC) Facility located at the Anniston Army Depot (ANAD). Closure of the storage missions at the ANAD was approved in 2013 and the closure of the treatment mission at the Anniston SDC was completed in May 2025. With the completion of these missions, the permit and application conditions are no longer applicable and have been required to be removed from the permit and application.

ANAD RCRA Application

These sections have been updated to remove the application conditions that are no longer applicable.

Formatting changes, e.g., spacing, indentation, alignment, etc. were not tracked to aid in the review process.

Declaration of Changes for MODR 4
ANAD RCRA Permit Application

Page(s)	Line(s)/Section	Rationale for Change
Table of Contents		
Global	N/A	The table of contents was revised to reflect final closure of the Anniston SDC and removal from the ANAD RCRA Permit Application. Changes were not tracked.
Section I Part A and Information Continuation Sheets		
Part A	N/A	The Site Contact Information was revised to add John Rogers and remove Bruce Williams.
1	9	Removed reference to the Anniston SDC and associated co-operators.
3	4	Removed reference to the Anniston SDC Air Permit.
3	5	Removed reference to the Anniston SDC.
3-4	6	Removed reference to the Anniston SDC.
9-20	7	Removed reference to the Anniston SDC waste streams. Updated the "Line Numbers" to correct mis-numbering in past submissions.
21-22	19	Removed certification block for Anniston Field Office and SDC Project
Section II B, C, F, G, H, and I, Section VI, V, and VI		
Global	N/A	Referenced sections have been updated to reflect final closure of the Anniston SDC and completion of the storage and treatment operations. Formatting changes such as removal of unnecessary spacing, and alignments were not tracked. Tables were reformatted to merge common information. Revised to consistently reference the ADEM Administrative Code. Removed placeholders for reserved tables and figures.
	IV, V, &V	Implemented Table of Contents to Sections IV, V, and VI

RCRA Modification Request Package No. 4

(1) ANAD RCRA Permit Application Sections (Redline)

RCRA Part A and Continuation Sheets

Section II B

Section II C

Section II F

Section II G

Section II H

Section II I

Section IV J

Section V

Section VI

(2) ANAD RCRA Permit Application Sections (Proof)

Table of Contents

RCRA Part A and Continuation Sheets

Section II B

Section II C

Section II F

Section II G

Section II H

Section II I

Section IV J

Section V

Section VI

United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

☐	Obtaining or updating an EPA ID number for an on-going regulated activity that will continue for a period of time. (Includes HSM activity)
☐	Submitting as a component of the Hazardous Waste Report for __________ (Reporting Year)
	☐ Site was a TSD facility and/or generator of > 1,000 kg of hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations)
☐	Notifying that regulated activity is no longer occurring at this Site
☐	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
☑	Submitting a new or revised Part A Form

2. Site EPA ID Number

A	L	3	2	1	0	0	2	0	0	2	7

3. Site Name

Anniston Army Depot

4. Site Location Address

Street Address	**7 Frankford Ave**		
City, Town, or Village	**Anniston**	County	**Calhoun**
State **Alabama**	Country **United States**	Zip Code	**36201**

5. Site Mailing Address ☐ Same as Location Address

Street Address	**7 Frankford Ave**	
City, Town, or Village	**Anniston**	
State **Alabama**	Country **United States**	Zip Code **36201**

6. Site Land Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary)	**92811**	C.	**336992**
B.	**562211**	D.	**332813**

8. Site Contact Information

☑ Same as Location Address

First Name John	MI W	Last Name Rogers
Title Director of Risk Management		
Street Address 7 Frankford Ave (Attn:TAAN-RK)		
City, Town, or Village Anniston		
State Alabama	Country United States	Zip Code 36201
Email john.w.rogers1.civ@army.mil		
Phone 256-235-7746	Ext	Fax 256-235-4793

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name Anniston Army Depot		Date Became Owner (mm/dd/yyyy) 2/17/1941
Owner Type ☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other		
Street Address 7 Frankford Ave		
City, Town, or Village Anniston		
State Alabama	Country United States	Zip Code 36201
Email		
Phone	Ext	Fax
Comments		

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name Anniston Army Depot (see continuation sht page 1)		Date Became Operator (mm/dd/yyyy) 2/17/1941
Operator Type ☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other		
Street Address 7 Frankford Ave		
City, Town, or Village Anniston		
State Alabama	Country United States	Zip Code 36201
Email		
Phone	Ext	Fax
Comments		

10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

☑ Y ☐ N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c		
	☑	a. LQG	-Generates, in any calendar month (includes quantities imported by importer site) 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste; or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material.
	☐	b. SQG	100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
	☐	c. VSQG	Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste.
If "Yes" above, indicate other generator activities in 2 and 3, as applicable.			
☐ Y ☑ N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.		
☐ Y ☑ N	3. Mixed Waste (hazardous and radioactive) Generator		
☑ Y ☐ N	4. Treater, Storer or Disposer of Hazardous Waste—Note: A hazardous waste Part B permit is required for these activities.		
☑ Y ☐ N	5. Receives Hazardous Waste from Off-site		
☐ Y ☑ N	6. Recycler of Hazardous Waste		
	☐	a. Recycler who stores prior to recycling	
	☐	b. Recycler who does not store prior to recycling	
☐ Y ☑ N	7. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.		
	☐	a. Small Quantity On-site Burner Exemption	
	☐	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D006	D011	D016	D021	D026	D031
D002	D007	D012	D017	D022	D027	D032
D003	D008	D013	D018	D023	D028	D033
D004	D009	D014	D019	D024	D029	D034
D005	D010	D015	D020	D025	D030	D035

C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

☐ Y ☑ N		1. Transporter of Hazardous Waste—If "Yes", mark all that apply.
	☐	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Underground Injection Control
☐ Y ☑ N		3. United States Importer of Hazardous Waste
☐ Y ☑ N		4. Recognized Trader—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter
☐ Y ☑ N		5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter

B. Universal Waste Activities

☑ Y ☐ N		1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated.
	☑	a. Batteries
	☑	b. Pesticides
	☑	c. Mercury containing equipment
	☑	d. Lamps
	☐	e. Other (specify) ______
	☐	f. Other (specify) ______
	☐	g. Other (specify) ______
☐ Y ☑ N		2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

☐ Y ☑ N		1. Used Oil Transporter—If "Yes", mark all that apply.
	☐	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply.
	☐	a. Processor
	☐	b. Re-refiner
☐ Y ☑ N		3. Off-Specification Used Oil Burner
☐ Y ☑ N		4. Used Oil Fuel Marketer—If "Yes", mark all that apply.
	☐	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
	☐	b. Marketer Who First Claims the Used Oil Meets the Specifications

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR 262 Subpart K.

☐ Y ☑ N	A. Opting into or currently operating under 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories—If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.	
	☐	1. College or University
	☐	2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university
	☐	3. Non-profit Institute that is owned by or has a formal written affiliation with a college or univer-
☐ Y ☑ N	B. Withdrawing from 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories.	

13. Episodic Generation

☐ Y ☑ N	Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator.

14. LQG Consolidation of VSQG Hazardous Waste

☐ Y ☑ N	Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQGs hazardous waste.

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

☐ Y ☑ N	LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.
	A. ☐ Central Accumulation Area (CAA) or ☐ Entire Facility
	B. Expected closure date: ___________ mm/dd/yyyy
	C. Requesting new closure date: ___________ mm/dd/yyyy
	D. Date closed : ___________ mm/dd/yyyy ☐ 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8) ☐ 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)

16. Notification of Hazardous Secondary Material (HSM) Activity

☐ Y ☑ N	A. Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.
☐ Y ☑ N	B. Are you notifying under 40 CFR 260.43(a)(4)(iii) that the product of your recycling process has levels of hazardous constituents that are not comparable to or unable to be compared to a legitimate product or intermediate but that the recycling is still legitimate? If "Yes", you may provide explanation in Comments section. You must also document that your recycling is still legitimate and maintain that documentation on site.

17. Electronic Manifest Broker

☐ Y ☑ N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?

18. Comments (include item number for each comment)

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11)**.

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Printed Name (First, Middle Initial Last) **See continuation sheets**	Title
Email	

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Printed Name (First, Middle Initial Last)	Title
Email	

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT PART A FORM

1. Facility Permit Contact

First Name John	MI W	Last Name Rogers
Title Director of Risk Management		
Email john.w.rogers1.civ@mail.mil		
Phone 256-235-7746	Ext	Fax 256-235-4793

2. Facility Permit Contact Mailing Address

Street Address 7 Frankford Ave		
City, Town, or Village Anniston		
State Alabama	Country United States	Zip Code 36201

3. Facility Existence Date (mm/dd/yyyy)

2/17/1941

4. Other Environmental Permits

A. Permit Type	B. Permit Number	C. Description
		See continuation sheets

5. Nature of Business

See Continuation Sheets

6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity (1) Amount	B. Process Design Capacity (2) Unit of Measure	C. Process Total Number of Units	D. Unit Name
								See Continuation Sheets

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes (1) Process Codes									D. Processes (2) Process Description (if code is not entered in 7.D1))
																	See Continuation Shts

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

See Sections II and IV of the ANAD RCRA Part B Permit Application

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

See Sections II and IV of the ANAD RCRA Part B Permit Application

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

See Sections II and IV of the ANAD RCRA Part B Permit Application

11. Comments

RCRA Subtitle C Site Identification Form
Continuation Sheet

Section 9. Legal Owner and Operator of the Site

All facility operations at Anniston Army Depot other than Anniston Munitions Center (ANMC) operations will be conducted by the U.S. Army as ANAD, Anniston, AL 36201-4199, phone number 256-235-6350; operator type, Federal.

Operations at the ANMC will be conducted by the following operator:

(1) Anniston Munitions Center (ANMC), JMBG-AN, 7 Frankford Ave., Anniston, AL 36201-4199; phone number 256-235-7570; operator type, Federal.

Section 11. Description of Hazardous Waste – A. Waste Codes for Federally Regulated Hazardous Wastes

D036								
D037	D038	D039	D040	D041	D042	D043	F001	F002
F003	F004	F005	F006	F019	P001	P002	P003	P004
P005	P006	P007	P008	P009	P010	P011	P012	P013
P014	P015	P016	P017	P018	P020	P021	P022	P023
P024	P026	P027	P028	P029	P030	P031	P033	P034
P036	P037	P038	P039	P040	P041	P042	P043	P044
P045	P046	P047	P048	P049	P050	P051	P054	P056
P057	P058	P059	P060	P062	P063	P064	P065	P066
P067	P068	P069	P070	P071	P072	P073	P074	P075
P076	P077	P078	P081	P082	P084	P085	P087	P088
P089	P093	P094	P095	P096	P097	P098	P099	P101
P102	P103	P104	P105	P106	P108	P109	P110	P111
P112	P113	P114	P115	P118	P119	P120	P121	P122
P123	P127	P128	P185	P186	P187	P188	P189	P190
P191	P192	P193	P194	P195	P196	P197	P198	P199
P200	P201	P202	P203	P204	P205	U001	U002	U003
U004	U005	U006	U007	U008	U009	U010	U011	U012
U014	U015	U017	U018	U019	U020	U021	U022	U023
U024	U025	U026	U027	U028	U029	U030	U031	U032
U033	U034	U035	U036	U037	U038	U039	U041	U042
U043	U044	U045	U046	U047	U048	U049	U050	U051
U052	U053	U055	U056	U057	U058	U059	U060	U061
U062	U063	U064	U066	U067	U068	U069	U070	U071
U072	U073	U074	U075	U076	U077	U078	U079	U080
U081	U082	U083	U084	U085	U086	U087	U088	U089
U090	U091	U092	U093	U094	U095	U096	U097	U098
U099	U101	U102	U103	U105	U106	U107	U108	U109
U110	U111	U112	U113	U114	U115	U116	U117	U118
U119	U120	U121	U122	U123	U124	U125	U126	U127
U128	U129	U130	U131	U132	U133	U134	U135	U136
U137	U138	U140	U141	U142	U143	U144	U145	U146
U147	U148	U150	U151	U152	U153	U154	U155	U156
U157	U158	U159	U160	U161	U162	U163	U164	U165
U166	U167	U168	U168	U169	U170	U171	U172	U173
U174	U176	U177	U178	U179	U180	U181	U182	U183
U184	U185	U186	U187	U188	U189	U190	U191	U192
U193	U194	U196	U197	U200	U201	U202	U203	U204

U205	U206	U207	U208	U209	U210	U211	U213	U214
U215	U216	U217	U218	U219	U220	U221	U222	U223
U225	U226	U227	U228	U234	U236	U238	U239	U240
U243	U244	U246	U247	U248	U249	U271	U278	U279
U280	U328	U353	U359	U364	U367	U372	U373	U387
U389	U394	U395	U404	U408	U409	U410	U411	

Hazardous Waste Permit Information Form
Continuation Sheet

Section 4. OTHER ENVIRONMENTAL PERMITS

Permit Type	Permit Number	Description
N	AL0002658	Anniston Army Depot (Operational)
N	ALG610000	Anniston Army Depot (General)
	301-T005-X002	Gasoline Transport Vessel w/a Vapor Collection System Trailer S/N C30012
R	AL3 210 020 027	Hazardous Waste Facility Permit
P	301-0023	Major Source Operating Permit Title V

Section 5. NATURE OF BUSINESS

MISSIONS AND MAJOR FUNCTIONS - ANNISTON ARMY DEPOT

Anniston Army Depot (ANAD) is a major equipment rework facility of the U.S. Army located in Calhoun County, Alabama. ANAD is located on approximately 15,000 acres and a major employer of skilled and semi-skilled workers in northeastern Alabama.

ANAD is the only depot capable of performing maintenance on heavy-tracked combat vehicles and their components. The depot is designated as the Center of Technical Excellence for the M1 Abrams Tank and is the designated candidate depot for the repair of the M60, AVLB, M728, M88 and M551 combat vehicles. ANAD has assumed responsibility for the towed and self-propelled artillery as well as the M113 FOV.

Under partnership agreements a wide range of vehicle conversions and upgrades are currently underway. ANAD also performs maintenance on individual and crew-served weapons as well as land combat missiles.

The Anniston Munitions Center (ANMC) is a tenant activity that is responsible for the maintenance, storage, recycling and disposal of conventional ammunition and missiles. These activities are a significant part of the depot's overall missions and capabilities.

Other key tenant organizations include the Defense Distribution Anniston Alabama (DDAA), Defense Logistics Agency – Disposition Services, and the Center of Military History Clearing House.

Section 6. PROCESS CODES AND DESIGN CAPABILITIES

Line Number	Process Code	Process Design Capacity			Number	For Official Use Only
			Amount	Unit of Measure		
1	S01	Building 512 (ANAD)	25,440	G	001	
2	S01	Building 466 (ANAD)	97,020	G	001	
3	S01	Building 527 (ANAD)	44,520	G	001	
4	S01	Igloo I-103 (ANMC)	60,083	G	001	
5	S01	Igloo F-704A (ANMC)	60,083	G	001	
6	S01	Igloo F-405 (ANMC)	60,083	G	001	
7	X01	Open Burning of Propellants – Burning Ground #1 (ANMC) 10		N	001	
8	X01	Open Detonation of Conventional Munitions (ANMC) 8		N	001	
9	S01	Roll-off Box Storage Facility (ANAD) 132		Y	001	
10	X03	Energetic Treatment Unit (ANMC) 0.18		N	001	
11	X03	Thermal Treatment Closed Disposal Process (ANMC) 0.7			001	
12	X01	Static Fire Stands 5		N	003	

Section 7. DESCRIPTION OF HAZARDOUS WASTES

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
1	D001	89,589	P	S01	Paint Residue (ANAD-INDUSTRIAL)
2	D005				
3	D006				
4	D007				
5	D008				
6	D010				
7	D015				
8	D018				
9	D019				
10	D028				
11	D035				
12	D039				
13	D040				
14	D043				
15	F002				
16	F003				
17	F005				
18	D006	2,000	P	S01	Paint Overspray (ANAD-INDUSTRIAL)
19	D007				
20	D008				
21	D015				
22	D018				
23	D019				
24	D028				
25	D029				
26	D035				
27	D039				
28	D040				
29	D043				
30	D006	2,000	P	S01	Dried Paint with Cans (ANAD-INDUSTRIAL)
31	D007				
32	D008				
33	D015				
34	D018				
35	D019				
36	D028				
37	D029				
38	D035				
39	D039				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
40	D040				
41	D043				
42	D001	2,000	P	S01	Liquid Paint with Cans (ANAD-INDUSTRIAL)
43	D006				
44	D007				
45	D008				
46	D015				
47	D018				
48	D019				
49	D028				
50	D035				
51	D039				
52	D040				
53	D043				
54	D001	507	P	S01	Paint Solvent (ANAD-INDUSTRIAL)
55	D006				
56	D007				
57	D008				
58	D015				
59	D018				
60	D019				
61	D028				
62	D029				
63	D035				
64	D039				
65	D040				
66	D043				
67	F002				
68	F003				
69	F005				
70	D001	54,060	P	S01	Paint Filters (ANAD-INDUSTRIAL)
71	D006				
72	D007				
73	D008				
74	D015				
75	D018				
76	D019				
77	D028				
78	D035				
79	D039				
80	D040				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
81	D043				
82	F003				
83	F005				
84	D001	15,043	P	S01	Cleaning and Degreasing Solvent (ANAD-INDUSTRIAL)
85	D002				
86	D005				
87	D006				
88	D007				
89	D008				
90	D010				
91	D018				
92	D029				
93	D035				
94	D039				
95	D040				
96	F001				
97	F002				
98	F003				
99	F005				
100	U002				
101	D002	2,792	P	S01	Chemical Vat Filters/Liners (ANAD-INDUSTRIAL)
102	D006				
103	D007				
104	D008				
105	D029	1,000	P	S01	Petroleum Naphtha (ANAD-INDUSTRIAL)
106	D040				
107	D001	258,170	P	S01	Waste Acids (ANAD-INDUSTRIAL)
108	D002				
109	D004				
110	D005				
111	D006				
112	D007				
113	D008				
114	D010				
115	D011				
116	D022				
117	D035				
118	D039				
119	D040				
120	F002				
121	D001	24,658	P	S01	Waste Caustics (ANAD-INDUSTRIAL)

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
122	D002				
123	D006				
124	D007				
125	D008				
126	D010				
127	D011				
128	D021				
129	D027				
130	D029				
131	D039				
132	F007				
133	F008				
134	F009				
135	D006	2,500	P	S01	Purge Water (ANAD-INDUSTRIAL)
136	D007				
137	D008				
138	D029				
139	D040				
140	F001				
141	F002				
142	F003				
143	F005				
144	D006	10,734	P	S01	Detergent Soaps (ANAD-INDUSTRIAL)
145	D007				
146	D008				
147	D035				
148	D006	218,738	P	S01	Steam Cleaning Sludge, Liquid (ANAD-INDUSTRIAL)
149	D007				
150	D008				
151	F002				
152	D006	5,000	P	S01	Steam Cleaning Sludge, Solid (ANAD-INDUSTRIAL)
153	D007				
154	D008				
155	D001	15,941	P	S01	Metal Finishing Solvents (ANAD-INDUSTRIAL)
156	D002				
157	D003				
158	D004				
159	D005				
160	D006				
161	D007				
162	D008				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
163	D009				
164	D010				
165	D011				
166	D018				
167	D019				
168	D021				
169	D022				
170	D026				
171	D027				
172	D028				
173	D030				
174	D032				
175	D033				
176	D035				
177	D036				
178	D039				
179	D040				
180	D041				
181	D042				
182	D043				
183	F001				
184	F002				
185	F003				
186	F005				
187	F007				
188	D001	7,682	P	S01	Filters from ANAD (ANAD-INDUSTRIAL)
189	D002				
190	D003				
191	D004				
192	D005				
193	D006				
194	D007				
195	D008				
196	D009				
197	D010				
198	D011				
199	D018				
200	D021				
201	D022				
202	D027				
203	D028				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
204	D035				
205	D039				
206	D040				
207	D043				
208	F001				
209	F002				
210	F003				
211	F005				
212	D002	2,000	P	S01	Alodine (ANAD-INDUSTRIAL)
213	D006				
214	D007				
215	D008				
216	D004	1,892,310	P	S01	Blasting Media (ANAD-INDUSTRIAL)
217	D005				
218	D006				
219	D007				
220	D008				
221	D009				
222	D010				
223	D011				
224	D004	3,320	P	S01	Socks/Bags/Filters from Blasting and Welding Operations (ANAD-INDUSTRIAL)
225	D005				
226	D006				
227	D007				
228	D008				
229	D001	11,055	P	S01	Contaminated Antifreeze from disassembly process and/or automotive shops (ANAD-INDUSTRIAL)
230	D004				
231	D006				
232	D007				
233	D008				
234	D010				
235	D018				
236	D019				
237	D021				
238	D035				
239	F002				
240	F003				
241	F005				
242	D001	15,837	P	S01	Contaminated Motor Fluids generated from tear-down process/automatic shops (ANAD-INDUSTRIAL)

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
243	D004				
244	D005				
245	D006				
246	D007				
247	D008				
248	D010				
249	D011				
250	D018				
251	D019				
252	D021				
253	D029				
254	D035				
255	D039				
256	F001				
257	F002				
258	F003				
259	F005				
260	D004	24,510	P	S01	Contaminated Oil Filters (ANAD-INDUSTRIAL)
261	D006				
262	D007				
263	D008				
264	D009				
265	D010				
266	D018				
267	D019				
268	D035				
269	D039				
270	F003				
271	F005				
272	D001	3,310	P	S01	Contaminated Rags (ANAD-INDUSTRIAL)
273	D006				
274	D007				
275	D008				
276	D018				
277	D019				
278	D021				
279	D029				
280	D035				
281	D039				
282	F002				
283	F003				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
284	F005				
285	D004	305	P	S01	Contaminated Absorbents (ANAD-INDUSTRIAL)
286	D005				
287	D006				
288	D007				
289	D008				
290	D009				
291	D010				
292	D011				
293	D018				
294	D019				
295	D028				
296	D029				
297	D035				
298	F001				
299	F002				
300	F003				
301	F005				
302	U210				
303	D004	3,412	P	S01	Contaminated Soils (ANAD-INDUSTRIAL)
304	D005				
305	D006				
306	D007				
307	D008				
308	D009				
309	D010				
310	D011				
311	D018				
312	D019				
313	D020				
314	D021				
315	D030				
316	D039				
317	D040				
318	D043				
319	F001				
320	F002				
321	F005				
322	F006				
323	D001	742	P	S01	Liquid Adhesives, Sealants, and Preservatives (ANAD-INDUSTRIAL)

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
324	D002				
325	D003				
326	D005				
327	D006				
328	D007				
329	D008				
330	D011				
331	D018				
332	D029				
333	D035				
334	D040				
335	F002				
336	F003				
337	F005				
338	D005	500	P	S01	Solid Adhesives, Sealants, and Preservatives (ANAD-INDUSTRIAL)
339	D006				
340	D007				
341	D008				
342	D029				
343	D035				
344	D040				
345	F002				
346	F003				
347	F005				
348	U223				
349	D001	172	P	S01	Photographic Chemicals (ANAD-INDUSTRIAL)
350	D002				
351	D007				
352	D011				
353	D006	273,549	P	S01	F006 WW Treatment Sludge from Electroplating (ANAD-INDUSTRIAL)
354	F006				
355	D004	27,226	P	S01	Oil-Water Emulsion/Mixture (ANAD-INDUSTRIAL)
356	D005				
357	D006				
358	D008				
359	D010				
360	D001	5,284	P	S01	Waste Batteries (ANAD-INDUSTRIAL)
361	D002				
362	D003				
363	D005				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
364	D006				
365	D007				
366	D008				
367	D009				
368	D001	15,910	P	S01	Off-Specification Materials, Lab Packs, or Mixed Materials, D, U, or P-listed Waste (ANAD-INDUSTRIAL)
369	D002				
370	D003				
371	D004				
372	D005				
373	D006				
374	D007				
375	D008				
376	D009				
377	D010				
378	D011				
379	D015				
380	D018				
381	D019				
382	D021				
383	D022				
384	D023				
385	D028				
386	D029				
387	D030				
388	D034				
389	D035				
390	D038				
391	D039				
392	D040				
393	D043				
394	F002				
395	F003				
396	F005				
397	F022				
398	F028				
399	F038				
400	P004				
401	P005				
402	P006				
403	P007				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
404	P008				
405	P009				
406	P010				
407	P015				
408	P040				
409	P041				
410	P042				
411	P050				
412	P051				
413	P081				
414	P095				
415	U002				
416	U008				
417	U019				
418	U037				
419	U042				
420	U043				
421	U044				
422	U045				
423	U050				
424	U051				
425	U057				
426	U080				
427	U108				
428	U117				
429	U122				
430	U123				
431	U129				
432	U140				
433	U151				
434	U154				
435	U159				
436	U161				
437	U165				
438	U188				
439	U210				
440	U220				
441	U221				
442	U225				
443	U226				
444	U228				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
445	U239				
446	U240				
447	U247				
448	D004	111,808	P	S01	Wood/Construction Debris, Fluorescent Bulbs and Ballast (ANAD-INDUSTRIAL)
449	D006				
450	D007				
451	D008				
452	D009				
453	D026				
454	D037				
455	D003	3,000	P	S01	Spent Carbon from ANAD (ANAD-INDUSTRIAL)
456	D004				
457	D005				
458	D006				
459	D007				
460	D008				
461	D009				
462	D010				
463	D011				
464	D022				
465	D028				
466	D030				
467	D043				
468	D006	1,234	P	S01	Groundwater Filters/Cartridges (ANAD-INDUSTRIAL)
469	D007				
470	D008				
471	D018				
472	D029				
473	D040				
474	F001				
475	F002				
476	F003				
477	F004				
478	F005				
479	D005	62,460	P	S01, S99	Secondary waste from OB/OD, TTCDP and ETU Operations (ANMC/AFO-CONVENTIONAL)
480	D006				
481	D007				
482	D008				
483	D009				
484	D030				

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
485	D001	100,000	P	S01, S99	Waste Military Munitions (ANAD-CONVENTIONAL)
486	D002				
487	D003				
488	D004				
489	D005				
490	D006				
491	D007				
492	D008				
493	D009				
494	D010				
495	D011				
496	D030				
497	D039				
498	U098				
499	D001	3,120	T	X01	Open Burning of Propellants – Burning Ground #1 (ANMC)
500	D003				
501	D004				
502	D005				
503	D006				
504	D007				
505	D008				
506	D009				
507	D010				
508	D011				
509	D030				
510	D032				
511	D039				
512	D001	2,496	T	X01	Open Detonation of Conventional Munitions (ANMC)
513	D003				
514	D004				
515	D005				
516	D006				
517	D007				
518	D008				
519	D009				
520	D010				
521	D011				
522	D030				
523	D032				
524	D039				
525	D001	7.6	T	X03	Energetic Treatment Unit (ANMC)

Line Number	EPA Hazardous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Process Codes	Process Description
526	D003				
527	D004				
528	D005				
529	D006				
530	D007				
531	D008				
532	D009				
533	D010				
534	D011				
535	D030				
536	D032				
537	D003	518	T	X03	Thermal Treatment Closed Disposal Process (ANMC)
538	D008				
539	D003	5	T	X01	Explosives-contaminated Solid Waste
540	D005	50	T	X01	Ash Residue from OB and ETU Operations
541	D006				
542	D007				
543	D008				
544	D009				
545	D0030				
546	D005	10	T	X03	Ash Residue from TTCDP Operations
547	D006				
548	D007				
549	D008				
550	D005	50	T	X03	Filter Media from TTCCP Operation
551	D006				
552	D007				
553	D008				

RCRA Subtitle C Site Identification Form
Continuation Sheet

Section 19: CERTIFICATION(S)

As the owner of the facility and the operator of facility operations other than Static Detonation Chamber and Anniston Munitions Center (ANMC) operations, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator Signature	8 May 2026 Date Signed

Charles A. Moore, Colonel, US Army, Commanding

Name and Official Title

RCRA Subtitle C Site Identification Form
Continuation Sheet

As operator of the ANMC, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Steven Wallace Co-Operator Signature	15 April 2026 Date Signed

Steven J. Wallace, Lieutenant Colonel, US Army

Name and Official Title

(2) ANAD RCRA Permit Application Sections (PROOF)

Table of Contents (PROOF)

TABLE OF CONTENTS

SECTION II: STORAGE **PAGE**

SECTION II: STORAGE (Tables) **PAGE**

SECTION II: STORAGE (Figures) **PAGE**

TABLE OF CONTENTS

SECTION IV B-IV J

FIGURES

IV C WASTE CHARACTERISTICS **PAGE**

TABLES

FIGURES

PAGE

TABLES

FIGURES

PAGE

IV E PROTECTION OF GROUNDWATER

TABLES

FIGURES

APPENDICES

TABLES

FIGURES

ATTACHMENT

IV G CONTINGENCY PLAN - ADEM ADMIN CODE R. 335-14-8-.02(5)(B)7

TABLES

FIGURES

TABLES

SECTION V **PAGE**

Section V FIGURES:

RCRA Part A and Continuation Sheets (PROOF)

Section II B (PROOF)

II B Facility Description

This section (Section II B) provides a general description of Anniston Army Depot (ANAD), Anniston, Alabama, and additionally provides a description of ANAD permitted hazardous waste storage units.

In 2014, closure of the Anniston Chemical Agent Disposal Facility was completed and approved by the Department. With the approval of the final closure of that facility, all references to chemical agent storage or processing at ANAD were removed from the permit via a modification.

In 2025, closure of the Anniston Static Detonation Chamber Facility was completed and approved by the Department. With the approval of the final closure of that facility, all references to processing at ANAD were removed from the permit via a modification.

In accordance with Alabama Department of Environmental Management (ADEM), 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(6)(b).

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.

II B-1 General Description
ADEM Admin. Code R.335-14-8-.02(5)(b)1

ANAD is the designated Center of Industrial and Technical Excellence for combat vehicles (tracked and wheeled), towed and self-propelled artillery, assault bridging systems, individual and crew served small caliber weapons, locomotives, rail equipment, and non-tactical generators. Major components of each vehicle are also overhauled and returned to stock. Additionally, worldwide distribution of stocks and the maintenance, storage, and demilitarization of conventional ammunition and missiles are significant parts of the Depot's overall mission and capabilities. Key tenant organizations on ANAD include Defense Distribution Anniston Alabama (DDAA), Defense Logistics Agency Disposition Services, Anniston Munitions Center (ANMC), and the Center of Military History Clearing House.

As a result of its U.S. Department of Defense (DoD) mission, ANAD generates a variety of hazardous industrial and process waste streams such as waste solvents, laboratory wastes, off-specification hazardous materials, filter media, and sludge from the industrial waste treatment plant (hereinafter referred to as industrial wastes). The

ANAD waste streams additionally include conventional munitions deemed a hazardous waste per the Military Munitions Rule (MMR) (hereinafter, referred to as Waste Military Munitions [WMM]) and secondary wastes related to thermal treatment/disposal of these WMM at the OB, OD, RMF stands, TTCDP or ETU treatment units.

II B-1a Applicability of Part B to this Facility

An Alabama Department for Environmental Management (ADEM)-approved hazardous waste permit is required for operation of ANAD's hazardous waste treatment, storage and disposal (TSD) operations in support of its DoD mission.

II B-1b Manages Waste Generated Onsite and Offsite

All hazardous industrial wastes (i.e., non-WMM) are accumulated and/or stored onsite while awaiting pickup by a transportation contractor for transport to an approved offsite hazardous waste TSD facility (TSDF). Hazardous industrial wastes are not accepted from offsite. ANAD is authorized to accept WMM from offsite DoD facilities for the purpose of storage and treatment/disposal at its permitted units. ANAD will not receive any hazardous chemical agent and/or chemical agent munitions waste from outside the State of Alabama. ANAD may receive hazardous waste conventional munitions or conventional munition components from chemical munitions which have been verified agent free from off-site Department of Defense facilities (from both within and outside the State of Alabama) for the purpose of reuse, recycle operations, and/or treatment and disposal. Recovered WMM, which were both recovered and received from locations within the State of Alabama and have been declared as hazardous waste, may also be received.

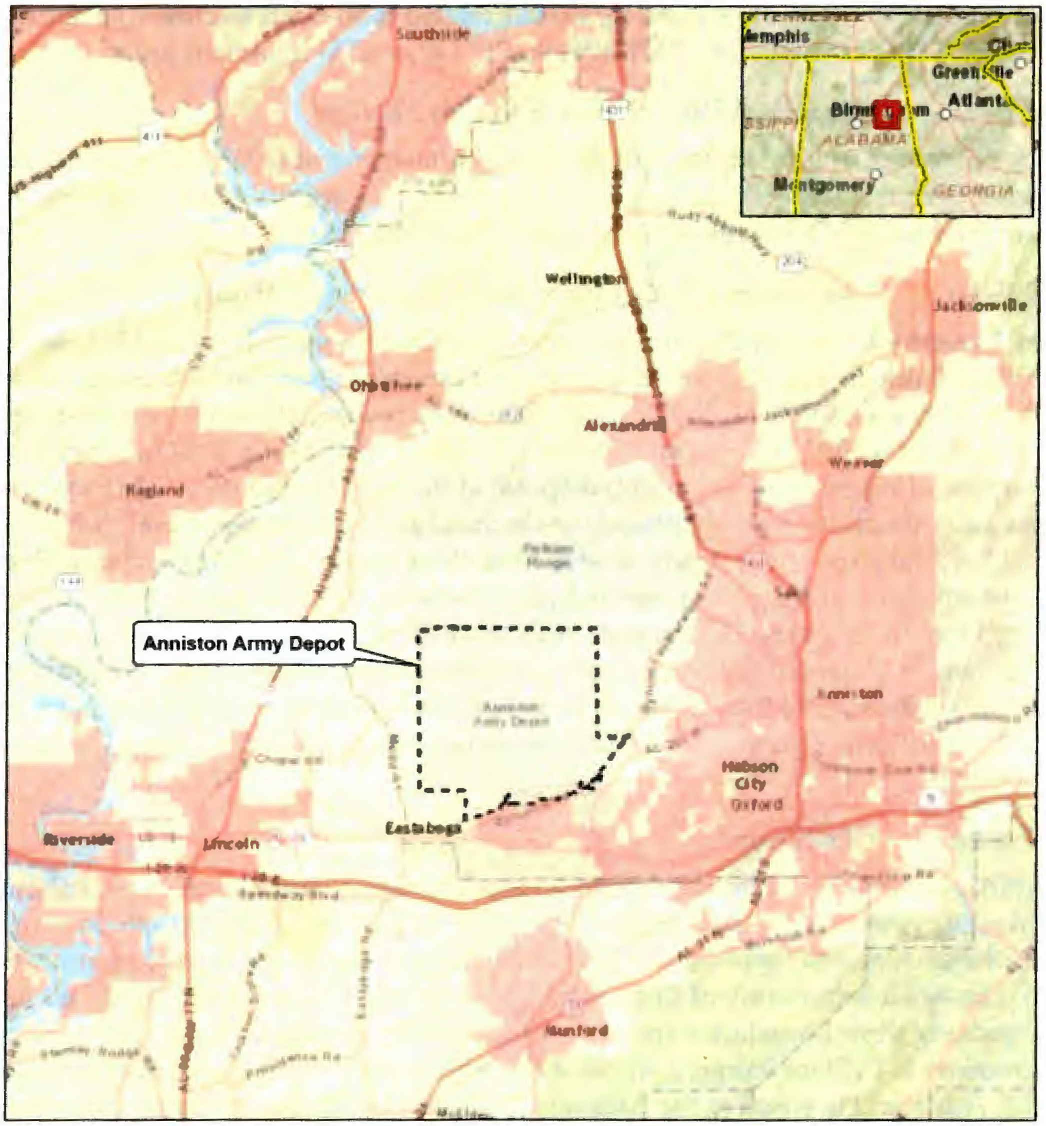
II B-1c Location

ANAD is located in Calhoun County in northeastern Alabama within the valley and ridge province of the Appalachian Highlands. ANAD consists of 15,246 acres in northeast Alabama, approximately 10 miles west of the city of Anniston (see Figure II B-1). The small community of Bynum is located on ANAD's southern boundary and the remaining three boundaries are adjacent to sparsely populated areas. The northern boundary is Pelham Range, a wooded operational and training area that is owned by the U.S. Army and licensed to the Alabama National Guard. The eastern and western boundaries are bordered by lightly populated rural lands. A short distance to the south is Interstate 20, a major east-west artery that provides access to two of the South's largest cities: Birmingham, Alabama (50 miles west) and Atlanta, Georgia (110 miles east).

The locations of all TSD units addressed in this permit application are shown on Figure II B-2.

II B-1d Owner or Operators Name, Mission

The owners and operators of the facility and facility operations are included with the Part A Application. See Section II B-1b for mission information.



Legend

- Installation Boundary
- Populated Area
- State Boundary
- Railroad

0 4 8
Miles

N

Figure II B-1
ANAD Location Map
Anniston Army Depot
Anniston, AL

Source
ESRI World Street Map online mapping service

DVR R:\GIS\HOU\Anniston\MapFiles\Anniston_LocationMap.mxd GTwigg_ch2mhillenvgi 2/10/2016 3:09:34 PM

ch2m.

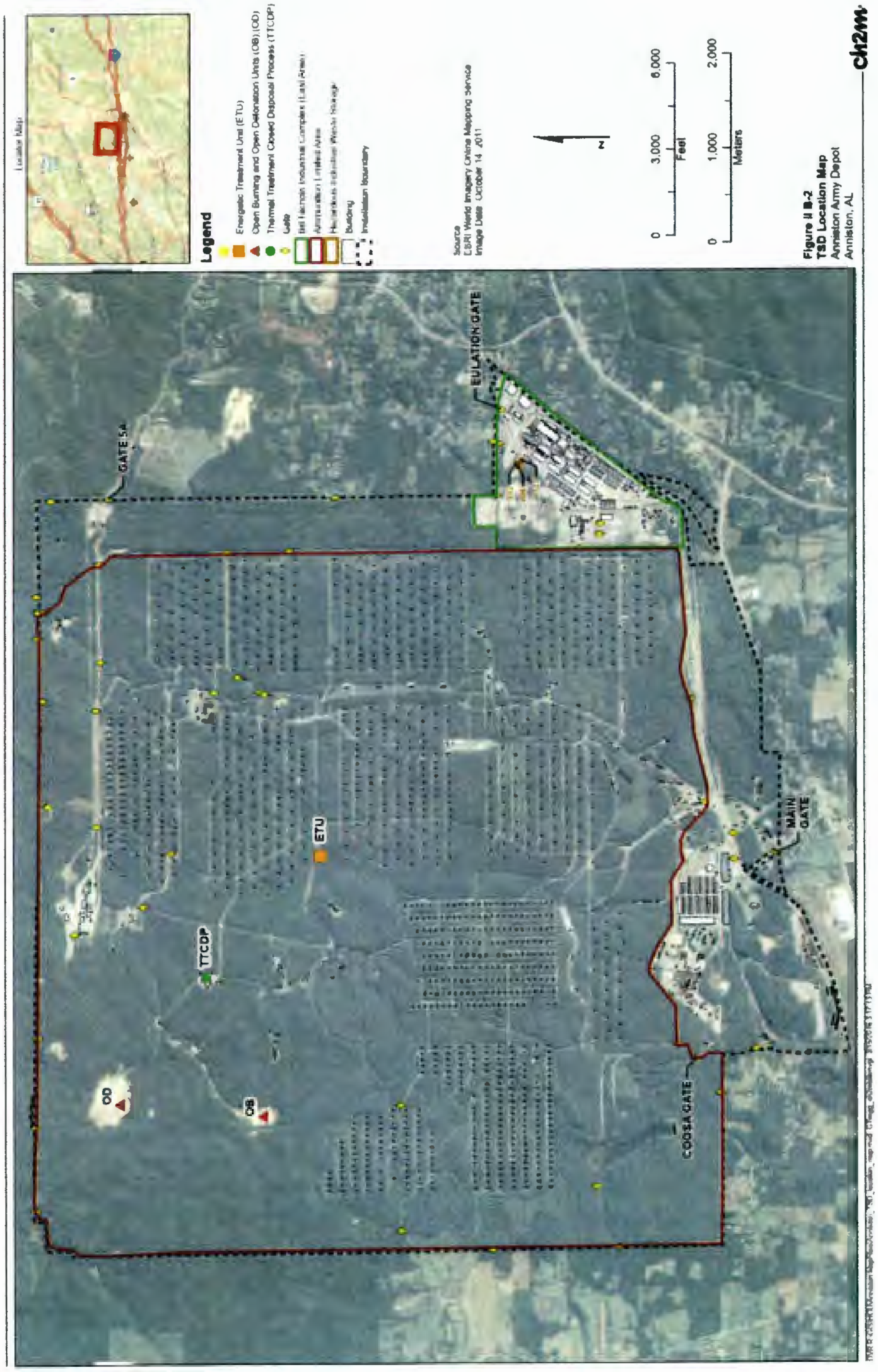


Figure II B-2
TSD Location Map
Anniston Army Depot
Anniston, AL

1

II B-1e Types of Waste Management Activities Conducted

ANAD hazardous waste management activities include generation, accumulation, storage and treatment/disposal. ANAD and its tenant organizations generate hazardous wastes from a variety of onsite activities.

The primary hazardous waste generating activities include maintenance and renovation of vehicles, weapon systems, and munitions and demilitarization of conventional munitions. Waste generating processes include, but are not limited to, metal cleaning, electroplating, stripping and painting, sandblasting, WMM thermal treatment operations, operation of the onsite industrial waste water treatment plant that treats wastewater from metal finishing operations, and the management of outdated chemicals. Other wastes that may be generated at ANAD include spill residues, contaminated soils, rags, and absorbents.

Permitted Units

Conventional munitions are treated in permitted treatment units. Conventional munitions and industrial process waste are stored in permitted storage units. The following TSD units are currently located at ANAD and included in this permit application:

Storage Units

- Three hazardous industrial waste container storage buildings (Buildings 466, 512 and 527), including roll-off box storage (also at Building 466)

Miscellaneous Units

- One WMM Open Burning (OB) Unit
- Three Static Fire stands for Rocket Motor Fire (RMF)
- One WMM Open Detonation (OD) Unit
- One WMM Thermal Treatment Closed Disposal Process (TTCDP)
- One WMM Energetic Treatment Unit (ETU)

The storage units are addressed in this section (Section II) of the permit application. Miscellaneous units are addressed in Section IV.

II B-1f Type of Storage Units

ANAD's permitted storage is for container storage, process code (S01). Industrial wastes and secondary wastes related to thermal treatment/disposal of WMM at the OB, OD, RMF, TTCDP or ETU treatment units are stored in container storage (S01). WMM may be stored in containers applicable to S01 and/or may be stored in appropriate packaging other than containers.

II B-1g Engineering Drawings

Engineering drawings for the hazardous industrial waste storage buildings and roll-off box are in Section II B-3b.

II B-1h Specifications of Wastes that have been Managed at the Treatment and Storage Units

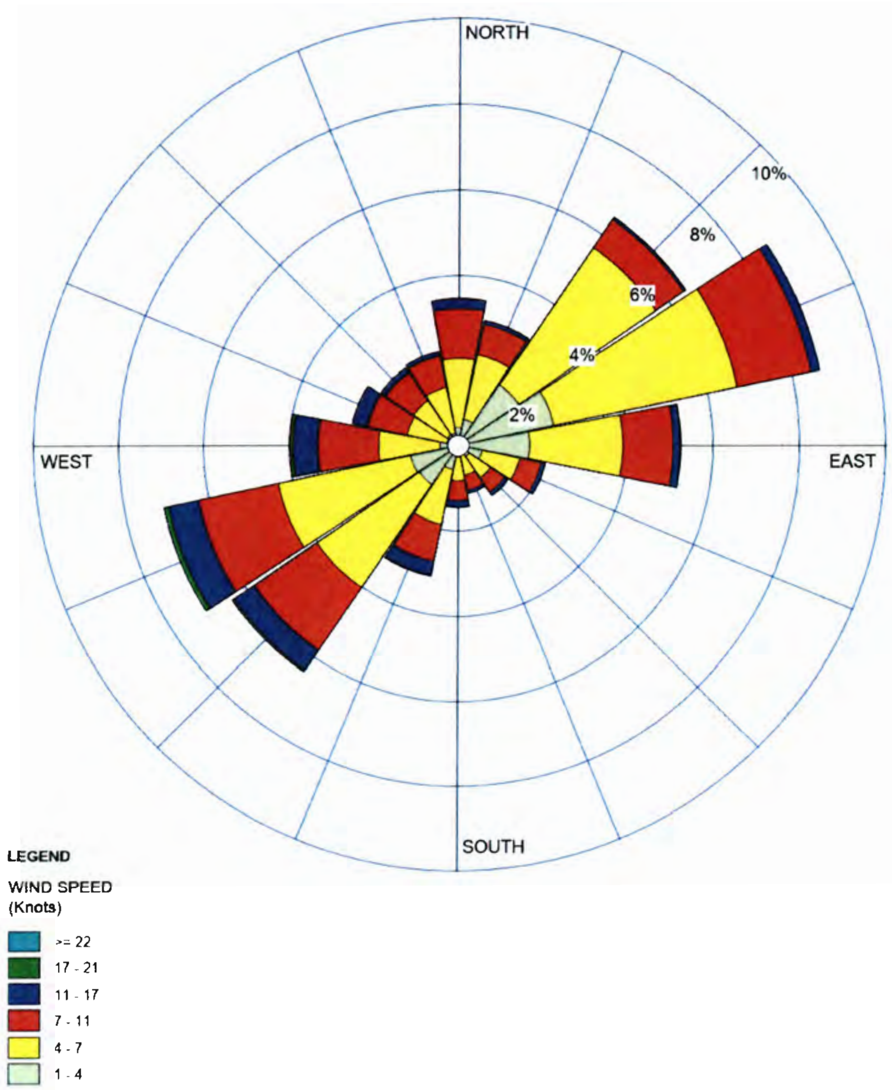
Specifications of wastes stored at ANAD are discussed in Section II C. Specification of wastes managed at treatment units are discussed in Section IV. Specifically, see Section IV C for OB, OD and RFM units, Section IV K C for the TTCDP, and Section IV L C for the ETU.

II B-1i Wind Rose

A wind rose for ANAD is included as Figure II B-3, which shows the average wind speed and direction from January 2009 through December 2013. Average total wind speed measured at the Anniston Airport is 3.58 knots.

WIND ROSE PLOT:
Station #13871 - ANNISTON METROPOLITAN ARPT, AL

DISPLAY:
Wind Speed
Direction (blowing from)



Calms 39.54%

Start Date. 1/1/2009 - 01:00
End Date 12/31/2013 - 23:00

Average Wind Speed. 3.58 Knots

FIGURE II B-3
Wind Rose *Anniston Army Depot Anniston, AL*

CH2MHILL.

1

II B-1j General Dimensions and Structural Description

Permitted storage unit design specifications are covered in Section II B-3b.

II B-2 Topographic Maps ADEM Admin. Code R.335-14-8-.02(5)(b) 19

In accordance with the requirements of ADEM Admin. Code R.335-14-8-.02(5)(b) 1, a topographic and other maps are used to detail the location and surrounding area of ANAD and the permitted storage units. The information includes topographic (contour maps), the location of surface waters, a wind rose, surrounding land use, and facility area designations.

II B-2a General Requirements

The topographic map, with a scale of 1 inch = 6,400 feet and encompassing ANAD, is shown on Figure II B-4. Topographic contours are displayed at 20-foot intervals. For large facilities and/or mountainous areas, other contours and scales may be appropriate provided that the pattern of surface water is clearly shown. This is the case with ANAD where the size of the facility requires the use of the larger scale. Surface water patterns are readily discernible on Figure II B-4. Legal boundaries around ANAD (i.e., the installation boundary) are also identified on the map.

Figure II B-5 shows land use within and in proximity to ANAD. Runoff at ANAD is controlled by three prominent drainage divides that divert surface water into drainage basins occupied by Choccolocco Creek to the east and south, Cane Creek to the north, and Blue Eye Creek to the west. The Cane Creek basin occupies the northern half of ANAD and the Blue Eye Creek basin includes the western portion of ANAD.

A layout map of the Bill Nichols Industrial Complex (East Area) with a scale of 1 inch = 400 feet is provided on Figure II B-6. This map shows the three hazardous industrial waste buildings (466, 512 and 527). .

These figures combined show the following features:

- Scale and date – shown on all figures
- 100-year floodplain area – shown on Figure II B-4
- Surface waters – shown on Figure II B-4
- Surrounding land use – shown on Figure II B-5
- Wind rose – shown on Figure II B-3
- Map orientation – shown on all figures
- Legal boundaries – shown on Figures II B-4 and II B-5
- Access controls (fences and gates) – shown on Figures II B-4 and II B-5
- Injection and withdrawal wells (onsite) – there are no Resource Conservation and Recovery Act (RCRA) injection wells on ANAD

- Buildings and other structures – shown on Figures II B-5 and II B-6
- Road and fire lanes – shown on Figures II B-5 and II B-6. Roads serve as fire lanes
- Drainage and flood control barriers – no hazardous waste storage units (hazardous industrial waste or WMM) are located within a 100-year floodplain and no barriers are required or in place at any HWSF
- Locations of all solid waste management units and areas of concern – addressed in Section VIII of the permit application

Land Use

Land use on and in the vicinity of ANAD is shown on Figure II B-5. ANAD was constructed in 1941. In 1962, the Depot employed 5,000 people. In 1995, ANAD employed 3,262 civilians and 7 military personnel. Today, ANAD employs approximately 4,200 personnel.

The small community of Bynum is located on ANAD's southern boundary. The remaining three boundaries are adjacent to sparsely populated areas. The northern boundary is Pelham Range, a wooded operational and training area that is licensed to the Alabama National Guard. Lightly populated rural lands border the eastern and western boundaries.

Land use within ANAD can be generally described as encompassing the following:

- The Bill Nichols Industrial Complex to the south, described as medium intensity/ developed land use
- The Ammunition Limited Area (ALA) encompassing the bulk of the Depot lands where WMM igloos and conventional munitions treatment/disposal operations occur. The ALA is described as open space/developed land use

Land use in the immediate area surrounding the hazardous industrial waste container storage units includes the Bill Nichols Industrial Complex to the south, where most of the industrial/process hazardous waste is generated. To the west are parking areas associated with the Industrial Complex and the ALA. The Depot boundary lies approximately 800 feet north of the hazardous industrial waste units across a relatively deep drainage course.

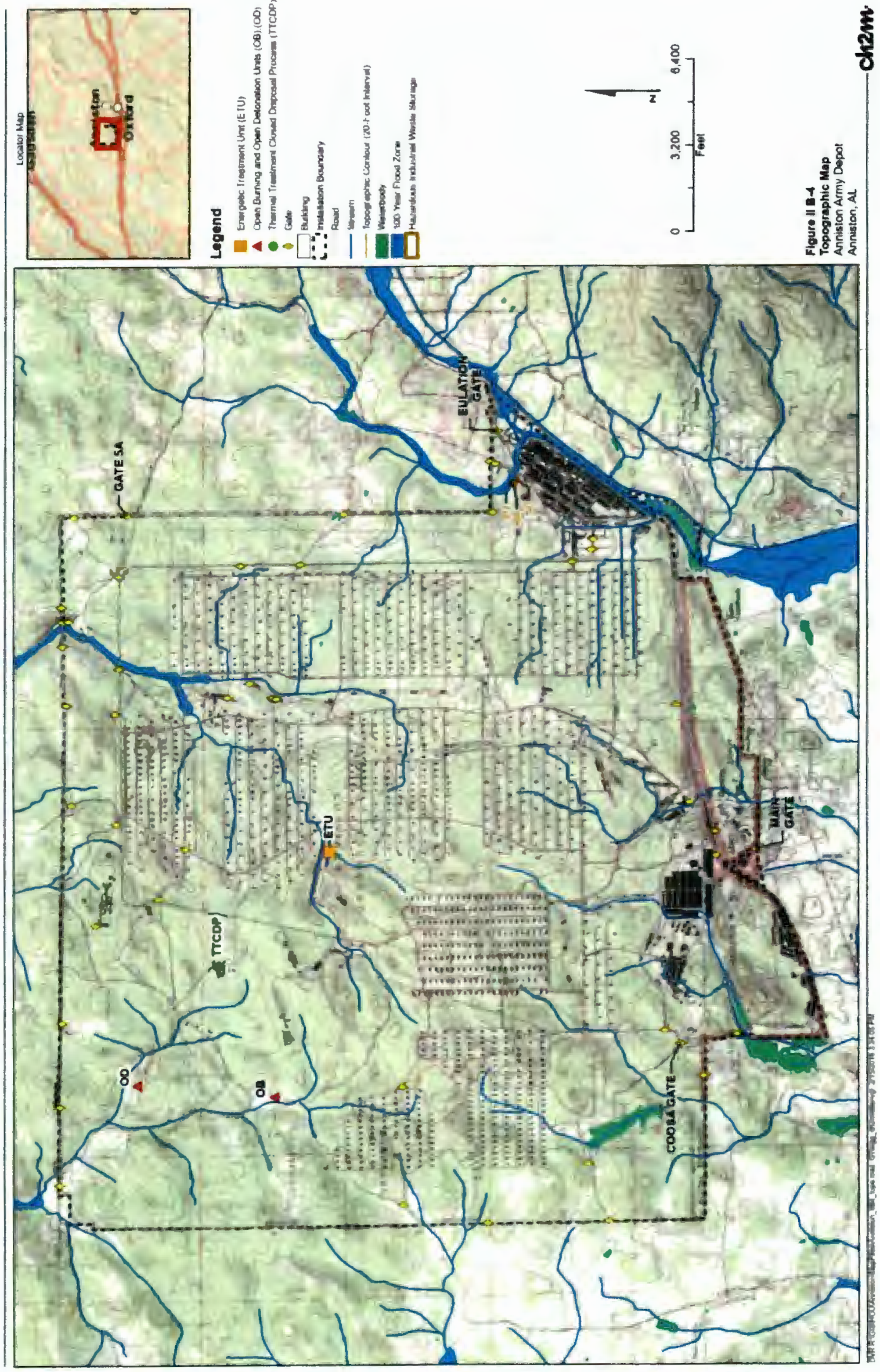
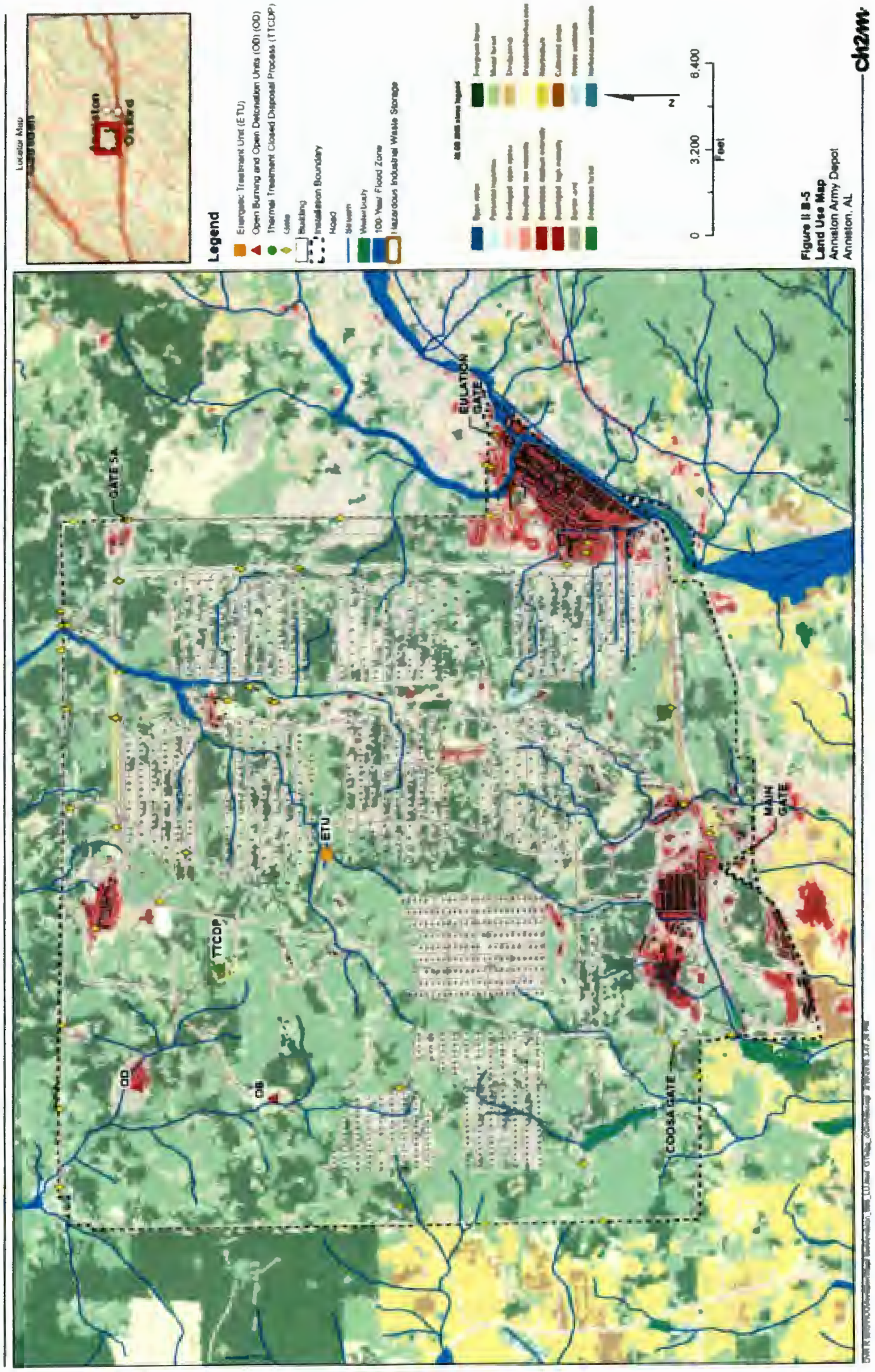


Figure II B-4
Topographic Map
Anniston Army Depot
Anniston, AL

1


Locator Map
Anniston
Oxford
Legend
Energetic Treatment Unit (ETU)
Open Burning and Open Detonation Units (OB/OD)
Thermal Treatment Closed Disposal Process (TTCDP)
Gate
Building
Installation Boundary
Road
Stream
Waterbody
100 Year Flood Zone
Hazardous Industrial Waste Storage
0
3,200
6,400
Feet
N
Figure II B-5
Land Use Map
Anniston Army Depot
Anniston, AL
ch2m
GATE 5A
EULATION GATE
MAIN GATE
COOSA GATE
ETU
TTCDP
OD
OB

1

Figure II B-6
Bill Nichols Industrial Complex
(East Area) Layout Map
Anniston Army Depot
Anniston, AL

1

Figure B-7
RESERVED

Precipitation

Normal precipitation in Anniston, Alabama, is 53 inches per year, of which nearly all occurs as rain. Highest rainfalls are in March, averaging 6.34 inches. Lowest rainfalls are in October, averaging 2.74 inches.

Rainfall run-off and run-on protection for all storage units is provided through construction design as described in Section II B-3b.

Surface Waters

Runoff at ANAD is controlled by three prominent drainage divides that divert surface water into drainage basins occupied by Choccolocco Creek to the east and south, Cane Creek to the north, and Blue Eye Creek to the west. Within ANAD, the Choccolocco Creek drainage basin is divided into sub-basins of approximately equal area defined by the watersheds of Eastaboga Creek, which drains the southwestern portion of ANAD and of Dry Creek, which drains the southeastern portion, including the Bill Nichols Industrial Complex. The Cane Creek basin occupies the northern half of ANAD and additionally includes the west side of Choccolocco Mountain, Ft. McClellan, Pelham Heights, Blue Mountain, and Pelham Range. The Blue Eye Creek basin includes the western portion of ANAD and the areas west to the confluence of Blue Eye Creek with the Coosa River.

Dry Creek provides the principal surface-water drainage for the southeastern portion of ANAD, as well as the northwest side of Coldwater Mountain, and a large area to the northeast of the Bill Nichols Industrial Complex. Dry Creek originates on the southwest side of Anniston and flows southwest toward ANAD, intersecting with the Bill Nichols Industrial complex just north of Building 512. The creek then flows southward along the eastern boundary of the Bill Nichols Industrial complex and eventually flows into Choccolocco Creek, approximately 2.5 miles south of ANAD.

Within the Dry Creek drainage basin, a number of small, intermittent, ephemeral and perennial streams and gullies contribute to the flow of Dry Creek. A portion of Dry Creek was diverted from its natural channel during construction of the Bill Nichols Industrial Complex and now follows a channel constructed along the eastern boundary of the site.

There are no RCRA injection wells on ANAD, or within 1,000 feet of the hazardous waste management areas. Groundwater monitoring wells are located at several locations around closed disposal sites. Point of compliance groundwater monitoring networks are additionally located at the permitted OB and OD treatment units discussed in Section IV E of the permit application. Withdrawal wells are located at three groundwater treatment facilities.

II B-2b Additional Topographic Requirements for Land, Storage, Treatment, and Disposal Facilities ADEM Admin. Code R.335-14-8-.02(5)(c) 3

Not applicable.

II B-3 Description of Storage Units
ADEM Admin. Code R.335-14-5-.09 (6)(b)

II B-3a Location

Figure II B-2 shows the location of all ANAD hazardous waste management units (storage units and miscellaneous thermal treatment/disposal units) requiring a hazardous waste operating permit.

The three industrial waste buildings and roll-off box are located in the southeast portion of ANAD, known as the Bill Nichols Industrial Complex. Building numbers associated with these three container storage buildings are 466, 512, and 527. Roll-off box storage is located at Building 466.

II B-3b Design
ADEM Admin. Code R.335-14-8-.02(6)(a) 1

This section (Section II B-3b) describes the storage units design, including the base, containment systems, and run-on controls. Additional information on how run-on liquids can be analyzed and removed is provided in Section II B-3c.

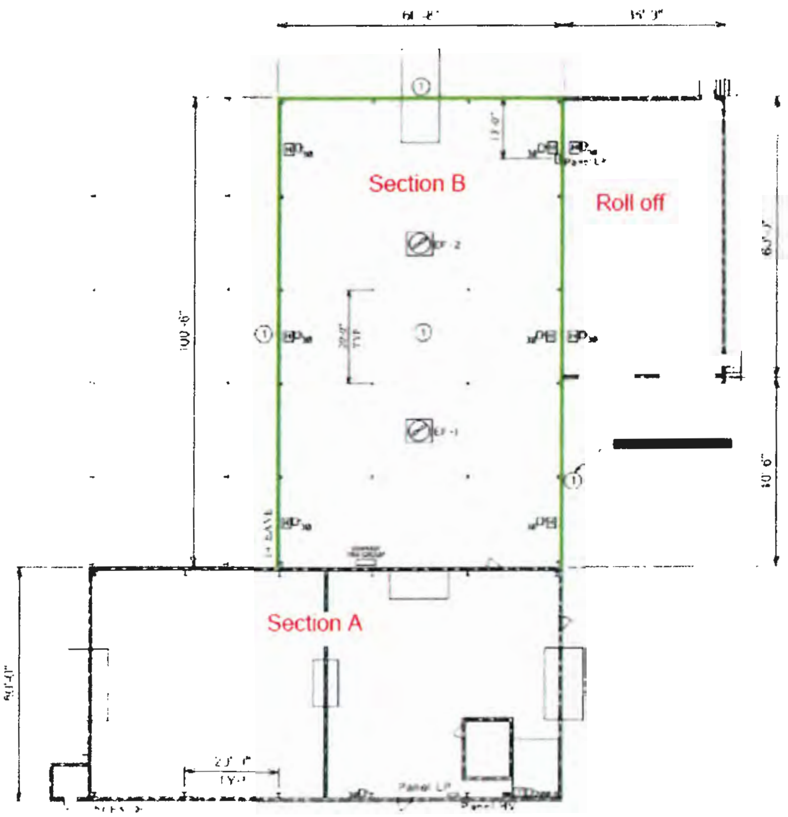
The WMM igloos design is in compliance with Department of Defense Explosive Safety Board (DDESB) standards. WMM igloosare designed to prevent any entrance of precipitation; therefore, management of run-on and run-off is not needed. The floors are non-seamed reinforced concrete. WMM igloo areas are designed to prevent run-on.

II B-3b(1) Hazardous Industrial Waste Container Storage

II B-3b(1)(a) Building 466

Building 466 consists of three sections: 466A, 466B and roll-off box storage. All structures are enclosed and have steel super-structures with metal siding and roofs.

466A has approximately 5,000 square feet of floor space (100 feet by 50 feet) and is 20 feet high at the lowest point. The enclosed portion of the building has a storage capacity of 504 fifty-five-gallon drums or 27,720 gallons. The secondary containment capacity of the building, excluding ramp, office and scale areas, is 16,230 gallons. The floor consists of 4 inches of crushed gravel, a 6-mil polyethylene vapor barrier and a 6-inch poured concrete floor with an integral 6-inch high curb around the perimeter, preventing any run-on or run-off. A 6-inch high curb physically divides the floor space of the enclosed portion into two equal areas. Each area has access ramps and the north, east and west walls have 16-foot wide roll-up doors. Of the 5,000 square feet of floor space, approximately 400 square feet is required for ramp areas, 140 square feet for scales, and 120 square feet for office space. Also, 3,220 square feet is reserved for aisles and storage of equipment and supplies. This leaves approximately 1,120 square feet for waste container storage space.



BUILDING 466

Figure II B-8
Building 466 Floor Plan

1

466B has approximately 6,000 square feet of floor space (60 feet by 100 feet) and is 13.5 feet high at the lowest point. The addition has a storage capacity of 1,260 fifty-five-gallon containers or 69,300 gallons. The maximum secondary containment capacity of the addition, excluding ramp areas, is 32,395 gallons. The floor consists of 6 inches of crushed gravel, a 6-mil polyethylene vapor barrier and a 6-inch poured concrete floor with a 9-inch concrete curb around the perimeter, preventing any run-on or run-off. Each opening has an access ramp. Of the 6,000 square feet of floor space, approximately 225 square feet is required for the two ramp areas, 2 feet of free space on the east and west walls, and 2,575 square feet is reserved for aisle space. This leaves approximately 2,800 square feet of actual storage area.

Figure II B-8 shows the basic floor plan of each section of Building 466. Figures II B-9 through II B-12 are photographs of the building.

Building 466A has secondary containment capacity of about 16,230 gallons, or about 58 percent of the working storage volume (27,720 gal). Building 466B has secondary containment capacity of about 32,395 gallons, or about 47 percent of the working storage volume (69,300 gal). Building 466A and 466B each has a concrete floor with a chemical resistant coating and is sealed. This allows compatibility of waste with the floor.

Roll-off Box Storage (part of Building 466)

Roll-off containers are stored in the roll-off box storage building (Building 466). No free liquids are accumulated in these containers at the Depot. Prior to storage, the absence of free liquid is verified either by generator knowledge or by analytical testing. In the event that free liquid is found in a roll-off box, the waste will be transferred to another container for proper storage. At no time will containers with free liquids be stored in the roll-off box storage building.

The roll-off box storage building is the only industrial storage unit at the Depot that specifically stores wastes that do not contain free liquids. The building has been built to the specifications that follow. Figure II B-13 shows the basic construction design for this building. Specific information on how the building design demonstrates compliance with ADEM Admin. Code R.335-14-5-.09(6)(c) is contained in the subsequent paragraphs and on Figure II B-14.

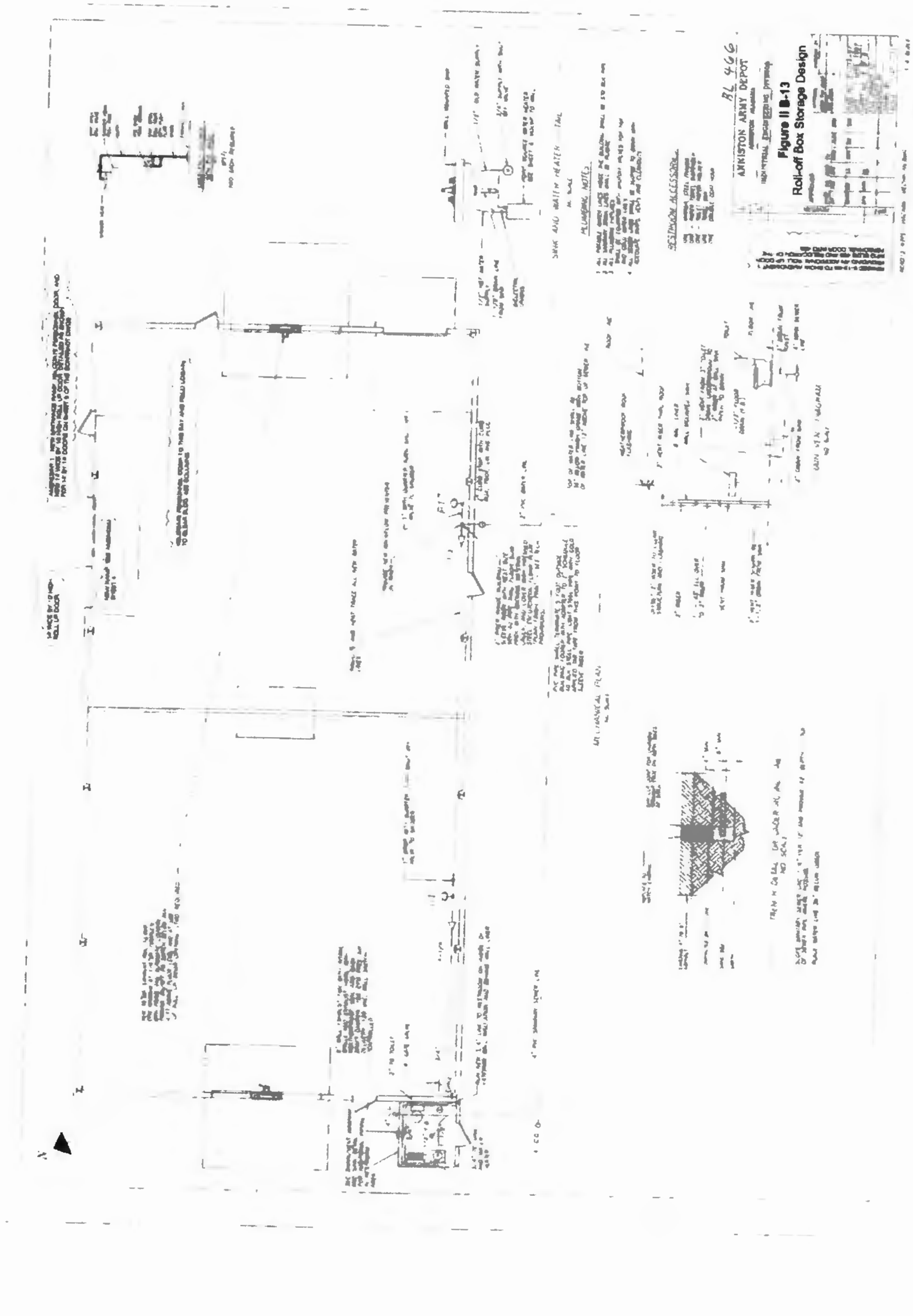
The structure measures 35 feet wide by 60 feet long by 14 feet high (eave height) and have the capacity to store four roll-off boxes with a capacity of 40 cubic yards per roll-off box. Personnel access is provided with two 3-foot by 7-foot hollow metal doors that lock to prevent unauthorized access. Roll-off boxes are delivered through two manually operated roll-up steel doors.

FIGURE II B-9
Building 466 Exterior - Container Storage Portion

FIGURE II B-10
Building 466 Exterior - Roll-off Box Portion

FIGURE II B-11
Building 466 Interior – Container Storage

FIGURE II B-12
Building 466 Interior – Roll-off Box Storage


BL 466
ANNISTON ARMY DEPOT
Figure II B-13
Roll-off Box Storage Design

1


ANNISTON ARMY DEPOT
Figure II B-14
Roll-off Box Storage Roof Design

1

The structure has a 20 pound per square foot (psf) live load (with no reduction to the loads), 15 pounds psf snow load, and 90-mile-per-hour (mph) wind load. The roof is a 24-gauge R-panel insulated with 1.5-inch vinyl faced fiberglass insulation. The building is ventilated with three 24-inch wind driven roof ventilators. The walls are constructed of siding insulated with 2-inch vinyl faced fiberglass insulation. Column foundations are constructed of 4,000 pounds per square inch (psi) fiber-reinforced concrete with isolation joints placed around them. A 4-inch minimum height by 12-inch minimum width concrete curb reinforced with two #5 bars are in place around the new building. The curb is doweled to the existing concrete by inserting 12 #5 dowels 4 inches into the existing concrete at 4-foot intervals. The curb area is sloped away from the roll-up doors to drain rainwater to the outside of the building. A 4-inch minimum height concrete slab for the building area is placed on top of the existing slab, with 30# felt under the new slab. The slab slopes toward the back of the building to provide a 4-inch containment area at the deepest point. An entrance ramp is placed in front of the roll-up doors. The ramp is 4 inches high (at its highest point) by 20 feet long by 36 inches wide and 6 inches thick. Three-foot by 3-foot stoops are in front of personnel doors. The top of the building columns and footings are at the same level as the stoops. The slab and ramp are reinforced with 6-inch by 6-inch wire mesh and the concrete will be 4,000-psi fiber reinforced concrete. Control joints are saw-cut every 20 feet and sealed with joint sealant. The slab is sealed with two coats of polyurethane. Interior lighting is provided by three 175-Watt pendant mounted lights. Emergency eye wash and showers are also installed.

The slab surrounding the exterior of the roll-off box building is sloped away from the building. A concrete ramp (4 inches at the highest point, 20 feet long and 36 feet wide) is constructed in front of the roll-up doors. This provides drainage away from the building. The floor in the interior of the building is sloped toward the rear at a rate of 1/16th inch per foot. The boxes are stored two wide and two deep in the building, with the rear-most boxes at no less than 5 feet from the rear wall of the building. All containers are braced to prevent slippage. This provides a capacity of approximately 14 gallons of standing water that will not contact the rear-most boxes should run-on occur. When the building is not at maximum capacity, roll-off boxes are stored toward the front of the building, which will increase run-on capacity.

II B-3b(1)(b) Building 512

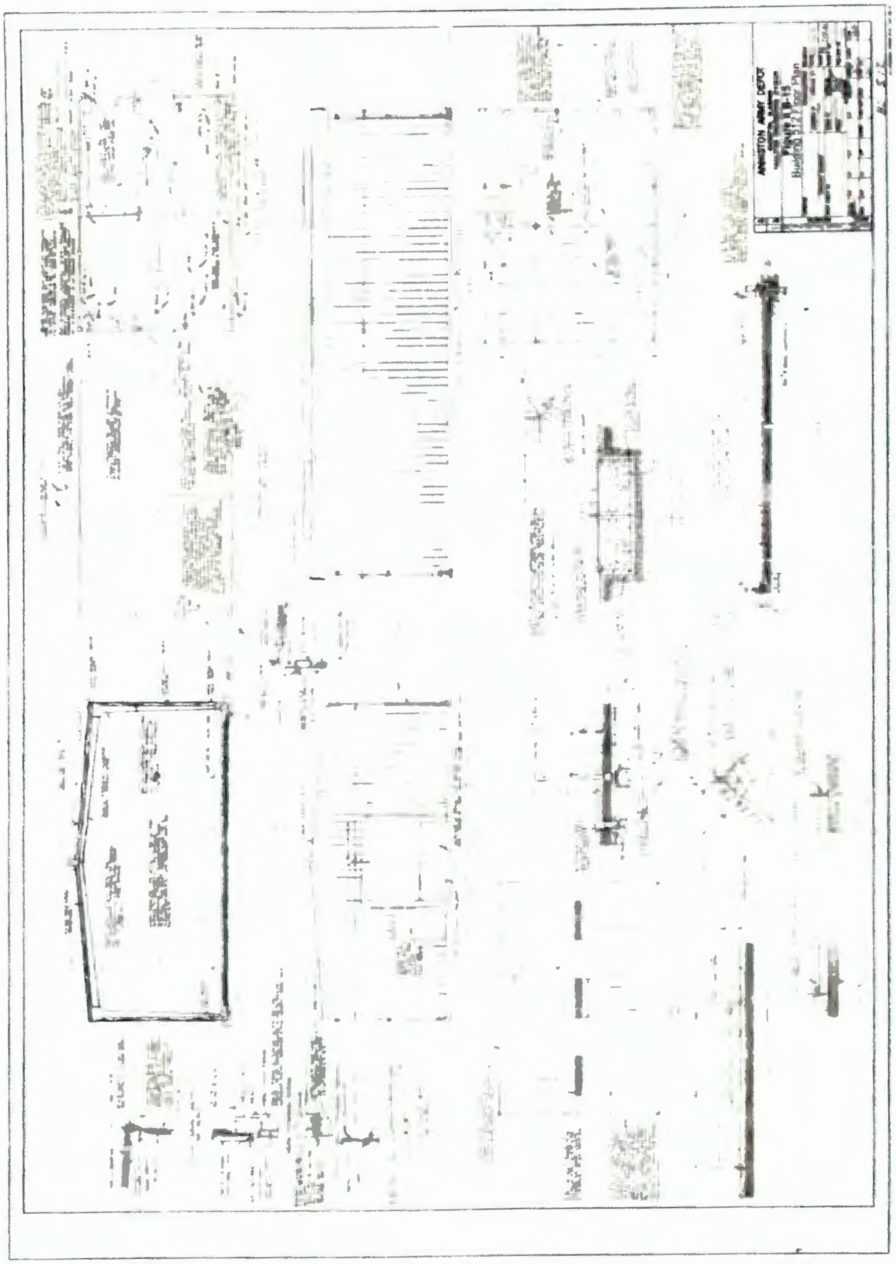
Building 512 has a storage capacity of approximately 480 fifty-five-gallon containers or 25,440 gallons. Building 512 has a steel super structure and galvanized siding and roof. The floor consists of 6 inches of crushed gravel, a 6-mil polyethylene vapor barrier and a 6-inch poured concrete chemical resistant flooring with a 9-inch high concrete curb around the perimeter preventing any run-on or run-off. The building has approximately 2,400 square feet of floor space (40 feet by 60 feet) and is 17 feet high at the lowest point. Of this floor space, 225 square feet is required for two ramp areas and 18 square feet is utilized for sump capacity. Additionally, 2 feet of free space is left on each wall and approximately 505 square feet is reserved for aisle space. This leaves approximately 1,441 square feet of actual storage area. This storage area is physically divided by a fire-resistant concrete block wall into two equal areas. Each area has an access door and ramp. The storage facility is equipped with overhead lighting, two emergency showers, and natural draft roof ventilation. An overhead fire sprinkler system provides fire protection for the northern area of the building. Motorized roll-up overhead doors are provided and the building is locked when not in use to prevent unauthorized entry. The building is located more than 50 feet from the facility property line. Figure II B-15 shows the basic floor plan of the facility. Figures II B-16 and II B-17 are photographs of the storage facility.

Building 512 has secondary containment capacity (excluding the sumps) of about 12,750 gallons or about 50 percent of the working storage volume (25,440 gal). Building 512 has a concrete floor with a chemical resistant coating and is sealed. This allows compatibility of waste with the floor.

II B-3b(1)(c) Building 527

Building 527 has a storage capacity of approximately 840 fifty-five-gallon containers or 44,520 gallons. Building 527 has a steel super structure and galvanized siding and roof. The floor consists of 6 inches of crushed gravel, a 6-mil polyethylene vapor barrier and a 6-inch poured concrete floor with a 9-inch high ramp and curbing, preventing any run-on or run-off problems. The building has approximately 5,000 square feet (100 feet x 50 feet). The concrete floor has a chemical resistant coating and is sealed, which allows compatibility of waste with the floor. Roll-up doors (14 feet by 14 feet) are located on one end and one side of the building. Communication equipment and emergency eye wash with shower is located in Building 527. Currently, half of Building 527 is being used for office space and supply storage. Normal maximum volume will be 420 fifty-five-gallon containers or 22,260 gallons until the office and storage space has been removed and the remainder of the building can be utilized. Figure II B-18 shows the basic floor plan of the facility. Figures II B-19 and II B-20 are photographs that show the basic design of the facility and layout.

Building 527 has secondary containment capacity of about 26,625 gallons, or about 60 percent of the working storage volume (44,520 gal). Only half of the total storage volume is used in Building 527 as a result of office space and supply storage located on one end of the building.



1

FIGURE II B-16
Building 512 Exterior

FIGURE II B-17
Building 512 Interior

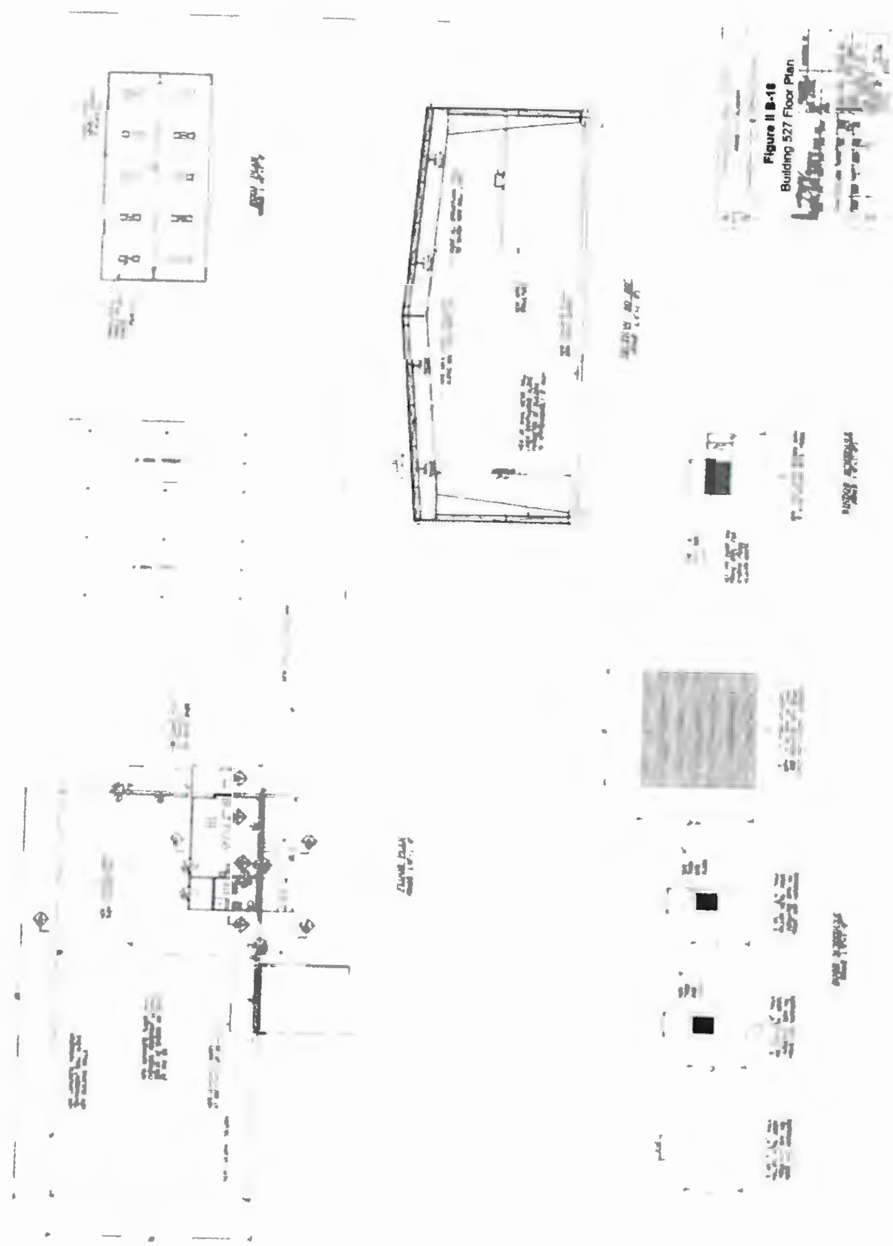


Figure II B-18
Building 527 Floor Plan

1

FIGURE II B-19
Building 527 Exterior

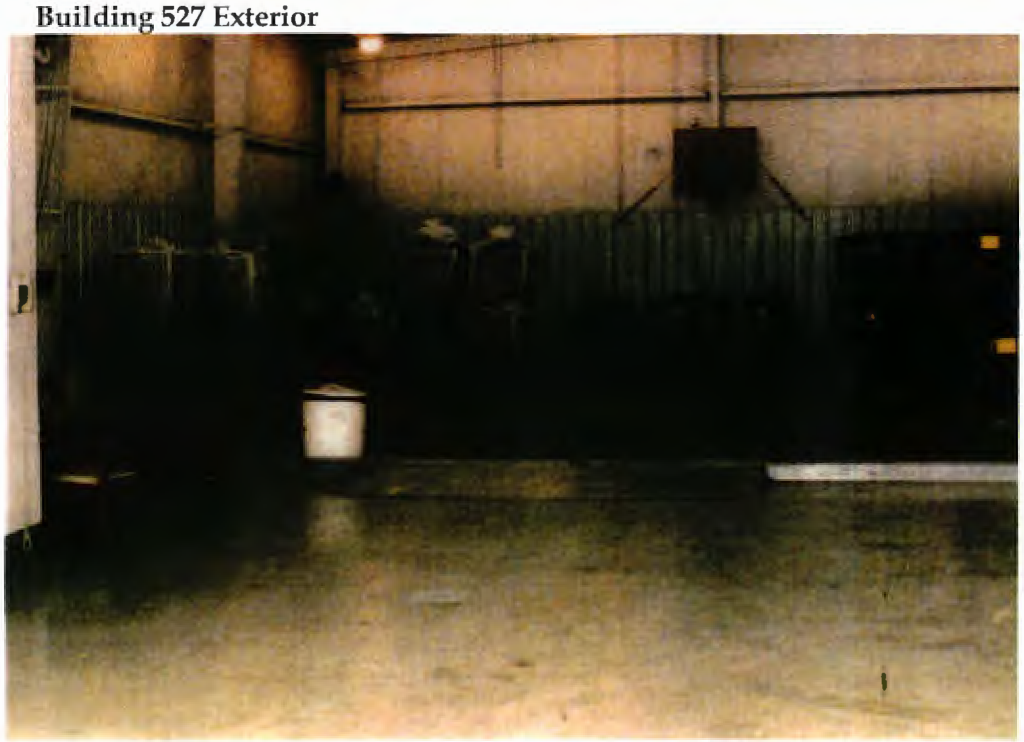


FIGURE II B-20
Building 527 Interior

II B-3b(2) WMM Igloos

Conventional munitions that have been deemed a waste in accordance with the MMR and are received or scheduled for treatment may be stored in one of the designated WMM igloos listed in Table II B-1. Secondary wastes related to WMM thermal treatment/disposal at the OB, OD, TTCDP or ETU treatment units may also be stored. WMM igloos are constructed and maintained in accordance with DDESB standards and satisfy the MMR requirements. Figures II B-21 and II B-22 are photographs showing the typical igloo construction.

Storage dimensions and volumes are listed in Table II B-1. The storage volume of the igloos was calculated by determining the maximum volume occupied by the M55 rockets as they were packaged for storage (pallet and dunnage approximate dimensions 83 inches long, 31 inches wide, and 31.25 inches high).

TABLE II B-1
Dimension and Volume of WMM Igloos

I-103	23′6″ x 12′9″ x 80	60,083
F-704A	23′6″ x 12′9″ x 80	60,083
F-405	23′6″ x 12′9″ x 80	60,083

Igloos used for storage of WMM are designed for munitions storage and are covered with soil to reduce explosive hazard. All igloos are covered with vegetation or a thermoplastic membrane to mitigate erosion. All igloo storage areas are located at least 300 feet from each other. The design of the igloos does not allow for entrance of precipitation. Re-enforced (re-bar) concrete is 18 inches at the base and slopes to 12 inches at the top of igloos. This design is for blast purposes (weakest point top of igloo, so a blast will go up, instead of to the sides, which will preclude the blast from propagating to adjoining igloos). The head wall (door area) is also designed to blow first; which is why igloos are staggered and are not facing each other. Two to 3 feet of dirt are on top of each igloo. The floors are non-seamed reinforced concrete. The concrete floor is 6-inch reinforced concrete and is presently in good shape. The roofs of the igloo storage areas are weather tight; therefore, run-on is not a problem. Igloo storage areas drain to the outside; therefore, hazardous waste liquids contained in munitions rely on outer shipping containers and/or drip pans as secondary containment.

FIGURE II B-21
Igloo Basic Layout

FIGURE II B-22
Igloo

II B-3c Other Types of Units
ADEM Admin. Code R.335-14-8-.02

Not Applicable

II B-3d Operation
ADEM Admin. Code R.335-14-8-.02(6)(a) 2

Operations Specific to the Container Storage Areas

Containerized hazardous industrial waste will be stored in Buildings 466, 512, and 527. Secondary wastes related to WMM thermal treatment/disposal at the OB, OD, TTCDP or ETU treatment units may also be stored.

Prior to placement in storage areas, the waste is containerized in steel containers that are constructed of low carbon steel that meets U.S. Department of Transportation (DOT) packaging requirements and bulk plastic bags. Epoxy phenolic linings, or polyethylene (plastic) protects containers storing corrosive waste. Transfer of containers to the container storage areas is performed by truck or forklift. Gasoline or propane powered forklifts will be used to load or unload the containers from the truck. Containers of waste are stored on flat pallets to elevate them from coming into contact with standing liquids in the storage buildings should any accidental spill occur.

Steel DOT-approved roll-off boxes will be used for waste storage in the roll-off box storage building. No more than four roll-off boxes will be stored in this building at any time. The roll-off boxes will be covered.

Standard industrial absorbents will be used to clean up small leaks or spills. Containment and pumping of rainfall is not necessary since the buildings are weather tight. All materials and absorbents used in the cleanup are placed in containers, labeled, and analyzed for suspected contaminants. Waste will be handled and analyzed in accordance with the Waste Analysis Plan (WAP) sampling and analysis plan found in Section II C. Any accumulated liquid will not overflow until the curb capacity of each building is exceeded (approximately 12,750 gallons for Building 512; 16,230 gallons for Building 466A; 32,395 gallons for Building 466B; and 26,625 for Building 527). No sumps are located in the roll-off box storage building or in Buildings 466A/B, or 527. Building 512 has a sump capacity of 134 gallons. Standard industrial absorbents will be used immediately to clean up spills in these locations. Used absorbents will be properly classified and placed in DOT labeled containers.

Operations Specific to WMM Igloo Storage

Munitions that will be stored in igloos will be stored in specially designed holders, such as wooden crates or pallets, or metal pallets which may be in turn stored upon flat pallets further removing the munitions from contact with the floor and any accumulated liquids. Munitions that are placed in containers will also be placed on flat pallets. The flat pallet serves to elevate the munitions and containers from coming into contact with any free standing liquids in case of an accidental spill or leak.

Storage of non-leaking liquid munitions in their shipping or storage container is considered a means of secondary containment.

General Container Management Operations

Approved DOT containers or roll-off boxes are used for hazardous wastes that are generated at ANAD. These containers may range from 5-gallon to an 85-gallon over-pack that is used for leaking containers. Roll-off boxes range from 15 to 40 cubic yards each. The majority of the processed waste will be in 55-gallon steel containers that are constructed of low carbon steel, while corrosive waste will be placed in epoxy or polyethylene (plastic) containers or in steel containers protected by epoxy phenolic linings, or polyethylene liners. Waste containers within container storage areas will not be stacked over two rows high for 55-gallon, or 85-gallon containers.

Prior to transfer to any of the container storage areas, all wastes are placed in the proper container, sealed, and labeled according to regulations for hazardous waste. Transfers of containers to container storage areas are performed by truck or forklift. Roll-off boxes are loaded and unloaded by truck and can be moved by gasoline or propane powered forklifts. All other containers are loaded and unloaded from the truck by gasoline or propane powered forklifts. During the transfer of containers, incompatible wastes are always transported in separate vehicles.

With the exception of roll-off boxes, all containers of waste will be placed on pallets prior to transport to the container storage area. This will elevate the containers of waste from contact with standing liquids should any accidental spill occur.

Emergency response guidance can be found in Sections II G of this application.

Inspection requirements are discussed in Section II F-2 and listed in Table II F-1. Aisle space requirements are provided in Section II F-3b.

II B-3e Maintenance

Deterioration or malfunction (of equipment or structures) discovered during an inspection will be corrected and maintained.

II B-3f Monitoring

Not Applicable

II B-3g Inspection

Storage unit inspection requirements are covered in Section II F.

II B-3h Closure
ADEM Admin. Code R.335-14-5-.30(3)(a)

The closure and post-closure requirements for storage units are listed in Section II I.

II B-4 Location Information
ADEM Admin. Code R.335-14-8.02(5)(b) 11

ANAD is located in Calhoun County and is in compliance with the seismic requirements of this regulation. ANAD is not located in any of the political jurisdictions listed in ADEM regulations.

II B-4a Seismic Considerations
ADEM Admin. Code R.335-14-8-.02(5)(b) 11

The seismic standards pertain only to owner or operators of a new facility that must identify the political jurisdiction in which the facility is proposed to be located. If the facility is to be located in an area listed in ADEM Admin. Code R.335-14, the owner or operators will demonstrate compliance with the seismic standard using either published geologic data or data obtained from field investigations carried out by the applicant.

ANAD is an existing hazardous waste facility and, therefore, is not subject to these standards. In addition, the facility is not located in any of the political jurisdictions specified in ADEM Admin. Code R.335-14 and, therefore, the seismic standard does not apply.

II B-4b Floodplain Standard
ADEM Admin. Code R.335-14-8-.02(5)(b)

ANAD is located in Calhoun County in northeastern Alabama within the valley and ridge province of the Appalachian Highlands. ANAD occupies 15,246 acres of land. The only portion of ANAD that is located in the 100-year floodplain is a canal that runs alongside the maintenance area of the ANAD. The 100-year floodplain is shown in the Topographic Map provided as Figure II B-4.

II B-5 Traffic Information of Existing Roads
ADEM Admin. Code R. 335-14-8-.02(5)(b)10

This section describes the traffic pattern, estimated volume, control, and access road(s) surfacing and load-bearing capacity for transporting hazardous waste.

Existing Roads

Most of the traffic volume is limited to the southwest and southeast portions of the facility. The largest portion of ANAD is used for munitions storage and has only minimal traffic. The road system consists of 113 miles of paved and 104 miles of unpaved roads with most of the unpaved roads located in the igloo storage area. The unpaved roads range from 16 to 22 feet wide, and the paved roads are generally 22 feet wide although some are as wide as 24 feet.

External Access

The major highways serving the ANAD are I-20 and US 78, running east and west, and US 431, running north and south. The main access to ANAD is from Alabama State Highway 202 by way of a 24-foot asphalt road with 10-foot shoulders through the Main Gate. This road is used by most employees and by commercial trucks. Commercial trucks may also access through Gate 5A via the Morrisville Road on the north side of the ALA. Eastbound employees exit through the Eulaton Gate. All other gates are normally closed to traffic. The movement of hazardous waste leaving ANAD is typically through the Main Gate or Gate 5A.

II B-5a Estimate of the Number and Types of Vehicles around the Facility

Approximately 4,200 vehicles enter and leave ANAD each workday. In addition, approximately 6,500 trucks are processed at ANAD each year. Essentially all civilian and truck traffic occurs on weekdays.

II B-5b Information about Waste Transfer and Pick-Up Stations

The internal transportation of hazardous waste at ANAD is the responsibility of each directorate. The Hazardous Waste Storage Facility (Building 527) maintains records on hazardous waste in storage. The Environmental Coordinator maintains records on all hazardous waste shipped off ANAD. The following procedures are followed for the transport of hazardous waste at ANAD:

- The specific shop that generates the waste containerizes the waste in appropriate containers and affixes the proper label.
- Appointed personnel within the shop make arrangements for the pick-up and transport of the waste to the container storage buildings.
- A DD Form 1348-1 turn-in document is completed for turn-in.
- Hazardous wastes are transported by forklift or flatbed trucks to the container storage buildings.

II B-5c Quantity of Waste Moved per Movement per Vehicle

The quantity of waste moved per movement per vehicle is dependent upon the capacity of the vehicle. At no time will the capacity of the vehicle moving hazardous waste be exceeded.

II B-5d Traffic Control Signs and Persons

Traffic is controlled by several means:

- All major road intersections have traffic control lights, check gates, or stop signs.
- All secondary road intersections have stop signs or yield signs.
- Speed limits are well posted.
- Civilian federal employee guard forces regularly patrol all traffic ways and enforce traffic regulations.

II B-5e Road Surface Composition and Load-Bearing Capacity

All roads described can be used to transport hazardous waste to the waste storage buildings. Most of the waste is generated within the industrial area and transported directly to the container storage area.

Most of the traffic volume is limited to the southwest and southeast portions of the facility. (The OB and OD units are located in the northwest portion.) The largest portion of ANAD is used for munitions storage and has only minimal traffic. The road system consists of 181 kilometers (113 miles) of paved and 166 kilometers (104 miles) of unpaved roads, with most of the unpaved roads located in the igloo storage and munitions demolition areas. The unpaved roads range from 4.89 to 6.7 meters (16 to 22 feet) wide, and the paved roads are generally 6.7 meters (22 feet) wide, although some are as wide as 7.2 meters (24 feet). Unpaved roads are primarily confined to the restricted area.

Roads used in transporting hazardous waste are capable of bearing loads up to 50,000 pounds per axle, which is more than sufficient for any anticipated traffic.

Section II C (PROOF)

II C Waste Characteristics

Section II C describes the chemical and physical characteristics of hazardous wastes to be stored at ANAD. Section II C also includes a Waste Analysis Plan (WAP), which outlines the parameters of sampling, testing, and evaluation of all wastes stored at ANAD to ensure that sufficient information is available for their safe management. In addition, this information will be used to ensure that all wastes are stored in compliance with ADEM regulations.

II C-1 Chemical and Physical Analysis of Wastes ADEM Admin. Code R.335-14-8-.02(5)(b)2

Three basic types of hazardous wastes may be generated and/or stored at ANAD: industrial waste, WMM, and secondary wastes related to WMM thermal treatment/disposal at the OB, OD, TTCDP, or ETU treatment units. ANAD stores all three basic types of waste.

IIC 1a Containerized Waste

Industrial Wastes

ANAD generates a variety of industrial waste streams that are considered hazardous because of the processes by which they are generated. Other wastes are considered hazardous because of their properties, such as ignitibility, corrosivity, toxicity, or reactivity. These wastes are generated throughout the Depot from several different processes such as cleaning, plating, degreasing, sandblasting, painting, thermal treatment and plant operations. Other wastes that may be generated at ANAD include spill residues, contaminated soils, rags, and absorbents. These wastes with associated hazardous characteristics are listed in Table II C-1. Table II C-1 identifies each of the known and potential hazardous wastes to be stored at ANAD along with their appropriate EPA waste codes and hazard code (i.e., basis for the listing).

TABLE II C-1
Waste Characteristics –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

No.	Waste Description	EPA Waste Codes	Hazard Codes (I,C,R,E,H,T)
I-01	Paint Residue	D001, D005, D006, D007, D008, D010, D015, D018, D019, D028, D035, D039, D040, D043, F002 F003, F005	E,I,T
I-02	Paint Overspray	D006, D007, D008, D015, D018, D019, D028, D029, D035, D039, D040, D043,	E
I-03	Dried Paint with Cans	D006, D007, D008, D015, D018, D019, D028, D029, D035, D039, D040, D043,	E
I-04	Liquid Paint with Cans	D001, D006, D007, D008, D015, D018, D019, D028, D035, D039, D040, D043,	E,I
I-05	Paint Solvent	D001, D006, D007, D008, D015, D018, D019, D028, D029, D035, D039, D040, D043, F002, F003, F005	E,I,T

TABLE II C-1
Waste Characteristics –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

No.	Waste Description	EPA Waste Codes	Hazard Codes (I,C,R,E,H,T)
I-06	Paint Filters	D001, D006, D007, D008, D015, D018, D019, D028, D035, D039, D040, D043, F003, F005	E,I,T
I-07	Cleaning and Degreasing Solvents	D001, D002, D005, D006, D007, D008, D010, D018, D029, D035, D039, D040, F001, F002, F003, F005, U002	C,E,I,T
I-08	Chemical Vat Filters/Liners	D002. D006, D007, D008	E,C
I-09	Petroleum Naphtha	D029, D040	E
I-10	Waste Acids	D001, D002, D004, D005, D006, D007, D008, D010, D011, D022, D035, D039, D040, F002	I,C,E,T
I-11	Waste Caustics	D001, D002, D006, D007, D008, D010, D011, D021, D027, D029, D039 , F007, F008	C,E
I-12	Purge Water	D006, D007, D008, D029, D040, F001, F002, F003, F005	E,T,I
I-13	Detergent Soaps	D006, D007, D008, D035	E
I-14	Steam Cleaning Sludge, Liquid	D006, D007, D008, F002	E,T
I-15	Steam Cleaning Sludge, Solid	D006, D007, D008	E,T
I-16	Metal Finishing Solvents	D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D021, D022, D027, D026, D028, D030, D032, D033, D035, D036, D039, D040, D041, D042, D043, F001, F002, F003, F005, F007	C,E,I,T,R
I-17	Filters from ANAD	D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D018, D021, D022, D027, D028, D035, D039, D040, D043, F001, F002, F003, F005	I,C,R,E,T
I-18	Alodine	D002, D006, D007, D008	C,E
I-19	Blasting Media	D004, D005, D006, D007, D008, D009, D010, D011	E
I-20	Socks/Bags/Filters from Blasting & Welding Operations	D004, D005, D006, D007, D008	E
I-21	Contaminated Antifreeze from disassembly process and/or automotive shops	D001, D004, D006, D007, D008, D010, D018, D019, D021, D035, F002, F003, F005	E,I,T
I-22	Contaminated Motor Fluids generated from tear- disassembly process/ automotive shops	D001, D004, D005, D006, D007, D008, D010, D011, D018, D019, D021, D029, D035, D039, F001, F002, F003, F005	E,I,T

TABLE II C-1
Waste Characteristics –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

No.	Waste Description	EPA Waste Codes	Hazard Codes (I,C,R,E,H,T)
I-23	Contaminated Oil Filters	D004, D006, D007, D008, D009, D010, D018, D019, D035, D039, F003, F005	E,I,T
I-24	Contaminated Rags	D001, D006, D007, D008, D018, D019, D021, D029, D035, D039, F002, F003, F005	E,I,T
I-25	Contaminated Absorbents	D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D028, D029, D035, F001, F002, F003, F005	E,I,T
I-26	Contaminated Soils	D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D020, D021, D030, D039, D040, D043, F001, F002, F005, F006	E,T,I
I-27	Liquid Adhesives, Sealants, & Preservatives	D001, D002, D003, D005, D006, D007, D008, D011, D018, D029, D035, D040, F002, F003, F005	C,E,I,T
I-28	Solid Adhesives, Sealants, & Preservatives	D005, D006, D007, D008, D029, D035, D040, F002, F003, F005, U223	E,I,T
I-29	Photographic Chemicals	D001, D002, D007, D011	C,E
I-30	F006 WW Treatment Sludge from Electroplating	D006, F006	E,T
I-31	Oil-Water Emulsion/Mixture	D004, D005, D006, D008, D010	E
I-32	Waste Batteries	D001, D002, D003, D005, D006, D007, D008, D009	C,E,R,I
I-33	Off-Specification Materials, Lab Packs, or Mixed Materials, D, U, or P-Listed Waste	D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D015, D018, D019, D021, D022, D023, D028, D029, D030, D034, D035, D038, D039, D040, D043, F002, F003, F005, F022, F028, F038, P004, P005, P006, P007, P008, P009, P010, P015, P040, P041, P042, P050, P051, P081, P095, U002, U008, U019, U037, U042, U043, U044, U045, U050, U051, U057, U080, U108, U129, U117, U122, U123, U140, U151, U154, U159, U161, U165, U188, U210, U220, U221, U225, U226, U228, U239, U240, U247	I,C,E,T,R,H
I-34	Wood/Construction Debris, Fluorescent Bulbs & Ballast	D004, D006, D007, D008, D009, D026, D037	E
I-35	Spent Carbon	D003, D004, D005, D006, D007, D008, D009, D010, D011, D022, D028, D030, D043	R,E
I-36	Groundwater filters/cartridges	D006, D007, D008, D018, D029, D040, F001, F002, F003, F004,F005	T,E,I
C-1	Hazardous WMM for Thermal Treatment	D001, D003, D004, D005, D006, D007, D008, D009, D010, D011, D030, D032, D039	E, R, I

TABLE II C-1
Waste Characteristics –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

No.	Waste Description	EPA Waste Codes	Hazard Codes (I,C,R,E,H,T)
C-2	Explosives-contaminated solid waste	D003	R
C-3	Ash Residue from OB and ETU Operations	D005, D006, D007, D008, D009, D030	E
C-4	Ash Residue from TTCDP Operation	D005, D006, D007, D008	E
C-5	Filter Media from TTCDP Operation	D005, D006, D007, D008	E

Notes:
C = Corrosive
E = Toxicity Characteristic
I = Ignitable
H = Acutely Hazardous
R = Reactive
T = Toxic

Industrial Waste Containers
ADEM Admin. Code R.335-14-5-.09 and R.335-14-8-.02

Industrial wastes and secondary wastes from any operation at the Depot are managed according to the RCRA generator accumulation standards and ADEM Admin. Code R.335-14-3 Standards. Free liquids are determined by process knowledge, or analysis using the Paint Filter Liquids Test or the Free Liquids Test Method (SW-846 Methods 9095 and 9096, respectively) to properly handle the materials according to the generator requirements. All industrial wastes are treated and/or disposed offsite at an approved TSDF.

All industrial wastes are properly stored onsite in one of the three permitted industrial waste storage buildings (Buildings 466, 512 or 527). Secondary wastes related to WMM thermal treatment/disposal at the OB, OD, TTCDP, or ETU treatment units may also be stored. Container (box, drum, roll-off box, etc.,) storage areas provide secondary containment with berms around each storage area. All waste are characterized, tested and handled in accordance with the WAP.

Conventional Munitions Containers
ADEM Admin. Code R.35-14-5-.09 and 335-14-8-.02

Hazardous WMM are stored in compliance with ADEM Admin. Code R.335-14-5-31. Primary containment for the hazardous WMM is the munitions body. Waste munitions may additionally be stored in a variety of secondary containers to include cardboard boxes, metal canisters, wooden boxes, etc.

II C-1b Wastes in Tanks

Not applicable.

II C-1c Waste in Piles

Not applicable.

II C-1d Landfill Wastes

Not applicable.

II C-1e Wastes Incinerated and Wastes Used in Performance Tests

Not applicable.

II C-1f Wastes to be Land-Treated

Not applicable.

II C-1g Wastes in Miscellaneous Treatment Units

ANAD operates five miscellaneous units for thermal treatment of WMM (OB, OD, TTCDP, and ETU). Miscellaneous units are addressed in Section IV.

II C-1h Wastes at Facilities with Process Vents

Not applicable.

II C-1i Wastes Used in Performance Tests

Not applicable.

II C-1j Wastes at Facilities with Process Vents

Not applicable.

II C-1k Wastes Used in Performance Tests

Not applicable.

II C-2 Waste Analysis Plan ADEM Admin. Code R.335-14-8-.02(5)(b)2&3

The following sections address the various components of the ANAD WAP for wastes stored at ANAD. These components include: analytical parameters and the rationale for their selection, test methods, sampling methods, frequency of analyses, additional requirements for ignitable, reactive or incompatible wastes, and laboratory quality assurance/quality control (QA/QC) procedures. In effect, the WAP delineates the waste parameters that will be determined prior to waste disposal. This section covers the WAP requirements set forth in ADEM Admin. Code R.335-14-5-.02(4) and ADEM Admin. Code R.335-14-8-.02(5)(b)3. The WAP also characterizes wastes generated at ANAD such as spent blasting media, paints and solvents, spent decontamination solutions and petroleum, oil, and lubricants (POL).

II C-2a Introduction

Process knowledge, chemical analysis and/or Safety Data Sheets (SDSs) along with quality assurance and engineering judgment are used to characterize wastes generated at ANAD.

Table II C-2 identifies the different wastes that are generated, analytical parameters for each waste, sampling method(s), frequency of analysis, and the rationale for selecting these analytical parameters.

TABLE II C-2
Analytical Parameters –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

Waste Description	Parameter(s)	Test Methods	Sampling Methods & Equipment	Analysis Frequency
Paint Residue	TC metals TC organics	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-4), and/or process knowledge	Grab sample No special equipment	Initial or Process Change
Paint Overspray	None	Process Knowledge	N/A	N/A
Dried Paint with Cans				
Liquid Paint with Cans				
Paint Solvent	TC metals TC organics Ignitability	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-3), and/or process knowledge	Grab sample ASTM Standard D140-70 "Coliwasa"	Initial or Process Change
Paint Filters			Grab sample No special equipment	
Cleaning & Degreasing Solvents			Grab sample ASTM Standard D140-70 "Coliwasa"	
Chemical Vat Filters and Liners	TC metals Corrosivity		Grab sample No special equipment	
Petroleum Naptha	TC organics		Grab sample ASTM Standard D140-70 "Coliwasa"	
Waste, Acids	TC metals TC organics Corrosivity			
Waste, Caustics				

TABLE II C-2
Analytical Parameters –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

Waste Description	Parameter(s)	Test Methods	Sampling Methods & Equipment	Analysis Frequency
Purge Water	TC metals TC organics		Grab sample No special equipment	Upon Generation
Detergent Soaps	TC metals TC organics		Grab sample No special equipment	Initial or Process Change
Steam Cleaning Sludge, Liquid				
Steam Cleaning Sludge, Solid				
Metal Finishing Solvents	TC metals TC organics Ignitability Corrosivity		Grab sample ASTM Standard D140-70 "Coliwasa"	
Filters from ANAD			Grab sample No special equipment	Initial or Process Change
Alodine	TC metals	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-3), and/or process knowledge	Grab sample ASTM Standard D140-70 "Coliwasa"	
Blasting Media			Grab sample No special equipment	
Socks/Bags/Filters from Blasting & Welding Operations				
Contaminated Antifreeze	TC metals TC organics Ignitability		Grab sample ASTM Standard D140-70 "Coliwasa"	
Contaminated Motor Fluids				Initial or Process Change
Contaminated Oil Filters			Grab sample No special equipment	
Contaminated Rags				
Contaminated Absorbents	TC metals TC organics			

TABLE II C-2
Analytical Parameters –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

Waste Description	Parameter(s)	Test Methods	Sampling Methods & Equipment	Analysis Frequency
Contaminated Soil				Upon Generation
Liquid Adhesives, Sealants, & Preservatives	TC metals TC organics Ignitability Corrosivity			Initial or Process Change
Solid Adhesives, Sealants, & Preservatives	TC metals TC organics		Grab sample No special equipment	Unable to identify all contamination using SDSs
Photographic Chemicals	TC metals Ignitability		Grab sample ASTM Standard D140-70	Initial or Process Change
F006 WW Treatment Sludges from Electroplating Operations	TC metals	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-3), and/or process knowledge	Grab sample No special equipment	Initial or Process Change
Oil-Water Emulsion/Mixture			Grab sample ASTM Standard D140-70 "Coliwasa"	
Waste, Batteries	Utilize SDS	None	None	Initial
Off-Spec, Lab Pack, Mixed, D, U, or P Listed				
Wood /Construction Debris, fluorescent bulbs/ballast/PCB Transformers	TC metals TC organics	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-3), and/or process knowledge	Grab sample No special equipment	Initial or Process Change
Spent Carbon	TC metals TC organics Free Liquids Reactivity			
Groundwater Filters/Cartridges	TC metals TC organics			
Explosives-Contaminated Solid Waste	Reactivity	None	None	N/A

TABLE II C-2
Analytical Parameters –Industrial Waste, WMM, and Secondary Wastes Related to WMM Thermal Treatment/Disposal

Waste Description	Parameter(s)	Test Methods	Sampling Methods & Equipment	Analysis Frequency
Ash from OB, TTCDP, ETU	TC metals TC organics	Test Methods for the Evaluation of Solid Waste, EPA publication SW-846 (see Table II C-3), and/or process knowledge	Grab sample No special equipment	Initial or Process Change
Personal Protective Suits		NA	Process knowledge	As generated

Notes:
1. Sample containers and preservation techniques, if any, will be in accordance with individual method of analysis.
2. The analysis for free liquids will be by visual inspection.
3. In order to comply with LDR, total metals and organics will be evaluated where applicable.

ASTM = American Society of Testing and Materials
EPA = U.S. Environmental Protection Agency
N/A = Not Applicable
TC = Toxic Characteristics

II C-2b Analyses and Rationale for Selection

Industrial Waste

A list of parameters chosen for analysis is identified in Table II C-2. The rationale for their selection is described by waste category in the paragraphs below. Waste is placed in containers or roll-off boxes as applicable for the waste stream.

Paint-Related Wastes - Paint residue, overspray, paint filters, paint solvent, dried and liquid paint with cans are generated from paint operations throughout ANAD. Paint residue is generated as a result of a mixture/blend of paint and thinner needed for the actual paint application, which includes paint sludges. Paint overspray and paint filters are generated as a result of the paint mist coming into contact with filters or paper that may be used to cover the floor in the paint booths and/or the dried paint that may collect on the walls of the booth. Paint solvents are generated from cleaning of painting equipment such as paint pots, lines, and spray guns. Dried and liquid paint with cans are generated from excess paint being left in gallon buckets and cans. Typical solvents that are used in each of these processes may include methyl ethyl ketone (MEK), aircraft thinner, xylene, and toluene. Process knowledge and/or sampling and analysis are used to characterize paint-related waste.

Cleaning or Degreasing Solvents – Some of the cleaning solvents are generated from degreasing operations while others are generated from the cleaning of military components. Hydrofluorocarbons are used in vapor degreasers while petroleum naphtha is used for cleaning vehicle components and parts. Aircraft thinner and MEK may be used for cleaning paint equipment. Either process knowledge and or sampling and analysis are used to characterize cleaning and degreasing solvents.

Acids and Caustics – Acids and caustics may be generated as a result of chemical depainting of metal surfaces. This may include alkaline or mixed acid and solvent type feedstocks. These wastes may contain heavy metals as a result of pigments used in paint formulations and vat drag-out (cross contamination). These wastes may also include sludges and solids that accumulate in the bottom of vats and are periodically removed. These sludges result from a broad range of solutions used in metal plating and other metal finishing operations. These sludges may be acid or alkaline based, and contain heavy metals due to the nature of the process. Typically acids and bases used are mixed chromic and sulfuric (chrome plating), sulfuric (anodizing), and potassium/ammonium chlorides (zinc plating). Either process knowledge and/or sampling and analysis are used to characterize the acids and caustic wastes.

Purge Water – This waste is generated from the groundwater-monitoring program. Wells may be purged during sampling events and sampling and analysis may reveal contamination above disposal limits, requiring treatment and disposal. Process knowledge and/or sampling and analysis will be used to characterize the purge waters.

Detergent Soaps – This waste is generated from using a liquid or powder soap mixed with water at a high temperature and high pressure (pressure washers) for the removal of heavy greases and oils from military components. Due to process operation, waste may exhibit the characteristic of toxicity and contain high concentrations of oils and greases. Process knowledge and/or sampling and analysis will be used to characterize the detergent soaps.

Steam Cleaning Sludge – This category of waste is generated from the steam cleaning of military vehicles and parts. Liquid or powdered soaps mixed with water at high pressure for cleaning oils, greases, blasting media, etc., from vehicle and parts. A pre-spray citrus-based cleaner is sprayed on vehicles prior to the steam cleaning process. Due to process operation, waste may exhibit the characteristic of toxicity and contain high concentrations of oils and greases. Process knowledge and/or sampling and analysis will be used to characterize this waste.

Metal Finishing Solvents – This category includes a broad range of solutions used in metal plating and other metal finishing operations. These solutions may be acid or alkaline based, and may contain heavy metals due to the nature of the processes. Typical acids or bases used are mixed chromic and sulfuric (chrome plating), sulfuric (anodizing), and hydrochloric acid (etching). Filters from the vats may also be generated. Process knowledge and/or sampling and analysis will be used to characterize this waste.

Blasting Waste – Blasting media waste is generated from the abrasive blasting operations used in mechanical paint removal. Metal surfaces may have been plated with chromium and cadmium or painted with coatings that contain heavy metals in the pigments. Socks and filters used in the dust collections systems may also be contaminated with heavy metals prior to disposal. Process knowledge and/or sampling and analysis will be used to characterize blasting media.

Socks/Bags/Filters from Welding Operations - Socks and filters used in the dust collections systems of welding machines may also be contaminated with heavy metals prior to disposal. Process knowledge and/or sampling and analysis will be used to characterize blasting media.

Petroleum, oil, and lubricants (POL) - These wastes include antifreeze, gasoline, diesel, motor oils, hydraulic oils, and filters that are generated from the teardown and rebuild of military vehicles. Vehicles are drained of all fluids prior to disassembly and during the rebuild process. Process knowledge and sampling and/or analysis will be used to characterize POLs.

Contaminated Rags and Absorbents - Used rags and absorbents are generated as a result of the overall process at ANAD. Rags may be used in paint operations, vehicle teardown process, rebuild and/or cleaning processes. Rags may be contaminated with solvents, oils, and/or paints. Rags will be tested for known contaminants. Absorbents are generated as a result of drips, leaks and spills from petroleum products. Absorbents are generally non-hazardous but flammability and the presence of benzene and heavy metals may cause the waste to be treated as hazardous. Process knowledge and/or sampling and analysis will be used to characterize rags and absorbents.

Contaminated Soils – Contaminated soils are generated as a result of spills and leaks. Soils may also be generated as a result of past contamination and clean up efforts for the ongoing remediation of the National Priorities List (NPL) sites. Process knowledge and/or sampling and analysis will be used to characterize soils.

Adhesives, Sealant, and Preservatives – Adhesives, sealant, and preservatives are generated as a result of the overhaul and rebuild of military vehicles. These products are used in several processes throughout ANAD. Some of the adhesives, sealant, and preservatives are generated as a result of being out of date (off-specification) and can no longer be used for its intended purpose. These items may be in liquid or solid form. Process knowledge, SDSs and/or sampling and analysis will be used to characterize the waste.

Photographic Chemicals – Photographic chemicals are generated as a result of silver recovery units, x-ray machines, and photo processing. These wastes are in liquid form and may contain silver and chromium and may possibly be corrosive. Process knowledge and/or sampling and analysis will be used to characterize photographic chemicals.

Industrial Waste Treatment Plant Waste – Wastewater treatment sludges are generated from the treatment of rinsewaters generated at electroplating operations and will carry the appropriate F-listing. Oil/water emulsions from the steam cleaning wastewater treatment and filters may also be generated during the industrial wastewater treatment process. Process knowledge and/or sampling and analysis will be used to characterize the waste.

Waste Batteries – Waste batteries will be generated from forklifts and electronic components from military equipment and vehicles. Process knowledge will be used to characterize the waste batteries.

Off-Specification Materials - Off-specification hazardous materials are generated as a result of materials being purchased in support of a mission, and the shelf life has expired prior to use. These materials will be deemed hazardous waste for proper treatment and disposal. Shelf life will be extended for all materials as necessary; however, when the shelf life can no longer be extended and material cannot be used for intended purpose, these items will be deemed a waste. An SDS will be used to characterize off-specification materials.

Wood or Construction Debris – Construction debris is generated as a result of demolition projects throughout ANAD. Construction debris may contain lead paint and/or other heavy metals. Process knowledge and/or sampling and analysis will be used to characterize debris.

Spent Carbon – Charcoal results from use in the air purifying respirators and filters used in industrial operations. Heavy metals (chromium) may be found in the filters. Process knowledge and/or sampling and analysis will be applied to properly classify the waste for proper treatment and disposal.

Groundwater Filters/Cartridges – Filters and Cartridges will be generated from groundwater treatment units. Heavy metals (cadmium, chromium, lead) and organics (trichloroethylene, dichloroethylene and benzene) that contaminate the groundwater may be found in these filters. Process knowledge and/or sampling and analysis will be applied to properly classify the waste for proper treatment and disposal.

Waste Military Munitions and Secondary Wastes Related to WMM Treatment/Disposal

Treatment/disposal of WMM is addressed in Section IV. Treatment by OB, OD, TTCDP, and ETU may generate a variety of solid, sludge, or liquid waste streams. These waste streams are generally described below. Analysis of WMM-related secondary waste streams is detailed in Section IV C for OB and OD, Section IV K C for the TTCDP, and Section IV L C for the ETU.

WMM - Various types of waste military munitions (as defined by the MMR) may be stored in the WMM igloos. In accordance with the MMR (ADEM Admin. Code R. 335-14-7-.13), an unused military munition, or component thereof, is not a solid waste when it is being repaired, reused, recycled, or reclaimed, disassembled, reconfigured, or otherwise subjected to materials recovery activities (as long as these do not involve use constituting disposal or burning for energy recovery). Unused military munitions (and components) are solid waste when abandoned (i.e., by being disposed of, burned, detonated); removed from storage for the purpose of being disposed of, burned, incinerated or treated prior to disposal; when damaged or deteriorated to the point they cannot be returned to service, subjected to R3 (reduce, reuse, recycle), or otherwise used; or when declared a waste by an authorized military official.

Military munitions are manufactured to fixed specifications and have been distinctively marked. Their appearance is unique and they cannot be mistaken for any other material. Detailed records are kept of the quantity, identity, and storage locations of all WMM. Further sampling of these items is not required because WMM are well characterized by product specification data, uniform in composition, and not likely to be misidentified or misplaced. Because sampling is not required, no test methods, sampling methods, frequency of analysis, etc., are presented.

WMM may be stored in designated WMM igloos prior to treatment/disposal.

Ash/Residue from OB, TTCDP, and ETU Operations – Ash/residue waste results from treatment of WMM. Munitions are produced from specific military specifications known and available to ANAD personnel. Process knowledge and sampling and analysis will be used to characterize the ash/residue from thermal treatment operations. Ash/residue waste is stored in one of the three industrial waste storage buildings and may also be stored in WMM igloos prior to disposal.

Energetic-Contaminated Solid Waste – This waste stream may be generated by OB/OD, TTCDP, ETU, or any ammunition operations where open propellant or explosives are managed.. 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 typically do not contain sufficient energetics to be classified as a reactive (energetic-contaminated) hazardous waste but are treated onsite at the OB/OD, TTCDP, or ETU units as a conservative measure for safety. Any solids generated in operations involving energetics where the solid may have been in contact with energetics are classified as energetic-contaminated.

Energetic-contaminated solids cannot be land disposed or released to the public until they have been treated to remove the energetic. These wastes may be temporarily stored at a satellite accumulation area, 90-day storage area, or a permitted storage area before treatment.

Waste description, parameters, test methods, sampling methods and equipment and frequency of analysis are listed in Tables II C-2 and II C-3.

TABLE II C-3
Test Methods

Parameter	Test Method	Reference[1]
TCLP Metals, Organics	Acid extraction of non-liquids Liquids--no extraction necessary	SW-846 Method 1311
Antimony	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7062 or E200.7
Arsenic	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—gaseous hydride	SW-846 Method 6010B/7061 or EPA 206.3
Selenium		SW-846 Method 6010B/7741 or EPA 270.3
Mercury	Automated cold vapor technique	SW-846 Method 7470A/7471
Barium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	SW-846 Method 6010B/7000 or EPA 208.1
Beryllium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7000 or E200.7

TABLE II C-3
Test Methods

Parameter	Test Method	Reference[1]
Cadmium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	SW-846 Method 6010B/7000 or EPA 213.1
Chromium		SW-846 Method 6010B/7000 or EPA 218.1
Nickel	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7000 or E200.7
Silver	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	SW-846 Method 6010B/7000 or EPA 272.1
Thallium Vanadium Zinc	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7000 or E200.7
Lead	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	SW-846 Method 6010B/7000 or EPA 239.1
Total Metals	Inductively-coupled plasma atomic emissions spectrometry (except mercury) and manual/automated cold vapor technique (mercury)	SW-846 Method 6010B/7471
Total Organics	Gas Chromatograph/Mass Spectrometry	SW-846 Method 8260B/ 8270C/ 8081/ 8082
pH	Soil and Waste pH	SW-846 Method 9040B/9045 or EPA 150.1
	Paper	SW-846 Method 9041A
Ignitability	Pensky-Martens closed cup method for determining ignitability; Ignitability of solids	SW-846 Method 1010A/1030
	Setaflash (Small Scale) closed cup method	SW-846 Method 1020B
Corrosivity	pH electrometric measurement	SW-846 Method 9040C
	Corrosivity toward steel	SW-846 Method 1110A
Free Liquids	Paint filter liquids test	SW-846 Method 9095B

Notes:
(1) The most current approved analytical method will be used.
EPA = U.S. Environmental Protection Agency
GC = Gas Chromatography
HPLC = High Performance Liquid Chromatography
TCLP = Toxicity Characteristic Leaching Procedure

II C-2c Test Methods
ADEM Admin. Code R. 335-14-5.02(4)(b)(2)

Industrial Waste

The overall strategy for waste characterization includes generator process knowledge and/or test procedures to determine the characteristics of the waste and analysis procedures to determine the composition of the waste.

Analytical testing will be performed on a sample from each waste stream unless there is sufficient information from the application of process and generator knowledge to indicate that the waste does not meet the requirements under ADEM Admin. Code R.335-14-2 for classification of a hazardous waste.

Appropriate analytical procedures to determine whether a sample contains a given toxic constituent will be followed as specified by reference in ADEM Admin. Code R.335-14-2 Appendix III, Chemical Analysis Methods, "Choosing the Correct Procedure" found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Methods found in SW-846 will be reviewed and the approved method will be employed for each sample analysis situation. The test methods and their references are listed in Table II C-3 for each test parameter identified in Table II C-2.

Waste Military Munitions/Residue

Military munitions are manufactured to fixed specifications and have been distinctively marked. Their appearance is unique and they cannot be mistaken for any other material. Detailed records are kept of the quantity, identity, and storage locations of all WMM. Further sampling of these items is not required because WMM are well characterized by product specification data, uniform in composition, and not likely to be misidentified or misplaced. Because sampling is not required, no test methods, sampling methods, frequency of analysis, etc., are presented.

The overall strategy for waste characterization of explosives-contaminated solid waste, ash, and residue generated as a result of OB, TTCDP, and ETU operations includes test procedures and/or generator knowledge to determine the characteristics of the waste and analysis procedures to determine the composition of the waste.

In general, analytical testing will be performed on a sample from each container or batch unless there is sufficient information from past sampling or the application of process and generator knowledge to warrant less frequent sampling.

No analytical testing will be applied to explosives-contaminated waste. This waste stream will be characterized through process knowledge.

Appropriate analytical procedures to determine whether a sample contains a given toxic constituent will be followed as specified by reference in ADEM Admin. Code R.335-14-2 Appendix III, Chemical Analysis Methods, "Choosing the Correct Procedure" found in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Methods found in SW-846 will be reviewed and the approved method will be employed for each sample analysis situation.

The test methods and their references are listed in Table II C-3 for each test parameter identified in Table II C-2.

For the reason described above, munition specifications will be used in lieu of testing to characterize WMM and their components (explosives, propellants, etc.)

II C-2d Sampling Methods
ADEM Admin. Code R. 335-14-2-App I, 335-14-5-.02(4)(b)(3)

Industrial Waste

Table II C-2 lists the specific equipment and methods (where appropriate) that will be used to obtain a representative sample of each waste type. One representative sample, plus appropriate QA/QC samples will be collected for each sample event.

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples collected using the sampling protocols listed in Table II C-2, for sampling waste with properties similar to the indicated materials, will be considered to be representative of the waste.

Waste Military Munitions

Because sampling is not required, no test methods, sampling methods, frequency of analysis, etc., are presented.

Secondary Waste Related to WMM Thermal Treatment/Disposal

Table II C-2 lists the specific equipment and methods (where appropriate) that will be used to obtain a representative sample of the ash residue that may be produced from OB, TTCDP, or ETU operations. One representative sample, plus appropriate QA/QC samples will be collected for each sample event. Additional details regarding sample equipment and methods to obtain representative samples of secondary wastes related to WMM thermal treatment/disposal at the OB, OD, TTCDP, or ETU treatment units are provided in Section IV. Specifically, see Section IV C for OB and OD, Section IV K C for the TTCDP, and Section IV L C for the ETU.

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples collected using the sampling protocols listed in Table II C-2, for sampling waste with properties similar to the indicated materials, will be considered to be representative of the waste.

II C-2e Frequency of Analyses
ADEM Admin. Code R. 335-335-14-5-.02(4)(b)(4)

Industrial Waste

Table II C-2 shows the frequency of analyses for each waste type and parameters for which sampling and analysis have been specified.

Waste Military Munitions

Because sampling is not required, no test methods, sampling methods, frequency of analysis, etc., are presented.

Secondary Waste Related to WMM Thermal Treatment/Disposal

Table II C-2 shows the frequency of analyses for the ash residues that may be generated as a result of OB, TTCDP, and ETU operations and parameters for which sampling and analysis have been specified. Sampling frequency of OB, OD, TTCDP, and ETU operations are further detailed in Section IV. Specifically, see Section IV C for OB and OD, Section IV K C for the TTCDP, and Section IV L C for the ETU.

II C-2f Additional Requirements for Waste Generated Offsite

Industrial Waste
ANAD will not receive industrial waste from offsite.

Waste Military Munitions
All receipts of WMM that have been declared a hazardous waste will be accompanied by a Uniform Hazardous Waste Manifest (UHWM) in accordance with ADEM Admin. Code R.335-14-5-.05 or appropriate DoD Shipping Documents when transported under the Conditional Exemption (CE) identified under the MMR.

Conventional Munitions received for or undergoing R3 (resource, recovery, and/or recycle) are exempt from classification as a hazardous waste under the MMR.

Chemical Agent Related Waste/Munitions
ANAD will not receive any hazardous chemical agent and/or chemical agent munitions waste from outside the State of Alabama. ANAD may receive hazardous waste conventional munitions or conventional munition components from chemical munitions which have been verified agent free 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 operations, and/or treatment and disposal. Recovered WMM, which were both recovered and received from locations within the State of Alabama and have been declared as hazardous waste, may also be received.

II C-2g Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

Information that satisfies the requirements for ignitable, reactive or incompatible wastes is provided in Section II F-5.

II C-3 Analysis of Outgoing Waste for Compliance with Land Disposal Restrictions

Waste streams that are disposed of offsite are evaluated for compliance with Land Disposal Restrictions (LDRs). Notifications are made with those shipments requiring notifications.

II C-3a Introduction

C-3a(1) Treatment Residues Generated
Additional information on secondary wastes related to WMM thermal treatment/disposal operations at the OB, OD, TTCDP and ETU treatment units are provided in Section IV. Specifically, see Section IV C for OB and OD, Section IV K C for the TTCDP, and Section IV L C for the ETU.

C-3a(2) California-List Wastes
In order to comply with LDR standards, total metals and organics will be evaluated where applicable.

C-3a(3) Waste Characteristics: First-Third Wastes with Treatment Standards

In order to comply with LDR standards, total metals and organics will be evaluated where applicable.

C-3a(4) Waste Characteristics: Second-Third Wastes with Treatment Standards

In order to comply with LDR standards, total metals and organics will be evaluated where applicable.

C-3a(5) Waste Characteristics: Third-Third Wastes with Treatment Standards

In order to comply with LDR standards, total metals and organics will be evaluated where applicable.

II C-3b Notification and Certification Requirements

Notification and Certification Records will be Maintained in Accordance with ADEM Admin. Code R.335-14-9-.01(7).

II C-3b(1) Retention of Generator Notices and Certifications

Notification and certification records will be retained in the facility files for three years in accordance with ADEM Admin. Code R.335-14-9-.01(7). The records that will be retained include the Waste Analysis Plan, analytical waste determination data, exceptions, and LDR notifications.

II C-3b(2) Notification and Certification for Wastes to be Further Managed

Notification and certification records will be maintained in the facility files for three years in accordance with ADEM Admin. Code R.335-14-9-.01(7). The records that will be retained include the Waste Analysis Plan, analytical waste determination data, exceptions, and LDR notifications.

II C-3b(3) Additional Notification and Certification Requirements for Disposal Facilities

Notification and certification records will be maintained in the facility files for three years in accordance with ADEM Admin. Code R.335-14-9-.01(7). The records that will be retained include the Waste Analysis Plan, analytical waste determination data, exceptions, and LDR notifications.

II C-3b(4) Notification and Certification Requirements Pertaining to Landfill and Surface Impoundment Disposal Restrictions

Not applicable.

II C-3c Additional Requirements Pertaining to Storage of Restricted Waste

ANAD does not store restricted waste except to accumulate quantities to facilitate proper treatment or disposal.

IIC-3c(1) Restricted Waste Stored in Containers

Wastes stored in containers at ANAD that are restricted from land disposal under ADEM Admin. Code R.335-14-9-.03 Subpart C are managed in compliance with the requirements of ADEM Admin. Code R.335-14-9-.05(1).

IIC-3c(2) Restricted Waste Stored in Tanks

Not applicable.

IIC-3c(3) Storage of Liquid PCB Wastes

Not applicable.

II C-3d Additional Requirements for Treatment Facilities

LDR requirements pertaining to treatment facilities are addressed in Section IV. Specifically, see Section IV C for OB and OD, Section IV K C for the TTCDP, and Section IV L C for the ETU.

II C-3d(1) Additional Notification and Certification Requirements for Treatment Facilities

The facility will comply with the provisions of ADEM Admin. Code R.335-14-9-.01(7).

II C-3d(2) Wastes with Treatment Standards Expressed as Concentrations in the Waste

The applicable LDRs are expressed as concentrations in ADEM Admin. Code R.335-14-9-.04.

II C-3d(3) Wastes with Treatment Standards Expressed as Concentrations in the Waste Extract

The applicable LDRs are expressed as concentrations in ADEM Admin. Code R.335-14-9-.04.

II C-3d(4) California-List Wastes not Subject to Treatment Standards

Not applicable

II C-3e Additional Requirements for Land Disposal Facilities

Not applicable.

II C-3f Exemptions from and Extensions to the Land Disposal Restrictions

Not applicable.

II C-3g Requirements for Land Disposal Facilities with an Approved Exemption or Extension

Not applicable.

II C-4 Waste Transportation and Offsite Treatment, Storage, and Disposal

All wastes disposed of offsite will be transported in accordance with Department of Transportation (DOT) and RCRA transporter requirements and disposed of in accordance with applicable regulations.

Section II F (PROOF)

II F Procedures to Prevent Hazards

This section contains information concerning procedures to prevent hazards in accordance with ADEM Admin. Code R.335-14-5-.02(5). This section contains a description of the security procedures and equipment, surveillance system, entry control, warning signs, inspection requirements, and internal/external communication. Figure II B-2 shows the location of the industrial waste storage buildings, including roll-off box and WMM igloos.

II F-1 Security

II F-1a Security Procedures and Equipment ADEM Admin. Code R.335-14-8-.02(5)

Security at ANAD is provided by a system that monitors the facility. The entire facility is enclosed within an 8-foot high industrial grade chain-link fence with three strands of barbed wire at the top of the fence. In addition to the peripheral fencing, the facility has extensive internal fencing. Entrance to the facility is through one of three gates. All gates are attended 24 hours/day by armed guards.

Signs that are legible from a distance of 25 feet are posted at all fence gates and numerous other fence locations around the installation. These signs are visible from all angles of approach, and bear the warning "Danger-Unauthorized Personnel Keep Out." Buildings 466, 512, and 527 also have "Keep Out" signs posted as required and authorized personnel monitor entrances at all times. "No Smoking" signs that are legible from a distance of 25 feet have been placed at the container and igloo storage areas.

The WMM igloos are within the highly restricted ALA. The area is encompassed by an 8 feet high double security fence topped with barbed wire No visitors are allowed in this area unescorted and no flame sources (matches, lighters) are allowed past the control gate. Security personnel are authorized to use deadly force if deemed necessary.

Armed civilian security guards and other personnel are equipped with two-way radios so that any intrusion by unauthorized individuals or hazardous conditions can be reported immediately. Guards are authorized to carry weapons and use force if necessary to prevent unauthorized entry.

II F-1a(1) 24-Hour Surveillance Systems ADEM Admin. Code R.335-14-5-.02(5)(b)1

Director of Law Enforcement and Security at ANAD is responsible for compliance with 24-hour surveillance at the installation. All security patrols are provided with fully equipped security vehicles.

In addition to the fencing, gates, and security guards, several other features contribute to safety and security within the facility. Civilian guards continually patrol the entire facility on a daily basis, 24 hours a day. The guards and other personnel are equipped with two-way radios so that any intrusion by unauthorized individuals or hazardous conditions can be reported immediately.

II F-1a(2) Barriers and Means to Control Entry

Section II F-1 addresses the means to control entry and all warning signs that are located at ANAD.

II F-1a(3) Warning Signs

Section II F-1 addresses the means to control entry and all warning signs that are located at ANAD.

II 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) do not apply, and therefore are not addressed.

II F-2 Inspection Schedule

ANAD conducts regular inspections of all permitted hazardous waste storage units for monitoring equipment, emergency and safety equipment, 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. The inspection schedule is located in Table II F-1.

TABLE II F-1
Inspection Frequency

Item	Frequency	Types of Problems
Industrial Waste Container Storage Unit (Drum/Roll-off Box) Safety and Emergency Equipment (Buildings 466, 512 and 527)		
Standard Industrial Absorbents (i.e., Vermiculite)	W	Out of Stock
Oil Dry	W	Out of Stock
Absorbent Booms	W	Out of Stock
Absorbent Pads	W	Out of Stock
55-Gallon Containers	W	Corrosion, structural damage
Emergency Eyewash	W	Water pressure, leaking, drainage
Face shields and protective eyeglasses	W	Broken or dirty equipment
Chemical cartridge respirators with cartridge for organic vapors and acid gases; half & full face types	W	Seals
Self-contained breathing apparatus (SCBA)	W	Air quantity in reserve, air delivery system, moisture in tank (cold weather)
Fire extinguishers	W	Inoperative
Telephone system	W	Inoperative
Protective Clothing	W	Holes, normal wear and tear

TABLE II F-1
Inspection Frequency

Item	Frequency	Types of Problems
Two-way radio, portable	W	Transmitter or receiver
Container Storage area gates & locks	W	Corrosion, damage to chain link fence or barbed wire, sticking or corroding lock
Base or foundation	W	Erosion; uneven settlement; cracks and spalling in concrete pad, wet spots
Ramps	W	Erosion, uneven settlement, cracks, spalling in concrete, leaks and spills
Container placement and stacking	W	Aisle space, height of stacks
Sealing of containers	W	Unsecured tops
Container labels	W	Identification, no date
Containers	W	Corrosion, leakage, structural defects
Segregation of incompatible waste	W	Storage of incompatible waste in same area
Pallets	W	Damaged, broken
Floor	W	Cracks, erosion, wet spots, spalling, spills
Curbs	W	Cracks, Spalling
Debris & refuse	W	Housekeeping
Ramps	W	Cracks, spalling, uneven settlement
Warning signs	W	Damaged, missing
Scales	W	Inoperative
Hazardous Waste Load/Unload Areas		
Labels	During loading/ unloading	Missing, incorrect
Segregation	During Loading/ unlo ading	Incompatible storage
WMM Storage in Permitted Igloos (I-103, F-704A, F-405)		
Storage Igloo Inspection[3]	A	Proper storage of materials, good housekeeping, condition of igloo doors, vents & maintenance of firebreaks.
Earth Cover Depth[3]	B	Composition and depth of earth cover of igloos
Lightning Protection System Visual Inspection[1]	S	Visual condition of lightning protection system
Lightning Protection System Electrical Test[1]	B	Components of the lightning protection system are electrically tested for continuity.

TABLE II F-1
Inspection Frequency

Item	Frequency	Types of Problems
Inventory[2]	A	Incorrect count, item not on record
Igloo Inspection[2]	Q	Inspect WMM in storage IAW DDESB standards
Hazardous Waste Storage in Permitted Igloos[3] (I-103, F-704A, F-405)		
Visual Inspections	W	Leaks, condition of outer packaging or any other condition affecting safe storage
Container placement	W	Height of stacks
Containers	W	Corrosion, deterioration, seals broken
Pallets	W	Damaged
Doors	W	Damaged, locks broken
Floors	W	Cracks, spalling, wet spots
Warning Signs	W	Damaged or missing
Shipping Containers	W	Damaged, leaking

Notes:
D – Daily (once every calendar day)
W – Weekly (once every calendar week)
M – Monthly (once every calendar month)
S – Semi-annually (once every six months)
A – Annually (once every calendar year)
Q – Quarterly (once every three calendar months)
B – Biennially (once every two (2) years)
1 – Record retained by Safety Office, Bldg 1
2 – Record retained by Anniston Munitions Center, Bldg 202
3 – Record retained by Anniston Munitions Center, Quality Assurance, Bldg 78

II F-2a General Inspection Requirements
ADEM Admin. Code R.335-14-5-.02(6)(b)

A schedule for inspecting safety and emergency equipment, security devices, operating and structural equipment, monitoring equipment, the industrial waste container storage buildings and roll-off box, and the WMM igloos are listed in Table II F-1. WMM storage is conditionally exempt from hazardous waste regulations when stored in compliance with ADEM Admin. Code R. 335-14-7-.13. Igloos I-103, F-704A and F-405 are subject to Department of Defense Explosive Safety Board requirements and are identified as WMM storage locations. WMM may be stored in these locations along with hazardous wastes not classified as WMM. Table II F-1 identifies the inspection requirements for each of these categories. These items are considered of high importance due to the role of 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 an inspection with the frequency of each inspection.

II F-2a (1) Types of Problems

The types of problems that are looked for during inspections such as leaks, deterioration, missing items, inoperative equipment, etc., are listed in Table II F-1.

II F-2a (2) Frequency of Inspections

Table II F-1 lists the frequency of the inspection for the permitted hazardous waste storage areas. The frequency is based upon the rate of possible deterioration of equipment and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected between inspections. Loading and unloading areas will be inspected daily when in use. Container (drum and roll-off box) storage units such as Buildings 466, 512, and 527 will be inspected on a weekly basis. Inspection items are identified on Waste Container Storage Area Inspection Log Sheets. Results of each inspection are recorded on the inspection log sheet. The frequency of WMM igloo inspections is referenced in the DoD Explosive Safety Board Standard DoD 6055.9 and in the Department of the Army Pamphlet 385-64.

II F-2b Specific Process Inspection Requirements

Different types of inspections and monitoring are conducted on a weekly, semi-annual, annual and biennial basis for all WMM igloos (see Table II F-1).

II F-2b(1) Container Inspection

Igloos that have not stored WMM are not inspected. Should hazardous waste storage operations begin in any of these igloos, that igloo will undergo inspections in accordance with Table II F-1.

For all other hazardous waste storage unit inspection requirements refer to Sections II F-2a, Table II F-1, and ADEM Admin. Code R.335-14-5-.02(6)(d).

II F-2b(2) Tank Inspections

Not applicable.

II F-2b(3) Waste Pile Inspections

Not applicable.

II F-2b(4) Surface Impoundment Inspections

Not applicable.

II F-2b(5) Incineration Inspection

Not applicable.

II F-2b(6) Landfill Inspection

Not applicable.

II F-2b(7) Land Treatment Inspection

Not applicable.

II F-2b(8) Miscellaneous Unit Inspection

Miscellaneous units are addressed in Section IV. Specifically, see Section IV F for OB and OD, Section IV K F for the TTCDP, and Section IV L F for the ETU.

II F-2b(9) Inspection for Process Vents

Not applicable.

II F-2b(10) Inspection Procedures for Equipment Leaks, Applicability, and Waste Analysis

Refer to Table II F-1.

II F-2b(11) Test Methods and Procedures

Refer to Table II F-1.

II F-2c Remedial Action ADEM Admin. Code R.335-14-5-.02(6)(c)

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 the Integrated Contingency Plan (ICP) (see Section II G) 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.

If during routine inspection of a container storage building, a drum is noted that has deteriorated or is beginning to leak (rusted, severely dented, lid fitting improperly, etc.), the drum content will be transferred to a new container or overpacked in place. Any spilled material will be cleaned up immediately.

II F-2d Inspection Records and Recordkeeping

Inspection log sheets that are used at storage areas will identify name of inspector, observations made, and date and nature of repairs or remedial action taken. Inspection log sheets for industrial waste container/roll-off box storage units, and WMM igloos and all other types of inspections conducted are on file at DRK/ANMC/ACWA and are kept for the period specified by ADEM Admin. Code R.335-14-5-.05(4).

II F-3 Documentation of Preparedness and Prevention Requirements

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 container storage and igloo storage are addressed primarily in Sections II B, II F, and II G.

II F-3a Equipment Requirements

II F-3a(1)/(2)/(3) Internal Communication/External Communication/Emergency Equipment

Internal communications, external communications, and emergency equipment are addressed in the ICP of Section II G.

II F-3a(2) External Communication

Internal communications, external communications, and emergency equipment are addressed in the ICP of Section II G.

IIF-3a(3) Emergency Equipment

Internal communications, external communications, and emergency equipment are addressed in the ICP of Section II G.

II F-3a (4) Water and Fire Control

Water for fire control requires water at adequate volume and pressure to supply water hose streams, or foam producing equipment or automatic sprinklers, or water spray system. ANAD maintains an adequate volume of water to support necessary requirements during an emergency situation.

II F-3b Aisle Space Requirements ADEM Admin. Code R.335-14-5-.03 (6)

The applicant does not wish to request a waiver for the aisle space requirements of ADEM Admin. Code R.335-14-5-.03. Aisle space to allow the unobstructed movement of personnel, fire protection equipment to any area of the facility operation in an emergency will be maintained at all permitted hazardous waste storage units.

II F-4 Preventive Procedures, Structures, and Equipment

Two different types permitted hazardous waste storage units are addressed in this section of the permit application, industrial waste container storage units and WMM storage units. These facilities are separated by distance and are used for distinctly different purposes..

II F-4a Unloading Operations

During unloading operations at each of the industrial waste container storage units, ramps are used for transport of hazardous waste into the building. Each of the industrial waste storage building (466, 512, and 527), have concrete ramps located at each end of the building for easy entrance and exit of the building.

Spills that occur during loading or unloading operations are unlikely; however, in the event of an accident, spills are immediately cleaned up. Standard industrial absorbents, absorbent booms, pads, sand, and dirt are used for cleanup of spilled materials. Spill residues are placed in DOT shipping containers, properly classified, labeled, and placed into storage awaiting offsite treatment and disposal.

Several precautions have been taken in the design of the container storage facilities to reduce the potential for hazards during the loading and unloading operations. The concrete ramps were designed and constructed to facilitate the movement of a forklift in and out of the buildings. A minimum of 10 feet of aisle space in the central aisle is maintained at all times, pallets are used to transport and store waste contained in drums, and adequate lighting is provided in each of the container storage areas.

Although movement of WMM is minimal, several precautions have been taken in the design of the storage igloos and WMM storage containers to reduce the potential for hazards during loading and unloading operations. The igloos are designed for entry by electric forklifts and are isolated from each other and any developed area.

II F-4b Runoff

The hazardous waste storage units (i.e., industrial waste container buildings and roll-off box storage units, and WMM igloos) have all been adequately designed to prevent run-off. All of these buildings are essentially weather tight with surface drainage away from the buildings. These buildings are not located in a floodplain area. Specific information concerning the structural design specifications are provided in Section II B.

All hazardous waste storage units have sufficient secondary containment to minimize or eliminate the discharge of hazardous materials/waste onto the unprotected ground.

All industrial waste container storage buildings (466, 512 and 527) are constructed with a concrete base, and coated with a chemical resistant epoxy paint that is free of cracks or gaps and is sufficiently impervious to contain leaks or spills.

All WMM igloos are constructed with a concrete base, with weather tight walls and roof and are inspected on a regular basis.

II F-4c Water Supplies

ANAD maintains an adequate volume of water to support necessary requirements during an emergency situation.

II F-4d Equipment and Power Failure

In the event of a short power interruption, equipment will be restarted as normal. In the event of a power outage, all operations requiring power will be shut down until proper restart procedures can be determined. In case of a blackout, designated personnel will be instructed to congregate at a designated point. Maintenance personnel will check onsite substations for malfunction and equipment failures. Alabama Power will be contacted immediately for assistance. All hazardous waste storage facilities will be immediately secured and locked during any power outage and inspected immediately upon resumption of power. Section II G, Contingency Plan addresses in detail the emergency procedures that will be followed.

II F-4e Personal Protective Equipment

ANAD regulations establish Occupational Safety and Health requirements necessary to protect workers from unhealthful conditions. Levels of personal protective equipment (PPE) for workers will vary throughout the installation and are based upon the specific task to be performed. Job Safety Breakdown (JSB) sheets are prepared for hazardous tasks at the Installation. These sheets identify work practices, protective clothing, and procedures necessary to protect the worker from chemicals as well as other hazards. Each supervisor within the work areas makes a complete analysis of the jobs under his/her supervision and prepares a written JSB, or equivalent, for use in the instruction of employees. Supervisors are required to outline the necessary steps for safe performance of the job and list any special environmental, quality, operational, and special security requirements within the JSB.

II F-5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste ADEM Admin. Code R.335-14-8-.02(5)(b)9

II F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

Many precautions are taken to prevent the ignition or reaction of ignitable and reactive waste during storage in the container storage areas. All waste within storage is compatible with the container used for collection of the waste, and each container is properly sealed prior to storage; therefore, the only source of ignition is external to the containers. All hazardous wastes are stored in the storage areas and are therefore not exposed to solar heat. Signs are placed in the container storage areas clearly marked with the legend, "No Smoking" and "Danger-Unauthorized Personnel Keep Out." Sparkproof tools such as brass hammers, wrenches, shovels, etc., are used on all containers storing ignitable materials. In addition, incompatible wastes are stored on separate sides of the building.

WMM are stored in designated igloos. The only hazards associated with the munitions are contained in the munition assembly. The WMM igloos are designed to minimize heat buildup and only spark proof tools and equipment are used when working in and around the area. The WMM igloos are located in a high-restricted area and are under close supervision at all times. Open flames, cutting and welding are not permitted near the WMM storage units, unless approved by ANAD Safety and ANAD Fire Department on a case-by-case basis. Signs on the ALA gate allow smoking only in designated areas. Signs on the ammunition storage area gates prohibited matches and cigarette lighters.

II F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

An extensive review of the engineering literature, surveys, employee training, and knowledge of federal and state regulations covering hazardous waste management practices has shown that adverse reactions can result from the mixing or combination of incompatible hazardous waste. Different classes of reaction include heat generation, fire, gas formation, formation of toxic fumes, generation of flammable gases, volatilization of toxic or flammable substances, formation of substances of greater toxicity, production of shock and friction-sensitive compounds, pressurization in closed vessels, and violent polymerization.

Three primary causes of the combination of incompatible wastes have been identified as follows:

- Insufficiency or inaccuracy of information about the waste
- Indiscriminate handling of the waste
- Indiscriminate waste disposal practices

In order to minimize and/or eliminate the chances of combining incompatible hazardous waste and to avoid the resulting adverse reactions, a method of determining waste compatibility is necessary.

Incompatible wastes are not mixed at ANAD. The primary mechanism for properly handling ignitable, reactive, or incompatible wastes is personnel knowledge of the materials being handled through employee training and knowledge of regulations. If information about a waste or material is not available, and knowledge is inadequate, characterization of the wastes by sampling and analysis is performed which will identify the respective chemical constituents of the waste. Once the chemical constituents of a material or waste are known, additional procedures are taken to predict and therefore prevent improper handling or mixing of waste.

II F-5c Management of Ignitable or Reactive Waste in Containers

ANAD takes several precautions in and around container and igloo storage areas where hazardous waste are stored to prevent accidental fire and explosion, including the proper storage of waste containers. Some of the precautions include minimum stacking of containers, adequate aisle space, labeling of each container, and ensuring each container is sealed and closed at all times except during the addition or removal of waste and separation of incompatible waste containers during storage.

Containers of ignitable or reactive waste that are not WMM will be stored in one of the three industrial waste container (drum/roll-off box) storage units, Building 466, 512, and 527, or in storage igloos. All containers of hazardous waste are sealed and labeled prior to storage. All containers of hazardous waste are stored on wooden or metal pallets to prevent the container coming into contact with free liquids in the event of an accidental leak or spill.

Figure II B-2 shows the locations of all permitted hazardous waste storage units (industrial waste container storage buildings 466, 512, and 527, and WMM igloos). All hazardous waste storage units are greater than 50 feet from the ANAD property fence. The WMM igloos are located in the northeastern area of ANAD in the ALA.

II F-5d Management of Incompatible Waste in Containers ADEM Admin. Code R.335-14-5-.09(8)(a), (b) and (c)

Any incompatible wastes that may be generated will not be placed in the same container. All industrial waste will be placed into new and/or cleaned containers for storage and offsite transportation and disposal. Any incompatible wastes within storage will be physically separated by a 9-inch berm. All industrial waste will be stored in one of three container (drum/roll-off box) storage buildings (466, 512, or 527).

II F-5e to f Management of Ignitable or Reactive / Incompatible Wastes in Tanks

There are no permitted storage tanks at ANAD.

Section II G (PROOF)

II G Contingency Plan

This section addresses the requirements for contingency planning for wastes generated and stored at ANAD. ANAD has an Integrated Contingency Plan (ICP) that 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. ANAD submitted the current version of the ICP August 10, 2016, and the document was verified as received by ADEM. Future revisions of the RCRA portion of the ICP will be submitted to ADEM.

II G-1 General Information

II G-1a Description of Wastes Generated

Wastes generated, stored and treated at ANAD are included in Sections II C, IV C, IV K C, and IV L C of this application.

II G-1b General Facility Traffic

Traffic information is included in Sections II B of this application.

II G-1c Topography

Depot topography information is included in Section II B of this application.

II G-1d General Flood Potential

Depot flood information is included in Section II B of this application.

II G-2 Emergency Coordinators

The Depot utilizes an ICP for responding to spills and to control releases. Part of this ICP includes RCRA response requirements. Emergency coordinators for ANAD are specified in Appendix B, Table 1 of the ICP.

II G-3 Implementation

The Depot utilizes an ICP for responding to spills and to control releases. Part of this ICP includes RCRA response requirements. The RCRA Contingency Plan is implemented at ANAD as specified in the Core Plan (Section 2) of the ICP.

II G-4 Emergency Response Procedures

The Depot utilizes an ICP for responding to spills and to control releases. Part of this ICP includes RCRA response requirements. Emergency response procedures are specified in the Core Plan (Section 2) of the ICP.

This page intentionally left blank.

Section II H (PROOF)

II H Personnel Training

This training program has been developed in accordance with ADEM Admin. Code R.335-14 as an integral part of the ANAD RCRA permit application for permitted storage of industrial wastes and WMM at the following units:

- Three industrial waste storage buildings (Buildings 466, 512 and 527), including roll-off box storage (also at Building 466)

The training program will be implemented to ensure these areas are operated in a manner that ensures protection of human health and the environment both on and off the ANAD. The employees who work in these areas and have TSDF responsibilities are referred to as "affected employees."

This section does not include training information concerning ANMC thermal treatment operation training programs. Training programs for WMM thermal treatment operations are addressed in Section IV H for OB, OD, TTCDP, and ETU.

The training program covers release prevention, hazardous waste operations, emergency response and contingency plan implementation, maintaining documentation of training, and normal facility operation and maintenance. A variety of training techniques will be utilized, including classroom courses, simulations, training materials, and hands-on experience. The training program provides for both initial and continuing training for all supervisors and all personnel involved in handling hazardous waste or operating and maintaining hazardous waste management equipment.

This training program will be available at ANAD. It will be reviewed and updated by the Directorate of Risk Management (DRK) Environmental Training Program Manager as needed and whenever there is a change in regulations, waste types, ANAD design or operation, waste management equipment or techniques, or Contingency Plan procedures.

Section II H-l provides a summary outline of the training program, while Section II H-2 describes implementation of the training program.

II H-1 Outline of Training Program

An integrated training program will be implemented to ensure that the ANAD industrial waste storage and WMM storage operations are conducted in an efficient and environmentally safe manner and to ensure the protection of both the workers and the general population. Affected personnel will receive initial training within 6 months of employment in areas where they have TSDF responsibilities. This initial training will include classroom instruction, demonstrations of the operations of processes and equipment, and hands-on training in ANAD procedures involving hazardous waste. Initial classroom training (usually 40 hours) will be provided to new affected personnel with TSDF responsibilities. New affected employees will not be allowed to work unsupervised prior to receiving the training.

Annual review training will also be provided for the affected employees.

Introductory and continuing training outlined below will address job titles/job descriptions; type and frequency of training; the DRK Environmental Program Training Manager; relevance of training to job position; and training for emergency responses.

II H-1a Job Title and Duties

This training program is designed to ensure that affected personnel at ANAD with TSDF responsibilities will manage the hazardous wastes in compliance with all technical and administrative standards established by ADEM.

Position training requirements are coded then identified in each employee's job position description.

II H-1b Training Content, Frequency, and Techniques

The following list is a summary of the content, frequency and techniques for the training of affected employees. Not all employees require all of the training outlined below. The specific modules that each employee requires will be determined by job description.

- Introductory Training (new employees as described above)
  - Classroom Instructions
    - Instructive course work covering the following topics:
      - ANAD organization
      - Description of wastes that the employee will be involved with
      - Waste handling/transportation
      - Drum storage building operations
      - Security Procedures
      - Contingency Emergency Procedures
      - Inspections and record keeping
      - RCRA Permit and conditions
      - Emergency Notification Procedures
  - On the Job Training
    - Job title and duties explanation for all affected ANAD personnel with TSDF responsibilities
    - Site inspections and demonstrations by ANAD personnel and others
    - Supervision during actual operations involving hazardous waste management
- Continuing Training
  - Classroom instructions
    - Safety meetings at the work sites
    - Annual Refresher training covering topics outlined under Introductory Training
    - Review of any changes in RCRA Permit and/or ADEM regulations

- On-the-job Training
    - Regular performance evaluations of all affected ANAD employees with TSDF responsibilities

II H-1c Training Program Manager

The DRK Environmental Training Program Manager will direct ANAD's training program for affected personnel. The DRK Environmental Training Program Manager will be responsible for teaching and/or coordinating the teaching of hazardous waste management procedures, including contingency plan implementation, to all affected personnel. The DRK Environmental Training Program Manager is trained in all aspects of hazardous waste management and will remain current in this subject area.

The DRK Environmental Training Program Manager will be thoroughly familiar with hazardous waste management requirements and operations prior to exercising control over training in this area. The DRK Environmental Training Program Manager will keep his/her knowledge current through a combination of taking courses offered by government agencies and/or continuing education companies, and reading and becoming thoroughly familiar with the permits, hazardous waste regulations, and hazardous waste operations applicable to the ANAD. The DRK Environmental Training Program Manager will work closely with the appropriate Army offices to ensure that all information received is current. All other instructors will be thoroughly knowledgeable in the areas in which they will be teaching. Training contractors shall be overseen by the Army, and will be responsible for developing training manuals and other course materials, and for conducting both initial and refresher training of ANAD personnel. Equipment vendors will also provide certain equipment-specific training as required.

II H-1d Relevance of Training to Job Position

Each affected ANAD job position will receive training relevant to the duties and responsibilities entailed by that position description. Affected personnel with TSDF responsibilities will receive initial and annual refresher RCRA training relevant to assigned hazardous waste job duties.

II H-1e Training for Emergency Response

This training program is designed to ensure that affected personnel not only handle hazardous wastes in a safe manner but also properly respond to emergency situations.

Training elements addressing non-routine or emergency situations include:

- Procedures for locating, using, inspecting, repairing, and replacing emergency equipment, as appropriate, based on job description
- Emergency communication procedures and alarm systems
- Response to fires or explosions
- Waste spill procedures
- Response to groundwater contamination incidents

- Power failure procedures
- Shutdown of operations

II H-2 Implementation of Training Program

The DRK Environmental Training Program Manager and all current affected personnel have been fully trained at the time of this submittal. In the future, all new affected personnel will complete this training program within 6 months of their date of employment. No affected personnel with assigned TSDF responsibilities will work unsupervised with hazardous waste prior to completion of the training program.

Records documenting the job title for each position, job descriptions, names of personnel, and completed training programs (both introductory and review), will be kept onsite by ANAD. These records will be kept on current personnel until closure of the facility and on former personnel for 3 years from the date of the individual's termination.

Section II I (PROOF)

II I Closure Plans, Post-Closure Plans, and Financial Requirements

This closure plan has been developed in accordance with ADEM Admin. Code R.335-14-5-.07(3). The closure plan specifies performance standards and describes procedures for the closure of permitted hazardous waste storage units. The permitted storage units include the industrial waste storage units, and WMM igloos. The closure performance standards of ADEM Admin. Code R.335-14-5-.07(2) are designed to minimize the need for further maintenance by removing all hazardous waste and hazardous waste constituents from storage units. The closure plan is also designed to provide closure in a manner that will control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to surface water, groundwater, or the atmosphere. Permitted storage units will be operated in accordance with permit requirements, therefore; the closure requirements of ADEM Admin. Code R.335-14-5 will be applied.

Post-closure maintenance will not be required if no hazardous waste or hazardous constituents resulting from storage activities remain above closure target levels following final closure.

See sections IV-I (OB/OD), IV-K (TTCDP), and IV-L (ETU) for specific closure requirements of those treatment units.

II I-1 Closure Plan ADEM Admin. Code R.335-14-8-.02(5)(b)13

II I-1a Closure Performance Standards ADEM Admin. Code R.335-14-5-.07 (2)

This closure plan specifies performance standards and describes procedures for the closure of permitted hazardous waste storage units located at ANAD.

This closure plan is designed to provide for closure of ANAD permitted hazardous waste storage units in a manner that will:

- Minimize the need for further maintenance.
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous waste decomposition products to surface water, groundwater, or the atmosphere.

Final closure of the permitted hazardous waste storage units at ANAD will accomplish the goals of the closure performance standards, noted above by: 1) processing the entire inventory located in storage units at or before the commencement of closure activities, and 2) removing and/or decontaminating all equipment, bases, structures, soils, or other materials containing or contaminated with hazardous waste or hazardous constituents associated with the hazardous waste storage units.

Post-closure maintenance or monitoring is not anticipated for the storage units since no hazardous wastes or hazardous constituents resulting from the storage activities are expected to remain above clean-closure target levels following final closure.

After final closure, certification, and acceptance of closure by ADEM has been completed, the storage units will no longer be classified as a hazardous waste management units.

II I-1b Partial Closure and Final Closure Activities ADEM Admin. Code R.335-14-5-.07(3)(b)

At this point, no specific date has been scheduled for implementation of closure for the industrial waste storage units, or WMM igloos that contain hazardous waste. Present estimates indicate that about 50 years are necessary to maintain activities essential to the mission at ANAD and its tenants. Upon implementation of closure activities, final closure should be completed within 1 year.

Final closure of the storage units will be accomplished by an integrated sequence of partial closures (that is, unit-by-unit).

Certification of Closure

Within 60 days of completion of final closure procedures, a certification will be prepared, signed by the ANAD Commander and an independent registered professional engineer that states that the storage units have been closed in accordance with the closure plan and all applicable regulations. Because there are not any regulated disposal units, only certification of final closure of storage units will be submitted.

During container storage operations, any identified hazardous waste spill will be cleaned up and containerized immediately. Records of all spills and cleanup activities will be recorded in an operating record. Containerized spill cleanup materials will be sent offsite to an approved TSDF If there is no evidence or record of a spill or cleanup activity in the operating record, closure will be limited to making an administrative (record keeping) activity report.

II I-1c Maximum Waste Inventory ADEM Admin. Code R.335-14-5-.07(3)(b)3.

Each storage unit will vary in size; therefore, the maximum waste inventory will also be different based upon size of facility. Table II I-1 presents estimates of the maximum amount of hazardous waste that may be stored at any one time during the operational life of each storage unit type.

TABLE II I-1
Maximum Volume of Permitted Storage Units

Management Unit Volume	Waste	Maximum
Container Storage Building 512	Process Waste/Lab waste	25,440 gallons
Container Storage Building 466	Process Waste	53,424 gallons
Container Storage Building 527	Process Waste	44,520 gallons
Roll-Off Box Storage Building 466	Process Waste	4-40 cubic yard roll-off boxes
WMM Igloos (23′6″ x 80′)	WMM	60,083 gallons

II I-1d Schedule for Closure ADEM Admin. Code R.335-14-5-.07(3)(b)6

Currently, no specific date has been established for implementation of closure for any industrial waste container (drum/roll-off box) storage unit and/or WMM storage unit that contain WMM at ANAD. Present estimates are that about 50 years are necessary to maintain activities essential to the mission at ANAD and its tenants.

The overall closure of each permitted hazardous waste storage unit will be completed by an integrated sequence of unit-by-unit closure (that is, close one unit at a time) until all hazardous waste storage units have been closed. Each closure will be completed within 180 days of initiating each unit closure. The ADEM will be notified in writing at least 45 days prior to the date that any final closure operations are scheduled to begin. All hazardous waste including any spill cleanup material and decontamination residues will be shipped offsite to an approved TSDF.

It is not expected that any unit closure will exceed 180 days for each unit. If extensive decontamination procedures are required to be implemented during closure of storage units and an extension for closure is necessary, ADEM will be notified. Final closure will be completed in accordance with all applicable extensions, etc.

II I-1d(1) Environment Protection

In accordance with ADEM Admin. Code R.335-14-5-.07(2)(b), ANAD will close all storage units in a manner that controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. In all instances of closure or extensions, ANAD will take all steps necessary to prevent threats to human health or the environment from unclosed but not operating waste management unit(s), including compliance with all applicable permit conditions pertaining to that unit(s). ANAD will comply with all applicable laws and regulations to ensure protection for human health and the environment.

II I-1d(1)(a) Extensions for Closure Time ADEM Admin. Code R.335-14-5-.07(3)(d)

If necessary, ANAD will request extensions, as specified in ADEM Admin. Code R.335-14-5-.07(3)(d).

II I-1e Closure Procedures ADEM Admin. Code R.335-14-5-.07(3)(b)

This section is organized in a manner that describes the general activities associated with closure of the permitted hazardous waste storage units. The storage units fall into two classifications:

- Industrial waste storage units
- WMM storage units

II I-1e (1) Industrial Storage Units (Buildings 466, 512 and 527)

Upon completion of storage operations at any of the industrial waste storage units, waste and waste residues will be removed by as necessary by pumping, scraping, washing, etc.

During closure operations, residues such as grit blast residue and other residues will be generated. Waste and decontamination residues will be characterized, containerized into approved DOT containers and transported offsite to an approved TSDF for proper treatment and/or disposal.

Decontamination of the container storage units will proceed after storage activities have been completed and hazardous waste has been removed. Closure will consist of cleaning the surface of the storage area by pressure washing, grit blasting, or other means. In order to sample the concrete pad, the pad will be divided into a grid consisting of 10 feet by 10 feet squares. A chip sample will be taken from each square. These samples will be analyzed for the constituents listed in ADEM Admin. Code R.335-14-2-Appendix VIII.

If contamination is found in the concrete samples, then representative soil samples from underneath the pad where contamination was found will be obtained by dividing the building into quarters and taking a core sample from each quadrant of the building. This sample will consist of the soil just below the soil-concrete interface. These samples will be analyzed for the constituents listed in ADEM Admin. Code R.335-14-2-Appendix VIII.

Soil borings will be taken from areas of known previous spills. Samples will be obtained from the surface soil and at a depth of 1 foot. These samples will be analyzed for the constituents listed in ADEM Admin. Code R.335-14-2-Appendix VIII.

Clean closure target levels will be established at the ADEM Alabama Risk Based Corrective Action (ARBCA) preliminary screening values (PSV). If any of the sample analyses are above the ARBCA PSV, a revised closure plan will be submitted detailing further activities.

II I-1e (2) WMM Igloos

The WMM igloo closure will be based on whether the igloos stored hazardous waste. If no hazardous waste has ever been stored in the units, submittal of documentation of this fact will be considered closure. Units having stored hazardous waste will undergo a closure process applicable to the waste previously stored.

Upon completion of storage operations at any of the WMM storage units, waste and waste residues will be removed by any means necessary to include high pressure wash, scraping, etc.

During closure operations, residues such as wash water and other residues may be generated. Waste and decontamination residues will be containerized into approved DOT containers and transported offsite to an approved TSDF for proper treatment and/or disposal.

Decontamination of the WMM storage units will begin after all storage activities have been completed and all hazardous waste has been removed. Closure will consist of pressure washing, steam cleaning, (or some other approved means) the interior surface of the storage area. Sampling will consist of wipe samples from four random locations inside the unit. These samples will be analyzed for lead and energetics.

Soil samples will not be taken, as there is no transport mechanism to the soil.

Clean closure target levels will be established in accordance with ARBCA. If any of the sample analyses is above the ARBCA clean closure level, a revised closure plan will be submitted detailing further decontamination activities. The unit will be closed in accordance with an ADEM approved closure plan.

II I-2 Post-Closure Plan
ADEM Admin. Code R.335-14-8-.02(5)(b)13

Since ANAD storage units are not disposal sites, and any residual hazardous contamination will be removed prior to closure, a post-closure plan is not required. However, if it is determined during closure that contamination has infiltrated the surrounding soil, surface water, or groundwater and cannot be removed, a post-closure plan will be prepared and submitted to ADEM.

II I-3 Certification of Closure
ADEM Admin. Code R.335-14-5-.07(6)

Within 60 days of completion of final closure procedures, a certification will be prepared, signed by the ANAD Commander and an independent registered professional engineer that states that the storage units have been closed in accordance with closure plan and all applicable regulations. Because there are no regulated disposal units, only certification of final closure of storage units will be submitted.

In the event that clean closure cannot be achieved, a post-closure care permit application will be submitted to the ADEM.

II I-4 Closure Cost Estimate

Since ANAD's storage units are not disposal sites, and any residual hazardous contamination will be removed prior to closure, closure cost estimates are not required. However, ADEM has requested these cost estimates, and they are provided annually.

II I-5 Financial Assurance Mechanism for Closure ADEM Admin. Code R.335-14-8-.02(5)(b)15

No financial assurance mechanism for the closure of storage units is required. ADEM Admin. Code R.335-14-5-.08(1) exempts states and federal government from the financial requirements of ADEM Admin. Code R.335-14-5.

II I-6 Post-Closure Cost Estimate ADEM Admin. Code R.335-14-8-.02(5)(b) 16

Not applicable.

II I-7 Financial Assurance Mechanism for Post-Closure Care ADEM Admin. Code R.335-14-8-.02(5)(b) 16

Not applicable.

II I-8 Liability Requirements ADEM Admin. Code R.335-14-8-.02(b) 17

Liability insurance is not required for ANAD because states and the federal government are exempt from this requirement in accordance with 40 ADEM Admin. Code R.335-14-5-.08(1)(c).

II I-9 State Financial Mechanism ADEM Admin. Code R.335-14-8-.02(5)(b)18

Proof of coverage by a state financial mechanism is not required for ANAD because no financial assurance mechanism for the closure of the storage units is required. ADEM Admin. Code R.335-14-5-.08(1)(c) exempts states and the federal government from the financial requirements of ADEM Admin. Code R.335-14-5

Section IV J (PROOF)

IV J RESERVED

Section V (PROOF)

V A Other Federal Laws

V A-1 Unit is Classified as a "Miscellaneous Unit"

Not applicable.

V A-2 Unit is Classified as a Process Vent

Not applicable.

V A-3 Unit is Subject to Equipment Leaks

Not applicable

V A-4 Considerations under Federal Laws

ADEM Admin. Code R.335-14-8-.02(5)(b)20 states that the applicant addresses other applicable federal and state laws as required. The following is a discussion of the application of these applicable laws. A listing of permits currently held at ANAD can be found in Section 6 of the Part A Application (Section I).

V A-4a National Environmental Policy Act (NEPA)

In accordance with the National Environmental Policy Act (NEPA), the Army will prepare required NEPA documents as necessary that will identify analysis of operations at ANAD. The ANAD DRK is the organization responsible for the facility's compliance with this law.

V A-4b Clean Air Act/Clean Water Act

The Clean Air Act permits required for ANAD are listed in Section 6 of Part A of this application. (Section I).

ANAD currently holds a National Pollutant Discharge Elimination System (NPDES) permit, number AL0002658, from ADEM. ANAD has prepared and will update, as needed, an integrated Spill Prevention Control and Countermeasures (SPCC) Plan.

V A-4c Toxic Substances Control Act (TSCA)

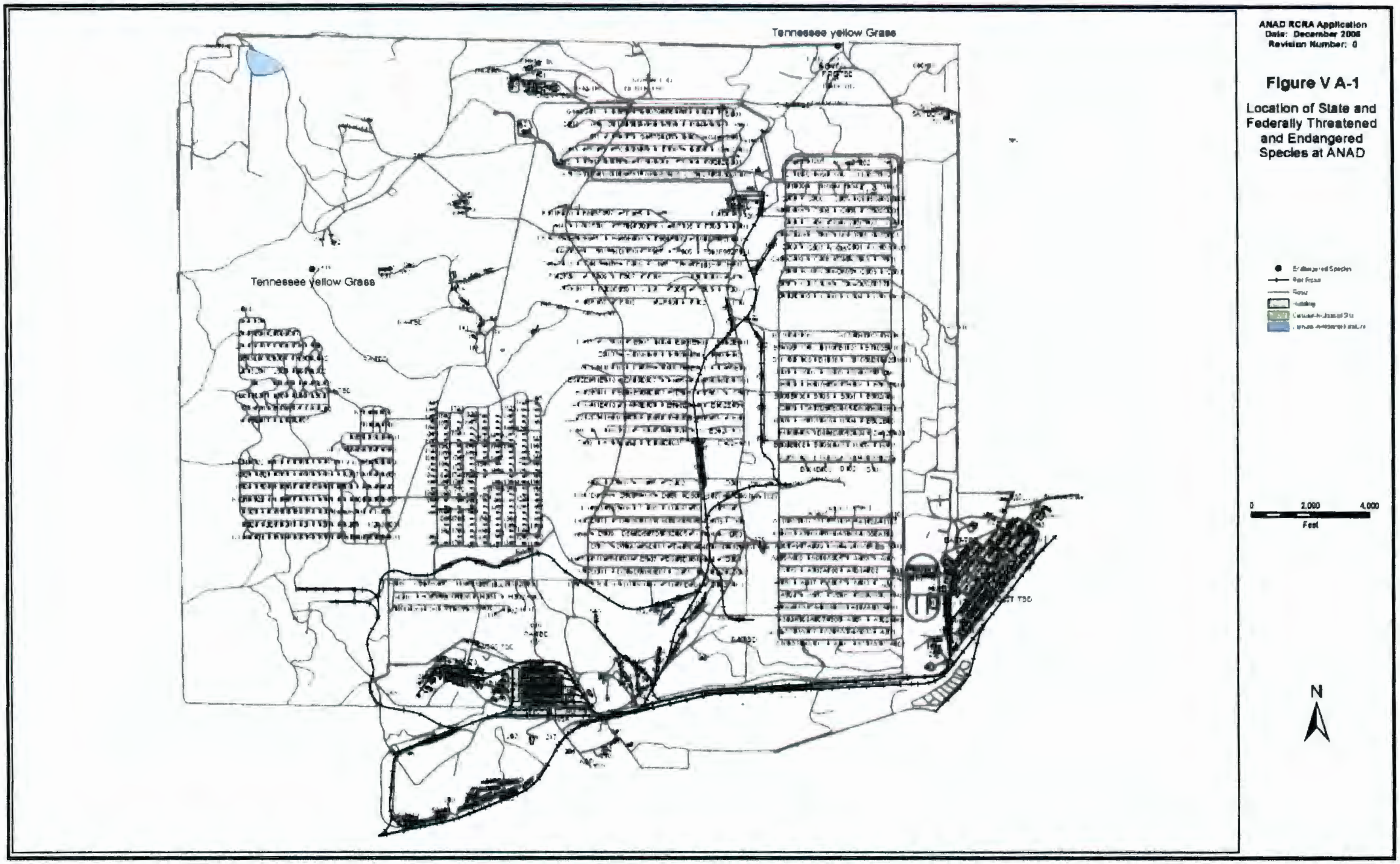
[RESERVED]

V A-4d Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA is a federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). These Acts provide for the investigation and cleanup of abandoned or uncontrolled waste sites. The Federal Facility Agreement (FFA) negotiated between the US EPA, Region IV, ADEM, and the US Department of the Army stipulates that the Army's CERCLA response obligations and RCRA corrective action obligations are to be integrated with respect to releases of hazardous substances, waste, constituents, pollutants, or contaminants. As the Army is the lead agency under CERCLA at ANAD, RCRA environmental response obligations are deferred to this program.

V A-4e Endangered Species Act/Fish and Wildlife Coordination Act

ANAD will comply with the Endangered Species Act and Fish and Wildlife Coordination Act as necessary. An investigation of the impacts for the ANAD facilities was conducted. The Pygmy Sculpin, a threatened fish species, is found in Cold Springs approximately five miles south of the installation. The Tennessee Yellow-Eyed Grass, an endangered plant species, is located adjacent to the OB unit in the ANAD's Ammunition Storage Area. ANAD is within range of the Red-Cockaded Woodpecker. Field activities have not revealed any abandoned colonies, cavity or nesting trees. ANAD forest management includes practices to mitigate impact to the Indiana Bat and the Northern Long-eared Bat. The issuance of this permit should not adversely affect either species and ANAD is actively managing impacts to the Pygmy Sculpin through remediation efforts at Cold Spring Creek. Figure V A-1 shows the location of state and federally threatened and endangered species found at ANAD with respect to the permitted units. The ANAD DRK is the organization responsible for the facility's compliance with this law.


Tennessee yellow Grass
Tennessee yellow Grass
ANAD RCRA Application
Date: December 2006
Revision Number: 0
Figure V A-1
Location of State and Federally Threatened and Endangered Species at ANAD
0
2,000
4,000
Feet
N

This page intentionally left blank.

V A-4f National Historic Preservation Act

ANAD has an Integrated Cultural Resources Management Plan, Historic Properties Component, and a Memoranda of Agreement signed in 2016 with the Alabama State Historic Preservation Officer with regards to continued operation of the facility Based on field observations and consultation with the State of Alabama Historic Preservation Officer, no historic or archaeological resources will be affected by normal operation of the facility. The ANAD DRK is the organization responsible for the facility's compliance with this law.

V A-4g Wild and Scenic Rivers Act/Coastal Zone Management Act

The location of the storage facilities or treatment facilities will not affect any wild and scenic rivers and coastal area. ANAD is not located within the watershed of the Sipsey Fork of the Black Warrior River which is the only Wild and Scenic River in the State of Alabama. ANAD is approximately 300 miles from the Gulf of Mexico.

V A-4h Executive Orders

Executive Order 13148 required federal facilities to implement an Environmental Management System (EMS). ANAD has complied with the order and in 2016 was re-certified under the International Organization for Standardization (ISO) EMS standard 140001. Executive Orders (EO) 11988 and 11990 stipulate that federal agencies should avoid using floodplain and wetland resources as sites for federal actions unless there is no practicable alternative. ANAD will comply with these executive orders. EO 12580 stipulates that federal agencies are responsible for implementing CERCLA as amended by SARA. In addition under EO 12586 (Emergency Planning and Right-to-Know Act), The Secretary of Defense has committed the DoD to an aggressive pollution prevention program and has ordered all DoD facilities to comply. EO 13693 established goals for waste minimization through sustainable procurement and source reduction, diversion of solid waste and construction and demolition waste, diversion of compostable and organic material from the waste stream, the use of printing/writing paper containing at least 30% postconsumer fiber and the reduction of the overall use of printing paper. ANAD will comply with these executive orders.

V A-4i Federal Facility Agreement

The Federal Facility Agreement between the USEPA Region IV, ADEM, and the U.S. Department of the Army was negotiated and finalized in June 1990. The general purposes of this agreement are to: ensure that the environmental impacts associated with past and present activities at ANAD are thoroughly investigated and appropriate remedial/ corrective actions are developed and implemented as necessary to protect the public health, welfare and environment; to establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions according to applicable law; to facilitate cooperation, exchange of information and participation of all three parties in such actions; and to set out the specific purposes of the agreement.

This page intentionally left blank.

V B Waste Minimization

V B-1 ANAD Pollution Prevention Program

V B-1a Background

ANAD operates a pollution prevention (P2) program in conjunction with their environmental management system (EMS). ANAD maintains the following environmental policy statement, endorsed by the ANAD Commander, which outlines ANAD's commitment to the environment:

> "ANAD is a world-class organization dedicated to the protection, conservation, and restoration of our natural environment and resources, the prevention of pollution, and compliance with environmental laws. ANAD is strongly committed to long-term sustainability, improved mission performance, and environmental protection using the following core principles:
>
> - Conserve resources through pollution prevention and green purchasing.
> - Compliance with environmental and safety laws and regulations.
> - Continuous improvement through incorporation of an Environmental Management System into our everyday business practices.
> - Protect and restore our natural and cultural resources.
> - Set and continually review environmental objectives and targets to minimize impacts by ANAD's activities, processes, products, and services on the environment.

As public awareness of and participation in environmental issues increases, a robust, proactive pollution prevention program is important to minimize the environmental impact of ANAD operations. Preventing pollution is a top environmental priority for ANAD.

V B-1b Process Improvements and Material Substitution

On April 8, 2009, The Secretary of Defense released a memorandum requesting installations to research and invest in alternatives for the replacement of hexavalent chromium ($Cr6+$). This memorandum directed for installations to take the following actions:

- Invest in appropriate research and development on substitutes.
- Ensure testing and qualification procedures are funded and conducted to qualify technically and economically suitable material and processes.
- Approve the use of alternatives where they can perform adequately for the intended application and operating environment.
- Update all relevant technical documents and specifications to authorize use of the qualified alternatives.
- Document the system-specific $Cr6+$ risk and efforts to qualify less toxic alternatives in the Programmatic Environment, Safety, and Occupational Health Evaluation for the system. Share knowledge derived from research, development, testing and evaluations and actual experiences with qualified alternatives.

ANAD is participating in research, development, test and evaluation projects for finding alternatives to hexavalent chromium in surface finishing processes. Demonstrations are planned for 2017 for to find substitutes for chromium in black oxide, phosphate sealers and wash primer operations. The existing wash primer specification utilizing chromium will be cancelled at the end of fiscal year 2017.

ANAD and the Anniston Munitions Center (ANMC) has worked diligently with the Aviation Missile Research Development and Engineering Center(AMRDEC) since 2012 on the design and installation of a new process to recycle Multiple Launch Rocket System (MLRS) in order to reduce the large MLRS stockpile that the Army currently maintains. After obtaining a hazardous waste treatment permit from ADEM in 2015, a Thermal Treatment Closed Disposal Process facility construction was completed in 2016. The process will recycle approximately 49% of the rocket system or approximately 2 million pounds of materials per year based on current design and estimated production rates

V B-1c Inventory Management

Materials in the ANAD industrial areas are limited to 30-day supplies and are procured on an as-needed basis, an approach similar to Just-In-Time Manufacturing. ANAD maintains a database application to track hazardous material purchases and usage, as well as hazardous waste generation and shipments. DRK staff maintains and updates the database on a regular basis. The shelf-life of materials is also tracked to ensure that materials are used prior to the labeled expiration date. In doing so, inventory levels are reduced and waste disposal and material procurement costs are avoided. Materials targeted for reduction or elimination (such as ozone depleting chemicals) are flagged for identification of acceptable, more environmentally-friendly substitutes. Hazardous wastes are tracked "cradle-to-grave" [from generator site to the treatment, storage, and disposal (TSD) facility] via the labeling and bar-coding features of the database.

In 2003, ANAD opened the Paint Store which centrally manages and distributes paint and paint-related products to satellite locations throughout the industrial complex at ANAD. The Paint Store is designed to provide rapid receipt and consistency of paint products, as well as preclude disposal costs for unused or out-of-shelf life paint products. This is accomplished by the paint vendor consigning the paint materials to the Paint Shop operators, who in turn, only charge the government for the product when it is ordered and receipted into the shops. This has reduced ANAD's paint-related wastes by eliminating the occurrence of expired shelf-lives.

V B-1d Cleaning, Degreasing, and Chemical Depainting Waste Reductions

In 2008, only two locations remained on ANAD utilizing trichloroethylene (TCE) as a parts degreaser. These operations were located in Buildings 409 and 129. ANAD's Directorate of Risk Management performed a Six Sigma project on the use of TCE in Building 409. As part of this project, personnel examined the parts put into the system for cleaning and drag out from the parts when removed from the vat. Also, the Directorate of Production (DP) replaced the existing vat at Building 409 with a smaller vat. With the Six Sigma project and the replacement of the vat at Building 409, ANAD's emissions were reduced drastically. In 2008, ANAD's Toxic Release Inventory (TRI) releases reported for TCE was 62,500 lbs. Even though ANAD's TRI releases were decreased drastically from the previous year, ANAD still pursued options to reduce it even more. In 2011, ANAD then moved the operations performed at Building 129 and eliminated the use of TCE at the new process location. That reduced the TCE operations to one vat. As part of ongoing efforts, ANAD's Directorate of Engineering and Quality (DEQ) worked with the Army Research Laboratory (ARL) to perform studies for replacements of TCE. In July 2013 TCE was removed from the operations at Building 409 and a more environmental friendly material was installed. A material containing no HAPs is currently being used to degrease. ANAD has removed all degreasing vats containing TCE.

V B-1e Volatile Organic Compound Emissions and Related Paint Reductions

VOC emissions and paint-related wastes have been reduced through combined state-of-the-art control technology and improved processes and material management.

ANAD's efforts towards reducing VOC emissions have resulted in a reduction in emissions of over 70 percent since 2002.

V B-1f Abrasive Blasting Reductions

Reductions in material usage, waste generation, and air emissions have also been evident in abrasive blasting operations. A 27-ton capacity automated shot blast "spinner hanger" system was installed in 1995 to provide more efficient cleaning of vehicle hulls and turrets. Due to their size, these components had been manually blasted. This automated spinner hanger uses stainless steel shot and generates less waste than comparable systems using sand or slag by recovering and re-using steel shot. Use of this system reduced manual blasting of these components by about 90 percent. An additional smaller steel shot spinner hanger was installed in 1999 to blast vehicle parts up to 4 by 8 feet in size. The smaller system fully complies with CAA emissions standards and operates similarly to the larger unit. Use of ultra-high pressure jet cleaning has also contributed to the reduction in abrasive blast media usage, waste generation, and emissions from blasting operations. Abrasive blast media waste was reduced from nearly 3.4 million pounds in 1992 to almost 2 million pounds in 1997 as a result of implementing these projects.

V B-1g Air Emission Reduction

ANAD received a final Title V major source operating permit in 2004 that includes monitoring, reporting, and record-keeping requirements for several air emission sources throughout ANAD. These requirements have provided ANAD with a means to monitor air emission sources closely and identify issues in equipment performance. ANAD has also increased education and awareness of air permitting requirements, which has resulted in an increase in communication between the directorates during the planning and construction phases of new projects. The Air Program is able to submit the necessary permit applications prior to installation of new equipment. These measures have resulted in a reduction of total tons of air emissions, as reported on the annual air emissions inventory (AEI), by over 50% since 2002.

V B-1h Sewage and Industrial Waste Treatment Plants

In March 2011, ANAD completed construction and began operating a new Industrial Waste Treatment Plant. The new facility replaced a thirty year old plant and significantly improved the wastewater treatment processes from cleaning and finishing operations while reducing the risk associated with old infrastructure.

In 2014 ANAD began a construction program to upgrade sanitary sewer, and industrial wastewater conveyance systems. The design is utilizing high density polyethylene piping, new lift stations, and will replace all existing main trunk and lateral lines from areas generating wastewater. The new lines will significantly reduce the potential of releases from old piping systems.

V B-1i Recycling and Integrated Solid Waste Management

ANAD began its recycling program in 1982, focusing mainly on office mixed paper, cardboard, aluminum cans, and ferrous/non-ferrous metals. The program at the time was operated primarily using appropriated funds. In 1990, ANAD's recycling program was transitioned to a Non-Appropriated Fund (NAF) activity, reducing salaries, which in turn reduced overall operating costs. By reducing operating costs, the NAF Recycling Program maximized its revenue returns. Also, ANAD expanded its NAF Recycling Program during 1990 to include non-metallic recyclable items such as wood, styrofoam, glass, and plastics.

The ANAD NAF Recycling Program is designated as a Qualified Recycling Program (QRP) in which all proceeds from the sale of recyclable materials are returned to the NAF Recycling Program account. The NAF Recycling Program pays its operating costs out of these proceeds; any excess funds are used to support environmental, health and safety, and Morale, Welfare, and Recreation (MWR) activities.

Recycling has become one of several components of an integrated solid waste management (ISWM) approach. An ISWM approach reflects EPA's pollution prevention hierarchy, which places priority, respectively, on source reduction, recycling, treatment, and disposal.

In FY2016, the NAF Recycling Program collected:

- 2.8 million lb of metals
- 4.9 million lb of wood products
- 757,000 lb of paper products
- 1.2 million lb of used oil

ANAD maintains a state-of-the-art tub grinder to reduce wood product volume as much as possible. Excess wood products are sold to the general public at Saturday sales.

The NAF Recycling Program's efforts help ANAD to:

- Avoid solid waste disposal costs and solid waste management costs
- Divert more than 62 percent of its solid wastes from entering disposal facilities in FY2016, exceeding the Army's 50 percent solid waste diversion rate goal established in 2016.

ANAD's NAF Recycling Program has been very successful in finding profitable qualified markets for resale of many recyclable items and developing working relationships and alignments with the Directorate of Risk Management as well as ANAD DLA Disposition Services. The recycling program markets directly to vendors, eliminating the need for a broker, or middle-man.

V B-1j Future Developments

ANAD is continuing its efforts towards reducing the release of pollutants by pursuing the following P2 opportunities:

- ANAD has implemented a program to upgrade the sanitary sewer and industrial wastewater line systems that began in 2015. Studies were conducted to identify significant risk areas in need of repair and replacement. The new systems will include pre-treatment systems to reduce hexavalent chromium at the source building.
- Green Purchasing Program: This active program will enhance ANAD's current procurement program to include the use of recycled-content products, EnergyStar® products, alternative fuel vehicles, bio-based products, non-ozone depleting substances, and replacements for EPA Priority Chemicals, as outlined under the DoD Green Purchasing Program.

This page intentionally left blank.

Section VI (PROOF)

VI Solid Waste Management Units

The Alabama Department of Environmental Management (ADEM) conducted a RCRA Facility Assessment of the Anniston Army Depot (ANAD) facilities in March 2018. The ADEM identified the following permitted units or areas as solid waste management units (SWMUs). Some of the SWMUs were previously identified as part of a CERCLA/SARA investigation of the Facility which resulted in a Federal Facility Agreement signed among the EPA, ADEM, and the Department of the Army in June 1990. Also, SWMUs were added during the 2007 RCRA Facility Investigation.

SWMU-1, Chemical Sludge Waste Pits

This unit is comprised of a series of seven trenches approximately 10 to 15 feet deep and transects approximately two acres north of the vehicle test track. These units were used from 1971 to 1981 for the disposal of various liquid industrial chemical wastes including corrosive waste, reactive waste, paint residue, spent solvents, spent cyanide solutions, and wastewater treatment sludge. The trenches were exhumed between November 1982 and May 1983. A total of 52,526 tons of contaminated soil was transported as waste to an authorized hazardous waste landfill facility. A reclamation project was conducted and the facility was closed under Resource Conservation and Recovery Act (RCRA) Subtitle C provisions and approved by ADEM in April 1983. The Trench Area groundwater pump-and-treat system, installed and operated for this area, addresses localized groundwater contamination at the Chemical Sludge Waste Pits (SWMU-1) and adjacent areas. This system was upgraded in 2001 to pump groundwater to a centralized treatment system located adjacent to the ANAD Sewage Treatment Plant. LUC signs have been posted around this SWMU.

SWMU-2, Sanitary Landfill

This unit is a 13.6-acre sanitary landfill operated from 1970 until formal closure in October 1993. The wastes disposed of included cardboard, pallets, packing material, cafeteria garbage, digested sludge, office waste, and containerized asbestos waste. Abrasive dust waste was disposed of from 1982 until 1986. Soils were not investigated under CERCLA because it was understood at the time the work plans were written that the landfill would be closed under RCRA Subtitle D Solid Waste regulations. On October 9, 1991, new federal regulations (40 CFR 257-258) went into effect that required a formal/engineered closure of any portion of the landfill utilized after that date. A 2-acre portion of this landfill was closed under RCRA in 1993 in compliance with a RCRA Solid Waste Closure Plan. Long-term monitoring and continued maintenance are ongoing. The remainder of the landfill was capped prior to RCRA-required closure. This unit is not identified as a source for groundwater contamination.

SWMU-3, Old Industrial Wastewater Treatment Plant

This closed unit was operated from 1976 to 1981 when a new Industrial Water Treatment Plant (IWTP) (SWMU-4) replaced it. It received industrial wastewater from various operations in the Bill Nichols Industrial Complex. Wastes contained cadmium, cyanide chromium, phenols, acids, bases, alkali, and other organics including grease and oil from steam cleaning operations. Wastes were contained in four clay-lined lagoons, two of which were used for chromium wastes (approximately 45 ft^2 with 35,000 gallon capacity), and two were used for general wastes (approximately 75 feet by 100 feet with a 200,000 gallon capacity). Clay lagoons were replaced with concrete-lined lagoons in 1978. The treated wastewater was discharged either directly to Dry Creek or to the sanitary sewer system where it received final treatment. Groundwater and soil impacted from this operation are currently being investigated under the ANAD Installation Restoration Program (IRP) as Operable Units (OU) 1 and 2, respectively.

SWMU-4, New Industrial Wastewater Treatment Plant

The New IWTP, constructed in 1980, treated all industrial wastewaters generated in the Bill Nichols Industrial Complex from 1981 through 2011. Lagoons of the Old IWTP (SWMU 3) were filled in and replaced with a variety of filters, clarifiers, sumps, and holding tanks. Wastes treated included cadmium and cyanides wastes, steam cleaning wastes containing hydrocarbons, chromium, phenol, and acids. SWMU 4 ceased operation in 2011. Demolition was conducted from June 2012 to May 2013. Buildings 525, 505B, 508, 505, and 520 were removed. A new IWTP was constructed near the Sewage Treatment Plant and began operations in 2011. All plant effluent discharges to Choccolocco Creek. National Pollutant Discharge Elimination System (NPDES) Permit Number AL0002658 regulates the discharge of treated wastewater to this creek.

SWMU-5, Sinkhole Disposal Area

A sinkhole, approximately 0.6 acres in size, is located immediately east of the 900 Row of B-Block between Alabama Avenue and the Ammunition Storage Area (ASA) perimeter road. The sinkhole is more than 1 acre in area, is 25 feet below ground surface (bgs) of the surrounding area, and is filled with water. SWMU-5 was used periodically from 1942 to 1978 for disposal of various wastes including construction debris, empty ammunition containers, railroad ties, and empty containers (USATHAMA, 1978). During a 1978 survey, containers labeled ammonium hydroxide, sodium hydroxide and sodium hypochlorite were observed in the area. In 1978, drums and other large debris were removed from the sinkhole; no visual evidence of contamination was noted (USAEHA, 1986). VOCs, semi-volatile organic compound (SVOCs), and lead have been detected in groundwater. LUCs have been implemented in accordance with the OU3 Record of Decision (ROD).

SWMU-6, Valve Disposal Pit

Located in the ASA, this SWMU had approximately 10,000 sodium-filled tank engine valves reportedly buried here in 1947 (USATHAMA, 1978). Each of the tank valves contained approximately 1 ounce of elemental sodium, yielding a total of 625 pounds of sodium disposed. The site is a rectangular pit approximately 50 feet by 110 feet. The Remedial Investigation (RI) conducted at this site stated that there is no risk to human health or ecological receptors from the residual contamination remaining. This site has been recommended as requiring No Further Action (NFA).

SWMU-7, Chemical Waste Burial Pit

A variety of industrial chemical wastes (including alkaline corrosion removers, phosphoric acid, lead, zinc, and cadmium coating compounds) were reportedly dumped into a small pit in this area during a 6-month period in 1960, then backfilled. This pit is reportedly located in the northeast area of the Bill Nichols Industrial Complex, across from Building 512. The exact location and dimensions of the SWMU are unknown. There were also reportedly three separate spills of paint stripper (caustic with lead, cadmium, and chelating agents) from a 1,000-gallon tanker at this site. As determined during the RI, soil contamination is not a significant source of groundwater contamination. Part of the area has been capped with concrete and cover was also placed on this site pursuant to the OU2 ROD as part of land use controls (LUC). Currently, the surrounding area is used for outdoor storage of wood and metal parts.

SWMU-8, Acid Disposal Pit

The unit was reportedly a concrete pit located in the Chemical Limited Area, a highly restricted portion of the ASA, between C-Block and G-Block. SWMU-8 was used between 1959 and 1961 before the Facility 414 Old Lagoons (SWMU-12) were placed into service. Waste disposed in the pit included paint stripper, alkalis, cadmium, phosphoric acid and stripped paint containing lead and zinc chromate. These wastes may have been containerized in drums at the time of disposal. After it was no longer used as a disposal area, the concrete pit was reportedly filled with sand used previously for cleaning metal parts (USATHAMA, 1978). Elevated levels of VOCs, SVOCs, metals, and explosives have been detected in the groundwater and are being addressed under the OU3 ROD.

SWMU-9, Calcium Hypochlorite Pit

This area was reportedly used in 1974 for disposal of 400 containers of calcium hypochlorite, each about 100 pounds. The pit is located approximately 500 feet southwest of the vehicle test track between SWMUs 12 and 22. USAHEA report noted that several containers had ruptured during burial and had caused a fire when the material came in contact with scrap dunnage. In accordance with the ANAD ROD, approximately 209 cubic yards of soil were excavated from this SWMU as well as SWMU 12 in 2005 and properly disposed of offsite. The area has been graveled and impacts to the soils are being addressed under the ANAD IRP. LUCs have been implemented at this site in accordance with OU2 ROD.

SWMU-10, TNT Washout Facility

SWMU-10 is located in the central portion of the ASA, approximately 3,300 feet north of J-Block. It consists of a large metal building (Building 172) and a wastewater sedimentation tank located approximately 100 feet north/northeast of the building. TNT washout operations were conducted from 1948 until the mid-1950s for washing explosives from demilitarized munitions. Explosives washout wastewater, known as pink water, generated from the ammunition washout operations at Building 172 moved through the building via floor-level troughs and was discharged through a hose from the building to the sedimentation tank. Overflow from the sedimentation tank (approximately 6 feet wide by

10 feet long) was then discharged through a pipe under the road into the TNT Washout Facility Leaching Beds (SWMU-11). Routine use of the facility was discontinued in the mid-1950s except for occasional use in the palletizing operation through the late 1960s. Reportedly, a soil sample collected directly beneath the building's interior pink water trough contained an unspecified concentration of TNT. Operations were resumed periodically in the 1960s and 1970s. The building was last used in 1978. The building currently is inactive and access to the interior of the building is restricted due to explosive hazards. Metals and explosives have been detected in the groundwater and are being addressed under the OU3 ROD.

SWMU-11, Sedimentation Tank Leaching Bed (TNT Washout Facility)

The SWMU is located across the road from SWMU-10 and east of Building 172. Overflow from the sedimentation tanks was discharged into the leaching beds from treatment of the explosive washout wastewater. The leaching beds consisted of a series of 24 parallel surface soil troughs, each approximately 70 feet long, 8 feet wide, 3 to 4 feet deep and covering a ¾-acre area. The troughs were fed by a half-round red ceramic pipe, which could be diverted to selected troughs. A small and intermittent stream is located along the eastern side of the SWMU within 15 feet of the beds. The stream was flooded by pink water overflow released from the beds during heavy rain events and once during a water main break in the late 1970s. Following the water main break, a 1-to 2-foot earthen berm was constructed along the eastern perimeter of the beds to prevent direct runoff into the stream.

From 1948 until the mid-1950s, the leaching beds received wastewater from the TNT Washout Facility (SWMU-10) sedimentation tank. From the mid-1950s through the late 1960s, the beds also were used occasionally for disposal of wash water from palletizing system filters. In April 1978, an unknown quantity of octol pink water was discharged to the beds at a concentration of 15 parts per million. The beds have not been used since April 1978. Sediment samples collected prior to capping may have contained explosives concentrations ranging from 40 to 80 percent, although this is unconfirmed. An August 14, 1985 memorandum for record indicated that soil samples were contaminated with up to 50 to 60 percent explosives. Remaining explosives contaminated waste/soil was estimated to be 3 to 4 feet thick (USAEHA, 1986). Intrusive sampling activities within the bed have been limited because of potential explosive hazards. In 1985, the area was graded and capped with 2 to 5 ft of native clay. Metals and explosives have been detected in the groundwater and this site is being addressed under the OU3 ROD. LUCs were implemented as part of the final remedy for this site.

Groundwater samples from wells installed during the Environmental Site Investigation (ESI), contained concentrations of TNT and RDX in the soils and groundwater.

SWMU-12, Facility 414 (Old Lagoons)

This area was used from 1960 to 1978 and consisted of three unlined industrial waste lagoons used for the disposal of abrasive dust wastes containing cadmium and possibly lead, metal plating, cleaning solutions, fuels, oils, solvents, and residue from the IWTP generated in the Bill Nichols Industrial Complex. The lagoons were emptied in 1978 and the liquid was pumped to the A-Block Lagoon (SWMU-22), a lined surface impoundment. The sludge and lagoon remnants were dredged and piled. In November 1982, the pile was excavated and 9,594 tons of material was transported to an authorized hazardous waste landfill facility. The Landfill Area groundwater pump-and-treat system, installed and operated for this area beginning in 1990, addresses contamination at this site. This system was upgraded in 2001 to pump groundwater to a centralized treatment system located adjacent to the ANAD Sewage Treatment Plant. Additionally, a separate removal action was conducted for TCE-contaminated soils and groundwater. The action was successful for soils but not groundwater. In 2005, soils were excavated and properly disposed of offsite. The area was then graveled. LUCs have been implemented at this SWMU in accordance with the OU2 ROD. Groundwater issues will be addressed under the ANAD IRP.

SWMU-13, SIA Acid Chemical Waste Pit

This SWMU located in a "sandy cut in a hillside" near the Bill Nichols Industrial Complex Old STP (SWMU 18). The pit was reportedly used for disposal of "tank-truck quantities" of unspecified industrial chemical wastes from late 1940's to the late 1950s or 1960, or from 1957 to 1972. As this area was shown to present unacceptable risk to industrial workers with respect to soil exposure, the area was capped in late 2005 in accordance with the OU 2 ROD. LUCs were implemented as part of the final remedy for this site.

SWMU-14, Laundry Waste Leaching Facility

This unit is located approximately 100 feet east of the former laundry (Building S-162). The laundry was used from 1948 to 1973 to wash the clothing of workers who handled explosives. This facility, which was demolished in approximately 1973, consisted of a laundry building, an above-ground settling basin, and a below-grade settling pond. At capacity, approximately 1,300 to 1,600 gallons per day of wastewater containing soap, lye, and entrained explosives material were generated which flowed first to the above-ground settling basin where heavy solids were removed and then on to the settling pond. Water was then discharged to a nearby stream. As determined by the RI, there is no risk posed to human or ecological receptors and this site has been recommended as requiring NFA.

SWMU-15, Propellant Disposal Facility

The Propellant Disposal Facility is located in the northwestern portion of the ASA, approximately 2,400 feet northeast of Building S-662 along the eastern side of the road, from the Chemical Limited Area gate on the northern side of G-Block to gate E-1. SWMU-15 is a 1-acre, fenced field with two open, concrete-lined disposal units used for burning propellants from Lance Missiles from approximately 1968 to 1978. The propellant disposal units consist of concrete pads, small incinerators (furnaces), and concrete spill containment troughs, which diverted any spills during propellant off-loading to the sumps and incinerators. One unit was used to dispose of unsymmetrical dimethylhydrazine (UDMH) and the other was used to dispose of inhibited red fuming nitric acid (IRFNA). Diesel fuel (the approximately 500-gallon capacity holding tank remains on-site) and natural gas were used to ignite and burn the IRFNA. SWMU-15 is inactive and is overgrown with brush.

Based on the RI completed in August 2001, it was determined that this site does not pose a risk to human or ecological receptors.

SWMU-16, Burning Ground #1

ANAD operates the Burning Ground to demilitarize outdated, unreliable or otherwise unstable ammunition items. The unit is located in the northwestern section of the ASA and has been in operation for over 40 years. The burning ground covers approximately six acres and contains multiple burning beds where waste materials (up to 2,000 pounds per bed) such as scrap explosives, explosive-contaminated material, and demilitarized ammunition are spread and ignited. Salvageable materials are removed to the salvage yard and the remaining ash is managed as a hazardous waste and drummed for off-site disposal. In the past, explosives and explosive-contaminated materials were ignited with fuel oil. Currently, the wastes are ignited electrically. The Burning Ground was permitted under RCRA in 2009 and is an active site.

SWMU-17, Demolition Pit

The Demolition Pit is an active open detonation area located in a valley in the northwestern section of the ASA. The pit is used for the destruction of high explosive items including cartridges and projectiles of various calibers, bombs, rockets, warheads, and mines. The pit area covers approximately 5 acres and contains 8 detonation sites. Items are detonated anywhere from ground-level to a depth of 14 feet depending on the amount of explosives and location in the demolition pit. The Demolition Pit was permitted under RCRA in 2009. This area is currently active.

SWMU-18, Old Sewage Treatment Plant

The Old Sewage Treatment Plant (STP) is located in the south-central area of ANAD in the southern side of Gadsden Avenue, south-southwest of the ANAD Administration Area. The Old STP was used from 1942 to 1982 to treat domestic sewage from the western area of the Depot. The treatment plant was originally was designed to treat wastewater at a capacity of 75,000 gallons per day. Original design drawings show a bar rack, Imhoff tank, trickling filter, and sludge-drying beds. A final clarifier and effluent chlorination tank were added to the STP in 1975. Effluent was discharged to Eastaboga Creek, which flows past, but not into, the state fish hatchery located at the ANAD southwestern boundary.

The area surrounding the abandoned STP is graveled with some grass cover. The trickling filter was used as a fire fighting training pit until 1992. For this use, the filter sludge discharge pipeline was plugged and the filter lined with firebrick. During firefighting training exercises, the filter was filled with water and diesel fuel was poured on top of the water, ignited, and extinguished. An oil/water separator (OWS) was added as an emergency response/release prevention measure to guard against accidental overflow of the diesel fuel from the filter. The OWS was opened and inspected during an October 1993 site visit. There was no sheen or other evidence of petroleum products in the OWS. The trickling filter was filled in with concrete in April 1995.

SWMU-19, Old Sewage Treatment Plant and Drying Beds

The Old STP, located approximately 600 ft southeast of the vehicle test track in the Bill Nichols Industrial Complex, was used from 1948 to 1982. It was replaced by the New Sewage Treatment Plant (SWMU-20) which was constructed at the same location and incorporated some of the older facilities. Approximately 435,000 gallons per day of domestic sewage wastes and pretreated industrial waste waters from the phenol and steam-cleaning wastewater treatment systems were processed at the unit. Effluent from the plant was discharged to Dry Creek. The Phase II RI, completed in 1998, shows that there are no constituents in the groundwater at concentrations exceeding the maximum contaminant level (MCL) or risk-based concentrations. Surface soils are not considered a human health or ecological risk. This site is being addressed under the ANAD IRP as part of OU 2. LUCs have been implemented at this SWMU in accordance with OU2 ROD.

SWMU-20, New Sewage Treatment Plant

The new STP was constructed in 1982 using an activated bio-filter design and some converted units from the old STP (SWMU-19). Capacity of the New STP is 520,000 gallons per day, consisting of domestic sewage wastes and pretreated industrial wastewater. The system discharged at Coldwater Creek until December 1987, when effluent was pumped to Choccolocco Creek. NPDES Permit Number AL0002658 regulates the discharge of treated wastewater to Choccolocco Creek. LUCs have been implemented at this SWMU in accordance with OU2 ROD.

SWMU-21, Abrasive Dust Landfill

The Abrasive Dust Landfill site is a 2.9-acre open area immediately north of the Sanitary landfill (SWMU-2) that was used from 1977 to 1981 for disposing of abrasive dust waste from sandblasting operations. The dust consisted of sand, steel shot, glass beads, walnut hulls, paint flakes, and metallic chips. The dust was periodically dumped and graded over the natural soils. Open dumping of abrasive dust waste shifted to the Sanitary Landfill (SWMU-2) in 1981. The Phase II RI shows that there is a risk posed to construction worker for the subsurface soils scenario, however, there are no releases occurring from this area. LUCs have been implemented at this SWMU in accordance with the OU2 ROD.

SWMU-22, A-Block Lagoon

The A-Block Lagoon is a 1.7-acre lined surface impoundment located approximately 600 feet southwest of the vehicle test track inside the ASA. The lagoon was built in 1978 for the temporary storage of liquid wastes pumped from Facility 414 Old Lagoons (SWMU-12) and various other liquid industrial chemical wastes until the upgraded IWTP (SWMU-4) was completed in 1981. As a result of a 1979 RCRA Corrective Action/Removal Action, a remediation contractor removed and disposed of the lagoon wastes. During closure, the lagoon was emptied, the synthetic membrane liner and contaminated soils removed and the area back-filled and graded. Final closure and closure certification was completed August 1982. A pump and treat system began operations in 1990 to treat source areas for VOCs in the Southeast Industrial Area. LUCs have been implemented at this SWMU in accordance with OU2 ROD.

SWMU-23, Asbestos Waste Disposal Trench

The Asbestos Waste Disposal Trench is a shallow trench located adjacent to the Abrasive Dust Landfill (SWMU-21) and was used from 1980 to 1981 for disposal of insulation containing asbestos. Wastes were wrapped in double bags and disposal in accordance with existing environmental regulations. The trench was backfilled with soil after the use of the trench was discontinued. The Phase II RI determined that a risk does exist for subsurface soils and the construction land use scenario. Impacts to the soils are being addressed under the ANAD IRP.

SWMU-24, Old Sanitary Landfill

The Old Sanitary Landfill, located immediately adjacent to the southwest corner of the vehicle test track in the Bill Nichols Industrial Complex, operated from 1942 until 1970 when the new Sanitary Landfill (SWMU-2) was constructed. Disposal methods consisted of digging trenches approximately 25 feet wide, backfilling each trench with solid waste and soil, and applying daily cover of 12 inches of compacted soil over the waste. Waste type and quantities were not documented, but reportedly consisted of typical municipal wastes such as paper, household items, cardboard, packing materials, garbage, and possibly industrial chemical wastes. No releases have been determined from this site.

SWMU-25, Building 130 Sump

An 8,000 gallon concrete underground sump was used from 1943 to 1975 for temporary storage of various industrial chemical wastes from Building 130 operations (mainly paint stripping containing methylene chloride and phenol and degreasing sludge) prior to discharge or disposal. The SWMU is located outside the southwest corner of Building 130. A 1982 inspection found the sump to be full of liquid waste, which were pumped out in April 1983 and transported to a hazardous waste disposal facility. The sump was dug out and removed in April 1983. In conjunction with cleanup activities at Chemical Sludge Waste Pits (SWMU-1) and Facility 414 Old Lagoons (SWMU-12), the sump and adjacent contaminated soil were excavated and transported to an authorized hazardous waste landfill facility. The area then was covered with a concrete pad. Groundwater contamination was addressed as part of a pump and treat system. The area is currently covered by a 20 feet by 20 feet concrete pad.

SWMU-26 and -27, North and South TNT Burial Pits

The North and South TNT Burial Pits are located in a remote section of ANAD near the northern installation boundary along the road leading from Gate E-1 to the Chemical Limited Area gate on the northern side of G-Block. Information regarding historical operations at these sites is limited. Available aerial photographs show no excavations at the sites in 1957, although both areas had been cleared of trees. In the 1969 photographs, excavations and areas cleared of vegetation around both pits are evident. Aerial photographs from 1969 show these pits as open rectangular excavations. Dimensions taken from these photographs indicate both pits were roughly the same size—approximately 50 feet long and 25 feet wide. Aerial photographs from 1977 show both sites overgrown with small trees; outlines of the pits are visible in the clusters of trees. The pits were backfilled (date unknown). They are currently well-vegetated and show little evidence of past burial activities except for immature trees and four posted "Closed landfill" warning signs around each pit. The area surrounding the pits is now heavily wooded. Reports suggest that TNT-contaminated wastes and decontamination dunnage may have been burned and buried in these pits. Metals have been detected in groundwater. This issue is being addressed under the ANAD IRP.

SWMU-28, Waste Wood Landfill

The Wood Waste Landfill site is a 3.7-acre closed landfill used until 1976 for disposal of various waste wood items including railroad ties, telephone poles and wooden pallets. It is located adjacent to Building 512 Annex and is approximately 15 feet deep. The landfill has been covered and graded with 2 to 3 feet of clean fill.

SWMU-29, Old Lumber Disposal Yard

The Old Lumber Disposal Yard covered 6.24 acres and was used from mid-1940 through the mid-1970s for disposal of wood (burned with waste oil) and as a stockpile of wood available to the public. One acre of this site was excavated in order to construct a warehouse and is now covered with concrete and a metal structure. Waste wood removed in the excavation was disposed of offsite. The other part of this site is a paved parking lot. LUCs have been implemented at this SWMU in accordance with the OU2 ROD.

SWMU-30, Northeast Lagoon Area

The Northeast Lagoon Area is approximately 1.8 acres where various surface impoundments and liquid disposal pits were used for waste from approximately 1949 until early 1960s. Wood debris disposal and trash burning may have occurred here. Types and quantities of waste disposed of at this unit are unknown; however, SWMU-30 may have been used as a primary disposal area for chlorinated solvents from the early 1950s to the early 1960s. The area has been filled and is now a gravel parking lot with no remaining evidence of the lagoons. A pump and treat groundwater recovery system was put into service at this site in 1990. This system was upgraded in 2001 to pump groundwater to a centralized treatment system located adjacent to the ANAD Sewage Treatment Plant. LUCs have been implemented at this SWMU in accordance with OU2 ROD.

SWMU-31, Building 114 (Metal Plating Shop)

The current operations at Building 114 include cleaning, treating, and plating of metals. Metal treating operations transferred from the old portion of Building 114 to the new addition of Building 114 in June 1982. Extensive chromium contamination exists in soils, surface water, and groundwater adjacent to the old portion of Building 114, possibly due to spills, leakage from the chromium waste sump, and/or atmospheric deposition of compounds through the ventilation system. Industrial wastes identified included chromic acid, phosphoric acid, nickel plating solution, copper plating solution, cadmium plating solution, hydrochloric acid, sodium cyanide and copper cyanide. Volatile organic compounds (VOCs) have been detected in soil and groundwater in the vicinity of Building 114. The area has been covered with asphalt and the groundwater beneath Building 114 now flows via French drains into a sump, which is then pumped to a treatment system near the New STP (SWMU-20). Sump water is treated using an air stripper system and granulated activated carbon to remove VOCs and hexavalent chromium, respectively. The air stripper was installed in 1990.

SWMU-32, Hazardous Waste Storage Building 512

Building 512 is a steel frame and panel building with concrete floor and is located in the northern portion of the Bill Nichols Industrial Complex. The building currently is permitted to store hazardous waste for greater than 90 days in drums and other containers.

SWMU-33, Hazardous Waste/Roll-off Box Storage Building 466

Similar in construction to the unit above, this building currently is permitted to store hazardous waste in drums and other containers for greater than 90 days. The roll-off box area portion of Building 466 is a steel frame and panel building with concrete floor. The building currently is permitted to store hazardous waste for greater than 90 days in roll-off boxes.

SWMU-34, Chemical Storage Igloos

Chemical Agent Munitions Storage Igloos that stored M55 Rockets (41 igloos in RCRA interim status) and over-packed leaking chemical agent munitions and waste from reconfiguration of chemical agent munitions (5 igloos authorized by Consent Order 98-053-CHW issued January 1998) were authorized for storage of hazardous waste. The total number of Chemical Storage Igloos that were authorized for storage of hazardous waste was 155 (see list below). The chemical igloos provided secure storage of secondary waste generated by the Anniston Chemical Agent Disposal Facility, until these wastes were returned to the Anniston Chemical Agent Disposal Facility for disposal. These units were clean closed in accordance with ANAD Igloo Closure Plan. No further action is required. Some of the igloos were then permitted for conventional WMM storage – refer to SWMU 49.

155 Igloos were previously used for chemical agent storage:

G101	G302	G209A	G508A	C802	C907A
G102	G303	G210	G509	C803	C908
G102A	G303A	G211	G510	C804	C1001
G103	G304	G211A	G511	C805	C1002
G104	G304A	G212	G512	C806	C1003
G105	G305	G213	G601	C807	C1004
G106	G306	G301	G601A	C808	C1005
G107	G306A	G408	G602	C808A	C1006
G108	G307	G408A	G602A	G604	C1007

G108A	G307A	G409	G603	G604A	C1008
G109	G308	G410	G603A	G605	C1009
G110	G308A	G411	G610	G605A	C1101
G200A	G309	G501	G611	G606	C1102
G201	G310	G502	G612	G607	C1103
G202	G311	G502A	G1001	G607A	C1104
G202A	G312	G503	G1002	G608	C1105
G203	G313	G503A	C701	G609	C1106
G203A	G401	G504	C702	G609A	C1107
G204	G402	G504A	C703	C809	C1108
G205	G403	G505	C704	C901	C1201
G206	G404	G505A	C705	C902	C1202
G206A	G404A	G506	C706	C903	C1203
G207	G405	G506A	C707	C904	C1204
G208	G405A	G507	C707A	C905	C1205
G208A	G406	G507A	C708	C906	C1206
G209	G407	G508	C801	C907	

[These igloos have been clean closed in accordance with Anniston SDC Closure Plan and/or ANAD Closure Plan. No further action is required.]

SWMU-35, Deactivation Furnace/Popping Furnace

The Deactivation Furnace (Building 393, also known as the Popping Furnace) site is located in the northwestern quarter of the ASA along the southeastern side of Gate 2 to Gate E Road. The building was constructed on a concrete pad and is surrounded by a gravel-covered parking lot. The furnace was used to deactivate small arms munitions up to 50-caliber with less than 600 grains of energetic material. Munitions were fed into a rotating retort where propellants were burned and lead projectiles were melted. Empty brass and steel shell casings were collected in a bin; molten lead was collected in an ingot mold. Particulate emissions from the furnace were collected in a baghouse where the dust was drummed and stored as a hazardous waste. All equipment was removed in 1999, the building was granted RCRA closure, and was demolished in 2000. The groundwater, surface and subsurface soils were investigated under the ANAD IRP. Soils posing a risk were excavated and disposed of at a permitted offsite facility in 2005.

In addition, a leaking 1,000-gallon underground diesel fuel tank located adjacent to the furnace building was removed and the surrounding soils remediated.

Groundwater monitoring and maintenance of LUCs are ongoing as outlined in the OU-3 ROD.

SWMU-36, Drill and Transfer System Site (Toxic Demilitarization Site)

This site was used for evaluation of a system to remove chemical agents from munitions. The Preliminary Assessment/Site Inspection was completed and no further action is required.

SWMU-37, Vehicle Wash Rack (Building 45)

The Vehicle Wash Rack is located in the utility area at the western end of Building 45 along the eastern side of Gadsden Avenue, approximately 1,000 feet south of the ASA fence. The wash rack is designed with two wash bays and a water heating/steam generating unit. No solvents are used in the vehicle cleaning process. An aboveground tank located on the northern side of the building stores the kerosene fuel for the water heating unit.

One bay is used for general washing of Depot vehicles, the other from steam cleaning operations. Waste water from cleaning operations are collected through floor drains and pumped through an aboveground OWS. The effluent water is reclaimed by a filtration system located in the building. Oils and solids from the OWS are collected routinely and disposed of as a non-regulated waste in a hazardous waste landfill.

The OU-5 RI is ongoing which includes an assessment of SWMU 37.

SWMU-38, Air Emission Baghouse (Buildings 5, 31, 74A, 103/111, 104, 113, 114, 117, 127, 129, 130, 133, 145, 147, 186, 409, 413, 431, 432, 433, 474, 475, 652, CD-020, and PUB)

Baghouses located throughout the Bill Nichols Industrial Complex are currently used to collect particulate emissions from various industrial operations. Collected dust is stored in drums or rolloff containers for eventual disposal off-depot. The RI states that the surface soils at this site do not pose a human or ecological risk. There is no significant groundwater or subsurface contamination from these units. This site is being recommended as requiring NFA.

SWMU-39, Dynamometer Wastewater Treatment System

The Dynamometer Wastewater Treatment System treats wastewater generated while testing engines for military vehicles. Wastewaters containing oil from testing and cleaning engines are pumped to an oil/water separator where oil is collected and drummed for removal and disposal and water is then routed to the IWTP. NFA has been recommended for this site.

SWMU-40, Oil Water Separator (Building 501 and 501 UST Site)

The Oil Water Separator is a below ground concrete tank located in Building 501 and is used to treat wastewaters from Building 503 (steam cleaning building) and Building 504 (military vehicle fuel and lubricant draining area and washdown pit). This unit separates waste oils from process waste waters. Oil is pumped to drums for temporary storage; remaining liquids are routed to the IWTP for further treatment. Primary wastes are oils, grease, and fuel residues.

SWMU-41, Steam Cleaning Buildings (Buildings 128A, 129, 130, 409, 414, 421, 474, 475 & 503)

Drains in the concrete floors collect wastewater from steam cleaning operations in these buildings. Sumps and settling basins collect miscellaneous solids. Wastewater is routed to the New IWTP (SWMU-4) for further treatment. Wastewater is expected to contain oils, grease, and solvent emulsion-type cleaning compounds.

SWMU-42, Paint Booths (Buildings 8, 31, 58, 74A, 105, 113, 117, 128A, 129, 130, 143B, 167, 409, 433, 474, 475, 499, 501, 652, & 680)

The paint booths are used to spray paint various parts for overhaul and maintenance of military equipment. Some paint booths had water curtain overspray collectors while other booths utilize a dry filter system. Various solvents are used in the painting systems for thinning paint and cleaning the spray paint equipment. Waste paint and solvents are drummed for offsite disposal. Paint filters containing the overspray are also sent offsite for disposal. The dry filters are disposed of as hazardous or non-hazardous waste depending on the paint. Various solvents are used to clean the spray painting and handling equipment.

SWMU-43, Cyanide Pretreatment System Building 506

The Cyanide Pretreatment System was built in 1974. This unit treated cyanide containing wastewater generated in Building 114 (SWMU-31). Cyanide pre-treatment was discontinued in 2010.

SWMU-44, Dry Creek

Dry Creek runs along the southern boundary of the Bill Nichols Industrial Complex and at one time received discharge from the Old IWTP (SWMU-3). ANAD was issued NPDES Permit Number AL0002658 on July 28, 1977 for this outfall. This permit established limits on the levels of contaminants discharged to surface waters. Failure to maintain NPDES permit conditions resulted in the Army Pollution Abatement Program (APAP PN 83) for the New

STP (SWMU-20) and IWTP (SWMU-4) facilities and the Storm Water Pollution Prevention Plan, Anniston Army Depot (DPW-Risk Management Division, ANAD 1994).

SWMU-45, Building 410 Former UST

Building 410 in which this underground storage tank (UST) was located is used for the performance testing of diesel and turbine engines for military vehicles that are rebuilt at ANAD (Dynamometer Test Cells). The use of this UST was discontinued in the 1980s due to a leak and was removed in 1993. A secondary investigation was completed in 1994. The site is currently covered with concrete. After free product was detected in three wells, recovery actions were initiated from 1995 and were completed in 2004. An Alabama Risk-Based Corrective Action was conducted at the site and was completed in 2005 and no further action is required.

SWMU-46, Building 6 Former USTs

Building 6 is the location for the fuel supply, diesel and gasoline, used in the Administrative Area on the west side of ANAD. The tanks were removed and a secondary investigation was completed in 1994. The Alabama Risk-Based Corrective Action was submitted to ADEM for review in 2002. A second phase of sampling was completed in 2003 and resubmitted. In 2005, this process was completed and site-specific clean-up levels were established. Groundwater is being monitored for natural attenuation under the ANAD IRP. The 2017 Groundwater Monitoring report concluded that the compliance monitoring results do not support a NFA at this time (based on ARBCA guidelines) and recommended continued compliance monitoring. Additionally, ANAD requested SWMU 46 be transferred to CERCLA and assessed during the Phase II RI for OU-5. ADEM concurred with this recommendation due to comingling of TCE contamination within the OU5 groundwater plume.

SWMU-47, Building 385 Former UST

An underground storage tank was located at Building 385 located in the Ammunition Limited Area L-Block. The UST system consisted of an approximately 550 gallon gasoline storage tank buried to a depth of 7 feet. The tank was reported to have been taken out of service in 1986 and removed in December 1993. The site was considered No Further Action by letter from ADEM dated March 28, 1996.

SWMU-48, Hazardous Waste Storage Building 527

Building 527 is a steel frame and panel building with concrete floor, located in the northern portion of the Bill Nichols Industrial Complex. The building currently is permitted to store hazardous waste for greater than 90 days in drums and other containers.

SWMU-49, Conventional Waste Munitions Igloos

Conventional military munitions that are deemed a waste per the Military Munitions Rule are stored in one of three designated igloos: F-405, F-704A, or I-103. These three igloos are located within the ALA.

Thirty-four permitted storage igloos, located in G block, were also available for use by the SDC. All of the permitted storage igloos are located within the ALA. The SDC-dedicated storage igloos which were available for storage are as follows:

G-102	G-202A	G-308A	G-505A	G-603A
G-102A	G-203A	G-404A	G-506A	G-604
G-103	G-206A	G-405A	G-507A	G-604A
G-104	G-208A	G-408A	G-508A	G-605
G-105	G-209A	G-502A	G-602	G-605A
G-108A	G-306A	G-503A	G-602A	G-606
G-200A	G-307A	G-504A	G-603	

[These igloos have been clean closed in accordance with Anniston SDC Closure Plan. No further action is required.]

SWMU-50, Brine Evaporator System

This system has never been operated and has been removed from the RCRA Permit. The evaporator package consisted of a flash evaporator, a heat exchanger, and auxiliary equipment composed of two circulation pumps (one a spare) and associated piping. The evaporator package and drum dryers would have been used to concentrate and dry the brines produced by the pollution abatement systems for the Deactivation Furnace System, LIC, and MPF. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-51, Container Handling Building

The Container Handling Building (CHB) was used to store munitions and ton containers prior to demilitarization operations in the Munitions Demilitarization Building. The CHB stored both primary waste and secondary waste. Chemical agents GB, VX, HD, and HT were contained in rockets, land mines, mortars, projectiles, cartridges, and ton containers. The munitions, which were placed in EONCs at the ANAD Chemical Limited Area, were transported to the CHB, where the actual demilitarization activities were conducted. Secondary wastes of all agent decontamination levels and types were stored in the CHB in containers suitable for the waste material. All secondary waste containers that contain free liquids stored in the CHB were placed on or in secondary containment devices. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-52, Brine Storage Tank System

The brine surge tank system was composed of two brine surge tanks. The brine surge tanks were located in a diked area adjacent to the Process and Utility Building. The tanks were used to provide storage for feed to the Brine Treatment System and to provide storage for pumping through the brine transfer line to tanker trucks for offsite disposal. The brine surge tanks each had a nominal capacity of 47,000 gallons. This tank system extended from the Pollution Abatement System to the brine surge tanks and from the brine surge tanks to the Brine Treatment System or the truck load/unload station. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-53, Toxic Maintenance Area

The Toxic Maintenance Area (TMA) was used for decontamination and maintenance of parts and equipment from areas that were contaminated with chemical agent. The wastes stored in the TMA may have exhibited any level of chemical agent contamination. The TMA was segregated into Category A, Category A/B, Category C, and Category D areas. The TMA stored both primary wastes and secondary waste. These wastes were stored in containers and various types of waste incineration containers. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-54, Upper Munitions Corridor

The Upper Munitions Corridor (UMC) was also a Category A/B area. The UMC, located on the second floor was the path of the charge cars, which were used for transferring the munitions or bulk items from the Munitions Processing Bay via the elevators to the LMC. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-55, Buffer Storage Area

The Buffer Storage Areas (BSAs) were Category A areas. The BSAs provided a temporary holding area for storing drained munitions and WICs prior to being fed by way of the munitions corridor to the Metal Parts Furnace (MPF). The area contained a munitions buffer storage conveyor for holding trays. These trays were transferred to charge cars in the munition corridor for delivery of the munitions to the MPF for thermal decontamination. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-56, Liquid Incinerator

The Liquid Incinerator (LIC) system was a two-stage, refractory-lined incinerator designed to incinerate all chemical agents, as well as liquid wastes (spent decontamination solutions and laboratory wastes) generated during demilitarization campaigns and liquid wastes generated during closure procedures. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-57, Deactivation Furnace System

The Deactivation Furnace System (DFS) was designed to process residual agent and to deactivate and incinerate energetic components from sheared rockets, land mines, mortars, and projectiles. The DFS deactivated the energetic components of these munitions and decontaminated their hardware. During the processing of projectiles and mortars, the DFS thermally deactivated all fuzes, bursters, and boosters. The DFS also processed miscellaneous waste that was potentially contaminated with explosive material. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-58, Brine Drum Dryers

This system was never operated and has been removed from the RCRA Permit. The evaporator package and drum dryers would have been used to concentrate and dry the brines produced by the pollution abatement systems for the DFS, LIC, and MPF. The two drum dryers would have been used to dry either fresh brine or brine that had been first concentrated in the evaporator package. This unit was never operated and was removed from the permit as a result. No further action is required. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-59, Agent Collection Tank System

The Agent Collection Tank System (ACS) consisted of the agent holding tank and agent surge tank, with a combined capacity of 1,960 gallons and a working volume of 1,520 gallons. These tanks were designated as ACS-TANK-101 and -102, and held the chemical agent in the Toxic Cubicle prior to its destruction in the LIC. This tank system extended from both the collection point in the Explosive Containment Rooms and the collection points in the Munitions Processing Bay in the Munitions Demilitarization Building (MDB) to the inlet of the LIC, located in the same building. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-60, Waste Transfer Facility

The Waste Transfer Facility (WTF) is a pre-engineered all metal building approximately 94 feet by 134 feet with an eave height of 16 feet. This building stored containers on 4-foot by 4-foot pallets. The wastes that were stored in the WTF were wastes at or below the STL and not greater than the WCL levels for chemical agent. These wastes were stored in containers compatible with the wastes to be contained in them. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-61, Lower Munitions Corridor

The Lower Munitions Corridor (LMC) was a Category A/B area. The LMC on the first floor was the path of the charge cars, which were used for transferring the munitions or bulk items from the first floor BSA to the TMA or MPF for processing. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-62, Spent Decontamination Holding Tank System

The three Spent Decontamination System (SDS) Tanks held spent decontamination solutions and liquid laboratory wastes in the SDS Room prior to treatment in the LIC. The three 2,300-gallon tanks, each with a working volume of 1,855 gallons, were designated as

SDS-TANK-101, -102, and -103. A sump and sloped foundation in the SDS Room provided secondary containment for the storage tanks. This tank system extended from the sump pumps, sumps, and trenches on the first and second floors of the MDB to the inlet of the LIC. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-63, Metal Parts Furnace

The MPF was used to thermally decontaminate munition bodies with residual agents that did not contain explosives or propellants and ton containers that previously held chemical agents. It also was used to decontaminate scrap metal and other miscellaneous wastes resulting from ANCDF operations, maintenance, or closure. The MPF consisted of two major subsystems: the incinerator (which included the charge airlock, the primary chamber, and discharge airlock) and the afterburner. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-64, HDC Bin Lay Down Area – Container Handling Building

The HDC Bin Lay Down Area or Cool Down Area was the location where the HDC Bins were placed for cooling. The Cool Down Area was a concrete pad with a roof and was open to the atmosphere on three sides. It was located in the loading dock area of the CHB. This area was used to cool the 5X material in the HDC bins to a core temperature of 145 °F. The HDC Bins were moved to the Residue Handling Area (RHA) within three calendar days. The Cool Down Area was placed into service in August 2003. [This unit has been clean closed in accordance with ANCDF Closure Plan. No further action is required.]

SWMU-65, Burning Ground #2

Burning Ground #2 was operated from approximately 1985 to 1986 and was used for approximately 3 to 4 months during that period. Burning Ground #2 was approximately 300 feet in length. Aerial photographs suggest that the unit was no wider than 20 feet. The unit was located in the Ammunition Limited Area, in the middle of the road approximately 0.6 mile northwest of Burning Ground #1. Waste military munitions were burned at Burning Ground #2. A closure report was submitted to ADEM in 2011. After a revised report was submitted in December 2012, ADEM requested additional groundwater data. Additional groundwater monitoring is in progress.

SWMU-66, Less than 90 Day Storage Areas (SWMU 1, SWMU 4, Buildings 114, 129, 130,133, 145, 147, 162, 431/432, 433, 466, 474, 475, 512, 520, & 652, CD-020, MILVANs 3-9, and Storage Magazines 385 and 386)

Storage areas are located throughout the industrial area of the Depot for the temporary storage of hazardous wastes (less than 90 days) from the various production processes. The wastes are stored in drums in the areas prior to being moved to the Hazardous Waste

Storage Facility for transport offsite. At the OB/OD site, conventional munitions may be stored in MILVANs prior to burning or detonation.

SWMU-67, Building 129 Test Range for M16

The concrete structure behind the building is used for test and accuracy activities for M16s. Once the small arms are remanufactured, the weapons are tested here to make sure that the firing range has a repeated accuracy. From discussions with knowledgeable ANAD small arms shop personnel, this range was placed into service about 1990. Small arms operations were moved to Building 31 in 2012. The test range in Building 129 is currently not in use. No further action is required at this time.

SWMU-68, Building 129 Test Range for Handguns

The handgun test firing range inside the building is used to make sure that the weapons are functioning properly. From discussion with ANAD small arms personnel, this range was placed into service about 1950. Small arms operations were moved to Building 31 in 2012. The test range in Building 129 is currently not in use. No further action is required at this time.

SWMU-69, Abandoned Phenol Basin at Industrial Wastewater Treatment Plant

Phenol waste flowed into the Industrial Wastewater Treatment Plant (IWTP) area through a gravity sewer. The waste flowed through this pipe flow into the phenol waste sump. The waste was then pumped out of the sump to the buffering and equalization basin and then was transferred slowly to the aeration basin. The treated waste flowed from the aeration basin to the clarifier and then to the outfall. The waste generated from this process was phenol, which was treated at the IWTP.

From general knowledge, the unit was placed into service sometime in 1962. The unit is a 10,000-gallon, in-ground pit, with approximately 12 feet reinforced concrete impoundment. In approximately 1989, the Depot discontinued the use of phenol paint stripper and changed to NPX. At that time, the activated sludge phenol treatment system was no longer needed and was abandoned. In 2009, ANAD submitted a PA report for the basin. No phenols were detected in any samples. Therefore the report recommended no further action (NFA) for SWMU 69. ADEM approved the NFA designation.

SWMU-70, Static Detonation Chamber (SDC)

The SDC facility where Waste Military Munitions (WMM) destruction occurs was located in the west side of G block within ANAD. The minimum footprint for the structure is 70 x 100 feet. The footprint was adjusted for ancillary equipment (e.g. generators, carbon filtration units, airlocks, control room, wastewater treatment, etc.). The SDC system was a totally enclosed, gas tight system used for the destruction or treatment of WMM which weree either explosively or non-explosively configured. The SDC was a heated, armored, double shell retort, which operated at high temperature. The munitions were fed to the SDC automatically under remote control and observation. The munitions heated up and any explosive present deflagrated or detonated and was destroyed. All gases evolved were treated in the pollution control system, all under automatic control. [This unit has been clean closed in accordance with Anniston SDC Closure Plan. No further action is required.]

SWMU 71, Western Industrial Area "Clean Fill Site"

ANAD's Western Industrial Area "Clean Fill Site" is located on a hilltop in the Western Industrial Area at approximately 33° 37′ 21.27′′ N latitude and 85° 59′ 0.02′′ W longitude and compromises an approximate area of 9.53 acres. The "Clean Fill Site" was established in approximately the year 2000 and is estimated to contain approximately 230,000 cubic meters of concrete, dirt, wood, asphalt, and rock with concrete presumed to be the greatest component. The approximate composition is 60 percent concrete, 35 percent soil, with the remaining materials made of wood, asphalt, and rock. There is also a concrete batching plant on site that is used to mix concrete during emergency situations for projects at ANAD. An RFI is ongoing.

SWMU 72, Building 409

Building 409 is located in the Bill Nichols Industrial Complex of ANAD. Building 409 is the component Cleaning and Painting Facility. These processes include but are not limited to depainting via chemical stripping and abrasive blasting, painting, chemical cleaning using acidic and caustic solutions and degreasing. Building 409 was constructed in 1956. Since 2009 there have been six releases of wastewaters from the chemical depainting and cleaning vat area in and around building 409. These wastewaters are rinse waters from tanks containing chemical paint strippers, acid and alkaline cleaners that are ultimately treated at ANAD's IWTP. Building 409 is located within a National Priorities List site where groundwater contaminated with trichloroethylene is being remediated by ANAD, The United States Environmental Protection Agency Region IV and ADEM under CERCLA through a Federal Facility Agreement. An RFI was submitted in 2011 to address the releases at Building 409, and a revised RFI was submitted in 2016. The RFI is currently ongoing.

SWMU 73, SDC Service Magazines

The service magazines (Buildings 712, 713 and 714) are located on the west side of G block, just north of the Demolition Pit road and next to building 695. The service magazines are actually one structure with three separate storage bays and doors. The magazine is an earthen covered steel reinforced concrete structure. The structure is 29 feet deep and 17 feet high at the highest and approximately 170 feet wide. The SDC-dedicated service magazines provided secure storage of WMM and hazardous waste for a time period greater than 90 days. Following chemical agent processing at the SDC, decontamination for chemical agent was conducted and the service magazines were determined to be agent free in 2012. These magazines continued to store conventional munitions for processing in the SDC. [This unit has been clean closed in accordance with Anniston SDC Closure Plan. No further action is required.]

SWMU 74, Thermal Treatment Closed Disposal Process (TTCDP)

The TTCDP, is utilized to demilitarize Waste Military Munitions (WMM) in the Ammunition Limited Area of ANAD, within the existing Multiple Launch Rocket System (MLRS) facilities. The TTCDP islocated within and adjacent to an expanded Building 670. The TTCDP has two separate thermal treatment processes for treatment of MLRS M77 fuze assemblies and M77 grenade bodies. The unit consists of three major components: 1) an electrically operated Grenade Treatment Unit, 2) an electrically operated enclosed detonation chamber, or Munitions Destruction System and, 3) an off-gas treatment system. The munitions are fed to the system automatically under remote control and observation. The RCRA permit was approved in September 2015 and the unit began operations in December 2016.

SWMU 75, Energetic Treatment Unit

The Energetic Treatment Unit (ETU) is located within the Ammunition Limited Area, bounded by an unnamed road leading toward Building 600 to the north and a wood line and stream to the south. The trailer-mounted ETU is located on a level concrete pad measuring approximately 96 feet long by 48 feet wide at the largest section, within a cleared gravel area of approximately 3,143 square meters (33,831 ft^2). The ETU is constructed primarily of steel and includes a furnace complete with burners, burner fuel train, combustion air blowers, controls, and stack. Ancillary equipment includes the fuel supply system (i.e., a 1,000-gallon propane tank, fuel supply lines, and a propane vaporizer); the furnace and controls mounted on the trailer; baskets, strong boxes, and trays to contain the treated items and ash; the trailer itself, which has been made stationary by chocking with a large concrete block; the concrete pad beneath the trailer; and a temporary field office (Building 701). A revised RCRA application for the ETU was submitted in May 2017 as part of the ANAD RCRA Part A and Part B Renewal Application.

SWMU 76, CC-ANAD-10: BUILDING 114

The Building 114 Site is located within the Southeast Industrial Area (SIA) (as known as Bill Nichols Industrial Complex). According to the Solid Waste Management Unit Assessment Report (SAR) dated December 2014, a release occurred in a 4-inch underground pipe near the corner of Building 114 in September 2014. The pipe is part of a general wastewater conveyance system which transports fluids from Building 114 to the ANAD Industrial Waste Treatment Plant (IWTP). According to the SAR, processes contributing to the general waste streams typically found in this piping system include electroless nickel and zinc plating, acid and alkaline cleaning and stripping, as well as chemical depainting. The SAR detailed that the wastewaters characteristically exhibit concentrations of metals such as cadmium, chromium, nickel, and zinc and can be acidic or alkaline. Following initial response actions, an RFI was initiated in 2016.

SWMU 77, CC-ANAD-11: BUILDING 117

The Building 117 Site is located within the Southeast Industrial Area (SIA). According to the SAR dated May 2014, a release occurred in a 4-inch PVC force main on the north side of Building 117 in February 2014. The piping serves as part of a general wastewater conveyance system which transports wastewater from Building 114 to the ANAD IWTP. According to the SAR, the processes contributing to the general waste streams typically found in this piping system include rinse waters from chemical cleaning (acid and alkaline), chemical paint stripping, and nickel and zinc plating processes conducted in Building 114.

The release was discovered and reported following observations of water seeping up through cracks in the concrete and flowing into a nearby storm water drop inlet. Following initial response actions, a RFI was initiated in 2016.

SWMU 78, CC-ANAD-12: BUILDING 136

The Building 136 Site is located on the northern boundary of the Southeast Industrial Area (SIA). According to the SAR dated June 2014, a release occurred in a 4-inch high density polyethylene underground force main located along the north side of Eulaton Gate Road near the north corner of Building 136. The release occurred in February 2014 from piping installed in 2010. The piping serves as part of a wastewater conveyance system which transported chromium wastewater from chrome plating and stripping from the former ANAD IWTP to the new IWTP. The SAR detailed that these processes utilize chromic acid to plate or chemically clean metal parts. The wastewaters from chrome processes appear to be segregated from other plating and finishing operations. No impact to the storm water systems has been reported. Following initial response actions, a RFI was initiated in 2016.

SWMU 79, CC-ANAD-13: BUILDING 524

The Building 524 Site is located on the northern boundary of the Southeast Industrial Area (SIA). According to the SAR dated September 2014, a release occurred in a 3-inch PVC underground pipe on the southwest side of Building 524 in June 2014. The piping serves as a conveyance system which transported wastewater fluids from the Building 414 Wash Rack oil and water separator to the ANAD IWTP. According to the SAR, the processes contributing to the general waste streams typically found in this piping system include oil and grease rinse waters from washing of exterior and engine components of combat vehicles. These wastewaters are known to contain petroleum hydrocarbons. Following initial response actions, a RFI was initiated in 2016.

SWMU 80, CC-ANAD-14: BUILDING 634

The Building 634 Site is located on the central northwest portion of ANAD. According to the SAR dated September 2014, a release occurred from septic tank piping, which held oily compressor blow-down. The septic tank served as containment for compressor blow-down wastewater as well as a shop sink. According to the SAR, the septic tank was periodically vacuumed out and the fluids were transported to the ANAD IWTP. These wastewaters are known to contain petroleum hydrocarbons. The release was discovered and reported when observations of oily fluids coming to the surface on the west side of Building 634 were observed. Upon discovery of the release, initial corrective measures were conducted by ANAD including excavation of contaminated soils, to the extent practicable and repairing the piping to stop the source. The excavated soil generated during the corrective measure was disposed of off-site. Following initial response actions, a RFI was initiated in 2016.

SWMU 81, Baseball Field

Identified during excavation for a baseball field expansion project in March 2008, the site contained buried construction debris comprised of concrete, wood and roofing shingles. The area is off the main access road west of the ANAD Badge Office. Based on historical aerial photographs and known former activities in the area, it appears that the construction debris is related to the demolition of housing/barracks some time prior to 1976. Potential contaminants are lead and asbestos. A Preliminary Assessment (PA) was conducted in 2008. The PA concluded that no further evaluation of soils or groundwater is warranted for the site.

SWMU 82, Building 128 Manhole ST-03A

In 2013, ANAD contracted for an integrity survey of the wastewater lines in the SIA. Based on the survey results, Manhole ST-03A required additional assessmentDuring the survey the grade adjustment rings for the manhole were found off-set and cracks were observed in the manhole concrete casing. Wastewaters flowing through this manhole are generated from steam cleaning operations in Buildings 400, 409, and 421. At that time, the steam cleaning wastewaters were characterized as non-hazardous. The Line Integrity Study SAR is currently ongoing.

SWMU 83, Building 133

In 2013, ANAD contracted for an integrity survey of the wastewater lines in the SIA. Based on the survey results, the general waste line at Building 133 required additional assessment. During the survey a hole was found in the top of the line. The hole was repaired on November 15, 2013. Wastewaters flowing through this pipe are general wastewaters from cleaning and metal finishing operations in Building 133. The Line Integrity Study SAR is currently ongoing.

SWMU 84, Building 414 Lift Station

On February 26, 2013, an oily sheen was found in an Unnamed Tributary of Dry Creek. Upon investigation, it appeared the lift station/oil water separator that conveyed Steam Cleaning wastewater from the Building 414 wash rack to ANAD's Industrial Wastewater Treatment Plant was not effectively pumping causing a release to the immediate area. At that time, the visible release was remediated and the wash rack was shut down pending further investigation of the extent of the release. An RFI is currently ongoing.

SWMU 85, Building 432 Outfall No. 36

During inspections conducted by ADEM in September and December 2007, releases of abrasive blast media were observed from Building 432 Spinner Hangar operations in the Southeast Industrial Area. Steel shot abrasive media was observed in the nearby storm drains and at the outfall to Dry Creek (SWMU 44). A SAR was submitted in 2008 and subsequent preliminary assessments identified constituents exceeding preliminary screening levels. An RFI is ongoing at the site.

SWMU 86, Lance Spill Site

An ANAD review of an Installation Assessment of Anniston Army Depot, dated April 1978 and prepared by US Army Toxic and Hazardous Materials Agency (USATHAMA), determined that approximately 500 gallons of unsymmetrical dimethylhydrazine (UDMH) was accidently discharged at the Lance Fueling Facility. The review was prompted by a letter to the Anniston Star in November 2007 regarding a release at the facility in the 1970's. According to the USATHAMA report, samples of water and soil in the area revealed no evidence of contamination beyond 50-100 yards from the spill area (the storage tank). A PA was submitted on June 23, 2008, which evaluated the presence or absence of a potential contaminant of concern (n-Nitrosodimethylamine [NDMA]) at the former Lance Missile Refueling Facility. Based on site observations and the analytical results, the PA concluded the site had not been adversely impacted by NDMA and recommended NFA for the site. ADEM concurred with this finding.

SWMU 87, Open Detonation Buffer Area

The former OD Buffer Area MRS is a 50-acre area that wraps around the operational OD unit to provide a safety buffer. The 2,400 foot buffer area surrounding the OD unit was established as a safety zone where "kickouts" of materials may have occurred during detonation. In 2012, the Army determined that the historical buffer area was unnecessary as part of the active range encompassing the operational detonation unit. The buffer area was reclassified as a closed range and, therefore, eligible for MMRP. ADEM required this closed buffer zone to undergo corrective action for possible MEC and MC contamination. The SI conducted at the former OD Buffer Area MRS in 2016. For ecological receptors, the detected levels of the metals cadmium, copper, lead, and zinc in surface soil at the former OD Buffer Area may constitute a potential risk based on the exceedances of ecological screening values and HQs ranging from 4 to 20. Therefore, the surface soil pathway for ecological receptors is considered to be complete for these metals and may potentially be complete for sediment and surface water, which were not evaluated in the SI. Based on these results, the report recommended a RI/FS for the buffer area. ANAD is proceeding with the RI/FS for the site.

SWMU 88, Building 31 Test Fire Tunnels 1-4

The Test Fire Tunnels are located along the northern internal wall of Building 31 in the WIA. The tunnels were installed in 2011, when the Small Arms Rebuild operations were relocated from Building 129 in the SIA. Operations began in 2012. One tunnel is 7 meters long, one is 50 meters long, and the other two are 100 meters long. The tunnels are separated from each other by concrete walls. The weapons tester mounts the test weapon on a firing stand at the firing line. The short tunnel captures the discharged projectile into a water trap. The projectiles are removed and placed into a 55-gallon drum for recycling. The remaining tunnels each capture discharged projectiles into snail traps which decelerates the projectile then deposits it into a 55-gallon collection drum. Wastewater from the tunnels flows to the ANAD IWTP. Sludge from the water traps are characterized and disposed off-site at a permitted facility or recycled. Vent filters are characterized and disposed off-site at a permitted facility. Mutilated projectiles are characterized and disposed off-site at permitted facility or recycled. This site requires no further action at this time.

SWMU 89, Building 186 Pistol Range

Building 186 houses an indoor Pistol Firing Range that was constructed in 2006. The building is located in the western portion of the WIA. The range is used by ANAD's security division for small arms (handgun) practice. The contact end of the firing range is known as the decelerator and is shaped like a V. Spent projectiles go through a slit at the end of the decelerator and fall into a collection system of buckets. Personnel retrieve the spent projectiles and place them in a 55-gallon drum to be sent for recycling. A small baghouse is attached to the decelerator for the removal of gunpowder laden smoke and dust from the firing range evaluation of this baghouse). This site requires no further action at this time.

SWMU 90, Linear Projectile/Mortar Disassembly Machine

In 2008, ANAD submitted a Permit Modification Request (RMODR1) for the Linear

Projectile/Mortar Disassembly (LPMD) machine. The application was approved and the unit began operation in 2008. The LPMD Machine removed fuzes from chemical agent munitions prior to treatment at ANCDF. The machine was located in Bays A, B, and C of Building 695. Notification for the closure of the LPMD was submitted on February 28, 2011. Closure activities for the LPMD began on April 30, 2011, after munition processing was completed and all waste was removed from the building. The boundaries for potential agent contamination were bays A, B, and C within Building 695. Based on the operational history, bays D through H never contained hazardous waste, therefore, no monitoring, concrete sampling or analysis was required in those areas. Sampling and analysis of the LPMD consisted of equipment decommissioning sampling, RCRA confirmation (concrete) sampling, ventilated monitoring and unventilated monitoring. Based on the closure activities, the LPMD building was determined clean for unrestricted use, and the unit was removed from the RCRA permit in 2014. The site requires no further action at this time.

SWMU 91, Lift Station GW-12A at Building 114

In 2013, ANAD contracted for an integrity survey of the wastewater lines in the SIA. Based on the survey results, Lift Station GW-12A required additional assessment. During the survey it was discovered that the lift station cover was damaged. Wastewaters flowing through this lift station are wastewaters generated from plating and stripping operations in Building 114. An RFI is ongoing for the site.

AOC A, Western Industrial Area

The Western Industrial Area (WIA) covers approximately 816 acres in the western portion of the Depot. The first series of permanent buildings was completed in 1942, and operations have remained consistent since that time. The WIA contains the facility's support facilities to the industrial operations including equipment maintenance, rail service, and automotive facilities. There are areas allocated for warehouse storage, fuel storage, administrative services, housing, and recreation. The Defense Logistics Agency-Disposition Services (DLA-DS, formerly Defense Reutilization Marketing Office) facility is also located within the WIA and investigation of the DLA-DS has been incorporated with the WIA. The DLA-DS facility and storage area receives materials no longer needed by ANAD. The materials are disposed or transferred off-site. Under the FFA, the WIA is being evaluated under CERCLA. It has been designated as OU -5, and is currently undergoing a SI.

AOC B, Underground Storage Tanks in Chemical Limited Area

Five non-petroleum USTs were located in the CLA. One UST was located at Building 71, three were located at Building 635, and one was located at Building 88. The UST at Building 71 was approximately 3.5 feet in diameter, and 10 feet long, with a capacity of 600 gallons. It was installed in 1979. The three USTs at Building 635 were 1,000 gallon unlined stainless steel tanks that were installed in 1979. The UST at Building 88 was approximately 4 feet in diameter, and 4 feet deep, with a capacity of 375 gallons. It was installed in 1979. All tanks were in place as of the 2007 RFA, and no soil or groundwater testing had been conducted in association with these units. The potential COCs were isopropyl alcohol and sodium hypochlorite. The USTs were used to store brine from laboratory operations in the adjacent buildings. When the laboratory operations ceased, the contents of the tanks were removed. During the 2007 VSI, an ADEM inspector evaluated the UST sites. The USTs were capped, and there was no evidence of leaks or spills in the vicinity of the UST areas. No RCRA violations were observed that could be attributed to these units. The RFA recommended closure of the USTs through ADEM's UST Program should the facility decide the USTs are no longer of use.

In 2009, ANAD submitted a PA for the tanks. During the PA work, each tank was excavated and the excavation backfilled. The PA report recommended no further action for the 5 USTs associated with Buildings 71, 88, and 635. ADEM approved the no further action designation for AOC B.

AOC C, Tank 77 Release

Tank 77 was installed in 1974, had a capacity of 500,000 gallons, and was used to store #2 diesel fuel. It was surrounded by an earthen dike and was located north of Building 74 in the WIA . On January 15, 2001, the facility identified a fuel release. Following cleanup activities, soil and sediment sampling was performed in the area, and permanent monitoring wells and piezometers were installed. The site groundwater was monitored on a semi-annual basis from 2004 to 2005.

Based on the findings of the December 2004 and June 2005 sampling events, no further investigative or remedial actions associated with the release of diesel fuel are required. ADEM concurred with ANAD's findings and issued a "No Further Action" letter for the site on 24 May, 2006.

AOC D, Recoilless Rifle Range

The Recoilless Rifle Range is located in the northeastern corner of the Depot; it was constructed in 1963 for testing the recoil of various recoilless rifles. Munitions used at the range included 57-mm, 75-mm, 105-mm and 106-mm projectiles. Testing continued through 1987. The Recoilless Rifle Range is approximately 45 acres. The firing point is in the easternmost portion of the site. The range fan extends from the firing point 1,200 meters to the west, which acts as a safety zone for materials fired from the rifle range. An impact bunker is located approximately 80 meters west of the firing point. A fire control bunker and a former ammunition bunker are located adjacent to the firing point. The western portion of the Recoilless Rifle Range firing fan extends into operational range area. Although inert ordnance was used at the site during the recoilless rifle testing, the potential for live munitions exists, because it is located east of the current operational range used for target practice with 57-mm and 106-mm projectiles (the operational range also was used for small arms from 1981 to 1983). Access to the site is not limited once inside the Depot's boundaries; however, its current location is at least 2 miles from any occupied buildings.

A PA was completed in 2003 under the MMRP. A SI conducted in 2005 concluded that a RI/FS was required for this unit. The RI/FS is ongoing.

AOC E, Pistol Range

The Pistol Range, approximately 1.2 acres, is located within the cantonment area in the southern section of the Depot. The pistol range was constructed 1981. A PA was completed in 2003 under the MMRP. A SI conducted in 2005 concluded that a RI/FS was required for this unit. The RI/FS is ongoing.

AOC F, Burning Ground Buffer Area

The Burning Ground Buffer Area is a 351-acre site located in the northwestern section of the Depot. The MMRP site is in an area that encircles the operational burning ground from the current buffer area of 1,250 feet to the extent of the historic buffer zone of 2,400 feet. The historic buffer zone of 2,400 feet was labeled on a 1964 Depot map. A PA was completed in 2003 under the MMRP. A SI was completed in 2005 and recommended a RI/FS for the unit. The RI/FS is ongoing.

AOC G, Competition Pistol Range

The Competition Pistol Range is a firing range that has been used by the ANAD security forces as a practice and qualifying range for small arms. Based on general knowledge, this range was constructed around 1981. This range is an active site. The total area for this range is 2.63 acres; it is located within AOC H. Weapons fired on this range are hand-held small arms. The Phase I Operational Range Assessment Program Report (site is identified as ANAD-1 for the purposes of the Phase I Report) concluded that the available information was insufficient to make a source-receptor interaction determination, or to indicate the potential for such an interaction to occur. In 2013, the Phase II Operational Range Assessment Program Report was completed. Analysis of surface waters and sediments, downstream of ANAD-1 indicated there was no unacceptable risk to off-range human and/or ecological receptors. The range will be placed in a review cycle to periodically re-evaluate whether future changes in conditions pose unacceptable risk to off-range receptors. Based on the Range Assessments, no further action is required at the site at this time.

AOC H, Tank Howitzer and Small Arms Range

The Tank Howitzer and Small Arms Range is a firing range that has been used by ANAD for test firing both small arms weapons and artillery that has been repaired, rebuilt, and/or assembled in the production shops on ANAD. This range is an active site. Small arms weapons are not hand-held, but are mounted in fixtures for function firing and target and accuracy firing. The total area for this range is 29.01 acres. The Phase I Operational Range Assessment Program Report (site is identified as ANAD-2 for the purposes of the Phase I Report) concluded that the available information was insufficient to make a source-receptor interaction determination, or to indicate the potential for such an interaction to occur. In 2013, the Phase II Operational Range Assessment Program Report was completed. Analysis of surface waters and sediments, downstream of ANAD-2 indicated there was no unacceptable risk to off-range human and/or ecological receptors. The range will be placed in a review cycle to periodically re-evaluate whether future changes in conditions pose unacceptable risk to off-range receptors. Based on the Range Assessments, no further action is required at the site.

AOC I, Pyrotechnics Range

This operational range is located in the northwestern portion of the Depot. This site is approximately 8.74 acres. This range reportedly was used for function testing of timed pyrotechnic devices and medium-caliber military munitions from the mid-1970s through at least 1981. The medium-caliber military munitions included projectiles from 20 mm to 60 mm (including 20 mm, 25 mm, 30 mm, 37 mm, 40 mm, and 60 mm). The pyrotechnic devices included signals, flash artillery, and hand grenades. Currently, no firing activity takes place on the range, but it is currently being used as an outside storage area. The Phase I Operational Range Assessment Program Report (site is identified as ANAD-3 for the purposes of the Phase I Report) concluded that the available information was insufficient to make a source-receptor interaction determination, or to indicate the potential for such an interaction to occur. In 2013, the Phase II Operational Range Assessment Program Report was completed. Lack of MCOC sources at ANAD-3 indicated there was no unacceptable risk to off-range human and/or ecological receptors. The range will be placed in a review cycle to periodically re-evaluate whether future changes in conditions pose unacceptable risk to off-range receptors. Based on the Range Assessments, no further action is required at the site.

AOC J, Defense National Stockpiles

The Defense National Stockpile Center (DNSC) stores strategic materials for national defense at locations throughout the U.S. DNSC has stored tin ingots, bauxite, and manganese ore at ANAD since World War II. Stockpiles were stored at several locations in the Ammunition Limited Area. The size of these stockpiles ranged from approximately one to 2 acres. In 1995, Congress ordered the sale of the stockpiles, and the ores were sold and transported offsite from 1995 through 2001. Typically, areas where the ores were stored have been managed under the CERCLA program. The sites are identified as: Bauxite Stockpile AOC J-A, Bauxite Stockpile AOC J-2, Bauxite Stockpile, AOC J-3 (south) and AOC J-4 (north), Manganese Dioxide Stockpile AOC J-1 B, and, Manganese Dioxide Stockpile AOC J-1 A, Tin Stockpile AOC J-B, and Tin Stockpile AOCJ-F. AOCs J-B and J-F require no further action at this time. An RFI was begun in 2008 and is ongoing for the remaining sites.

AOC K, Underground Pipe Release at Building 504

Building 504 is used to drain fuel from tracked vehicles that are received at the Depot for refurbishing. In the 1990s, the Depot conducted several investigations of Building 504; these investigations revealed that soil and groundwater had been affected by petroleum products from a UST and leaks in the floor of the building. ANAD applied for and received authorization from ADEM to remove the UST and install a free product recovery system. Manual free product recovery was initiated in 1993, and an automatic system was installed in 1997. The automatic recovery system did not perform as designed, and the operation was discontinued. The floor of Building 504 subsequently was re-sealed in 2002 to prevent spilled petroleum products from entering into the subsurface. ANAD continued to find free products in the ground and manually bailed or pumped them out. Mobile Enhanced Multi-Phase Extraction (MEME) events took place in 1999 and 2005 on the existing monitoring wells. MEME events are designed to remove free product from groundwater and affected soil within the monitoring wells. Several MEME events occurred after 2007: April, July, October, and December 2008, October 2009, April, and November 2010, and April 2011. The 2011 compliance monitoring report indicated that the volumes of LNAPL recovered by MEME had declined over time and might not be as effective a method as it was at the beginning of remedial efforts. Therefore, ANAD discontinued MEME events. Groundwater sampling has been conducted annually and the site currently has 18 groundwater monitoring wells. In 2011, ADEM required ANAD to submit a CMIP for AOC K. ANAD submitted a plan in 2012 but it is not yet finalized.

This page has been left intentionally blank.

DEPARTMENT OF THE ARMY
ANNISTON ARMY DEPOT
7 FRANKFORD AVENUE
ANNISTON, ALABAMA 36201-4199

MAY 20 2025

SUBJECT: Burning Ground No. 2, SWMU No. 65 Corrective Measures Work Plan, Revision 2 and Response to Comments

Directorate of Risk Management

Ms. Ashley T. Mastin, Chief
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059

Dear Ms. Mastin:

Anniston Army Depot (ANAD) is pleased to submit to the Alabama Department of Environmental Management (ADEM) the revised *Corrective Measures Work Plan Burning Ground #2, Solid Waste Management Unit #65 – Anniston Army Depot, Revision 2, April 2025* and the response to comments from the ADEM letter dated 10 April 2025.

For further information, please contact Mr. Joseph Owens at (256) 235-4226 or joseph.m.owens42.civ@army.mil.

Sincerely,

John Rogers
Director of Risk Management

Corrective Measures Work Plan

Burning Ground #2, Solid Waste Management Unit #65 – Anniston Army Depot
Anniston, Calhoun County, Alabama

Revision 2 - April 2025

Contract No. W911KF22C0019

Prepared for:	**Army Contracting Command – Warren** **Anniston Army Depot** **7 Frankford Avenue, Bldg 35** **Anniston, AL 36201-4199**
Prepared by:	**First Environment, Inc.** **1275 Shiloh Road NW** **Suite 2110** **Kennesaw, GA 30144**

Contents

Tables

Figures

Appendices

LIST OF ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
AAC	ADEM Administrative Code
ADEM	Alabama Department of Environmental Management
ALA	ammunition limited area
amsl	above mean sea level
ANAD	Anniston Army Depot
ARBCA	Alabama Risk-Based Corrective Action
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern
COPC	constituent of potential concern
CSM	Conceptual Site Model
ft	feet
ft/day	feet per day
ID	inside diameter
IDM	investigation derived materials
KGS/Trinity	KOMAN Government Solutions, LLC/Trinity Analysis & Development Corp.
LUC	land use control
MCL	maximum contaminant level
mg/kg	milligram per kilogram
NDMA	n-nitrosodimethylamine
OB	open burning
OD o	pen detonation
PAH	polycyclic aromatic hydrocarbons
POE	Point of Exposure
PSV	preliminary screening value
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RM-2	Risk Management-2
RSL	Regional Screening Level
SVOC	semi volatile organic compound
SWMU	Solid Waste Management Unit
Trinity	Trinity Analysis & Development Corp.
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 Introduction

This Corrective Measures Work Plan has been prepared on behalf of Anniston Army Depot (ANAD) by First Environment, Inc. This report was prepared under Army Contracting Command – Warren, Contract No. W911KF22C0019 .

This work plan describes the proposed field activities, data analysis, and reporting to ADEM for Corrective Measures required for Burning Ground #2, Solid Waste Management Unit (SWMU) #65 at ANAD.

Burning Ground #2 (SWMU #65) is identified as SWMU 65 in Table 8-1 of Module VIII, Corrective Action for Solid Waste Management Units in ANAD Permit No: AL3210020027. Burning Ground #2 (SWMU #65) operated under interim status as a miscellaneous treatment unit based on its inclusion in the original Resource Conservation and Recovery Act (RCRA) Part B Permit Application for Open Burning/Open Detonation (OB/OD) at ANAD (Engineering, Design, and Geosciences Group, Inc., 1988).

Previous studies performed at the site include a RCRA facility investigation report (CH2M Hill, 2008) that culminated in the preparation of a risk-based corrective action closure report (CH2M Hill, 2011). CH2M Hill (2011) presents the results of an RM-1 risk evaluation and a request for clean closure certification. ADEM, in their letter dated March 5, 2013 (ADEM, 2013), did not accept the CH2M Hill (2011) request for clean closure.

ADEM comments on the RM-1 risk evaluation requested an RM-2 risk evaluation to include an evaluation of risk from vapor emissions, a better understanding of risks due to arsenic and N-nitrosodimethylamine (NDMA), and four rounds of quarterly groundwater sampling that includes the background monitoring well, 10-BG2-01 (ADEM, 2013). Four rounds of quarterly sampling of the background monitoring well were not possible at that time due to a lack of groundwater in the well (CH2M Hill, 2011).

Field work was subsequently performed to support the RM-2 and included additional soil sampling and analyses, an attempt at installing additional background monitoring wells that failed due to encountering shallow bedrock, and four quarters of monitoring well network sampling. The field work plan is described in a technical memorandum (Trinity, 2019) and a Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) Work Plan (Trinity, 2020).

The Final Risk-Based Corrective Action (RBCA) Closure Report, Burning Ground #2, Solid Waste Management Unit #65 was submitted to ADEM in November 2023 (KOMAN/Trinity, 2023). Based on the results of assessment conducted during the field study, the extent of groundwater contamination is limited to the area defined by the Burning Ground #2 boundaries which is a rectangle approximately 35 by 250 ft. The impacted groundwater is contained within a shallow residuum of low-permeability, sandy to silty clay and a transitional zone consisting of low- to high-permeability clayey sand and gravel formed at the top of weathered bedrock,

Section 7 of the RBCA Closure Report concluded that risk management is needed to address the exceedances of groundwater risk-based regional screening levels (RSLs; US EPA RSL Tables dated November 2024) of 0.043 mg/L for manganese and 0.00000011 mg/L for N-nitrosodimethylamine for a potential future residential groundwater receptor and RSLs of 1.8 mg/L for acetone and 0.00012 mg/L for naphthalene for the protection of groundwater resource pathway. These RSLs will be used as remediation goals for the groundwater monitoring proposed later in this document. ADEM subsequently requested via their letter dated January 5, 2024 that ANAD should proceed with the submittal of a Corrective Measures Work Plan (ADEM, 2024).

The ANAD contact is Mr. Joseph Owens, III, Environmental Engineer. Mr. Owens' email address and phone number are joseph,m.owens42.civ@army.mil and 256-235-6439. The site has no specific address. The address for ANAD is 7 Frankford Avenue, Anniston, AL 36201. The site is known as Burning Ground #2 and SWMU #65. There are no other site aliases. Burning Ground #2 (SWMU #65) site coordinates are approximately 33°40'26.1" North latitude / 85°59'57.6" West longitude.

2.0 Background

2.1 Site Location

ANAD occupies approximately 15,250 acres in northeastern Alabama, in the southwest portion of Calhoun County. It is approximately 8 miles west of the city of Anniston as shown in Figure 1 and Figure 2. The community of Bynum is on the southern boundary of ANAD. The northern boundary is Pelham Range, a wooded operational and training area owned by the Alabama National Guard. The eastern and western boundaries are bordered by lightly populated rural lands. Interstate 20 is approximately 3 miles to the south.

Burning Ground #2 (SWMU #65) is in the Ammunition Limited Area (ALA), a restricted access area used primarily for ammunitions storage, conventional munitions demilitarization, and incineration of chemical munitions. Burning Ground #2 (SWMU #65) is in the northwest quadrant of ANAD and within about 1 mile of the western and northern boundaries of the installation. Burning Ground #2 (SWMU #65) is approximately midway between the operational OB unit (Burning Ground #1) and the operational OD unit (Figure 3).

Burning Ground #2 (SWMU #65) is a portion of a packed dirt/gravel interior road. The road is wooded on both sides, primarily with pine and moderate to dense undergrowth. The unit dimensions were determined to be 250 feet (ft) by 35 ft (CH2M Hill, 2009). The site covers approximately 0.20 acres.

2.2 Operational History

ANAD is primarily used for storing munitions and for refurbishing, testing, decommissioning combat vehicles and various ordnances. ANAD has been in operation since 1941 (CH2M Hill, 2007).

No historical use records for Burning Ground #2 (SWMU #65) exist. Personnel interviews with employees indicate that the unit operated for approximately three to four months in 1985 to 1986 to thermally treat a single workload of 90-millimeter (mm) rounds (approximately 4,000 rounds). No OD is known or suspected to have occurred (CH2M Hill, 2009).

The precise configuration of the 90-mm rounds treated at Burning Ground #2 (SWMU #65) is not known. However, the treatment process (i.e., burning versus detonation) indicates that the rounds contained no high explosive or white phosphorous and that only the cartridge case and not the projectile was disposed. The propelling charge within the cartridge case would have consisted primarily of a mixture of nitrocellulose, nitroglycerin, and/or nitroguanidine. Components of military propellants are in solid form and contain no free liquids. Decomposition from burning of these types of propellant compounds results primarily in carbon dioxide, water, nitrogen, and oxygen (CH2M Hill, 2009).

According to personnel interviews, the 90-mm rounds were placed on the soil surface, covered with straw, and ignited, which burned the energetic filler. The munitions casing would remain intact. After cooling, the casing was removed for recycling. There was a standard operating procedure in place for Burning Ground #2, which stated that burned residue would be placed into 55-gallon drums and transferred to Building 512, to be removed from ANAD for disposal (CH2M Hill, 2009).

The area that formerly comprised Burning Ground #2 (SWMU #65) has since reverted to use as an unimproved access road. ANAD personnel infrequently use the road. There are no records or memory of road repair or maintenance activities following use of the site for OB to thermally treat the single workload of 90-mm rounds. No buildings, paved areas, fencing, above-ground or below-ground facilities were constructed on Burning Ground #2.

2.3 Regulatory History

Burning Ground #2 (SWMU #65) is identified as SWMU 65 in Table 8-1 of Module VIII, Corrective Action 25 for Solid Waste Management Units in ANAD Permit No: AL3210020027. Burning Ground #2 (SWMU #65) is categorized as an interim status miscellaneous treatment unit, due to its inclusion in the original RCRA Part B Permit Application for OB/OD at ANAD (Engineering, Design and Geosciences Group, Inc., 1988).

ANAD's intent of including the unit in the Part B Permit Application was to increase operational flexibility via a second burning ground (i.e., in addition to Burning Ground #1). Burning Ground #2 (SWMU #65) was used only one time over the 3 to 4-month period in 1985 and 1986 for the demilitarization of the 90-mm workload. Its use occurred prior to the promulgation of the 40 Code of Federal Regulations (CFR) standards regulating miscellaneous units in Part 264, Subpart X on December 10, 1987. The new standard regulated OB/OD operations under RCRA (CH2M Hill, 2009).

Burning Ground #2 (SWMU #65) was identified by ANAD on its Part A and Part B Permit Application dated May 1991 and was intended to be used for workload overflow. ANAD personnel confirmed the unit was never used, maintained, or cleared of vegetation after thermally treating the single workload of 90-mm rounds (CH2M Hill, 2009).

2.4 Topography

A topographic map of the area in the vicinity of Burning Ground #2 (SWMU #65) is shown on Figure 4. The site is relatively flat and ground surface elevations range from about 665 to 670 ft above mean sea level (amsl). The site is located within a small valley. An intermittent stream symbol is shown on the topographic map, within 100 ft east of the site. Water has been observed in the area of the intermittent stream symbol based on observations made during field work for borings, soil sampling, and historical quarterly groundwater sampling events.

2.5 Geology

ANAD lies within the fold and thrust belt of the Appalachian Valley and Ridge physiographic province. The fold and thrust belt are characterized by Paleozoic rock formations that repeatedly were folded and thrust-faulted by northwestward-directed tectonic stresses. As a result of this deformation, major geomorphic and geologic structures, including fold axes, fault traces, and lithologic boundaries, are present in the area and commonly oriented in a northeastern-southwestern direction. ANAD lies on the margin of a widespread distribution of Cambro-Ordivician carbonate rocks in a high rainfall area of the United States. Under such high rainfall climatic conditions, karst topography may form in areas underlain with soluble carbonate strata (SAIC, 1998).

2.6 Hydrogeology

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 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 bullets review the current conceptual elements of the local 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. Progressing from near-surface to saturated conditions within the groundwater system, the following elements are present:

- 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 (the transitional zone).
- Bedrock zone characterized by a fracture flow system with relatively impermeable dolostone matrix blocks.

Four wells were installed at Burning Ground #2 (SWMU #65) as part of the closure report activities (CH2M Hill, 2011) Well locations are shown on Figure 5. A geologic cross-section is shown in Figure 6. Well depths range from approximately 11.6 to 15.1 ft below ground surface (bgs). The total depth of each well was limited by encountering refusal, which is reported to be the top of the bedrock. The monitoring wells were constructed on top of bedrock in the unconsolidated overburden. ADEM has not requested investigations below the bottom of the monitoring wells (i.e., ADEM has accepted the bottom of the study zone as the top of the bedrock).

The direction of groundwater flow is toward the north as shown on the piezometric surface maps from May 19, 2020 (Figure 7), August 28, 2020 (Figure 8), November 17, 2020 (Figure 9), and February 10, 2021 (Figure 10). Depth to water and the water column in each well is relatively small and decreases during the calendar year.

3.0 Corrective Measures

Section 7 of the RBCA Closure Report (KOMAN/Trinity, 2023) concluded that risk management is needed to address the exceedances of site-specific groundwater risk-based target levels for manganese and N-nitrosodimethylamine for a potential future residential receptor and acetone and naphthalene for the protection of the groundwater resource pathway. Corrective Measures at Burning Ground #2 (SWMU #65) to address both the residential receptor and the groundwater resource pathway shall consist of Land Use Controls (LUCs) and site groundwater monitoring for the specific contaminants of concern. The Corrective Measures are described in the following sections below.

3.1 Current Land Use

Burning Ground #2 (SWMU #65) is currently an unimproved hard-packed dirt and gravel interior access road. The road is infrequently used by ANAD during security patrols. Observations made during field work for borings, soil sampling, and quarterly groundwater sampling events confirm the infrequent use of the road. The surrounding area is vacant and wooded. There are no records or memory of road repair or maintenance activities following use of the site for OB to thermally treat the single workload of 90-mm rounds.

The Burning Ground #2 (SWMU #65) is relatively small (approximately 0.20 acres). It is not located within, adjacent to, or in the vicinity of perennial surface water bodies, wetlands, conservation areas, sensitive resource areas, or agricultural or livestock areas. Only one listed federally endangered species, Tennessee yellow-eyed grass, is currently known to be present at ANAD. However, this federally endangered species is not located within, or in the vicinity of, the Site.

No buildings, paved areas, fencing, above-ground or below-ground facilities are on site. No products or materials are stored at the site. Remedial actions have not been performed at the site.

3.2 Future Land Use

No change in land use is planned for the Burning Ground #2 (SWMU #65) area. The road will remain as an unimproved access road for occasional use by ANAD security patrols. No change in land use is planned for the surrounding, vacant, wooded area. No buildings, paved areas, fencing, above-ground or below-ground facilities are planned for the site. There are no plans for product or material storage at the site.

3.3 Proposed Land Use Control Measures

ANAD already maintains and applies the following area specific conditions collectively to other SWMUs at the Depot. It is proposed that the same conditions be applied to the Burning Ground #2 (SWMU #65) as follow:

a. No access or use of groundwater shall be allowed at the site to prevent contact or consumption of contaminants of concern. The area of Land Use Control (LUC) restrictions shall be the 0.2 acre area defined as Burning Ground #2 (SWMU #65) as shown on Figure 5. This area is a rectangle of approximately 35 ft wide by 250 ft long, with the northeast corner at N33°40”24.76”, W85°59’57.01”, the southeast corner at N33°40’22.57”, W85°59’57.43”, the southwest corner at N33°40’22.57”, W86°00’00.72”, and the northwest corner at N33°40’24.76”, W85°59’57.58”.

b. Public access shall be restricted to prevent potential unauthorized contact with shallow groundwater or disturbance to soil containing groundwater resource protection GRP) contaminants of concern. ANAD shall patrol the existing chain-link fence bordering the entire installation as a security measure to prevent unauthorized entry into the area. Entrance into the facility shall be authorized only with a badge or pass.

c. ANAD shall install, inspect, and maintain land use control (LUC) visible warning signs prohibiting unauthorized excavation and entry by both the public and unauthorized ANAD personnel so as to prevent potential contact with shallow groundwater or disturbance to soil containing GRP contaminants of concern. The signs shall read "Hazardous Soil and Groundwater Area-Unathorized Access Beyond this Point is Prohibited", ANAD shall install, inspect, and maintain the signs along the boundary of Burning Ground #2 (SWMU #65), leveled and positioned facing outward from the SWMU boundary (Figure 5), legible from a distance of 25 feet. ANAD shall place the signs at entry locations and the Burning Ground #2 boundaries spaced approximately every 100 feet at locations to be seen from any approach, targeting locations that are visible near roads or access points.

d. ANAD shall monitor the Burning Ground #2 (SWMU #65) for land use restriction violations and promptly report any LUC restriction violations to the facility Installation Restoration Program (IRP) manager and/or the appropriate organizations. ANAD shall take immediate action to restore the integrity of the LUC and prevent future violations.

e. ANAD shall conduct an annual inspection of Burning Ground #2 (SWMU #65) to ensure the effectiveness of LUC mechanisms and to identify LUC restriction violations. ANAD shall prepare an annual inspection report and submit the report to ADEM. ANAD will use their existing inspection checklist developed for use at the Depot to ensure consistent reporting of LUCs. A copy of the LUC checklist is provided as Appendix A.

f. ANAD shall provide a LUC training course for designated supervisors in all directorates, tenants, contractors, all personnel associated with the Depot's environmental, security, safety, and public works organizations, and for new employees during new employee orientation. The LUC training course shall provide an overview of the current land use restrictions and procedures for preventing and reporting land use restriction violations. ANAD shall maintain a list of personnel who have received training and the date of completion of training.

g. ANAD shall review the placement of new facilities and equipment planned for installation within 1,000-feet of the Burning Ground #2 (SWMU #65) to ensure that construction projects will not violate the land use restrictions.

h. ANAD shall record and update the LUCs for Burning Ground #2 (SWMU #65) on its Geographical Information System (GIS).

i. ANAD shall maintain the LUCs at Burning Ground #2 (SWMU #65) until concentrations of contaminants of concern remain at levels to allow unrestricted use/unrestricted exposure (UU/UE) for three consecutive monitoring events and a petition to remove the LUCs is submitted to ADEM for review and approval.

j. ANAD shall restrict the land use to industrial land use only; no other (residential, commercial, and agricultural, etc.) land uses shall be permitted.

k. Well installation, except for monitoring or investigation wells, shall be prohibited at Burning Ground #2 (SWMU #65). All proposed well installations shall be approved by ADEM.

l. ANAD shall implement a Notice of Environmental Use Restrictions (NEUR) as specified in ADEM Administrative Code r. 335-5. A draft copy of the proposed NEUR is included as Appendix B to this work plan.

3.4 Proposed Groundwater Monitoring

Groundwater at Burning Ground #2 (SWMU #65) shall be monitored by sampling for site-specific contaminants once every year. The goal of groundwater monitoring is to check for migration of GRP contaminants of concern to groundwater and to observe natural attenuation of the contaminants of concern over time.

Sampling shall be conducted initially upon ADEM approval of this Corrective Measures Work Plan and thereafter at one-year intervals. Sampling shall be conducted in the spring when groundwater levels are expected to be near their highest elevations. A brief report detailing the sampling event and the laboratory analytical results shall be submitted to ADEM within 60 days of the sampling event. Groundwater monitoring shall continue until concentrations of contaminants of concern are at levels to allow unrestricted use/unrestricted exposure (UU/UE) for three consecutive monitoring periods. Furthermore, it is assumed that if UU/UE concentrations are achieved, that Groundwater Resource Protection Contaminants of Concern are no longer an issue and that no leaching is likely to occur. To further support this assumption, ANAD will further evaluate the site conditions once the site groundwater achieves UU/UE levels to demonstrate whether there is a potential for future leaching. Considerations such as the elapsed time since the original release, depth to groundwater, current soil chemistry, and the original COC concentrations will be evaluated.

In accordance with groundwater sampling procedures already established at ANAD, the following sampling procedures shall also be utilized at Burning Ground #2 (SWMU #65).

3.4.1 Water Table Elevation Measurements

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.

The measurements will be used to calculate the well volumes required for purging. Casing volumes will be determined using the formula:

πr2h × 7.48 gal
Volume (gal) = 1 ft3
where:
r = radius of the well casing (feet),
h = height of the water 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. 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 extra length on the indicator tip past the sensor.

9. Record the depth to water and total well depth in the field logbook.

10. Decontaminate probe and the entire length of the water level indicator that entered the well.

3.4.2 Field Water Quality Measurements

Water quality measurements shall be made in the field during the well purging process and recorded. The water quality screening instruments that may be used in the field are listed below:

- Specific conductance, oxidation-reduction potential (ORP), dissolved oxygen, and temperature meter;
- pH meter and thermometer;
- Turbidity meter; and
- Electronic water level indicator.

These indicators were 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 and recorded on the sampling sheets.

3.4.3 Well Evacuation (Purging)

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 (Puls and Barcelona, 1996). 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 interval.
- 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, oxidation-reduction potential (ORP) 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 Investigations Standard Operating Procedures (1996). 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 5-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 up to five well volumes may be removed.

If the parameters have not stabilized within purging a maximum of five borehole volumes, the sample will be collected.

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 has occurred .

3.4.4 Sample Preparation

Groundwater samples will be collected in appropriate sample containers, properly preserved, sealed, and labeled. Labels will be completed with black or blue 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 Chain of Custody 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 point (well number)
- Designation of QC samples (for example, blank, splits, or duplicates)
- Observations during sampling (for example, odors and colors)
- Chain of Custody control number and request for analysis number
- Preservatives used
- Field observations and measurements
- Water level measurement and how obtained
- Purge volume and pumping rate and date and time of purge
- Equipment calibration information
- Weather Conditions

3.4.5 Laboratory Analyses

The following methods, or the most current version of the method at the time of analysis, will be used for the analysis of groundwater from the Burning Ground #2:

- Metals (EPA Method 6010B) – specifically Manganese (total and dissolved)
- SVOCs (EPA Method 8270C) – specifically Naphthalene and N-nitrosodimethylamine
- VOCs (EPA Method 8260B) – specifically Acetone

Table 1 shows the complete list of chemicals of concern for the Burning Ground #2 and their associated Preliminary Screening Values (PSVs). The PSVs for groundwater results are consistent with the screening criteria based on U.S. Environmental Protection Agency (EPA) Maximum Contaminant Limit (MCL), or Regional Screening Level (RSL) for Tapwater, as of May 2024. The results for each future sampling event will be compared to the most recently published version of the MCL or RSL table.

Groundwater samples will be properly packed and shipped to a certified analytical laboratory.

3.4.6 Equipment Decontamination Procedures

Sampling equipment consists of peristaltic pumps utilizing Teflon-lined HDPE tubing, water level meters, and a multi-parameter water quality meter equipped with a flow-through cell. Peristaltic pump tubing shall only be used once and discarded after sampling, The water level meters and water quality meters shall be decontaminated as follows:

1. Wash thoroughly with Liquinox® detergent and tap water.
2. Rinse with tap water.
3. Rinse with deionized water.
4. Allow to air dry before use at the next well

Equipment not expected to be used immediately after air drying will be wrapped in clean foil (i.e., water meter probe, flow cells and water quality meter probes).

3,4,7 Investigation-derived Wastes

Investigation-derived wastes are expected to include purge water, used tubing, and decontamination liquids. The wastes are anticipated to be non-hazardous. The used sample tubing will be disposed of by placing in the Depot's solid waste collection containers at the Open Burning/Open Detonation (OB/OD) Offices located near the Burning Ground #2 Site. Purge water and decontamination liquids will be collected and placed into a 55-gallon storage drum located at the OD/OB Offices. This drum will be collected by the Depot's environmental personnel when full and taken to the treatment plant in the Southeast Industrial area for characterization and disposal.

3.4.8 Quality Assurance/Quality Control Procedures

QC procedures are operations employed during field sampling and chemical analysis 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. Table 2 outlines the sample containers, preservatives, and holding time requirements for the groundwater samples collected at the Burning Ground #2 (SWMU #65).

3.4.9 Data Evaluation and Reporting

Groundwater data from the downgradient wells (10-BG2-02, 10-BG2-03, and 10-BG2-04; Figure 5) will be compared to preliminary screening values (PSVs) and/or data from the upgradient well (10-BG2-01; Figure 5) as part of the monitoring program. This will be done to determine whether there is statistically significant evidence of contamination present at the Burning Ground #2 (SWMU #65).

In determining whether statistically significant evidence of contamination exists, ANAD will use the methods that follow the requirements of its current permit under ADEM R.335-14-5-34 .06(8)(h). Annually, the concentration data from the three downgradient monitoring wells will be compared with the background data from the one background (upgradient) 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 non-compliances 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 concentration trend analysis of four most recent 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 annual monitoring reports to ADEM within 60 days of the sampling event, which are planned to occur once a year in the Spring when the water table is at its highest level.

ANAD will prepare groundwater monitoring reports after each annual sampling event. 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 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 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 the Burning Ground #2 (SWMU #65)
- 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

Monitoring reports shall be submitted electronically in pdf format to ADEM.

3.4.10 Contingency for Replacement Wells

In the event any existing monitoring wells are dry during two consecutive monitoring events, ANAD will implement a drilling program to replace the dry wells with deeper wells that will consistently yield a representative sample of groundwater at the site. However, it should be noted that previous attempts to install a replacement upgradient well into the unconsolidated aquifer materials above dolostone bedrock encountered bedrock prior to the water table and a new well was not completed. In order to install a successful replacement well, use of air rotary drilling methods and penetration into the uppermost fractured bedrock may be necessary to reach the water table. This could result in a different sample condition than the other monitoring wells onsite.

4.0 Implementation Schedule

The Corrective Measures at Burning Ground #2 (SWMU #65) will be implemented upon receipt of ADEM approval for this work plan. It is anticipated that the Land Use Conditions for the Burning Ground #2 (SWMU #65) will be implemented and recorded by ANAD within 30 days of ADEM approval of the work plan. Ground water monitoring will commence in the spring following ADEM approval (assumed to commence in 2026) and be conducted thereafter every year.

5.0 References

ADEM. 2013. Responses to ANAD Comments on ADEM Review of the March 2011 Closure Report, Burning Ground No. 2 (SWMU 65), in letter format from ADEM to ANAD. March 5.

ADEM, 2024. Response to Risk-Based Corrective Action Closure Report Burning Ground #2, Solid Waste Management Unit #65, Revision 2, dated November 8, 2023, in a letter format from ADEM to ANAD. January 2024.

CH2M Hill. 2008. Burning Ground #2, Solid Waste Management Unit 65, Resource 16 Conservation and Recovery Act, Facility Investigation Report. Anniston Army Depot, 17, Anniston, Alabama. May.

CH2M Hill. 2009. Risk-Based Corrective Action Closure Plan, Burning Ground #2, 29 Solid Waste Management Unit 65, prepared for the U.S. Army Corps of Engineers, Mobile. July.

CH2M Hill. 2011. Anniston Army Depot Closure Report, Risk-Based Corrective Action, Burning Ground #2, Solid Waste Management Unit #65. March.

Engineering, Design and Geosciences Group, Inc. 1988. RCRA Part B Permit Application for Open Burning/Open Detonation (OB/OD) at ANAD. November.

EPA/540/S-95/504, April 1996. Puls, Robert W. and Michael J. Barcelona, Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures, Technology Innovation Office Office of Solid Waste and Emergency Response, US EPA, Washington, DC.

EPA, May 1996. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, U.S. EPA, Region 4, Athens Georgia.

Fauss, L.M. and L. Mata. 1987. Photogeologic Study of Potential Groundwater Pollution Pathways Between Anniston Army Depot and Cold Spring, Alabama. Contract No. 68-03-3 3161. Bionetics Corporation (subcontract to JEG), Warrenton, Virginia.

KOMAN/Trinity. 2023. Risk-Based Corrective Action Closure Report, Burning Ground #2, Solid Waste Management Unit #65. November.

Osborne, W.E. and M.W. Szabo. 1984. Stratigraphy and Structure of the Jacksonville Fault, Calhoun County, Alabama, Geological Survey of America.

SAIC. 1998. Report of Findings for the Groundwater Tracer Test at the Anniston Army Depot Southeast Industrial Area, Anniston, Alabama. Prepared for USACE Mobile District, Oak Ridge, Tennessee. May.

SAIC. 2001. Science Applications International Corporation (SAIC). Final Anniston Army Depot Ammunition Storage Area Remedial Investigation Report. August.

Scott, J.C., W.F. Harris, and R.H. Cobb. 1987. Geology and Susceptibility of Coldwater Spring and Jacksonville Fault to Surface Contamination in Calhoun County, Alabama. USGS Report No. 87-4031.

Trinity. 2019. Technical Memorandum, Proposal and Cost Estimate for Path Forward for Anniston

Army Depot, Alabama, Burning Ground #2 Solid Waste Management Unit #65. To Mr. Joseph M. Owens, Anniston Army Depot, Directorate of Risk Management, from Benjamin Stewart, Trinity Project Manager/Geologist. July.

Trinity. 2020. Groundwater Monitoring Well Installation and Soil and Groundwater Sampling Alabama Risk-Based Corrective Action Closure, Burning Ground #2, Solid Waste Management Unit #65 Uniform Federal Policy-Quality Assurance Project Plan, Anniston Army Depot, Calhoun County, Alabama. April.

Tables

TABLE 1
SAMPLE CONTAINER AND PRESERVATION REQUIREMENTS FOR GROUNDWATER
BURNING GROUND #2, ANNISTON ARMY DEPOT
ANNISTON, AL

ANALYSIS	CONTAINER[a]	PRESERVATION	HOLDING TIMES
Metals (total)	500-mL plastic	Cool 4°C, HNO_3 pH <2	28 days until analysis for mercury 180 days until analysis for other metals
Metals (dissolved)	500-mL plastic	Cool 4°C, laboratory filtered	28 days until analysis for mercury 180 days until analysis for other metals
SVOCs, including N-Nitrosodimethylamine	Two 1-L amber glass	Cool 4°C	7 days until extraction 40 days until analysis
VOCs	Three 40-mL glass[b]	Cool 4°C, 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.

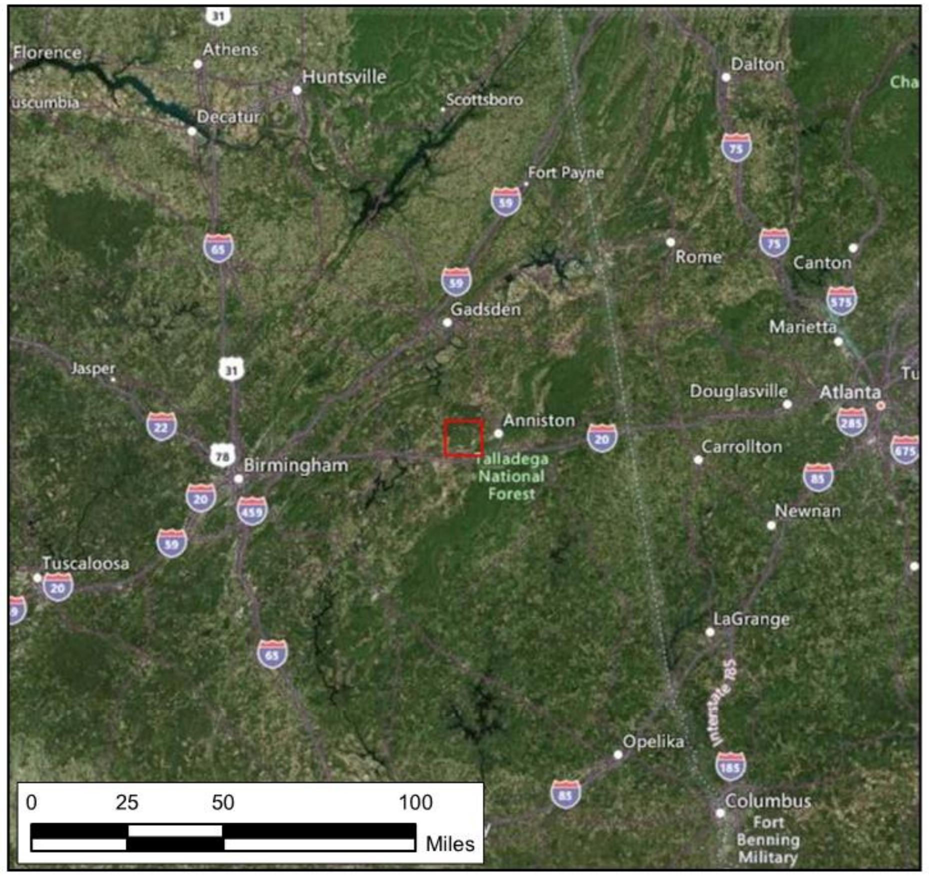
TABLE 2
CONSTITUENTS OF CONCERN
BURNING GROUND #2, ANNISTON ARMY DEPOT
ANNISTON, AL

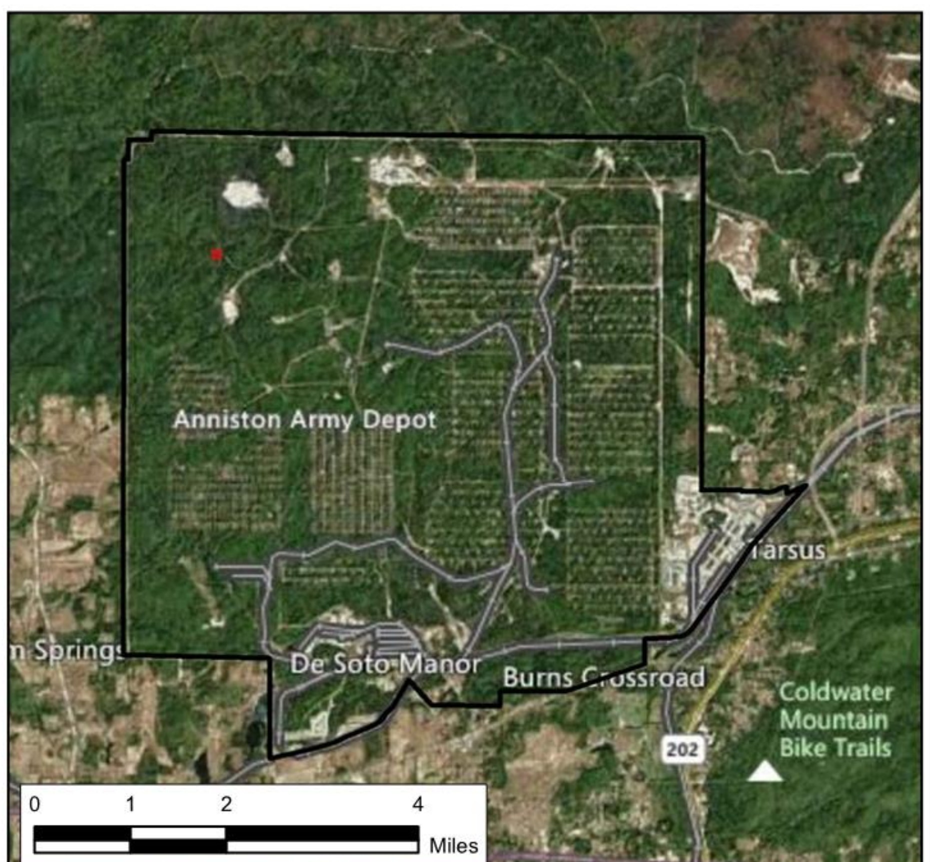
ANALYTE	PSV, GROUNWATER, MG/L	GROUNDWATER REFERENCE
Metals (Method 6010B)		
Manganese	0.043	b
SVOCs (Method 8270C)		
Naphthalene	0.00012	b
N-Nitrosodimethylamine	0.00000011	b
VOCs		
Acetone	1.8	b

(a) Federal Maximum Contaminant Level for Drinking Water.

(b) U.S. EPA Regional Screening Levels Table, November 2024.

Figures





N
W
E
S

FIRST ENVIRONMENT

Anniston Army Depot Boundary
Former Burning Ground #2

Figure 1
Site Location
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot
Anniston, Alabama

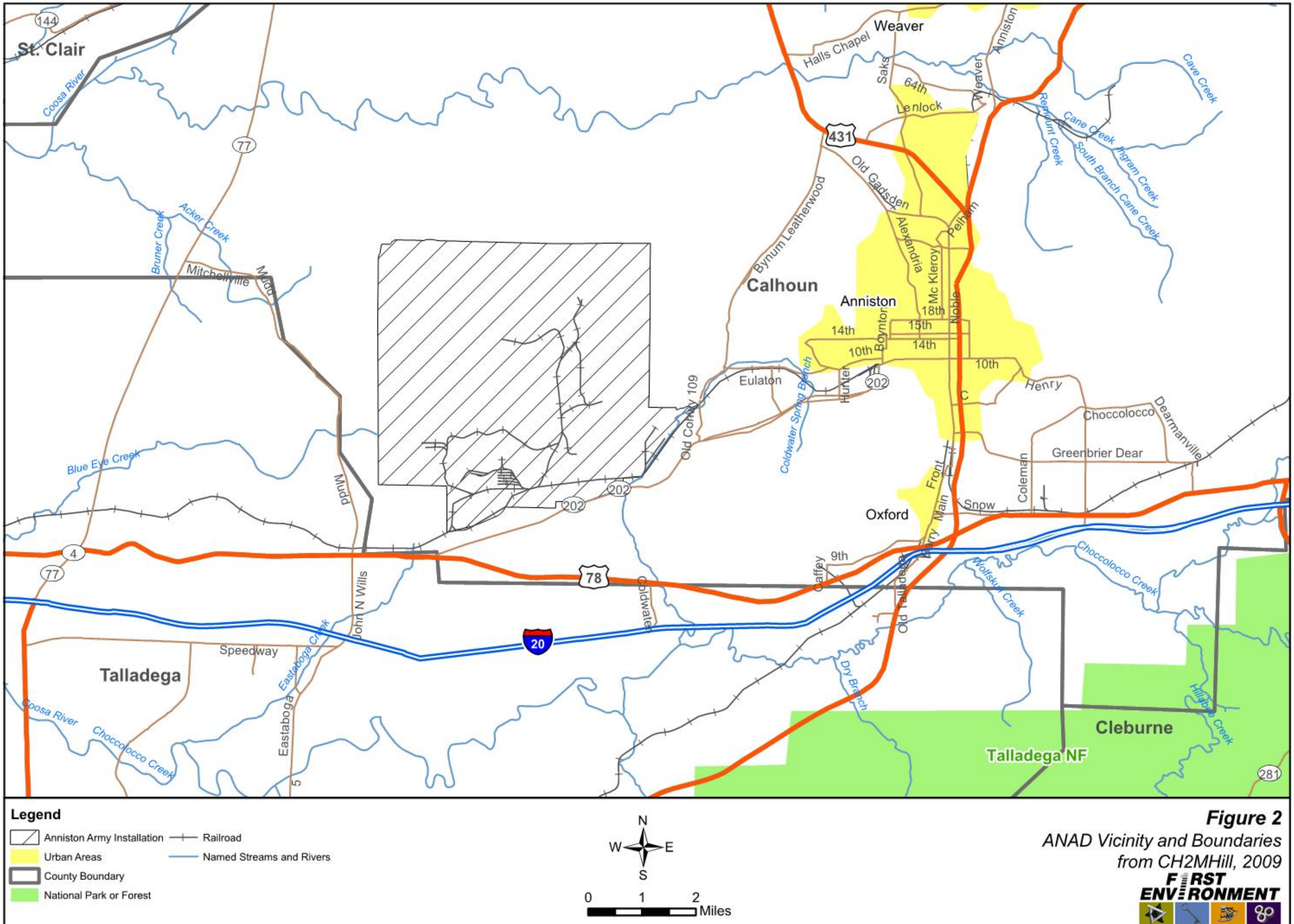
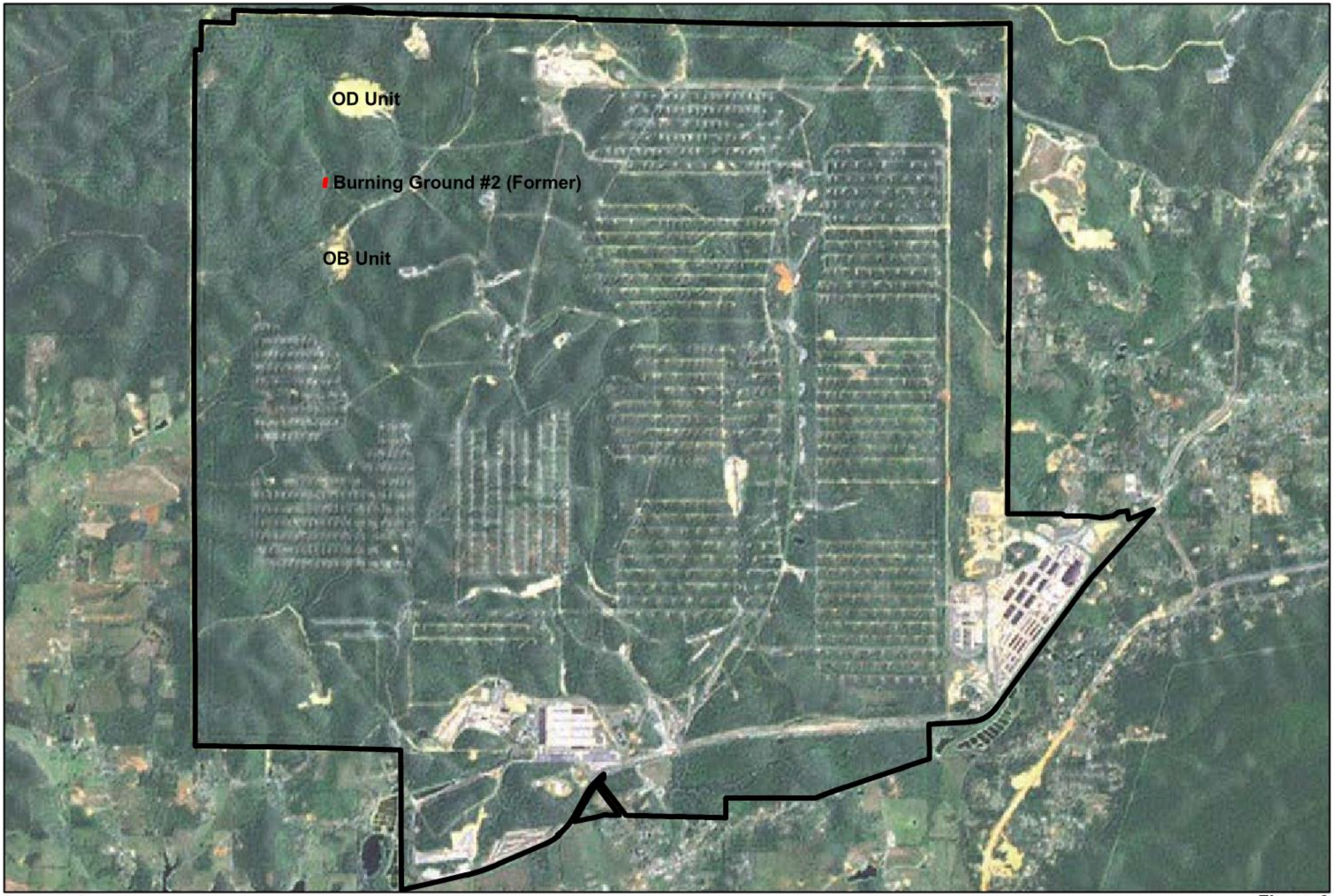


Figure 2
ANAD Vicinity and Boundaries from CH2MHill, 2009

FIRST ENVIRONMENT



Legend

Former Burning Ground #2 Boundary

Installation Boundary

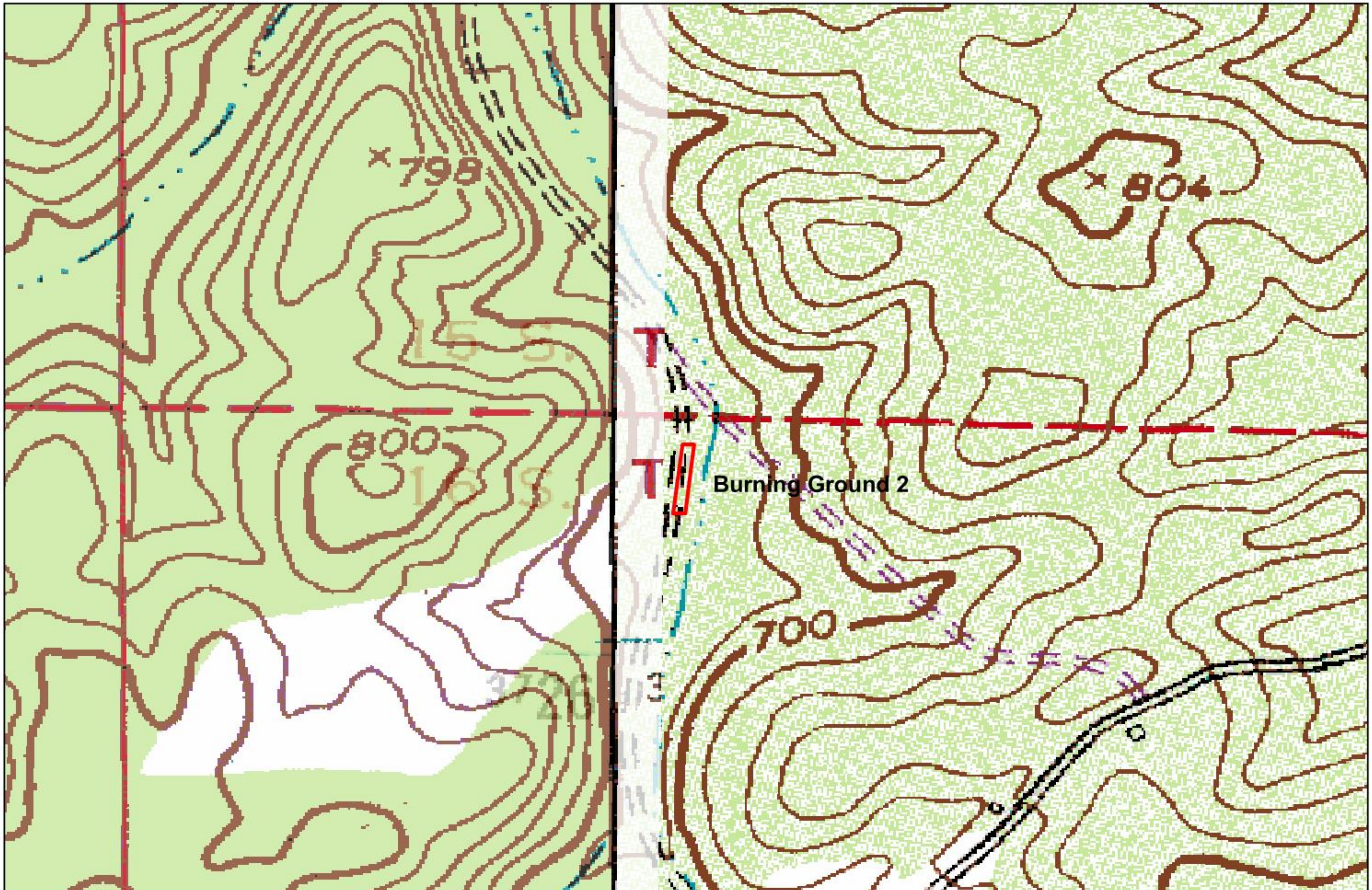
N
W E
S

0 2,600 5,200 Feet

Figure 3
Location of Burning Ground No. 2
from CH2MHill, 2011

FIRST ENVIRONMENT

\\GALILEO\PROJ\ANNISTON\MXDS\BG2_LOCATION.MXD GBOQUIN 2/22/2011 16:21:23



Legend

Burning Ground 2 Boundary

N W E S

0 250 500 Feet

FIRST ENVIRONMENT

Figure 4

Topography in Vicinity of Burning Ground No. 2 from CH2MHill, 2009

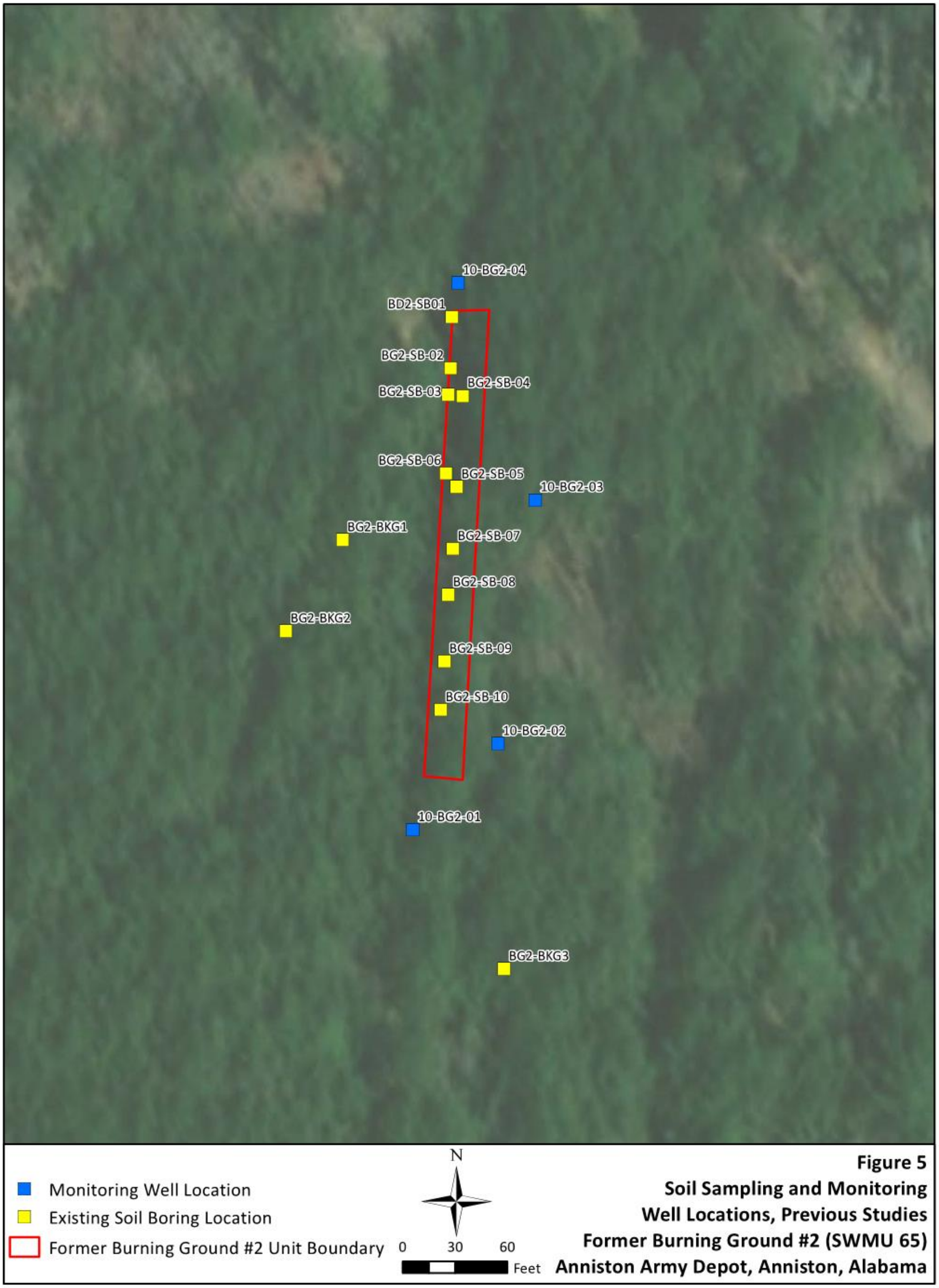


Figure 5
Soil Sampling and Monitoring Well Locations, Previous Studies
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot, Anniston, Alabama

FIRST ENVIRONMENT

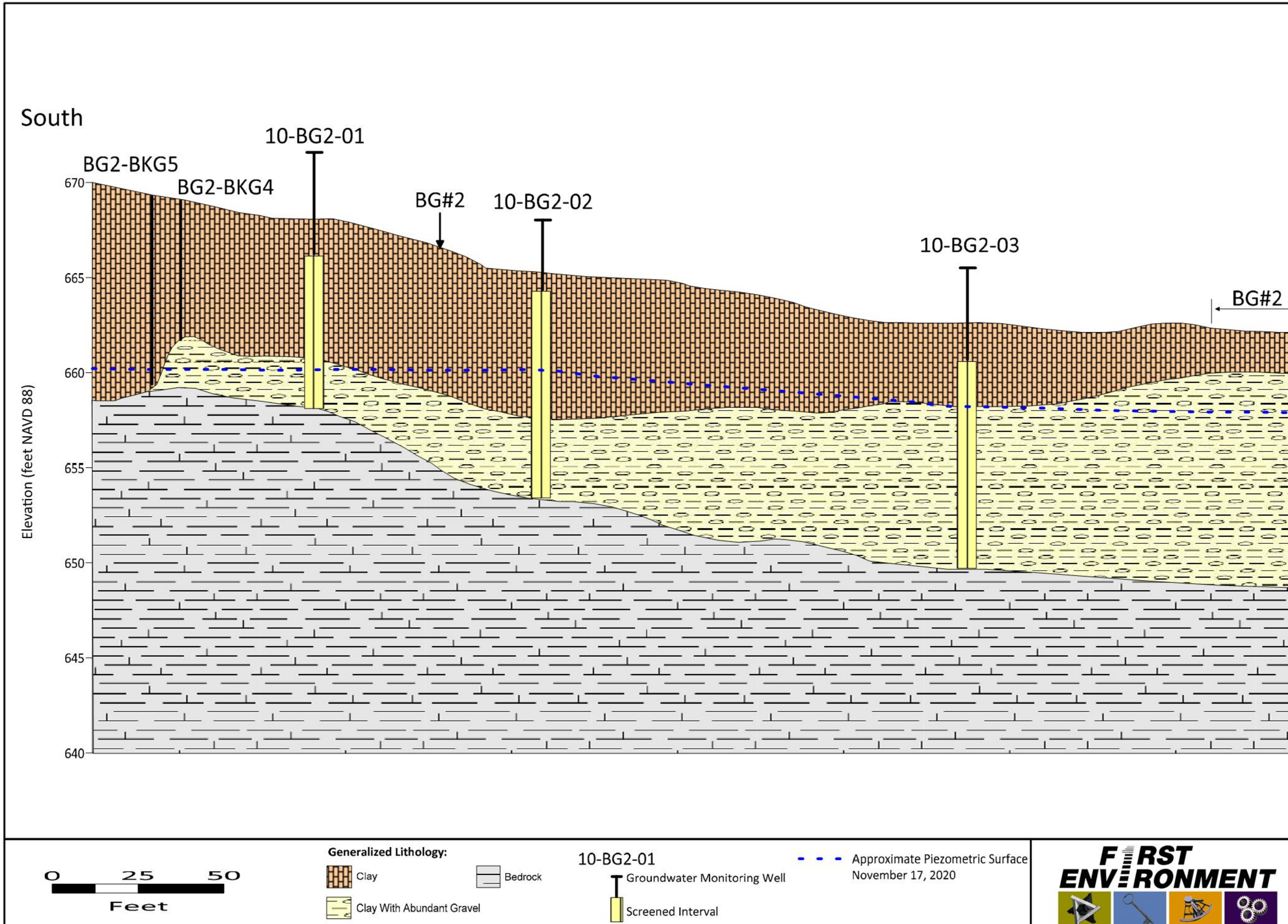
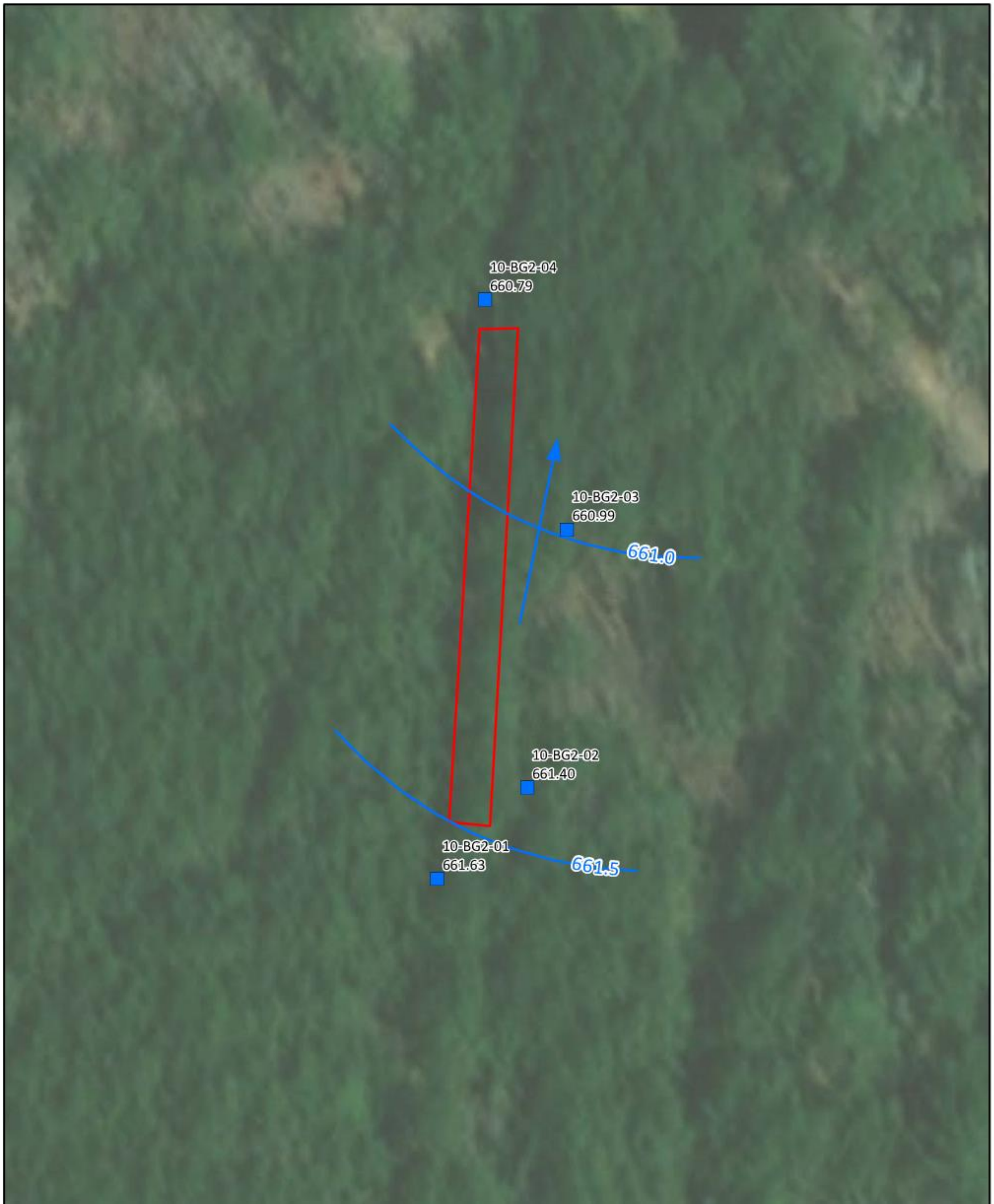


Figure 6
Geologic Cross Section
Burning Ground No. 2



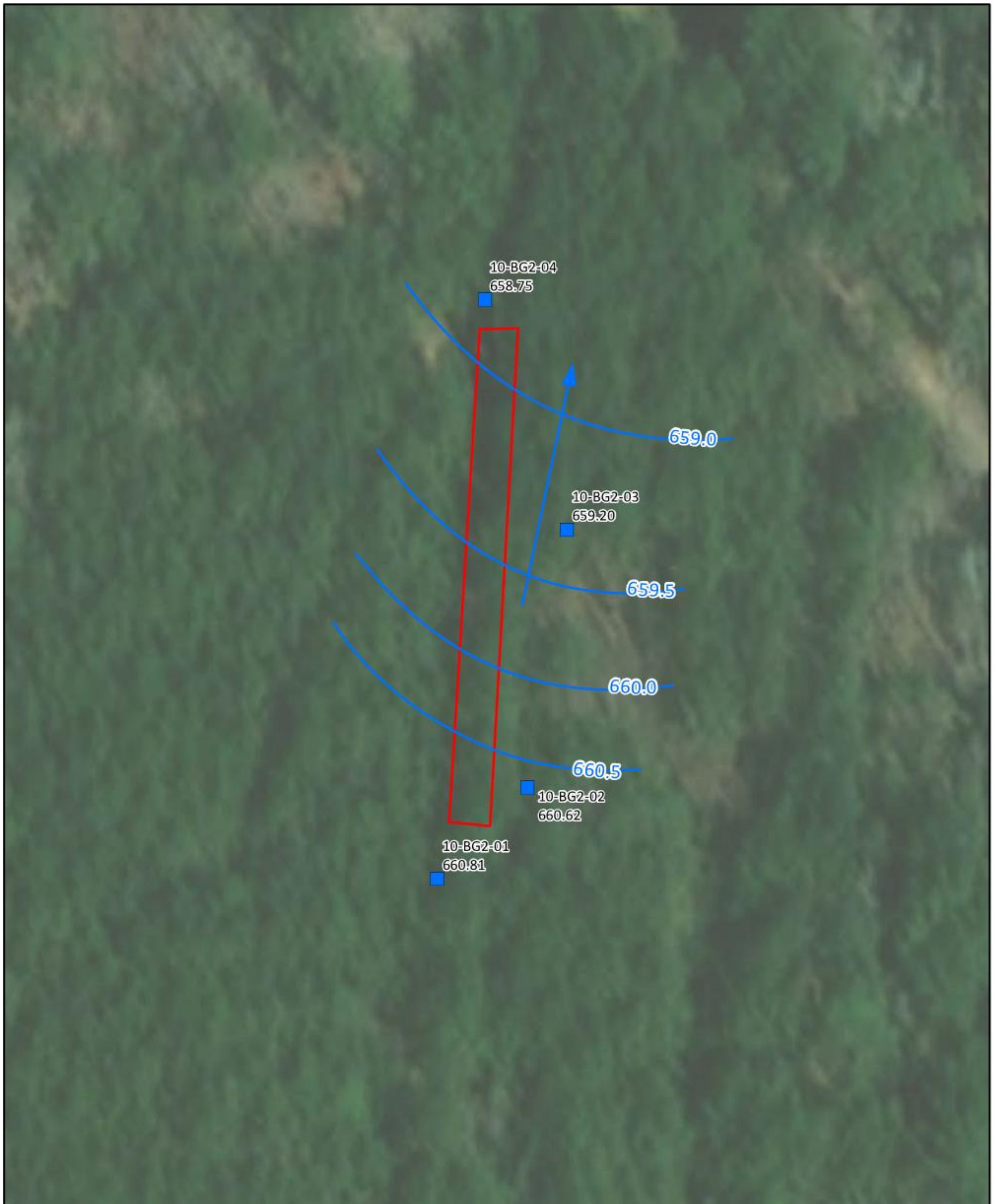
Monitoring Well Location
Groundwater Elevation Contour (ft msl)
General Direction of Groundwater Flow
Former Burning Ground #2 Unit Boundary

N

0 30 60
Feet

Figure 7
Piezometric Surface Map - May 19, 2020
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot
Anniston, Alabama

FIRST ENVIRONMENT



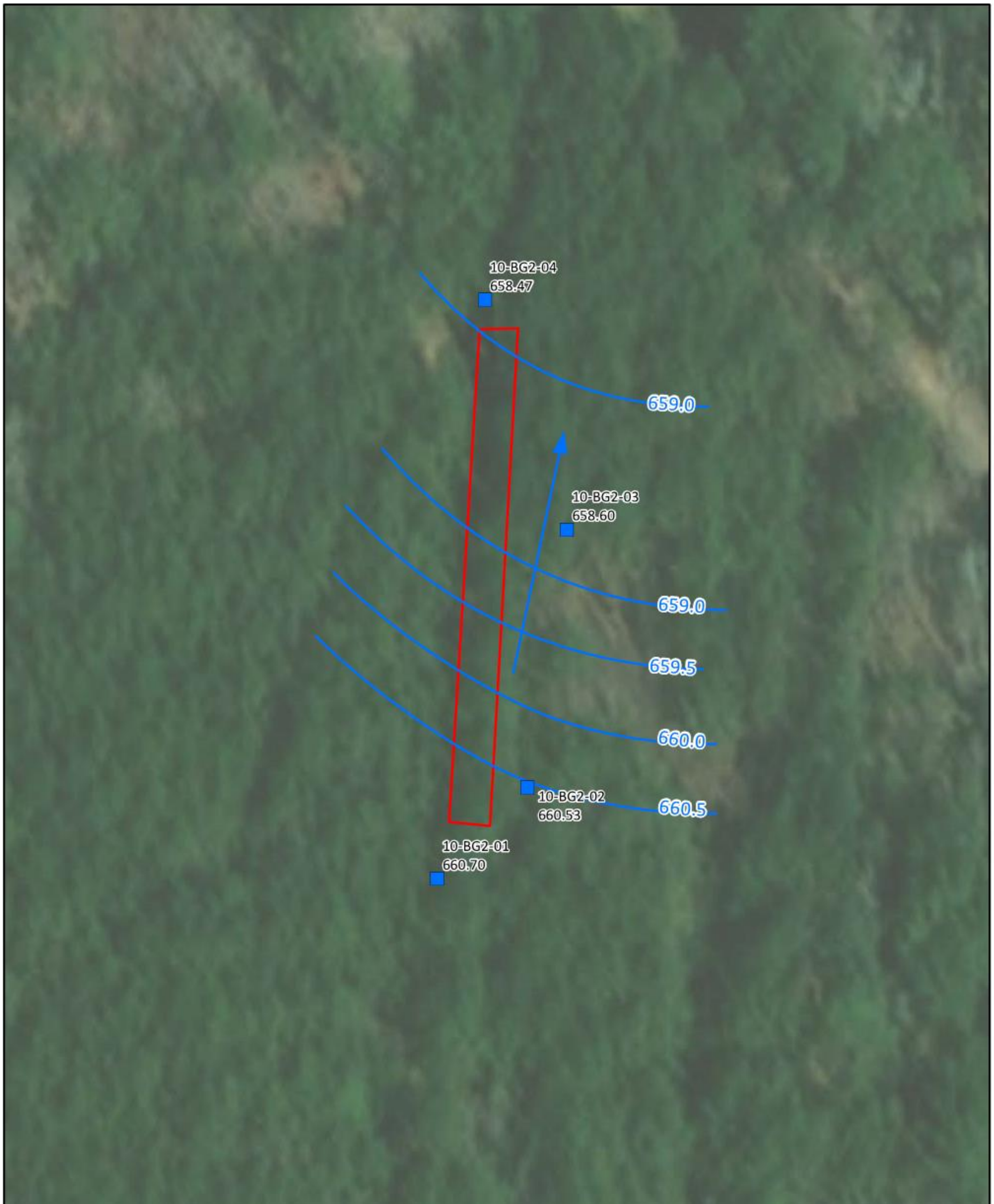
Monitoring Well Location
Groundwater Elevation Contour (ft msl)
General Direction of Groundwater Flow
Former Burning Ground #2 Unit Boundary

N

0 30 60 Feet

Figure 8
Piezometric Surface Map - August 28, 2020
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot
Anniston, Alabama

FIRST ENVIRONMENT

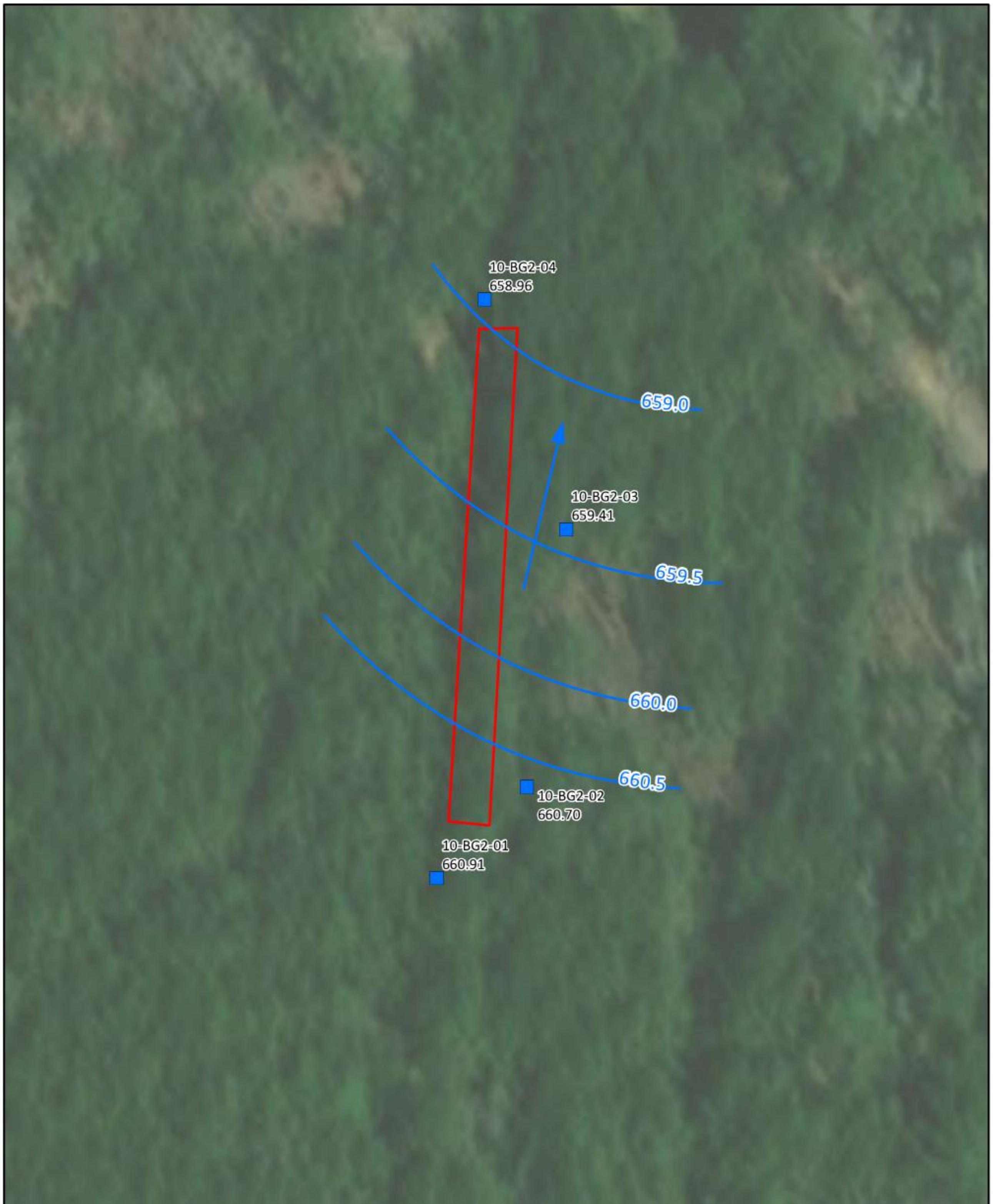


Monitoring Well Location
Groundwater Elevation Contour (ft msl)
General Direction of Groundwater Flow
Former Burning Ground #2 Unit Boundary

N
0 30 60
Feet

Figure 9
Piezometric Surface Map - November 17, 2020
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot
Anniston, Alabama

FIRST ENVIRONMENT



Monitoring Well Location
Groundwater Elevation Contour (ft msl)
General Direction of Groundwater Flow
Former Burning Ground #2 Unit Boundary

N

0 30 60 Feet

Figure 10
Piezometric Surface Map - February 10, 2021
Former Burning Ground #2 (SWMU 65)
Anniston Army Depot
Anniston, Alabama

FIRST ENVIRONMENT

APPENDIX A
LUC CHECKLIST

INSPECTION CHECKLIST
LAND USE CONTROL
STANDARD OPERATING PROCEDURE
ANNISTON ARMY DEPOT, ANNISTON, ALABAMA

Item	Response
LUC SOP, LUCIPs, and GIS Maps • Have the LUC SOP, LUCIPs, and GIS maps been updated? • Has the LUC SOP been provided to all affected ANAD organizations? • Is the LUC SOP available on the ANAD website?	
Employee Awareness/Training • Was General Workforce Awareness Training provided? • Was key Supervisor Training/Refresher Training provided? • Was Employee Training/Refresher training provided?	
Dig Permit Program • Is dig permit program in operation?	
Annual LUC Site Inspections • Were all LUC sites inspected? • Were any land use restriction violations observed during the inspection? • If yes, describe any corrective action.	

APPENDIX B

DRAFT NOTICE OF ENVIRONMENTAL USE RESTRICTIONS

STATE OF ALABAMA

CALHOUN COUNTY

NOTICE OF ENVIRONMENTAL USE RESTRICTIONS

WHEREAS, this Notice is consistent with the provisions of the Alabama Department of Environmental Management (ADEM) Admin. Code r. 335-5-1-.02(3) and the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) Permit Number: AL3210020027 dated September 21, 2021; and,

WHEREAS, the UNITED STATES OF AMERICA is the owner of certain property under the jurisdiction of the Secretary of the Army ("Army") commonly referred to as Burning Ground #2/Solid Waste Management Unit (SWMU #65, located at Anniston Army Depot, Calhoun County, Alabama, more particularly described in Attachment A, attached hereto and incorporated herein by reference as though fully set forth (hereinafter referred to as "the Property"); and,

WHEREAS, this Notice is provided for information only and is not independently enforceable. This notice should not be construed to transfer, dispose of, or in any way alienate any real property interest held by the United States of America in the Property, and the filing of this Notice does not transfer, relinquish, or in any way create any real property interest in the Property; and,

WHEREAS, this Notice is advisory in nature and does not independently impose use restrictions on the Property. The use restrictions described herein are a part of the approved environmental corrective action prepared and proposed by the Army to ensure protection of human health and the environment by limiting exposure to chemicals of concern which remain on the Property after implementation of the approved corrective action; and,

WHEREAS, implementation of such environmental corrective actions has achieved, or is expected to achieve, risk-based clean-up levels deemed protective of human health and the environment based on certain use restrictions implemented for the Property to limit exposure to chemicals of concern; and,

WHEREAS, the purpose of this Notice is to promote protection of human health and the environment by giving notice of the restrictions identified as components of the environmental corrective actions described in Permit Number: AL3 210 020 027, Part VIII.B.; and,

WHEREAS, further information concerning the environmental corrective actions may beobtained by contacting:

Chief, Land Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110
(334) 271-7700

NOW, THEREFORE, the Army hereby gives notice and declares that the land use restrictions as contained in the environmental corrective actions described in

Permit Number: AL3 210 020 027, Part VIII.B. and as described as follows are in place at the Property for the protection of human health and the environment:

1. Use restrictions.

   a. Burning Ground #2/SWMU #65 shall be restricted to its current undeveloped uses. Residential use and/or residential development of the LUC area of the site, including use or development for residential housing, elementary and secondary schools, childcare facilities, and playgrounds, are prohibited.

   b. Inspection of the sign installed at the boundary of the LUC area shall be performed annually to ensure that they are present and legible. Sign repair or replacement will be made on an as-needed basis. The Army will notify ADEM within 10-days if the inspections identify any site uses inconsistent with the restrictions imposed on the site.

      Intrusive activities within the site LUC boundaries shown on Figure 1 will be conducted with appropriate approvals and safety controls (e.g., anomaly avoidance, on-call unexploded ordnance (UXO) support).

The Army has incorporated the above land use restrictions into its Installation Master Plan GIS database of record denoting the coordinates of the Land Use Control boundaries. The land use restrictions will be managed and maintained by the Site Access Control Program as well as the Record of Environmental Review Program for any land disturbance on the Installation. This database is the incorporated into the Anniston Army Depot Master Plan and utilized for all land constraint analysis and evaluation. All cleanup plans, decision documents, permits and other instruments relying upon or referencing this Notice shall include appropriate conditions requiring that this Notice remain in place for the duration of federal ownership. The continued approval of any remedy relying upon or referencing this Notice is conditioned upon the timely execution and filing of a covenant at the time the property is transferred to an owner that is not the federal government.

2. Modifications. These use restrictions continue in effect as long as required by AHWMMA Permit Number AL3 210 020 027. Where the conditions necessitating the restrictions have been appropriately remediated or no longer exist and ADEM has approved a modification or termination of the use restrictions in the Permit Number AL3 210 020 027 pursuant to the AHWMMA, this Notice may be modified or terminated consistent with such approval.

3. Conveyances out of Federal Control. If the Army conveys any of the Property (as described in Attachment A) to any entity or person that is not an agency, department, or instrumentality of the United States, the Army will assist any such non-federal entity with the development of an Environmental Covenant to be executed with ADEM approval and appropriately filed in the land records of Calhoun County, Alabama pursuant to § 35-19-1, Code of Alabama, as amended at the time of such conveyance.

4. Transfer of Jurisdiction to another Federal Agency. If the Property is transferred to another federal agency, these use restrictions shall remain in effect and are binding on the recipient agency, unless this Notice is modified or terminated consistent with the Permit.

5. Other Regulations. Pursuant to ADEM Admin. Code r. 335-5-1-.02(3)(a)(1)(vi), other regulations applying to an environmental covenant shall apply to this Notice of Environmental Use Restrictions; and consistent with ADEM Admin. Code r. 335-5-1-.02(3) for property or sites that are owned by the federal government, which are unable to execute an environmental covenant, only the procedural regulations (e.g., those regulations that do not convey or acquire a real property interest) apply. However, nothing herein shall create, modify, or replace underlying legal requirements which establish or remove environmental use restrictions.

6. Filing. This Notice shall be recorded by the Army in the land records of Calhoun County, Alabama

In Witness Thereof, this Notice of Environmental Use Restrictions is given by U.S. Army, Anniston Army Depot, Alabama on this the___day of_______________, 20___.

By: ____

Title: ____

STATE OF ALABAMA

COUNTY OF

CALHOUN

ACKNOWLEDGEMENT

I, the undersigned Notary Public in and for said County and State, hereby certify that _______________________, whose name is signed to the foregoing Notice, and who is known to me, acknowledged before me this day that, being informed of the contents of the Notice, he executed the same voluntarily on the day the same bears date.

Given under my hand and official seal the______day of___________________, 20___.

SEAL

____

Notary Public

My commission expires: ________________

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

This Notice of Land Use Restrictions has been approved by and registered with the AlabamaDepartment of Environmental Management this__day of_____________, 20___.

By:___________________________________

Chief, Land Division

Alabama Department of Environmental Management

STATE OF ALABAMA

COUNTY OF CALHOUN

ACKNOWLEDGEMENT

I, the undersigned Notary Public in and for said County and State, hereby certify that ________________________, whose name is signed to the foregoing Notice, and who is known to me, acknowledged before me this day that, being informed of the contents of the Notice, he executed the same voluntarily on the day the same bears date.

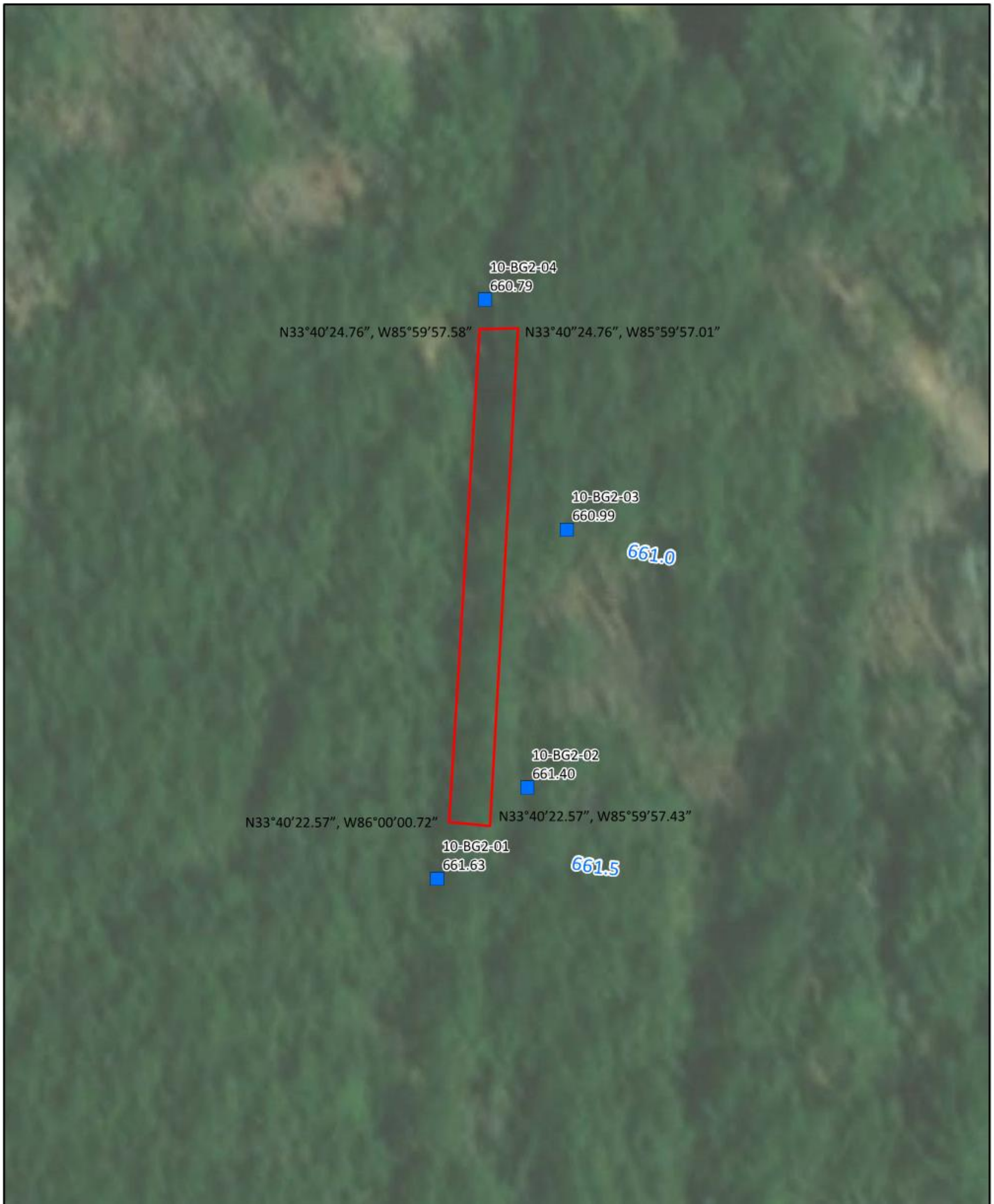
Given under my hand and official seal the______day of__________________, 20___.

SEAL ______________________________________

Notary Public

My commission expires: ______________

ATTACHMENT A



Monitoring Well Location

Former Burning Ground #2 Unit Boundary

N

0 30 60 Feet

ATTACHMENT A

SWMU Boundaries for NEUR

Former Burning Ground #2 (SWMU 65)

Anniston Army Depot

Anniston, Alabama

FIRST ENVIRONMENT

ADEM Review Comments:

Corrective Measures Work Plan for Burning Ground #2 (SWMU 65), Revision 1 dated February 10, 2025

1. **Page 5, Section 1.0 Introduction and Table 2 Constituents of Concern:** In this revision, the risk-based target levels (RBTLs) for the chemicals of concern (COCs) were added to the last paragraph on the page. However, Table 2 lists Environmental Protection Agency (EPA) regional screening levels (RSLs) for the COCs. Of the four COCs, only acetone has an RBTL that is the same as its RSL. It is unclear which values will be used as the remedial goals for the groundwater monitoring. Please revise the document to clarify which values will be used.

   In addition, the RSLs listed for naphthalene and N-nitrosodimethylamine in Table 2 are not the values listed in the May 2024 RSL table that is stated as the reference. The value listed for N-nitrosodimethylamine is actually the value for N-nitrosodiethylamine.

   Response: *The text on Page 5 and 6 has been revised to show that US EPA Regional Screening Levels (RSLs) will be used as remedial goals for the groundwater monitoring. The text and Table 2 were also revised to reflect the proper values and to update the values to the current US EPA RSL tables dated November 2024.*

2. **Page 12, Section 3.4 Proposed Groundwater Monitoring:** The text states, "*Groundwater monitoring shall continue until concentrations of contaminants of concern are at levels to allow unrestricted use/unrestricted exposure (UU/UE) for three consecutive monitoring periods. Furthermore, it is assumed that if UU/UE concentrations are achieved, that Groundwater Resource Protection Contaminants of Concern are no longer an issue.*" However, the groundwater resource protection (GRP) soil COCs (acetone and naphthalene) were not above screening levels in groundwater. The concern was whether these constituents would leach to groundwater in the future. While the GRP COCs remaining below screening criteria until all groundwater COCs are below UU/UE levels would show that significant leaching has not occurred up to that point, other factors such as the time since the initial release, the depth to groundwater, soil chemistry, and COC concentrations would need to be evaluated to demonstrate whether or not there is a potential for leaching in the future. ANAD should conduct a re-evaluation of the GRP COCs once groundwater achieves UU/UE levels.

   Response: *The text on Page 12 has been amended to state that ANAD will further evaluate the site conditions once the site groundwater achieves UU/UE levels to demonstrate whether there is a potential for future leaching.*

3. **Page 18, Section 4.0 Implementation Schedule:** This section still states that groundwater monitoring will be conducted every two years. Please correct this statement since the facility has revised the document in other sections to state that groundwater monitoring will be conducted annually.

Response: *The text on Page 18 has been revised to state that groundwater monitoring will be conducted annually.*

4. **Appendix B Draft Notice of Environmental Use Restrictions [NEUR]:** The first paragraph references Redstone Arsenal's permit number instead of ANAD's. Please revise the first paragraph of the Draft NEUR to reference the correct permit number.

   Response: *The noted paragraph has been revised to reference ANAD's permit number.*

5. **Appendix B Draft Notice of Environmental Use Restrictions [NEUR]:** The Attachment A figure has not been included. Please add a figure showing Solid Waste Management Unit (SWMU) #65 which includes coordinates specifying the boundaries of the SWMU.

   Response: *A figure showing the SWMU #65 boundaries and coordinates has been added to Appendix B.*