ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PROPOSED PERMIT MODIFICATION
FACT SHEET

Hazardous Waste Facility Permit
No. AL3 210 020 027
U.S. Department of the Army, Anniston Army Depot
U.S. Department of the Army, Anniston Munitions Center
U.S. Department of the Army, Anniston Field Office
Washington Demilitarization Company LLC

The Alabama Department of Environmental Management (ADEM) has prepared a draft modification to the Hazardous Waste Facility Permit issued to the above Permittees for the Anniston Army Depot near Anniston, Alabama in accordance with the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) and the ADEM Administrative Code. This fact sheet has been prepared to briefly advise the public of the principal permitting and legal issues associated with the proposed permit modification.

I. PERMIT MODIFICATION PROCESS

The purpose of the permit modification process is to allow the State and the public to evaluate the Permittees ability to comply with the hazardous waste management requirements of the AHWMMA, as amended. The Permittee must comply with hazardous waste management conditions set forth in the permit during the effective period of the permit, which is ten years from the last permit renewal.

II. PROCEDURES FOR REACHING A FINAL DECISION

ADEM Admin. Code r. 335-14-8-.08(6) requires that the public be given at least a 45-day comment period for each draft permit and permit modification which has been determined to be a major modification in accordance with ADEM Admin. Code r. 335-14-8-.04(2). The comment period will begin on November 25, 2016 which is the date of publication of the public notice in major local newspaper(s) of general circulation, and will end on January 26, 2017, for a total comment period of 60 days. This 60-day period also satisfies the MACT requirements of 40 CFR 63.1207(e). Any person interested in commenting on the proposed permit modification must do so within this time period.

All persons wishing to comment on any part of the proposed permit modification should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, P.O. Box 301463, Montgomery, Alabama, 36130-1463, ATTENTION: Russell A. Kelly. In order to affect final decisions, all comments must address issues that have an impact on the applicant's ability to comply with environmental laws, rules and regulations. Only the modified portions of the permit are subject to comment. ADEM will consider all written comments received during the comment period in making its final permit decision for this facility.

When the Department makes its final decision, notice will be given to the applicant and to each person who has submitted written comments or requested notice of the final decision.

III. FACILITY DESCRIPTION

The Anniston Army Depot (ANAD), EPA ID No. AL3 210 020 027, located on Highway 202 West near Anniston, Alabama, was issued a permit on June 19, 1997 by ADEM to construct and to operate a hazardous waste storage and treatment facility. The permit was renewed on November 14, 2007.

Waste military munitions (WMM) are treated by Open Burning (OB) and Open Detonation (OD) operations which were permitted on September 5, 2009. Prior to these dates, the Depot treatment, storage and disposal operations were regulated under interim status standards for hazardous waste activities. On May 5, 2010, a major permit modification was approved to add a Static Detonation Chamber (SDC) for processing both conventional and chemical munitions.

Waste management practices at this facility require the issuance of an AHWMMA Hazardous Waste Permit. The permit also imposes requirements for corrective action of groundwater and soil contamination related to solid and hazardous waste management activities at the site, including provisions requiring any other solid waste management units at the facility to be addressed, should others be identified at a later time.

The AHWMMA Hazardous Waste Permit was issued to the U.S. Department of the Army, Anniston Army Depot (ANAD) (Facility Owner, Facility Co-Permittee, Facility Operator); the U.S. Department of the Army, Anniston Munitions Center (Facility Co-Permitee, Facility Co-Operator (ANMC operations)); the U.S. Department of the Army, Anniston Field Office (Facility Co-Permittee, Facility Co-Operator (AFO-SDC Site)), and the Washington Demilitarization Company(WDC) LLC (Facility Co-Permittee, Facility Co-Operator (SDC site)). The permit authorizes the Permittees to operate a hazardous waste storage and treatment facility located near Anniston, Alabama.

ANAD is responsible 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 final corrective actions, and closure or post-closure activities.

ANMC is responsible for the energetic treatment of waste military munitions by open burning and open detonation and the associated storage of waste within permitted igloos for these operations. 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.

AFO is responsible for hazardous waste management activities at the SDC Site. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or final corrective actions, and closure or post-closure activities.

WDC is responsible for hazardous waste management activities involved in the day to day management of the SDC operations associated storage within service magazines and storage igloos. These responsibilities include waste analysis, handling and monitoring, record keeping and related hazardous waste activities.

IV. SUMMARY OF PROPOSED PERMIT MODIFICATIONS

The proposed modification to the AHWMMA Permit pertains to the demonstration by a Comprehensive Performance Test that emissions of the Static Detonation Chamber (SDC) meet all performance standards as prescribed by the permit and to further demonstrate an increase in the explosive feed rate to the unit. In addition to the permit, Section III of the facility's Part B permit application was removed and Section IV of the Part B application was revised to include all SDC operational information which was formerly included in Section III. Additionally, the Part A was revised to include signatory changes. All of the submittal documents are part of the public record on display at the location identified in the accompanying Public Notice.

V. CHANGES TO THE EXISTING PERMIT

The specific changes to the permit are explained below. Table 1 itemizes each section of the permit that is proposed for change and a brief description of the reason for each change.

Table 1

Permit Module/Sectio	Rationale For Change
Cover Page	Updated to include the current modification and request dates.
Introduction Pages ii-ix	Updated pages to include the current modification date and number. Added the modification submittal dates. Updated the dates for the SDC Risk Assessment and Emissions Test Plans.
Module V Section V.A.2	Revised permit application references by deleting Section III K H reference for Standard Operating Procedures and re-ordered and re-formatted remaining permit application references.
Module V Section V.A.3.i	Removed permit application reference Section III K H from the training requirements. Re-ordered and re-formatted remaining references
Module V SectionV.B.3.a	Replaced Figure III.K-5 with Figure IV J-5 due to deletion of Section III of the permit application.
Module V Section V.B.3.b	Increased the non-mass detonating explosive feed rate from 6.7 lbs to 23.0 lbs. as demonstrated in a treatability study of the unit. The feed rate for mass detonating material did not change. Added condition for processing both mass detonating and non-mass detonating at the same time.
Module V Section V.C.3	Reformatted permit application references for waste characteristics.
Module V Section V.D.1.d.i	Reformatted permit application reference for Waste Analysis Plan.

Table 1 (continued)

Module V Section V.D.2.d.i	Reformatted permit application reference for OD residue control.
Module V Section V.D.c	Reformatted permit application reference for conventional WMM list.
Module V Section V.D.3.c (v)	Changed the treatment quantity of Non-Mass Detonating Explosives to 23.0 lbs NEW/event. Added condition for processing both mass detonating and non-mass detonating at the same time.
Module V Section V.D.3.c(vi)	Changed permit application references from III.K to IV J for SDC maintenance of equipment and carbon filter disposal requirements.
Module V Section V.D.3.m(i & iv)	Changed permit application reference from III.K to IV J for both the storage igloo specifications and the Inspection Schedule for the SDC.
Module V Section V.E	Removed Table III.K-3 from the list of inspection frequencies due to deletion of Section III of the permit application and re-formatted.
Module V Section V.E.3	Removed Section III.K.F as a permit application reference for inspection log sheets for the SDC and re-formatted IV J F reference.
Module V Section V.H	Removed permit application reference to III.K.I from the closure requirements. Also re-ordered and formatted remaining references.
Module V Section V.H.1.b	Removed permit application reference III.K.I from the decontamination and disposal description and reformatted other references for consistency.
Module V Section V.H.2.a	Reformatted Section IV I permitted application reference.
Module V Table 5-1	Corrected footnote formatting.
Module V Table 5-3	Added the date for the final SDC emissions test report to footnote number 2.
Module V Table 5-4	Changed the title of the second page of Table 5-4 to be consistent with the first page.

VI. TECHNICAL CONTACTS FOR THE PROPOSED PERMIT MODIFICATION

For questions involving the technical content of the proposed permit modification, please contact the individuals listed below:

Chrystal Strickland
Alabama Department of Environmental Management
Governmental Hazardous Waste Branch, Land Division
Facilities Engineering Section
Telephone: (334) 274-4186
Email: cstrickland@adem.alabama.gov

Leslie Ware
U.S. Department of the Army
Program Executive Office
Assembled Chemical Weapons Alternatives
Anniston Army Depot
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AHWMMA Permit

Note:

The changes to the permit referenced in the Fact Sheet are found on the permit pages with the "*draft*" watermark.

HAZARDOUS WASTE FACILITY PERMIT

ISSUED TO: United States Department of the Army, Anniston Army Depot
United States Department of the Army, Anniston Munitions Center
United States Department of the Army, Anniston Field Office
Washington Demilitarization Company, LLC

EPA ID/PERMIT NUMBER: AL3 210 020 027

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

UNITS PERMITTED:

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 Static Detonation Chamber (SDC)
3 SDC Service Magazines
34 SDC Conventional Waste Munitions Storage Igloos
1 Thermal Treatment Closed Disposal Process (TTCDP)

ISSUANCE DATE: **November 14, 2007**

Modification R1, March 24, 2008 - Minor
Modification R2, September 19, 2008 - Major
Modification R3, April 20, 2009 - Minor
Modification R4, June 15, 2009 - Major
Modification R5, August 3, 2009 - Minor
Modification R6, September 25, 2009 - Major
Modification R7, December 17, 2009 - Minor
Modification R8, February 18, 2010 – Minor
Modification R9, May 5, 2010 - Major
Modification R10, June 8, 2010 - Minor
Modification R11, September 23, 2010 - Minor
Modification R12, November 18, 2010 - Major
Modification R13, June 8, 2011- Major
Modification R14, September 9, 2011- Minor
Modification R15, December 20, 2011 - Minor
Modification R16, February 8, 2013 - Minor
Modification R17, April 19, 2013 - Major
Modification R18, June 28, 2013 - Minor
Modification R19, January 10, 2014 - Minor
Modification R20, September 30, 2014- Minor
Modification R21, February 20, 2015 - Major
Modification R22, September 10, 2015 - Major
Modification R23, January XX, 2017 - Major

EXPIRATION DATE: **November 13, 2017**

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

Alabama Department of Environmental Management

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE STORAGE AND TREATMENT PERMIT

Permittee: **United States Department of the Army, Anniston Army Depot**
United States Department of the Army, Anniston Munitions Center
United States Department of the Army, Anniston Field Office
Washington Demilitarization Company LLC
Permit Number: AL3210020027
EPA I.D. No.: AL3210020027
Anniston, Alabama
Modification Number: R23~~2~~

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

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

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

- The U.S. Department of the Army, Anniston Army Depot (ANAD), as Facility Owner, a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the ANAD Facility. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- The U.S. Department of the Army, Anniston Munitions Center (ANMC), as Permittee and Operator, acknowledges its responsibility for hazardous waste management activities under the control of ANMC as a tenant property to ANAD. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions and closure or post-closure activities. The areas under ANMC control include the energetic treatment of waste munitions by open burning, open detonation and thermal treatment closed disposal process and the associated storage of waste within permitted igloos for these operations.
- The U.S. Department of the Army, Anniston Field Office (AFO) as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the SDC Site, including responsibility for funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- Washington Demilitarization Company LLC as a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the SDC Site for day to day management within its direct management control and authority (including waste analysis, handling and monitoring, record keeping and related hazardous waste activities) as governed by law and the decisions and direction of the Army. The areas under control include the Building 695 Complex and the SDC used for the treatment of energetic waste munitions and the associated storage of waste within permitted service magazines and storage igloos for these operations.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in Chapters 335-14-1,

335-14-2, 335-14-5, 335-14-7, 335-14-8, and 335-14-9 of the ADEM Administrative Code (hereinafter referred to as the "AAC"). Applicable AACs are those which are in effect on the date of issuance of this Permit.

This Permit is based on the assumption that the information contained in the facility Part B Permit Application dated December 6, 2006, as revised on January 5, 2007, August 30, 2007, November 26, 2007, January 7, 2008, February 2, 2008, February 4, 2008, February 19, 2008, June 19, 2008, August 25, 2008, August 27, 2008, November 18, 2008, December 1, 2008, December 22, 2008, February 6, 2009, March 11, 2009, March 23, 2009, May 4, 2009, May 26, 2009, June 25, 2009, July 10, 2009, August 18, 2009, September 2, 2009, October 14, 2009, January 11, 2010, February 5, 2010, April 21, 2010, May 10, 2011, June 28, 2010, August 12, 2010, September 7, 2010, October 7, 2010, December 10, 2010 January 18, 2011, May 9, 2011, August 19, 2011, October 18, 2011, January 3, 2012, January 4, 2012, February 2, 2012, March 27, 2012, July 2, 2012, April 3, 2013, October 13, 2013, December 5, 2013, March 14, 2014, April 28, 2014, June 9, 2014, August 4, 2014, September 3, 2014, October 10, 2014, ~~and~~ November 3, 2014, September 21, 2015, April 14, 2016, August 10, 2016, September 27, 2016, and October 20, 2016 (hereby incorporated by reference and hereafter collectively referred to as the Application) is accurate.

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

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

This Permit is effective as of November 14, 2007, as revised March 24, 2008, September 19, 2008, April 20, 2009, June 15, 2009, August 3, 2009, September 25, 2009, December 17, 2009, February 18, 2010, May 5, 2010, June 8, 2010, September 23, 2010, November 18, 2010, June 8, 2011, September 9, 2011, December 20, 2011, February 8, 2013, April 19, 2013, June 28, 2013, January 10, 2014, September 30, 2014, February 20, 2015, ~~and~~ September 10, 2015, and January XX, 2017 and shall remain in effect until November 13, 2017, unless revoked and reissued, or terminated (See ADEM Admin. Code rule 335-14-8-.04(4)).

Alabama Department of Environmental Management	Date Signed

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DOCUMENTS INCLUDED BY REFERENCE:

Part B Permit Application (all revisions listed below)

~~ANCDF 2002~~SDC Condition 3 Emissions Testing Risk Assessment, February 2013 ~~and Subsequent Addendums~~

Final 2011 and 2016 SDC Emission Test Plans

SDC Emissions Test Reports

SDC CEMS Certification Plan

THE RESOURCE CONSERVATION AND RECOVERY ACT HAZARDOUS WASTE PERMIT APPLICATION FOR THE U.S. DEPARTMENT OF THE ARMY, ANNISTON ARMY DEPOT, THE U.S. DEPARTMENT OF THE ARMY, ANNISTON MUNITIONS CENTER, THE U.S. DEPARTMENT OF THE ARMY, ANNISTON FIELD OFFICE, AND WASHINGTON DEMILITARIZATION COMPANY LLC DATED DECEMBER 6, 2006, AS AMENDED JANUARY 5, 2007, RESUBMITTED AUGUST 30, 2007, AS MODIFIED BY SUBSEQUENT AMENDMENTS DATED NOVEMBER 26, 2007, JANUARY 7, 2008, FEBRUARY 2, 2008, FEBRUARY 4, 2008, FEBRUARY 19, 2008, JUNE 19, 2008, AUGUST 25, 2008, AUGUST 27, 2008, NOVEMBER 18, 2008, DECEMBER 1, 2008, DECEMBER 22, 2008, FEBRUARY 6, 2009, MARCH 11, 2009, MARCH 23, 2009, MAY 4, 2009, MAY 26, 2009, JUNE 25, 2009, JULY 10, 2009, AUGUST 18, 2009, SEPTEMBER 2, 2009, OCTOBER 14, 2009, JANUARY 11, 2010, FEBRUARY 5, 2010, APRIL 21, 2010, MAY 10, 2011, JUNE 28, 2010, AUGUST 12, 2010, SEPTEMBER 7, 2010, OCTOBER 7, 2010, DECEMBER 10, 2010, JANUARY 18, 2011, MAY 9, 2011, AUGUST 19, 2011, OCTOBER 18, 2011, JANUARY 3, 2012, JANUARY 4, 2012, FEBRUARY 2, 2012, MARCH 27, 2012, JULY 2, 2012, APRIL 3, 2013, OCTOBER 28, 2013, DECEMBER 5, 2013, MARCH 14, 2014, APRIL 28, 2014, JUNE 9, 2014, AUGUST 4, 2014, SEPTEMBER 3, 2014, OCTOBER 10, 2014, ~~AND~~ NOVEMBER 3, 2014, SEPTEMBER 21, 2015, APRIL 14, 2016, AUGUST 10, 2016, SEPTEMBER 27, 2016, AND OCTOBER 20, 2016 (HEREAFTER COLLECTIVELY REFERRED TO AS THE APPLICATION) IS HEREBY INCORPORATED BY REFERENCE INTO THIS PERMIT AND THE PERMITTEES SHALL BE SUBJECT TO THE REQUIREMENTS THEREIN.

LIST OF ACRONYMS

%	Percent
˚F	Degrees Fahrenheit
2MRA	2 Minute Rolling Average
AAC	ADEM Administrative Code
ACAMS	Automatic Continuous Air Monitoring System
ACFM	Actual Cubic Feet per Minute
ADEM	Alabama Department of Environmental Management
ANMC	Anniston Munitions Center
AFO	Anniston Field Office
AHWMMA	Alabama Hazardous Wastes Management and Minimization Act
AL	Airlock
ALA	Ammunition Limited Area
ANAD	Anniston Army Depot
ANCDF	Anniston Chemical Demilitarization Facility
AOC	Area of Concern
ASC	Allowable Stack Concentration
ASME	American Society of Mechanical Engineers
BD	Buried Detonation
BDAT	Best Demonstrated Available Technology
BTU	British Thermal Unit
CAMU	Corrective Action Management Unit
CDC	Centers for Disease Control
CEC	Cation Exchange Capacity
CEM	Continuous Emissions Monitor
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFM	Cubic Feet Per Minute
CFR	Codified Federal Regulations
Cl_2	Chlorine
CMS	Corrective Measure Study
CO	Carbon Monoxide
CO_c	Corrected CO ppm
CO_m	Measured CO ppm
CON	Control Room
CS	Confirmatory Sampling
CWA	Clean Water Act
D/P	Differential Pressure
DAAMS	Depot Area Air Monitoring System
DDESB	Department of Defense Explosive Safety Board
DECON	Decontamination
DHHS	Department of Health and Human Services
DOD	Department of Defense
DOT	Department of Transportation
DRE	Destruction and Removal Efficiency
DSCFM	Dry Standard Cubic Feet per minute
EPA	Environmental Protection Agency
EVAP	Evaporator
EXCH	Exchanger

FD	Forced Draft
FFA	Federal Facilities Agreement
FPI	Feed Prohibitive Interlock
FT	Foot
FT^2	Squared Feet
FT^3	Cubed Feet
G	Grams
GAL	Gallons
GC	Gas Chromatograph
GFE	Government Furnished Equipment
GPL	General Population Limit
GPM	Gallons Per Minute
GTU	Grenade Treatment Unit
HCl	Hydrochloride
HEPA	High Efficiency Particulate Air
HF	Hydrofluoride
HHRA	Human Health Risk Assessment
HHS	Health and Human Services
HMMS	Hazardous Materials Management System
HPLC	High Performance Liquid Chromatography
HR	Hour
HSWA	Hazardous and Solid Waste Amendment
HTH	High Test Hypochlorite
HVAC	Heating, Ventilation, and Air Conditioning
HWMU	Hazardous Waste Management Unit
IAW	In Accordance With
I.D.	Identification
ID	Induced Draft
IDLH	Immediately Dangerous to Life and Health
IDS	Intrusion Detection System
INWC	Inches of Water Column
JSB	Job Safety Breakdown
LAB	Laboratory
LBs	Pounds
LBs/2-min	Pounds Per 2-minute Average
LDR	Land Disposal Restrictions
LSS	Life Support System
m^3	Cubed Meter
MCL	Maximum Contaminant Level
MDS	Munitions Destruction System
MEK	Methyl Ethyl Ketone
MG	Milligram
MIN	Minute
Mini-CAMS	Miniature Continuous Air Monitoring System
MMR	Military Munitions Rule
MMRP	Military Munitions Response Program
MSDS	Material, Safety and Data Sheets
ND	Non-Detect
NDE	Non-Destructive Examination
NEW	Net Explosive Weight
No	Number

NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
O_2	Oxygen
O_m	Measured Percent Oxygen
OB	Open Burning
OD	Open Detonation
OGT	Off-gas Treatment
ONC	Onsite Storage Container
P_c	Corrected Concentration of Particulate Matter
P_m	Measured Concentration of Particulate Matter
PCB	Polychlorobiphenyls
PIC	Products of Incomplete Combustion
PM	Particulate Matter
POHC	Principal Organic Hazardous Constituents
POL	Petroleum, Oil and Lubricants
PPB	Parts Per Billion
PPE	Personal Protective Equipment
PPM	Parts Per Million
PPMW	Parts Per Million by Weight
PRA	Preliminary Risk Assessment
PRW	Process Water
PSIG	Pounds Per Square Inch Gauge
PUB	Process and Utility Building
QAPP	Quality Assurance Project Plans
QA/QC	Quality Assurance/ Quality Control
RA	Risk Assessment
RAA	Risk Assessment Addendum
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFC	Request for Concurrence
RFI	RCRA Facility Investigation
RL	Reporting Limit
ROHA	Rolling Hourly Average
RPM	Rounds Per Minute
S	Seconds
SAR	SWMU Assessment Report
SCBA	Self Contained Breathing Apparatus
SCFH	Standard Cubic Feet per Hour
SDC	Static Detonation Chamber
SDS	Spent Decontamination Solution
SGU	Specific Gravity Unit
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SOPC	Substances of Potential Concern
STB	Surrogate Trial Burn
STEL	Short-Term Exposure Level
STL	Short Term Limit
SWMU	Solid Waste Management Unit
TBD	To Be Determined
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure

TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, Disposal
TSDF	Treatment, Storage, Disposal Facility
TTCDP	Thermal Treatment Closed Disposal Process
US	United States
WAP	Waste Analysis Plan
WCL	Waste Control Limit
WMM	Waste Military Munitions
WPL	Worker Protection Limit
Y	Measured Oxygen Concentration in the Stack Gas

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MODULE V: MISCELLANEOUS TREATMENT UNITS (SUBPART X)

V.A. MISCELLANEOUS TREATMENT UNIT REQUIREMENTS

1. This Module allows the thermal treatment of conventional waste military munitions (WMM), disassembled explosive components removed from both conventional WMM and chemical munitions that have been verified 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 V.C.5 as described in the Section IV of the facility permit application. The thermal treatment units described in this module are regulated under AAC 335-14-5-.24. The following units are permitted for thermal treatment of wastes:

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

   b. Open Detonation (OD) Unit – SWMU 17

   c. Static Detonation Chamber (SDC) – SWMU 70

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

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

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

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

   b. 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 or OD) as listed in Permit Condition V.D,

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

h. Copies of all inspection records for each unit,

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

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

k. For SDC and 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. The Permittee shall also record all incidents of the FPI function failures including the corrective measures taken to correct the condition that caused the failure, and

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

V.B. DESCRIPTION OF THERMAL TREATMENT UNITS

1. Open Burning (OB):

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

pans are located in Figures IV.B-4 and IV.B-5 of the facility permit application.

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

2. Open Detonation (OD):

a. The OD unit occupies approximately 51 acres in the northwestern corner of the ASA. Treatment by OD may be conducted within an approximate 900 x 300 feet area designated for digging of pits which are used for detonation stations. No more than 8 detonation pits shall be used during any detonation series. Detonation stations may be ignited electrically or non-electrically. Both above ground and buried detonations (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-6 and IV.B-7 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. Static Detonation Chamber (SDC)

a. The SDC is located on the west side of G block near Building 695 in the ALA of ANAD. The footprint for the structure is approximately 70 x 100 feet. Treatment by SDC shall be conducted by loading ammunition trays which are conveyed into the SDC unit. No more than one feed tray may be loaded into the SDC per feed event. The general arrangement of the SDC facility is located in Figure ~~III.K~~IV J-5 of the facility permit application.

b. The SDC may be used to process WMM obtained from either inside or outside the State of Alabama that are not defined as chemical munitions and are determined to be chemical agent free. Recovered WMM which are both recovered and received from locations within the State of Alabama may also be processed. The SDC may treat conventional munitions components from chemical munitions which have been verified agent free and received from outside the State of Alabama. The SDC unit may treat conventional WMM munitions which are either explosively or

not-explosively configured and secondary waste generated by the SDC operations. The explosive capacity of the SDC unit shall not exceed 6.7 pounds (lbs) of mass detonating explosive material or 23.0 lbs of~~, both mass and~~ non-mass detonating explosive material per feed event. If mass detonating and non-mass detonating explosives are both contained in any single feed event to the SDC, then the entire feed for that event shall be considered mass detonating. The SDC unit may be used to treat wastes, including waste contaminated with energetics, that are generated on-site by the facility or off-site by other DoD installations.

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 will interface 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.

c. The TTCDP may process WMM grenade submunitions including fuze-less grenades, fuze assemblies/remnants, and copper cones from the demilitarization of the MLRS. 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.

V.C. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. The majority of WMM treated by OB, OD, SDC, and TTCDP at ANAD require disposal because the munition has exceeded its shelf life and the Designated Disposition Authority (DDA) has determined that it cannot be reused or recycled. For OB, OD, and SDC operations, military munitions become hazardous waste when they are removed from the munitions storage igloos/service magazines IAW the Military Munitions Rule (AAC 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 and OD units may exhibit the reactivity (D003) hazardous waste characteristic as defined in AAC 335-14-2-.03(4) and include small arms ammunition (hazard class 1.4). In addition, the OB and OD wastes may also exhibit the ten toxicity characteristics (D004, D005, D006, D007, D008, D009, D010, D011, D030 or D039). WMM treated at the SDC may exhibit ignitability (D001), corrosivity (D002), or the D003 hazardous waste characteristics. In addition, the SDC waste may exhibit the toxicity characteristics of D004, D005, D006, D007, D008, D009, D011, D030, D032, D033, D034, D035 D036, D037, D038, D039, D040, D041, D042, D043, P016, P017, P022, P028, P030, P033, P036, P063, P095, and U125. 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 of the facility permit application.

3. The wastes treated at the OB and OD units shall not contain pesticides, herbicides, dioxins, or polychlorinated biphenyls (PCBs). Conventional waste types and waste characteristics are detailed in 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 IV~~-~~C-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 condition V.C.2 may be treated at the OB, OD, SDC and TTCDP. Recovered WMM, components of recovered liquid filled munitions, and recovered liquid fill-contaminated explosive components may be treated in the SDC, but are prohibited to be processed at the OB, OD, and TTCDP units.

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

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. Conventional components of chemical munitions may be processed in the SDC as long as they have been verified “chemical agent free”.

8. The SDC facility may receive recovered liquid-filled munitions, components of recovered liquid filled munitions, and recovered liquid-filled contaminated explosive components which have been recovered from off-site locations within

the boundary of the State of Alabama only. Receipt of recovered items from outside the State of Alabama is prohibited.

9. The facility shall notify the Department prior to receipt of any recovered munitions and/or components described in Permit Condition V.C.8.

10. For each event requiring the processing of potential agent contaminated recovered munition(s)/component(s), a plan, which describes the process for agent monitoring IAW the AFO SDC "Guidance for Developing a Recovered Munition Monitoring Plan", must be submitted within 45 days prior to the receipt of the munition(s)/component(s). The facility must obtain Department approval of the plan before processing any recovered chemical munitions. At a minimum, the plan must include the following:

    i. Identification of required monitoring equipment, such as Automatic Continuous Air Monitoring Systems (ACAMS), Depot Area Monitoring System (DAAMS), MiniCAMS, Draeger tubes, etc.

    ii. Locations of monitoring equipment required.

    iii. Analytical/monitoring methods which will be utilized.

    iv. Responsible agencies and/or on-site personnel who will set up and conduct monitoring.

    v. Prior concurrence from the Department if deviation from the approved monitoring plan is necessary.

11. Upon completion of each monitoring event required by Permit Condition V.C.10 above, the facility shall submit a report to the Department within 30 days. This report shall describe the results of the monitoring and processing of the agent contaminated waste munition(s) including any deviations from the original monitoring plan.

V.D. THERMAL TREATMENT OPERATIONS

1. Open Burning (OB)
    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 which 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): Shall not exceed 2,000 pounds (lbs) NEW per pan (total daily 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.

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) where appropriate. All containers must be managed IAW the conditions set forth in Module IX 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 AAC 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 V.D.1.a. When ash is present following the cooling period and prior to removal, lids are to be placed on the burn pans in order to prevent precipitation from accumulating in the burn pans.

ii. Scrap Metal from 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 (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 (maximum daily limit 16,000 lbs NEW for the eight detonation stations). No more than 16 detonations may be conducted per operating day. 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-8 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.

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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.K.3.

ii. Sediment from Retention Basins

Any run-off sediment collected and removed from the retention basin may be reused within the OD unit boundary. However, any sediment applied onto the soil surface outside the OD unit boundary shall constitute land disposal and, as such, must comply with all applicable Land Disposal Restriction (LDR) treatment standards under AAC 335-14-9. Any sediment disposed of off-site must be properly characterized and disposed of IAW the ANAD Waste Analysis Plan.

3. Static Detonation Chamber (SDC)

a. Meteorological Restrictions

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

b. Hours of Operation

The SDC has no restriction on the hours of operation.

c. Treatment Quantities and Maximum Limits

The following quantity of material may be treated at the SDC unit, expressed as NEW. NEW represents the combined explosives weight of all energetics contained in a munitions item. Explosive limits have been established for the SDC unit and these limits shall not be exceeded at any time. The volume of conventional WMM treated at the SDC unit may vary based on the disposal and demilitarization needs of DoD but shall not exceed the limits below. Conventional WMM listed in Section IV -C. of the facility permit application (including small arms, projectiles, mines, rockets, grenades, pyrotechnics, and explosives contaminated material, toxic containing materials, fuses, detonators, etc.), secondary waste

generated by the SDC, waste contaminated with energetics received from off-site DoD facilities, and recovered WMM from within the State of Alabama may be processed in the SDC provided the following boundary conditions are not exceeded. An event shall be defined as processing of one tray within the SDC.

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

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

iii. Chlorine < 11.1 lbs/event,

iv. Sulfur < 6.3 lbs/event,

v. Non-Mass Detonating Explosives < ~~6.7~~23.0 lbs NEW/event, and

vi. Mass Detonating Explosives < 6.7 lbs NEW/event. If mass detonating and non-mass detonating explosives are both contained in any single feed event to the SDC, then the entire feed for that event shall be considered mass detonating.

d. Maintenance

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

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

iii. Prior to treating hazardous waste in the SDC unit, the Permittee shall install and test all process monitoring and control instrumentation specified in Table 5-1 according to manufacturer specifications and the SDC Continuous Emissions Monitoring System (CEMS) Certification Plan.

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

v. The Permittee shall maintain the SDC during systemization, emissions testing, post emissions testing, and normal operating periods such that when operated IAW the operating requirements specified in this Permit, it shall meet the applicable performance

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standards specified in the Emissions Test Plan and Permit Condition V.D.3.h.

vi. The Off-Gas Treatment (OGT) system and Carbon Filtration System shall be maintained and operated so as to minimize the emissions of air contaminants. This equipment shall be properly operated and maintained IAW Section ~~III.K~~IV J of the facility permit application. Carbon filter disposal shall be managed IAW Section ~~III.K~~IV J ~~.~~C~~-.~~2a and Table ~~III K~~IV J-5 of the facility permit application.

vii. The Carbon Filtration System shall be monitored IAW the SDC CEMS Certification Plan and this permit.

a) The OGT Safeguard Filtration unit must be operational at all times during processing.

b) The first bank of the OGT Safeguard Filtration unit shall contain Sulfur Impregnated Carbon (SIC) as demonstrated during emissions testing for mercury removal.

e. Emissions Test Plan and Data Submittal

An emissions test is required by RCRA regulations whenever the waste feed stream is altered. Prior to processing any new waste types, an emission test plan and emissions test data report will be prepared and submitted IAW the following:

i. The Permittee shall operate and monitor the SDC unit during the short-term periods (systemization, emissions testing, and post emissions testing) as specified in the approved emissions test plan.

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

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

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

v. The Permittee shall submit a summary of all data collected during the emissions test to the Department upon completion of each test

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

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

f. Systemization

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

ii. The systemization period for the SDC shall begin with the introduction of conventional munitions into the SDC unit and shall end with the start of the emissions test.

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

g. Reporting

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

h. Performance Standards

The following performance standards must be satisfied prior to initiating feed into the detonation chamber:

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

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

Where: Co_c = corrected CO ppm

Co_m = measured CO ppm

O_m = measured % O_2

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

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

Where: P_c = corrected concentration of PM

P_m = measured concentration of PM

Y = measured O_2 concentration in the stack gas

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

a) Hydrogen chloride (HCl) emissions

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

c) Volatile, semivolatile, and total organic compound emissions

d) Dioxin/furan emissions, and

e) Energetic emissions.

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

i. Limitations on Waste Feed

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

ii. After successful completion of the emissions test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 50 % of the maximum feed rates for all hazardous waste processing.

iii. After successful completion of the emissions test, the Permittee shall be authorized to commence hazardous waste feed to the SDC at rates up to 75% of the maximum feed rates upon submittal and Departmental approval of a report in a format specified by the Department showing compliance with the performance standards in Permit Condition V.D.3.h.

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

a) A complete emissions test report,

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

c) An updated Risk Assessment Addendum (RAA) and/or a final Human Health Risk Assessment (HHRA) Report.

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

vi. During the systemization, emissions test, post-emissions test, and normal operating periods, the Permittee shall verify that the waste feed is within the physical and chemical composition limits specified in this Permit. The munitions treated in the SDC may contain fill materials, such as riot control agents, tear gas, smokes, illumination mixtures, phosphorous mixtures, etc. Fill material and metal feed rates will be based upon the results of emissions testing. Feed rates for sulfur, chlorine and energetics (NEW) will be established by using munitions specific data available from MIDAS, the Material Assessment Review Board (MARB) or other appropriate source of data for the munition type. Feed determinations must be made for each feed event to the SDC. One determination is sufficient for identical feed trays.

vii. During the systemization and emissions testing periods conducted on various dates from December 2010 through August 2011, the

SDC was limited to on-site conventional munitions from the ANAD storage igloos which were required to conduct performance and emissions testing. This included up to 68 pyrotechnic rounds and demonstrated feed up to 24 60mm rounds per hour. No off-site munitions were processed during these initial systemization and testing periods.

j. Operating Conditions

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

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

iii. After approval of the emissions test report, the Permittee shall operate the SDC IAW the feed limitations specified in this Section.

k. Monitoring Requirements

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

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

l. Feed Prohibitive Interlock (FPI) Requirements

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

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

m. Permitted Waste Storage Areas for the SDC

i. The Permittee shall operate the SDC-dedicated service magazines and storage igloos as specified in Sections ~~III K~~IV J D-1a(2) of the facility permit application.

ii. The Permittee shall not store more energetic material in either the permitted storage igloos or service magazines than is allowed by Department of Defense Explosive Safety Board (DDESB) specifications.

iii. Any container of secondary waste containing free liquids shall be provided with a secondary containment device when stored in the service magazines or storage igloos. The Permittee shall inspect weekly any secondary containment in use to ensure that it is free of accumulated liquids.

iv. The Permittee shall inspect the service magazines and the storage igloos weekly when they are being used to store hazardous waste to detect leaks and deterioration caused by corrosion or other factors IAW the Inspection Schedule (Section ~~III K~~IV J F-2 of the facility permit application). All inspection data shall be recorded and the records shall be placed in the operating record IAW Permit Condition II.I.

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 5-4.

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 5-4 according to manufacturer specifications.

iii. 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.

iv. 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

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i. The Permittee shall treat only the hazardous wastes that meet the requirements listed in Permit Condition V.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 V.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 20 reject grenades at any one time in the reject box within the grenade reject station during operation of the GTU.

f. Operating Conditions

i. The Permittee shall operate the TTCDP in order to maintain the FPI System and process instrumentation listed in Table 5-4.

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 5-4.

g. Monitoring Requirements

i. The Permittee shall maintain, calibrate, and operate process monitoring, control, and recording equipment, as specified in Table 5-4 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 5-4 fail to operate properly.

h. Feed Prohibitive Interlock (FPI) Requirements

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i. The Permittee shall operate the systems, specified in Table 5-4, to automatically prohibit hazardous waste feed to the TTCDP when the monitored operating conditions deviate from the setpoints specified in Table 5-4. The destruction sequence may not resume until the parameter(s) which cause the interlock is/are restored to permit limits and all other parameters are within permit limits.

ii. In the event of a malfunction of the FPI System listed in Table 5-4 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.

V.E. INSPECTION

The Permittee is required to conduct routine inspections at the OB, OD, SDC, 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 ~~III.K-3,~~ IV F-1, IV ~~.~~J-3, ~~IV.F-1,~~ and IV K 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 OB, OD, SDC, 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 and OD inspections shall be performed IAW Section IV.F-2 of the facility permit application. OB and OD inspections shall be documented IAW Figures IV.F-1, IV.F-2, and IV.F-3 (inspection log sheets) of the facility permit application.

3. SDC inspections shall be performed IAW Sections ~~III.K.F and~~ IV ~~.~~J~~.~~ F of the facility permit application and IAW the SDC inspection log sheets. Inspections of SDC-dedicated igloos and service magazines will be conducted when used for hazardous waste storage.

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.

V.F. GROUNDWATER MONITORING PROGRAM

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

V.G. AIR MONITORING

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

1. The Permittee shall conduct a HHRA and Ecological Risk Assessment (ERA) based upon operational limits of the thermal treatment units in Permit Condition V.C.

2. A cumulative assessment of cancer risk to off-site receptors posed by ANAD's OB, OD, SDC, 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 V.D.

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

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

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

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.

V.H. CLOSURE AND POST-CLOSURE PLAN

The Permittee shall close the OB, OD, SDC, and TTCDP units IAW ADEM Admin. Code R. 335-14-5-.07 and Sections ~~III.K.I, VI.K.I,~~ IV .I, ~~and~~ IV .J I, and VI K 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.K.

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 V.D.2.d.iii.

b. All burn pans and lids shall be decontaminated or disposed as required by AAC 335-14-5-.07(5) and as described in Section IV.G of the facility permit application. Decontaminated burn pans and lids may be removed from the OB unit and disposed as scrap metal or may be put to other use at ANAD. All SDC and TTCDP equipment shall be decontaminated or disposed of as required by AAC 335-14-5-.07(5) and as described in Sections ~~III.K.I,~~ IV .J .I, IV .K .I of the facility permit application.

c. Concrete pads shall be decontaminated and/or cleaned to remove untreated waste and/or ashes as required by AAC 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 V.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 V.H. If removal or remediation of all contaminated soil cannot be attained during approved closure activities, the OB and OD units shall be closed IAW AAC 335-14-5-.07 and an approved post-closure plan.

e. If the OB, OD, SDC, and TTCDP units cannot be clean-closed and certified for unrestricted use pursuant to the Uniform Environmental

Covenant Act (UECA)[AAC 335-5], then a Land Use Control Plan must be developed and submitted in the post-closure plan.

2. Groundwater

a. Groundwater underlying the OB and OD units is required to be monitored throughout the operating life of the OB and OD units 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.

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Table 5-1: FPI Conditions for the SDC [1]

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	MIN	1,741º F
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	MAX	- 0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	MAX	400º F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	170º F
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200º F
SDC-FPI-11	AIT-900	CO Concentration	MAX	100 ppm, dry basis @7% O_2 (instantaneous)
SDC-FPI-12	QICA 36008	Neutral Scrubber pH	MIN	7.0 pH

Footnote:

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

Abbreviations:

%.....percent
°F .....degrees Fahrenheit
FPI .....feed prohibitive interlock
MAX.....maximum
O_2.....oxygen
psi .....pounds per square inch
-SDC .....Static Detonation Chamber
@ .....at
CO.....carbon monoxide
cfm.....cubic feet per minute
MIN .....minimum
ppm.....parts per million

Table 5-2: [RESERVED]

Table 5-3: Metal and Chloride Feed Rates for Munitions and WMM Feed Events for the SDC (1, 2)

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

Footnotes:

1. These rates were demonstrated during Conditions 3 and 4b emissions testing.
2. Rates shown here are extrapolated from the demonstrated values using allowable MACT rules as explained in the Final SDC Emissions Test Report for Condition 4b, Section 8.5, conducted in August 2011.

Table 5-4: 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	8 inwc
TTCDP-FPI-09	TBD	Pre-Filter Differential	MIN	0.1 inwc
TTCDP-FPI-10	TBD	Pre-Filter Differential	MAX	3.0 inwc
TTCDP-FPI-11	TBD	HEPA Filter Differential	MIN	0.1 inwc
TTCDP-FPI-12	TBD	HEPA Filter Differential	MAX	6.0 inwc
TTCDP-FPI-13	TBD	Air Filter Inlet Temperature	MAX	250ºF

Table 5-4: **FPI Conditions for the TTCDP** ~~Operating System and Process Parameters 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
GTU.....Grenade Treatment Unit
MDS .....Munitions Destruction System
TBD .....to be determined
inwc.....inches water column
MAX .....maximum
MIN.....minimum
TTCDP.....Thermal Treatment Closed Disposal Process

Table 5-5: 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 A and Part B Facility Permit Application

Includes Comprehensive Performance Test Plans

Note:

This is the final version of the application including approved changes as requested in the Department's Notice of Deficiency.

DEPARTMENT OF THE ARMY
PROGRAM EXECUTIVE OFFICE
ASSEMBLED CHEMICAL WEAPONS ALTERNATIVES
ANNISTON ARMY DEPOT
7 FRANKFORD AVE, BLDG 75
ANNISTON, ALABAMA 36201

REPLY TO
ATTENTION OF:

August 10, 2016

Site Project Manager

SUBJECT: Response to the First Notice of Deficiency for Static Detonation Chamber (SDC) Modification Request Number 45 (RMODR45) and Addendum

Mr. Phil Davis
Chief, Land Division
Alabama Department of Environmental Management
P. O. Box 30130-1463
Montgomery, AL 36130

Dear Mr. Davis:

References:

a. Alabama Department of Environmental Management (ADEM) letter, July 1, 2016, subject: First Notice of Deficiency (NOD1) – RMODR45 and Addendum.

b. AECOM letter, SDC-160019, August 8, 2016, subject: Response to the First Notice of Deficiency for Static Detonation Chamber (SDC) Modification Request Number 45 (RMODR45) and Addendum (enclosed).

Reference b is being submitted as the response to Reference a, the Alabama Department of Environmental Management (ADEM) First Notice of Deficiency (NOD1) for RMODR 45 and its Addendum. The point of contact for this action is the undersigned at (256) 238-1652, ext. 245.

Sincerely,

Timothy K. Garrett
Anniston Field Office
Site Project Manager

Received
AUG 15 2016
Land Division

Enclosure

Copies Furnished: (w/o enclosure)
AECOM/Ms. Tracy Greenwood (electronically)
AECOM/Mr. Will Leslie
ANAD, TAAN-RK/Mr. Bruce Williams
ADEM/Ms. Chrystal Strickland (w/enclosure)
ADEM/Mr. Will Bacon (w/enclosure)
ANAD, TAAN-CO/Martine S. Kidd, Colonel, LG, Commanding
PCAPP, BNI/Mr. Neil A. Brill
PCAPP, BNI/Mr. Sean J. Jodoin
ANAD, TAAN-RK/Mr. Greg Jones (electronically)
ANAD, TAAN-L/Ms. LaVette Lyas-Brown (electronically)

RECEIVED AUG - 8 2016

AECOM

SDC-160019

August 8, 2016

Mr. Will Leslie, Static Detonation Chamber (SDC) Plant Manager
Washington Demilitarization Co., LLC (WDC)
7 Frankford Avenue, Building 695
Anniston, AL 36201

Received
AUG 15 2016
Land Division

Mr. Timothy K. Garrett
Anniston Field Office (AFO)
7 Frankford Avenue, Building 75
Anniston, AL 36201

Subject: Response to the First Notice of Deficiency for Static Detonation Chamber (SDC) Modification Request Number 45 (RMODR45) and Addendum

Reference: Alabama Department of Environmental Management (ADEM) Letter, dated 07/01/16; Subject: First Notice of Deficiency (NOD1) – RMODR45 and Addendum

Dear Mr. Garrett:

WDC is submitting the attached response to the Alabama Department of Environmental Management (ADEM) First Notice of Deficiency (NOD1) for RMODR 45 and its Addendum.

WDC requests that the response be submitted to the ADEM at your earliest convenience but not later than August 10, 2016. Any questions or comments should be directed to Tracy Greenwood at (256) 419-2265.

Sincerely,

Robert Taylor for Will Leslie

Will Leslie
SDC Plant Manager

Enclosure(s)
cc: DCC

FILE

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) MODIFICATION REQUEST (RMODR) #45 ADDENDUM

April 2016

Prepared by:

Washington Demilitarization Company, LLC
7 Frankford Avenue
c/o: SDC, ANAD Building 695
Anniston, AL 36201

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RMODR #45 ADDENDUM SYNOPSIS

This permit modification addresses revisions to the Resource Conservation and Recovery Act (RCRA) Permit Application and submittal of the Static Detonation Chamber (SDC) Emissions Test Plans for Conditions 1 and 2 which constitutes being classified as a "major" request.

Changes to the RCRA Permit are proposed as part of this modification request.

BASIS OF PROPOSED MODIFICATIONS

This modification request is being submitted for the following reasons:

(1) Update descriptive text in the RCRA Application to accurately reflect the configuration and daily operation of the SDC and Off-Gas Treatment (OGT) Systems.

(2) Revised the Inspection Schedule to remove the requirement to inspect the Sprung Structure Ventilation System. The requirement to operate the Sprung Structure Ventilation System was only applicable during operations which involved processing chemical agent. Processing of chemical agent was completed in 2011.

(3) Sections III K and IV J are almost identical. Section III K was written based on a contractor (Washington Demilitarization Company) operating the SDC. Section IV J was written assuming the Government would be operating the SDC.

Initially, all proposed changes were incorporated into Section III K. Any requirements (mostly closure) that were unique to Section IV J, were merged into Section III K. Based on discussions with ANAD Department of Risk Management, it was decided to retain Section IV J and hold Section III K in "reserved" status. Therefore, Section III K was renamed Section IV J. Operational control of the SDC remains with the Anniston Field Office and Washington Demilitarization Company.

(4) As a tenant of Anniston Army Depot (ANAD), emergency response actions and responsibilities are included in the ANAD Integrated Contingency Plan. The SDC Contingency Procedures list the steps required as a "first responder" while ANAD mobilizes for the emergency response. The Inspection Schedule has been revised to only list those items that are need for first responder activities at the SDC. All other equipment required for emergency response actions can be found in the applicable ANAD Inspection Schedule.

(5) The Waste Analysis Plan was revised IAW regulations and site procedure, to mandate a consistent approach and frequency for characterizing waste streams. All waste streams will be characterized at a minimum of annually or if the feed stream changes (campaign change).

(6) The Training Program has been updated to reflect the requirements that are specific to SDC operations, hazard waste communications, and first responder responsibilities.

(7) Currently, the processing limits for mass and non-mass detonating energetic material are the same at the SDC. In previous performance evaluations, the SDC has demonstrated that non-mass detonating material can be processed at a rate greater than that which is currently listed in the RCRA Permit.

In order to formally demonstrate this increased rate and to satisfy requirements to request the increased rate be incorporated into the RCRA Permit, this modification request includes a request to perform an emissions test to demonstrate compliance with current emission limitations and operational controls while processing up to 23 pounds of non-mass detonating energetic material per event.

Other Submittals

In accordance with the RCRA and Clean Air Act Permits, emissions testing shall be conducted no later than 61 months after the initial emissions testing; and, the test plan shall be submitted one year in advance of the intended testing. For these reasons, the SDC Emissions Test Plans for Conditions 1 and 2 are being submitted with this modification request. The SDC Emissions Test Plans also includes the Continuous Monitoring System Performance Evaluation Plan as mandated by Maximum Achievable Control Technology (MACT) requirements.

The SDC Continuous Emissions Monitoring System (CEMS) Certification Plan has been revised as part of the annual procedure review cycle and reformatted into a “plan”, versus “procedure”, layout. Summary of changes are as follows:

(1) Changed from SDC-OPS-3.08 to SDC-ENV-003. This change caused it to be identified as Revision 0 rather than Revision 2.

(2) Removed references that were linked to chemical agent processing.

(3) Removed references to the Chemical Materials Agency and Monitoring Concept Plan that was associated with monitoring at chemical agent processing facilities.

(4) Revised staff titles and removed references to functions performed by the Quality Assurance branch at the former ANCDF.

(5) Removed references to ANCDF documents that no longer exist.

(6) Removed reference to the internal data storage abilities of the CEMS units. Data is no longer stored internally for a period of up to 7-days. All electronic data is now captured solely within the PDAR system.

(7) Revised references to location of storage for current calibration records for the CEMS units. Current records are maintained in the monitoring house.

(8) Removed statement that indicated CEMS data was backed up on tape daily. All electronic data is now collected solely in PDAR.

(9) Updated references to manufacturer of the CEMS units.

(10) Removed ANCDF reference documents for maintaining CEMS and replaced with applicable EPA reference standards.

(11) Multiple editorial changes such as:

(a) Changed name of CEMS shelter to monitoring house;

(b) Typographical error and syntax corrections;

(c) Removal of dated acronyms and incorporation of current acronyms;

(d) Incorporated current processing allowances taken from current approved RCRA Permit to identify the ability to process recovered WMM from within the State of Alabama;

(e) Removed requirement for the CEMS Technician to maintain a spare parts inventory; and

(f) Revised reference to sample pumps for CEMS to internal from external.

A signed copy of the SDC CEMS Certification Plan is being submitted with this modification request.

DECLARATION OF CHANGES TO ANAD RCRA APPLICATION

IV J-	Line(s)	Rationale for Change
Part A – Continuation Pages		
Part A-21	NA	Inserted certification language and certifying personnel information for an additional authorized party at the SDC.
Section IV J		
All	General	There are multiple minor changes in the document which are editorial in nature and correct format-related anomalies. These changes will not be itemized in the Declaration of Changes. The following items are considered format-related: (1) Capitalization; acronyms, punctuation, and grammatical errors; (2) Removal of internal references, i.e., "of the ANAD RCRA application." All references can be assumed to be within the document, unless otherwise stated; (3) Differentiating between Building 695 Complex and SDC Facility; (4) Redundant referencing; (5) Removed remaining references to ANCDF; (6) Changing from Section K to J; and (7) Combining like terms. In addition, changes to the Table of Contents will not be tracked as the section is revised.
1	3	Building 695 Complex is technically located on the Anniston Army Depot not the Anniston Field Office.
2	36 - 37	The SDC can operate with or without people in the Sprung Structure. Permission to access the Sprung Structure must be obtained from the CON prior to entering.
3	9	Removed "hazardous" because some of the waste generated has been deemed "nonhazardous."
	11	Added location-specific criteria for recovered WMM as listed in the RCRA Permit.
5	36 - 37	Not all roads within the Ammunition Limited Area have 6-foot shoulders.
6	14 - 16	Access to the SDC from ANCDF has been restricted due to closing of Gate 5A.
8	7	Incorporated reference to mass detonating explosive material to allow for bifurcation of limits for mass detonating explosive material and non-mass detonating explosive material
	9	Incorporated updated NEW limit for non-mass detonating material in accordance with planned demonstrating during the requested emissions test.
9	32 - 34	Information unique to Section III K has been merged into this section.
10	9	Title has been change to match the criteria of the AAC reference.
	11 - 22	This information is not specific to this section topic; info has been relocated to Section IV J C-1h.
11	1 - 2	Updated paragraph to include the latest regulatory-required test event.
	8 - 19	Relocated information from IV J C-1f.

IV J-	Line(s)	Rationale for Change
12	1	Operation and possession of the SDC has not been turned over to the ANAD as was previously stated in Section IV J. This correction removes reference to ANAD processing WMM as the Anniston Field Office and Washington Demilitarization Company remain the owner and operator.
13	9	Dust is collected from other sources than just the cyclone. Text has been revised to reflect the content of Table IV J-1.
	17 - 24	Text has been revised to reflect the sampling methodology and frequency specified in site procedures which is more rigorous than originally required.
	26 - 33	Updated requirements for WRS salts to be consistent with other waste streams.
	36	Revised to reference specific filters.
14	19 - 22	Refractory “material” is used at the SDC as opposed to brick.
	37	The Reserve Flush Tank has been retired in-place and waste characterization is not required.
15	22 - 24	Revised text to reflect current requirements specified in the RCRA Permit for WMM allowed to be processed in the SDC.
	28	Deleted specific reference to job titles/description in lieu of generating facility responsibilities.
16	12 - 25	Information unique to Section IV J has been merged into this section.
17	37	Revised retention time to be consistent with regulatory requirements.
20	4	Incorporated clarification to specifically state that the sprung structure ventilation system is not required for treatment of WMM.
	40 - 41	Removed language referencing mustard processing.
21	1	
	5	The SDC Facility has two electrical switchgear utility containers.
	7 - 21	Descriptive text on the SDC process has been removed from this section because it is more applicable to process description than container content. Revised process descriptive text has been added to Section III K D-1b.
	23 - 25	Example list is no longer required.
	29	Incorporated reference to mass detonating explosive material to allow for bifurcation of limits for mass detonating explosive material and non-mass detonating explosive material
	30	Incorporated updated NEW limit for non-mass detonating material in accordance with planned demonstrating during the requested emissions test.
22	1 - 2	Revised descriptive text to reflect the layout of the service magazines.
	6	Added clarifying text indicating that either munitions per the MMR or WMM will be stored.
	20	Boilers, maintained by ANAD, are also operated using natural gas.
22 - 34	Section III K D-1b (all)	This section was initially composed based on design and vendor documentation. The entire process description has been revised to reflect current operating standards in accordance with site specifications, procedures, and plans.

IV J-	Line(s)	Rationale for Change
25	16-31	Moved descriptive text regarding the process into appropriate area of Section IV J D-1b. Renamed section to be applicable to the contents.
26	5	LC1 is not sealed gas-tight.
	11 – 13	Gate 2 is equipped with 4 instead of 2 pneumatic seals. Reference to a specific NEW load as it relates to design pressure has been removed.
27	5 – 6	There is no insulation between the LDC and scrap chute as described.
	10 - 12	The terms DCLS and DCRS are not commonly used in site documents; therefore, they have been removed. Revised description to accurately list the type of equipment used to rotate the LDC.
29	12	The term "equalization" is not commonly used at SDC; therefore, it has been deleted.
30	15	The means of destruction has been revised to reflect the actual process.
	21	Propane is not used at the SDC facility.
	23	Revised original citation to indicate specific permit temperature requirements.
32	32 - 34	Hydrochloric acid is not used as a solution in the neutral scrubber, only sodium hydroxide.
33	18	Removed text as it is not considered a function of a filter.
	24 - 25	SDC does not use a bag in/bag out system as a means of replacement.
34	31 - 38	This section has been revised to be specific to containment of spills to water or soil. Text regarding mitigation of releases to soil or water are has been moved to Section IV J D-1f.
35	1 - 5	
36	1, 6, 12	Section numbers and titles have been added which are applicable to the AAC reference.
	26 - 28	Moved text to IV J D-1f as it is general in nature and not specific to section.
38	7 - 13, 20 - 25	Moved test from IV J D-1g(2) to IV J D-1g to mirror intended content of section title.
	30 - 32	Revised text to reflect current staffing titles.
39	4 - 38	Divided Section II K D-2 into two sections – containers (D-2) and service magazines/storage igloos (D-3). The description of the service magazine structure has been revised to accurate construction specifications. Reorganized section to describe containers Service magazines are not considered container, so descriptive text has been removed. Service magazines are descripted elsewhere in Section III K.
40	1 - 2	
42	28	Gate 5A has been closed.
45	19	Inspection records will be kept IAW AAC requirements.
47	3 - 9	As a tenant of ANAD, emergency response actions and responsivities are included in the ANAD ICP. The SDC Contingency Procedures list the steps required as a "first responder" while ANAD mobilizes for the emergency response. The inspection schedule has been revised to only list those items that are needed for first responder activities at the SDC. All other equipment required for emergency response actions can be found in the applicable ANAD section.
	19 - 23	Text has been revised to align the aisle spacing requirements of service magazine and storage igloos dedicated to the SDC.

IV J-	Line(s)	Rationale for Change
49	9 - 10	ANAD regulations do not establish OSHA requirements.
	33 - 36	Personnel are allowed within the Sprung Structure during processing.
50	3 - 4	The 2-person rule is not applicable within the Sprung Structure during processing. This requirement was only required during agent operations.
52	5	Not all SDC personnel have hazardous waste duties.
53	5	Added specific agency name.
	30 - 31	Description of the training program has been updated to reflect current content provided to SDC personnel.
	35 - 36	The SDC Training Coordinator is responsible for maintaining training records.
54	11 - 32	Description of the training program has been updated to reflect current content provided to SDC personnel.
	33 - 36	The SDC Training Coordinator is responsible for training.
56	25	Introductory and annual training are mandatory not offered for completion.
58	13 - 16	Text has been moved from Section IV J I-1a to IV J I.
	17 - 30	Information unique to Section IV J has been merged into this section. General content references have been deleted and can be found in the respective sections.
	35 - 37	Inserted language to address closure of storage areas that are never placed into service.
59	1 - 4	All waste is disposed through ANAD Waste Management.
	7 - 25	Incorporated information regarding closure performance standards for the SDC as required under the AAC.
	26 - 29	Text has been moved from Section IV J I-1a to IV J I.
60	1 - 3	This information is already covered in Section IV J I-3.
61	5 - 10	Information unique to Section IV J has been merged into this section.
	13 - 17	The requirement to complete an annual closure estimate and certification has been added for the SDC.
73	Table IV J-1	Depending on the amount of waste available, grab or composite (from several) drums may be conducted. Requirement applied to Bag House Filter dust and WRS salts.
		IAW regulations and site procedure, all waste streams will be characterized at a minimum of annually or if the feed stream changes (campaign change). Requirement applied to Scrap Conveyor ash, dust from Buffer Tank, Cyclone, Process Ventilation System, or Bag House Filter dust, and WRS salts.
		Baghouse dust will be rigorously analyzed as is done with for all other waste streams.
74	Table IV J-1	Depending on the amount of waste available, grab or composite (from several) drums may be conducted. Requirement applied to miscellaneous solid and liquid waste and brine sludge.
		IAW regulations and site procedure, all waste streams will be characterized at a minimum of annually or if the feed stream changes (campaign change). Requirement applied to OGT System brines.
		Only refractory material, not brick, is used at the SDC.

IV J-	Line(s)	Rationale for Change
74	Footnote 1	Analytical results will be used to characterize waste stream.
75	Footnote 2	Already stated within table.
	Note a	Converted into new Footnote 2.
78	Table IV J-3	The description of the inspection requirement for the detonation chamber has been revised to reflect current operations IAW site procedures.
79	Table IV J-3	Operation of the Sprung Structure Process Ventilation System was required only while processing chemical agent munitions. While the system remains available, it is no longer required to be inspected.
		The inspection requirements of the Uninterruptable Power Supply have been revised to reduce operator interpretation in the field and be specific to the UPS controls installed.
		The requirements to maintain emergency response equipment has been revised to reflect first responder equipment as delineated in the SDC Contingency Procedures and ANAD ICP. Equipment required for emergency response actions can be found in the applicable ANAD inspection schedule.
80	Table IV J-3	

PROPOSED ANAD RCRA PERMIT CHANGES

ANAD RCRA PERMIT APPLICATION, PART A CONTINUATION SHEETS

REDLINE CHANGES

ANAD RCRA PERMIT APPLICATION, PART A CONTINUATION SHEETS

PROOF

ANAD RCRA PERMIT APPLICATION, SECTION III K

REDLINE CHANGES

ANAD RCRA PERMIT APPLICATION, SECTION III K

PROOF

ANAD RCRA PERMIT APPLICATION, SECTION IV J

REDLINE CHANGES

ANAD RCRA PERMIT APPLICATION, SECTION IV J

PROOF

SDC CEMS CERTIFICATION PLAN

SDC EMISSIONS TEST PLAN FOR CONDITION 1

SDC EMISSIONS TEST PLAN FOR CONDITION 1

REDLINE CHANGES from Initial MODR45 Submittal

SDC EMISSIONS TEST PLAN FOR CONDITION 1

PROOF

SDC EMISSIONS TEST PLAN FOR CONDITION 2

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III K

[RESERVED]

~~B Facility Description~~

~~This section provides a general description of the Static Detonation Chamber (SDC) at the Anniston Field Office (AFO) in Anniston, Alabama.~~

~~Permitting of the SDC was originally pursued to support the destruction of waste military munitions (WMM) containing mustard agent. Munitions originally to be processed at the SDC included overpacked munitions, reject munitions, munitions with limited safety features, and munitions for demonstration testing such as emissions testing or feasibility assessments. Since mustard munitions also involve conventional explosives, the SDC application includes language to support permitting the SDC to destroy conventional munitions deemed appropriate or needed while this unit is being operated within controls of Section III of this application.~~

~~Mustard munitions processing at the SDC facility was completed on September 18, 2011. ANCDF completed chemical agent decontamination of all SDC equipment and structures in accordance with the ANCDF RCRA Closure Plan. The SDC Decontamination Report was submitted on April 5, 2012 and the SDC unit and facilities are now classified as chemical agent free under the ANCDF clean closure standards defined in the closure plan. Approval of this report was received on July 22, 2013.~~

~~The SDC is an explosive detonation chamber designed to dispose of WMM. The SDC unit located at the ANAD site may be used to process munitions that are not defined as chemical munitions or contaminated with chemical agent from both inside and outside of the State of Alabama. Recovered WMM received from areas inside the State of Alabama may also be processed. The SDC may also treat conventional munitions components from chemical weapons which have been verified agent free and received from outside the State of Alabama.~~

~~WMM may include items containing fill material such as white phosphorus, smoke rounds, tear gas, riot control agents, tracers, illumination and incendiary munitions, liquid-filled conventional munitions, liquid contaminated explosive components, etc. and related items. Related items may include shipping and storage containers, packing materials, and personal protective equipment (PPE). These items will be characterized prior to treatment in the same manner as WMMs. The feed limitations demonstrated during emissions testing to the unit (e.g. – chlorine, metals, sulfur, etc.) will be adhered to at all times and the completion of reaction of the previously fed items will be ensured by monitoring of system response to ensure that feed durations are controlled in accordance with procedural and permit requirements.~~

~~In accordance with the Alabama Department of Environmental Management (ADEM) Administrative Code (AAC) 335-14-8-.02(5)(b)1, Section III K B-1 provides the general description of the SDC and an overview of the treatment operations proposed for WMMs currently stored at ANAD, or recovered from areas within the State of Alabama.~~

~~Section III K B-2 provides and discusses the ANAD and SDC topographic map required by AAC 335-14-8-.02(5)(b)19 and other facility related information.~~

~~Section III K B-3 addresses the location information requirements of AAC 335-14-8-.02(5) (b)11.~~

~~Section III K B-4 describes the ANAD and SDC traffic patterns as required by AAC 335-14-8-.02(5)(b)10.~~

~~III K B-1 GENERAL DESCRIPTION~~

~~ADEM Admin. Code 335-14-8-.02(5)(a) and 335-14-8-.02(5)(b)1~~

~~The SDC facility where WMM treatment will take place is located within the Ammunition Limited Area (ALA) on the west side of G block within ANAD. The description of ANAD is located in Section II B of the ANAD RCRA application. The SDC facility is designed for destruction or treatment of WMM munitions and munitions components which are either explosively or non-explosively configured. The SDC facility does not require the use of explosive counter charges to destroy munitions. Over-packed munitions can be processed without being removed from the over-pack container. This reduces the risk of accidental explosions and unexpected environmental release. The system is very flexible, and is able to destroy many types and sizes of munitions. It can also decontaminate equipment, scrap or soil.~~

~~A detailed description of the SDC facility is contained in Section III K D.~~

~~III K B-1a Overview of the SDC Facility Operations~~

~~WMM, including recovered items will be brought to the SDC by truck or appropriate transportation vehicle and may be stored in the three permitted service magazines, 34 permitted storage igloos or delivered directly to the loading area. WMM will be transported in appropriate packaging to ensure the safety of the workers and the environment.~~

~~Once processing is to begin, the WMM will be brought to the facility by forklift or appropriate transportation vehicle and placed in the loading room. In the loading room the munitions are placed on ammunition trays and loaded onto the feed conveyor. A lifting assist device may be used for this operation. Once the munitions have been placed on the feed conveyer, no further handling is required. The munitions are fed to the SDC automatically under remote control and observation. The munitions heat up and any explosive present deflagrates or detonates and is destroyed. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy any fill materials, such as riot control agents or tear gas without the presence of explosives. No counter charges, detonators, or~~

~~munitions handling is needed. All gases from the treatment of WMM are treated in the pollution control system, all under automatic control. No one is required to be present within the sprung structure during these operations.~~

~~The unit is able to treat any type of WMM provided permitted limits are not exceeded and dimensional limitations are adhered to for each feed event. Changes in munition feeds do not require modification of the system, and the system can handle mixed feeds. If a munition contains fill materials such as smokes, illumination mixtures, white phosphorous, or a fuze, these are destroyed at the same time that the explosive is destroyed, without the need for donor charges, and with an absolute minimum of munitions handling.~~

~~III K B-1b Hazardous Wastes Managed / Generated at the SDC~~

~~The SDC receives munitions for treatment (see Figure III K-1 for the general facility layout)[1]. Munitions may be stored in one of three service magazines, 34 permitted storage igloos or delivered directly to the SDC prior to being processed. The hazardous wastes managed or generated at the SDC include:~~

- ~~WMM~~
- ~~Recovered WMM~~
- ~~Energetic contaminated material~~
- ~~Scrap metals from munitions after treatment process~~
- ~~Miscellaneous liquid wastes~~
- ~~Brines and Off-Gas Treatment (OGT) System fluids~~
- ~~Solids generated during the treatment process~~
- ~~Miscellaneous solid waste / dunnage~~

~~Detailed descriptions of the materials to be processed and wastes generated are provided in Section III K C-1, "Chemical and Physical Analysis."~~

~~The three service magazines and 34 igloos for storage of WMM are located within the ALA and are constructed in accordance with DDESB standards. This satisfies ADEM Admin. Code R.335-14, the Military Munitions Rule (MMR), and requirements for WMM munitions storage.~~

~~III K B-1cHazardous Waste Management Unit to be Permitted~~

~~The hazardous waste management unit addressed in this section of the permit application is considered a Miscellaneous Unit (40 Code of Federal Regulations (CFR) 264 Subpart X). Wastes generated during SDC operations are accumulated in containers. The containers will not remain in the building longer than 90 days. This permit application does not seek permitting of the SDC facility, as less than 90-day storage areas are exempt from permitting requirements [40 CFR 262.34(a)]. However, the Service Magazines and igloos used for waste storage are permitted in accordance with the Military Munitions Rule.~~

~~A detailed description of operations to be conducted at the SDC facility is provided in Section III K D-1.~~

~~III K B-2 TOPOGRAPHIC MAP~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)1~~

~~III K B-2a General Requirements~~

~~In accordance with the requirements of AAC 335-14-8-.02(5)(b)19, a topographic map and other maps are used to detail the location of the SDC and the surrounding area. The information includes the following: contour maps, the location of surface waters, a wind rose, surrounding land use, and facility area designations.~~

~~[1] All figures are located at the end of this section.~~

~~The topographic map (Figure III K-1)[2] depicts a distance of approximately 1,000 feet around the SDC. The map's scale is 1 inch equals 240 feet. Topographic contours are displayed at 2-foot intervals. There are no legal boundaries shown for the SDC facility because it is totally self-contained within the ANAD. Legal boundaries for the ANAD are shown in Figure III K-1. The service magazines (Buildings 712, 713 and 714) near the SDC facility are shown on Figure III K-5.~~

~~Additional Drawings (Figures III K-2, III K-3, and III K-4), each with a scale of 1 inch equals 30 feet, show contours, locations of catch basins, manholes, storm sewers, sanitary sewers, drain lines, culverts, fences, guard rails, gas lines, fire water lines, hydrants, power poles, access roads, and road surfaces in relation to the SDC facility. The SDC will be the only solid waste management unit within the boundary of Building 695.~~

~~Wind roses for the ANAD are included in Figures III K-7 and III K-8. Figure III K-7 shows the average wind speed and direction for the 12 months ending June 30, 1999 at a height of 10 meters (m). Figure III K-8 shows the average wind speed and direction for the same period at the 30-m level. Average total wind speed at the ANAD for the 12 months ending June 30, 1999 was 1.6 meters per second at the 10-m level and 2.3 meters per second at the 30-m level, with winds common from the east-southeast, southeast, and south-southeast.~~

~~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.~~

~~For the twelve-month period ending June 30, 1999, 55 inches of precipitation were recorded at ANAD. The highest rainfall (9.4 inches) was recorded in June. The lowest rainfall (1.1 inches) was recorded in September of that period.~~

~~The SDC facility is not located in the 100-year floodplain. Section II of the storage permit application contains a copy of the Federal Insurance Agency Flood Hazard Boundary Map, Community-Panel Number 010013-0250 B, Panel Number 250 of 300. Zone "A" depicts the 100-year floodplain. The figure clearly shows that SDC Facility is not in the 100-year floodplain.~~

~~There are no surface waters within 1,000 feet of SDC facility.~~

~~The SDC facility does not have any process sewage systems. Sanitary sewage is piped to the existing sewage treatment plant located in the southeast portion of the ANAD.~~

~~There are no injection wells on the ANAD, or within 1,000 feet of the SDC facility. There are groundwater monitoring wells located at several locations within the ANAD around closed disposal sites, and withdrawal wells at three~~

~~[2] All drawings are located at the end of this section.~~

~~groundwater treatment facilities. None of the monitoring or withdrawal wells are located in the vicinity of the SDC facility.~~

~~Storm drainage from upslope areas is diverted around the SDC facility area by the use of berms, swales, and ditches, thereby preventing any run-on. Storm drainage from the roof and paved areas is directed to catch basins and storm sewers and discharged north of the building using a combination of swales, ditches, and culverts. The runoff is directed to existing offsite drainage courses. 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 small community of Bynum is located on the 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.~~

~~III K B-3 LOCATION INFORMATION~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)11~~

~~III K B-3a Floodplain Standard~~

~~ADEM Admin. Code 335-14-5-.02(9) (b), and 335-14-8-.02(5) (b) 11 (iii)~~

~~The ANAD is located in Calhoun County in northeastern Alabama within the valley and ridge province of the Appalachian Highlands. The ANAD occupies 15,246 acres of land. None of the land within 1,000 feet of the SDC is in the 100-year floodplain.~~

~~III K B-4 TRAFFIC INFORMATION~~

~~ADEM Admin. Code AAC 335-14-8-.02 (5) (b) 10~~

~~The transport of WMM is described in Section IV B-5 of the ANAD RCRA Permit Application.~~

~~The locations of the roads connecting SDC facility to the ANAD ALA are shown in Figure III K-1. All main access routes to SDC facility are paved, all-weather roads meeting Department of the Army (DA) road design standards. Construction of ANAD roads meet the technical requirements contained in Army Technical Manuals (TMs) TM 5-822-2 and TM 5-822-5. The roads have 10-foot wide lanes with a minimum cross-slope of 2 percent and 6-foot wide gravel shoulders with a minimum cross-slope of 6 percent.~~

~~III K B-4a Description of Existing Roads~~

~~The largest portion of the ANAD is used for munitions storage and, therefore, has only minimal traffic. The ANAD road system consists of 113 miles of paved roads and 104 miles of unpaved roads with most of the unpaved roads located in the Ammunition Restricted Area and the Munition Demolition 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.~~

~~III K B-4b External Access~~

~~The major highways serving the ANAD are I-20 and U.S. 78, running east and west, and U.S. 431, running north and south. The main access to the ANAD is from Alabama State Highway 202 by way of a 24-foot wide concrete road with 10-foot shoulders through the Main Gate. This road is used by most employees and by all commercial trucks. Two alternate gates are used for incoming and outgoing employee traffic during shift changes. Eastbound employees exit through the Eulation Gate. All other gates are normally closed to traffic. An additional access way has been constructed to support operations at the AFO-SDC. The road enters at Gate 5 at the northeast corner of the ANAD and passes just north of the ALA.~~

~~At present, there are approximately 2,500 privately owned vehicles entering and leaving the ANAD each day. In addition, approximately 3,200 truck shipments leave and 1,100 truck shipments are received at the ANAD each year. Essentially, all civilian and truck traffic occurs on weekdays.~~

~~III K B-4cTraffic Control~~

~~Traffic on the ANAD 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.~~

~~III K C Waste Characteristics~~

~~The chemical and physical characteristics of the wastes that are managed at the SDC facility are discussed in this section. Section III K C-1 describes the chemical and physical properties of the wastes to be processed in the SDC. Section III K C-2 presents the Waste Analysis Plan that details the methodologies for sampling, testing, and evaluating all wastes generated from the treatment process to ensure that sufficient information is available for their proper characterization and safe management. This information is also used to ensure that all wastes are treated in accordance with best-demonstrated available technology (BDAT) to maintain compliance with the land disposal restrictions (LDRs). Section III K C-3 addresses waste analysis requirements pertaining to LDRs.~~

~~III K C-1 CHEMICAL AND PHYSICAL ANALYSIS~~

~~ADEM Admin. Code 335-14-5-.02(4), and 335-14-8-.02(5)(b)2~~

~~The SDC facility will be used to thermally treat WMM or waste material contaminated with energetics. Other wastes that may be generated and treated include PPE, dunnage, rags, towels, mops, and sampling equipment.~~

~~Table III K-1[3] and III K-4 identify each known and potential hazardous waste managed or generated at the SDC facility along with the appropriate analysis method for determining RCRA hazardous waste designation, the EPA waste codes, the RCRA regulatory citation for the relevant definition or criteria for designating the waste as hazardous, and the specific data or rationale relating the waste to the respective criterion or definition. Specific physical and chemical information on the wastes managed or generated at the SDC facility are provided in Section III K C-1a, "Volume and Composition of Wastes in Miscellaneous Treatment Units."~~

~~Illumination, smoke, phosphorous items, other such items, and other WMM, to include recovered WMM, are also available for destruction within the SDC. Detailed information for each of these types of items not addressed in Section IV C as applicable will be assessed per feed event to ensure compliance with limitations demonstrated as a result of the emissions tests conducted at the SDC. WMM may be properly categorized using the Munitions Items Disposition Action System (MIDAS), the Material Assessment Review Board (MARB), or other appropriate source of data for the munition type. These systems identify the constituents contained within WMM found in the demilitarization stockpile, including recovered WMM, and allow for accurate characterization for control of feed parameters for the operation of the SDC. For items not listed in Sections III K C or IV C,~~

~~[3] Reference Table III K-4 for more details.~~

~~concurrence for processing will be received from both ADEM Air and Land divisions prior to processing within the SDC.~~

~~III K C-1a Volume and Composition of Waste in Miscellaneous Treatment Units ADEM Admin. Code 335-14-5-.24(2), and 335-14-8-.02(14)~~

~~The volume of WMM treated at the SDC facility fluctuates based on the disposal needs of the DoD. The SDC system is designed to accept a maximum gross weight of up to 330 pounds per feed event including the feed tray.~~

~~The explosive capacity for the SDC facility is:~~

- ~~Up to 6.7 lbs explosive material (TNT equivalent, Net Explosive Weight (NEW)) per feed cycle~~

~~For the purposes of destruction in the SDC most class 1.1 materials that are not confined and class 1.2 and 1.3 materials confined or unconfined are considered non mass detonating as they typically deflagrate in the SDC. Exceptions are the primary class 1.1 explosives, which normally mass detonate whether confined or not. The NEW of a munition represents the combined explosive weight of all energetics contained in a munition item or items.~~

~~Section IV C of the ANAD RCRA Application includes detailed information about WMM and any associated breakdown products.~~

~~III K C-1a(1) Fill Materials~~

~~The munitions treated in the SDC operations may contain fill materials, such as riot control agents, tear gas, smokes, illumination mixtures, phosphorous mixtures, etc. The Army recognizes the toxic nature of these fill materials and the need to implement strict and conservative management practices to facilitate effective processing at minimal risk to human health and the environment. Therefore, the Army is minimizing the handling of these wastes by limiting handling to designated locations and by employing, where possible, automated handling and conveyance systems. Section IV C of the ANAD RCRA Application includes detailed information about the fill materials and any associated breakdown products.~~

~~III K C-1a(2) Explosives and Propellants~~

~~The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured and loaded according to strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from manufacture and quality control for these materials have been used with engineering knowledge to characterize and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV C of the ANAD RCRA application. Examples of the various explosives and propellants that are contained in the WMM demilitarized at the SDC facility are identified in Table III K-4 or are identified in Section IV C of the ANAD RCRA Application. For items not listed in Section IV C, detailed product composition will be reviewed prior to treatment within the SDC to ensure compliance with established limitations. .....~~

~~III K C-1a(3) Wastes Contaminated with Energetic Material~~

~~Demilitarization of WMM is typically performed using mechanical equipment which may come in contact with energetic components of the WMM. This process can leave a portion of the energetic material affixed to the equipment which in turn requires cleaning to ensure that subsequent operations are conducted safely. Cleaning of the equipment or tools used to demilitarize WMM therefore will generate items such as PPE, rags, mops, etc. that will potentially be contaminated with energetic material. The SDC is capable of processing these items, under approved feed limitations based on characterization of the material, to ensure that the energetic material is destroyed prior to release of the resultant ash or process waste for disposal.~~

~~III K C-1b Containerized Waste~~

~~The storage of WMM is addressed as container storage with regards to the hazardous waste regulations [AAC 14-5-.09 and 14-8-.02(6)]. Refer to Section II of the ANAD RCRA Permit Application for further detail on container storage of hazardous waste.~~

~~Waste material collected post-treatment at the SDC facility is containerized and removed from the units, managed, and disposed. These materials include, but are not limited to, scrap metal, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, and filter units from the exhaust filter. Waste material may be temporarily stored at an appropriate hazardous waste storage location at ANAD prior to disposal offsite or treatment onsite.~~

~~Sections III K C-1b(1) – III K C-1b(5) discuss the major waste streams to be containerized.~~

~~III K C-1b(1) Treated Scrap Material from the SDC~~

~~Waste resulting from emptying the SDC consists mainly of scrap metal from munitions processing and overpacks which have been treated by the SDC. Treated materials that are discharged from the SDC may be fed back into the system for reprocessing if necessary. Inorganic waste material may remain as a dust from treatment of feed trays, munition boxes (if fed with the munitions) or waste contaminated with energetics. This waste can be characterized as scrap after cooling to room temperature. The scrap is a mix of the above fractions. The content of the fractions may differ depending on the type of material initially fed to the SDC.~~

~~III K C-1c Waste in Tanks~~

~~There is no waste stored in tanks at the SDC facility; therefore the requirements for this section are not applicable.~~

~~III K C-1d Waste in Piles~~

~~ADEM Admin. Code 14-5-.12(c)1~~

~~The SDC facility will not have waste piles; therefore the requirements for this section are not applicable.~~

~~III K C-1e Landfilled Wastes~~

~~ADEM Admin. Code 14-8-.14~~

~~The SDC facility will not have landfilled wastes; therefore the requirements for this section are not applicable.~~

~~III K C-1fWaste Incinerated and Waste Used in Performance Tests ADEM Admin. Code 14-8-.06(2)(B)2.(i)~~

~~Waste to be treated in the SDC facility:~~

~~WASTE INPUT~~

~~1. WMM, including liquid filled, and/or recovered items~~
~~2. Explosives and Propellants~~
~~3. Fuzes and Bursters~~
~~4. Miscellaneous solid and liquid waste, including waste material contaminated with energetics~~

~~TREATMENT RESIDUE~~

~~1. Scrap metal~~
~~2. Ash~~
~~3. Off Gas Treatment System Solids (spent carbon, HEPA and pre-filters)~~
~~4. Off-Gas Treatment System liquids~~

~~Various physical and chemical properties of fill materials, explosives and propellants are summarized in Section IV C. Information on each of the materials used in performance tests may be found in the SDC Emissions Test Report.~~

~~The ANCDF SDC conducted emissions testing for conventional WMM (Condition 1 [C1]) from December 3 to 7, 2010, surrogates and metal oxides (Condition 2 [C2]) from February 1 to 4, 2011 and (Condition 3 [C3]) from February 8 to 9, 2011, mustard at a reduced feed rate (Condition 4a [C4a]) from July 5 to 8, 2011 and mustard-filled munitions (Condition 4b [C4b]) from August 9 to 13, 2011.~~

~~III K C-1g Miscellaneous Components~~

~~Please refer to Section IV C for miscellaneous components.~~

~~III K C-1h Hazardous Waste Treatment~~

~~The SDC may also process hazardous waste in the form of recovered WMM or other items associated with the management of recovered WMM and components that may be classified as hazardous waste.~~

~~Any items classified as hazardous waste should arrive under manifest at the ANAD or SDC. If manifests accompany items to be processed, appropriate records to include final copies of the manifest will be returned to the necessary agencies upon receipt and completion of the treatment process.~~

~~Hazardous wastes to be processed in the SDC will be characterized using available government sources of information such as the MARB, MIDAS or other source of information relative to the items being processed. These actions will be completed to ensure that the feed control for any items processed is allowed under the approved feed rates for the SDC. Characterization of waste material contaminated with energetics will be based on generator knowledge of the energetics to which the item was exposed.~~

~~III K C-1iWaste to be Land Treated~~

~~ADEM Admin. Code 14-5-.13(3)(a) and 14-5.13(3)(c)1.(i)~~

~~The SDC facility has no land treatment units. Therefore, the requirements of this section are not applicable.~~

~~III K C-1jWastes in Miscellaneous Treatment Units~~

~~ADEM Admin. Code 14-5-.24(2) and 14-8-.02(14)~~

~~ANAD treats WMM in miscellaneous units using the SDC. Military munitions are defined in ADEM Admin. Code R.335-14-1-.02. These munitions require disposal because the ANAD has determined that they cannot otherwise be reused or recycled. These military munitions become WMM when removed from the various storage igloos at ANAD and offered for disposal at the SDC.~~

~~Section IV C of the ANAD RCRA Application contains detailed information about WMM and any associated breakdown products.~~

~~III K C-2 WASTE ANALYSIS PLAN~~

~~ADEM Admin. Code 335-14-5-.02(4)(b) and (c), 335-14-5-.02(8), 335-14-8-.02(5)(b)3, and 335-14-9-.01(7)~~

~~The following sections address the various components of the SDC facility Waste Analysis Plan. These components include: analytical parameters and the rationale for their selection, test methods, sampling methods, frequency of analyses, additional requirements for wastes generated offsite, and additional requirements for ignitable, reactive, or incompatible wastes. In effect, the Waste Analysis Plan delineates the waste parameters that are determined prior to treatment of waste during SDC facility operations. Waste streams from the operation of the SDC facility include, but are not limited to, scrap metal, ash, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, filter units from the exhaust filters, OGT brines and sludges. Other miscellaneous wastes that may be generated include PPE, dunnage, rags, towels, mops, cardboard dunnage, banding / box hardware, and sampling equipment.~~

~~The Army is using production knowledge, quality assurance and analytical data, and engineering judgment to characterize wastes processed in the SDC facility. The Army is both the WMM manufacturer and the SDC owner. The SDC was engineered to achieve the treatment requirements for WMM munitions treatment and is operated with attention directed to minimizing the risk associated with all WMM activities conducted at the SDC.~~

~~III K C-2a Parameters and Rationale~~

~~ADEM Admin. Code 14-5-.02(4)(b)1~~

~~The analytical parameters and rationale for their selection are described by waste category in the paragraphs below and have been divided into three groups –~~

~~solids, liquids, and sludges. This information is summarized in Table III K-1[4].~~

~~III K C-2a(1) Solids~~

~~III K C-2a(1)(a) Treated Scrap Material from the SDC~~

~~This waste stream consists of ash from metal munitions and miscellaneous parts that have been thermally treated in the SDC. A grab sample will be collected from the residue of waste streams processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for TCLP organics and TCLP metals. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(1)(b) Dust Material from the Buffer Tank, Cyclone and Dust Collection System~~

~~Dust material is generated during regular operation of the SDC and during maintenance activities associated with the cyclone equipment. A grab sample will be collected from the residue of each waste stream processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for TCLP organics and TCLP metals. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(1)(c) Spent Solids from the Bag House Filter~~

~~The bag house is utilized for particulate and semi-volatile metal collection. Therefore, generator knowledge will be used to evaluate this waste stream based upon sample results of the characterized waste streams processed through the SDC.~~

~~III K C-2a(1)(d) Salts from Water Recycle System~~

~~This waste stream comes from the water recycling operation and consists of residual salts with collected dust particles from scrubber operation. Samples will be tested for TCLP organics and TCLP metals. Profiles for these solids may be used to characterize waste for disposal for specific waste streams. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(1)(e) Filter Units from the Exhaust Filter~~

~~This waste is comprised of HEPA and carbon filters from the exhaust filter system. The filter system is designed as a backup for the SDC OGT system. Due to the efficiency of the particulate removal devices upstream of this filter unit, it is not expected that this system will ever be exposed to pollutants that will require filter replacement. In the event the filters are replaced, spent filters~~

~~[4] All tables are located at the end of this section.~~

~~will be properly stored in containers and analyzed for TCLP organics and TCLP metals. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(1)(f) Explosives and Propellants~~

~~The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured according to strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from the manufacturer and quality control for these materials have been used with engineering knowledge for proper characterization and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV of the ANAD RCRA application.~~

~~III K C-2a(1)(g) Miscellaneous Solid Waste~~

~~Miscellaneous solid waste includes, but is not limited to, valves, pumps, gearboxes, conveyors, belts, piping, hoses, flanges, thermocouples, pH probes, nuts, bolts, gaskets, and other waste removed from the SDC equipment or generated during operation of the SDC submitted for disposal. Miscellaneous solid waste will be characterized by generator knowledge and/or analysis. Analysis may be limited to a particular hazardous waste code or series of codes, such a TCLP metals, or it may be extensive as necessary to adequately characterize and profile the waste. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(1)(h) Refractory Brick~~

~~Refractory brick from the thermal oxidizer exit duct may be periodically removed and replaced. A batch consists of all the brick removed during one periodic change out. Each batch of discarded refractory brick will be analyzed for TCLP metals. Table III K-1 details the analyses that may be needed for sufficient characterization and the associated disposal requirements. The disposal requirements are based on the analysis results.~~

~~III K C-2a(2) Liquids~~

~~III K C-2a(2)(a) OGT System Brines~~

~~OGT brines are generated from the treatment of munitions in the SDC. A composite sample will be analyzed for TCLP metals and TCLP organics and pH as necessary to properly characterize the brine. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(2)(b) Miscellaneous Liquid Waste~~

~~Miscellaneous liquid waste such as, but not limited to, clean up fluids, reserve flush tank solution, hydraulic fluid and lubricating oil will be generated periodically during operations at the SDC facility. This waste stream is typically characterized by generator knowledge. Miscellaneous liquid waste that is not characterized by generator knowledge will be analyzed for TCLP metals and TCLP organics and pH as necessary for proper characterization~~

~~with the exception of the process fluids from the reserve flush tank. The disposal requirements will be based on the analysis results.~~

~~III K C-2a(3) Sludges~~

~~III K C-2a(3)(a) Brine Sludge~~

~~Brine sludge generated from the operation of the SDC OGT system will be tested for TCLP metals and TCLP organics and pH as necessary for proper characterization. The disposal requirements will be based on the analysis results.~~

~~III K C-2b Test Methods~~

~~ADEM Admin. Code 335-14-5-.02(4)(b)2~~

~~Process knowledge during waste treatment will be incorporated to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes at the SDC facility. The methods used to test the parameters for WMM treated and treatment residues are described in Table III K-2 of the RCRA application.~~

~~III K C-2c Sampling Methods~~

~~ADEM Admin. Code 335-14-5-.02(4)(b)3 and 335-14-2, Appendix I~~

~~Sampling, when required, will be performed in accordance with Table III K-1 and Table III K-2.~~

~~III K C-2d Frequency of Analysis~~

~~ADEM Admin. Code 335-14-5-.02(4)(b)4~~

~~Frequency of analysis will be performed as described in Table III K-1 and Table III K-2.~~

~~III K C-2e Additional Requirements for Wastes Generated Offsite~~

~~ADEM Admin. Code 335-14-5-.02(4)(a),(b) and (c), 335-14-5-.02(5), and 335-14-5-.05(4)(a) and (b)~~

~~ANAD and the SDC may accept conventional munitions from offsite DoD facilities. Only WMM that are permitted for treatment at ANAD will be accepted. WMM shipments to ANAD are coordinated well in advance with Anniston Munitions Center (ANMC) Ammunition Maintenance Division (AMD). WMM shipments to ANAD are characterized by the generating unit and are accompanied by an EPA shipping manifest or appropriate DoD shipping controls as defined by the Military Munitions Rule. Ammunition handlers from the generating activity provide all necessary information, including National Stock Number (NSN) and DoD Identification Code. No unknown wastes or unidentified wastes are accepted.~~

~~III K C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes~~

~~ADEM Admin. Code 335-14-5-.02(4)(b)6. and 335-14-5-.02(8)~~

~~The majority of hazardous wastes treated at the SDC facility are reactive (D003). Some of the wastes may be ignitable (D001) as well. These characteristics are the primary RCRA characteristics of concern. Therefore, the waste characterization procedures were developed considering the reactivity,~~

~~ignitability, and potential incompatibilities of munitions/explosives. There are no additional waste characterization requirements to be addressed.~~

~~III K C-3 WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS~~

~~ADEM Admin. Code 335-14-9, 335-14-8-.02(5)(b)3, 335-14-5-.02(4)(a)1, and 335-14-5-.02(4)(b)6~~

~~The Hazardous and Solid Waste Amendments of RCRA prohibit land disposal of certain types of wastes and establish concentration limits and treatment standards for certain restricted wastes before land disposal. Information provided in this section describes the identification, characterization, documentation, and certification of wastes that are subject to LDRs.~~

~~III K C-3a Waste Characterization~~

~~ADEM Admin. Code 335-14-9-.01(7)~~

~~Wastes to be managed during SDC operation are characterized as described in Section III K C-1, "Chemical and Physical Analysis," and Section III K C-2, "Waste Analysis Plan." The information provided by this characterization allows for determinations of LDR applicability and compliance with LDR treatment standards, concentration limits, or notification and certification requirements for LDR constituents and underlying LDR constituents. Specific analysis required to determine whether the waste is an LDR restricted waste and whether the waste is being managed properly under the land disposal requirements of AAC 335-14-9 are discussed in this section.~~

~~The following paragraphs describe the analysis requirements pertaining to LDR regulations for each waste stream.~~

~~III K C-3a(1) Treatment Residues and Other Miscellaneous Wastes Generated~~

~~Treatment residue from the SDC facility is limited to waste such as ash and metal fragments. These materials are generated as dry solids, with the exception of OGT fluids (brine), and containerized properly for temporary storage. Other miscellaneous waste may be characterized based on generator knowledge and/or analysis. Disposal of these items will be based on analysis results or in accordance with applicable regulation.~~

~~III K C-3a(2) Explosives and Propellants~~

~~The explosives and other energetic components of the munitions, as described in Section III K C-1, are characterized as reactive wastes (D003).~~

~~In addition to the reactivity characteristic (D003), wastes treated at the SDC facility may also be classified as hazardous due to the hazardous characteristics of ignitability (D001), corrosivity (D002), and/or toxicity codes based on munition type.~~

~~Other waste codes associated with WMMs or components of WMMs have been included in Section I Part A of this Permit Application. Section IV C of the~~

~~ANAD RCRA Application includes detailed information about WMMs and any associated breakdown products.~~

~~For the reactive waste code D003, the applicable treatment standard is deactivation and requires meeting the concentration limits in AAC 335-14-9 for underlying hazardous constituents. Disposal of these items will be based on analysis results or in accordance with applicable regulation.~~

~~III K C-3b Notification and Certification Requirements~~

~~ADEM Admin. Code 335-14-5-.02(5)(7), and (9)~~

~~The SDC facility may be a generator of wastes subject to LDRs. ANAD will comply with all generator notification requirements applicable to SDC operations including a notification in accordance with AAC 335-14-9-.01(7). All supporting data and waste analysis data will be retained for a period of at least 5 years. Copies of all notices, certifications, demonstrations, and other documentation produced to support the determination for restricted waste treated, stored, or disposed of at an approved hazardous waste Treatment Storage and Disposal Facility (TSDF) will also be retained.~~

~~III K C-3c Requirements Pertaining to the Storage of Restricted Wastes~~

~~ADEM Admin. Code 335-14-9-.05~~

~~The AFO SDC does not store restricted waste.~~

~~III K C-3d Exemptions, Extensions, and Variances to Land Disposal Restrictions~~

~~ADEM Admin. Code 335-14-9-.01(5) and (6), and 335-14-9-.04(5)~~

~~The applicant is not seeking any case-by-case extensions, or petitions to allow land disposal of a prohibited waste, or variances from treatment standards.~~

~~III K C-4 Waste Transportation and Offsite Treatment, Storage, and Disposal~~

~~ADEM Admin. Code 14-3~~

~~**All waste disposed offsite will be transported offsite and disposed in accordance with applicable regulations. Information concerning transportation procedures for hazardous waste can be found in Section II B-5.**~~

~~III K D Miscellaneous Units~~
~~ADEM Admin Code 335-14-5-.24(1) to (4) and 335-14-8-.02(14)~~

~~Section III K D, addresses the treatment of WMM inside the SDC at the ANAD. This section describes the SDC treatment processes. The SDC facility does not fit the definition for other types of treatment units and is therefore categorized as a miscellaneous treatment unit under the RCRA.~~

~~III K D-1 DESCRIPTION OF MISCELLANEOUS UNIT~~
~~ADEM Admin. Code 335-14-8-.02(14)(a)1, and 335-14-8-.02(14)(a)2~~

~~The SDC unit is designed to destroy WMM munitions which are either explosively or non-explosively configured. The SDC does not require the use of explosive donor or counter charges to destroy munitions. The unit is able to handle various types of munitions. Changes in munition feeds do not require reconfiguration of the system, and the system can handle mixed feeds. Munitions that have been over-packed can be processed without being removed from the over-pack container. If a munition contains smoke, illumination mixtures, white phosphorus, or a fuze, these are destroyed at the same time that the explosive is destroyed. The unit is designed and built in such a way as to eliminate worker or public exposure to explosive or environmental hazards at any time during operations, and to produce products that are environmentally acceptable. The system is designed with interlocks and redundant systems where required, for safety and to prevent release of untreated products.~~

~~A description for the SDC facility is described in Section III K D-1b. A description of the service magazines and storage igloos is also included.~~

~~III K D-1a Physical Characteristics~~
~~ADEM Admin. Code 335-14-8-.02(14)(a)1~~

~~This section describes the physical characteristics of the SDC facility. The layout of the SDC facility is shown in Figure III K-6[1]. The conceptual design of the SDC facility is discussed below.~~

~~The SDC and the service magazines are located on the west side of G block and just north of the Demolition Pit road and next to building 695. The storage igloos are located in G block. For safety, the buildings are at least 1,250 feet south of SDC. The SDC is also 1,200 feet from the nearest storage igloo in G block. Access roadways are provided for trucks, buses, forklifts, and service vehicles. Access roads are provided to G block on the east and to the emergency egress road on the west. Refer to Section III K B for a detailed description of the location of the SDC.~~

~~[1] All figures are located at the end of this section.~~

~~The SDC unit is contained in a sprung structure, which is an engineered stress membrane structure. The sprung structure is constructed of extruded aluminum arches, connected to an all weather outer membrane which will cover the loading room, SDC equipment and OGT equipment. The sprung structure is not required for treatment of WMM.~~

~~The SDC system is designed and built as a mobile system, able to be transported over road, rail or by sea using containers which are configured as standard ISO specification containers. Each container is equipped with a frame, dimensions and lifting points per ISO standards and contains parts of the SDC system pre configured and installed, ready to place and bolt together with a minimum of connections. The unit remains installed within the containers for use. Installation of the system occurs at the point of use. The various containers are received at the location and placed in the proper location using a crane. Once in place the containers are bolted together into a rigid structure using rigid connectors, and then the inter-container process piping and electrical connections are made. All electrical connections are brought to one junction box per container to facilitate connections and plug in connectors are used to the extent possible. Process piping interconnectors are flange type prefabricated junctions, and piping meant to contain potentially hazardous materials are double wall construction. Where required expansion joints are provided in the process piping to accommodate temperature swings. The process for erection is as follows:~~

~~a) Containers are unloaded and placed according to the erection plan~~
~~b) Side walls are removed for easy access where not necessary~~
~~c) Necessary stairs and platforms are connected~~
~~d) Process connections are made between the containers~~
~~e) Power and bus cables are connected~~
~~f) Cameras and PA speakers external to the containers are mounted~~
~~g) Sprung structure is erected, filters connected, external cameras mounted~~
~~h) Consumables are connected with flexible double wall hose to the process containers~~
~~i) Electrical and process checks are performed according to a defined check list~~
~~j) Leakage test is done for the whole system before start up~~

~~An exhaust filtration unit, though not required for WMM operations, may be connected to the sprung structure to provide negative pressure within the structure with respect to the outside. The minimum footprint for sprung structure is 70 x 100 feet. The footprint may be adjusted for ancillary equipment outside of the sprung structure (e.g. generators, carbon filtration units, airlocks, control room, waste water treatment, etc).~~

~~The SDC system is contained within a series of containers which are trucked to the site and placed using a crane. After placement, the sprung structure is erected around the system which acts as a tertiary containment (primary~~

~~containment is afforded by the system itself, and secondary containment is afforded by the ISO sea containers). For processing mustard munitions the tertiary containment is kept under negative pressure by a series of activated carbon/HEPA filters attached to ID fans. Blast protection panels are incorporated into the sea containers as necessary. The SDC loading container, detonation chamber container and scrap bin container are located in three sea containers which are stacked one on top of the other for operations. The OGT system is housed in another three containers with additional containers for the loading and scrap handing operations, and an electrical switchgear utility container.~~

~~The SDC facility is a heated, armored, double shell retort, which operates at high temperature. The inner chamber is heat resistant stainless steel excellent at high temperatures which is able to withstand the mechanical stress loads caused by detonation pressures. The inner and outer chambers are separated from one another by an air space which serves to decouple detonation stresses from the inner to the outer chamber, thus enhancing the overall safety and reliability of the unit. Placed within the bottom of the outer chamber are electric resistance heaters, which supply heat to the unit. The outer chamber also includes thermal insulation for efficiency. This enclosure serves as an additional barrier between the chamber and process room and protects workers from burns and dust, as well as providing additional vapor containment in the highly unlikely event that both chambers are breached.~~

~~During operations the chambers are mated to a flange which is attached to the loading system. The connection uses metal gaskets backed up with triple redundant inflatable seal rings to ensure a leak tight seal. The loading system is composed of a loading conveyer, a munitions lift, and two airlock type loading chambers equipped with gates. The loading conveyer begins in the munitions loading room and ends at the munitions lift.~~

~~III K D-1a(1) Munitions Limitations~~

~~In addition, all types of explosive containing material such as small arms, projectiles, cartridges, mines, rockets, grenades, pyrotechnics, and explosives contaminated material, toxic containing materials, fuzes, detonators etc can be processed in the system as long as the following boundary conditions per feed cycle are not exceeded:~~

- ~~Chlorine below 11.1 lbs~~
- ~~Sulphur below 6.3 lbs~~
- ~~Explosives below 6.7 lbs (TNT equivalent)~~
- ~~No shape charges unless shape charge function is defeated prior to feeding~~
- ~~Overall weight of 330.7 lbs (including feed tray)~~

~~All feed events (eg. miscellaneous solid waste, dunnage, process fluids) will be bound by the feed rates contained in the RCRA Permit.~~

~~III K D-1a(2) Description of the Service Magazines and Storage Igloos~~

~~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 storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and will serve as the primary storage for WMM prior to them being offered to the SDC for treatment. The igloos are also being permitted to allow for storage of hazardous waste material contaminated with energetics that is delivered for treatment at the SDC from DoD facilities and for storage of Recovered WMM that have been declared as hazardous waste. The SDC Service Magazines are designated as 712, 713, and 714. The following is a list of igloos numbers which may be used for storage by the SDC:~~

~~G-602~~	~~G-404A~~
~~G-602A~~	~~G-405A~~
~~G-603~~	~~G-408A~~
~~G-603A~~	~~G-502A~~
~~G-604~~	~~G-503A~~
~~G-604A~~	~~G-504A~~
~~G-605~~	~~G-505A~~
~~G-605A~~	~~G-506A~~
~~G-606~~	~~G-102~~
~~G-102A~~	~~G-103~~
~~G-108A~~	~~G-104~~
~~G-200A~~	~~G-105~~
~~G-202A~~	~~G-306A~~
~~G-203A~~	~~G-307A~~
~~G-206A~~	~~G-308A~~
~~G-208A~~	~~G-507A~~
~~G-209A~~	~~G-508A~~

~~III K D-1a(3) Fire Protection~~

~~The fire protection system will be an automatic sprinkler system that complies with the requirements as stated in UFC 3-600-01 (6-10.5) Table 4-1 for Ordinary Hazard Group 2.~~

~~III K D-1a(4) Utility System~~

~~A 1500-kilovolt ampere (kVA), pad-mounted transformer is provided to supply electrical power to the SDC facility. Natural gas or Propane will be supplied to heat the thermal oxidizer. Water is received from ANAD via pipeline and distributed to points of consumption throughout SDC facility. The system also supplies water to the required process systems.~~

~~III K D-1b Process Descriptions~~
~~ADEM Admin. Code 335-14-8-.02(14)(a)2~~

~~The loading room is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor movement. After the loading conveyor is loaded, the loading operator leaves the area and the loading conveyor moves one tray at a time into the SDC. As each item is conveyed from the loading room to the SDC for destruction the loading conveyor conveys it over to the munitions lift where it is elevated to the level of the first loading chamber. From the lift, the item is then conveyed to the apron of the first loading chamber. Due to the shape of the round inlet opening of the SDC the maximum package diameter shall not exceed 18 inches (in.). The maximum size of the feed tray is 59 in. (Length) x 16 in. (Width) x 16 in. (Height). Diagrams and equipment drawings may be found in Attachment K-1 of this application.~~

~~At this point the loading system pauses until the control room operator acknowledges that the tray is ready to load into the SDC. All movements from the loading conveyor to the first loading chamber are automatic. However, the control room operator has full control of all movements and can abort or reverse the movements as required. The loading conveyor and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.~~

~~Once at the apron of the first loading chamber and after the operator gives the go-ahead for the loading operation, the first loading chamber gate is opened to admit the tray. The first loading chamber gate is equipped with an inflatable gasket seal which prevents leakage from the first loading chamber. After the gate is opened, the tray containing the munition item is pushed into the munition feed tray located in the first loading chamber by an electrically operated ram equipped with sensors to detect misfeeds and other problems. After the tray is inserted, the ram withdraws and the first loading gate is closed and sealed. Next the second feed gate (which is also fitted with inflatable seals to prevent leakage) opens and a hydraulically operated ram pushes the munition into the second loading chamber. The ram is withdrawn and the second loading gate closes. When needed, the first loading chamber may then be filled with flush tank solution to ensure that no air which may contain contamination remains in the first loading chamber. Air displaced by this operation is fed to the SDC main chamber for treatment. Flush tank solution may either be fed into the SDC for treatment or recycled back to the reserve flush tank for re-use.~~

~~To transfer the WMM from the second loading chamber to the SDC, the cradle and fragment valve rotate 90 degrees (°) as a unit. The fragment valve is a round~~

~~circular plug shaped device that is positioned above the entrance to the SDC to prevent fragments from impacting the second loading chamber. When rotated, the fragment valve moves out of the opening to the SDC and the cradle is aligned discharging the munitions to the SDC. Once the munitions have been delivered to the SDC, the cradle and fragment valve are rotated in the opposite direction, lining up the fragment valve over the opening to the SDC and the cradle to receive the next load. Once over the SDC, a hydraulic piston presses down on the fragment valve to hold it in position. Loading chamber gates are configured and designed to contain detonations or fragments within them equal to the design limit of the rest of the chamber.~~

~~After the munitions are fed to the inner detonation chamber the items heat resulting in a detonation and/or deflagration. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy fill material without the presence of explosives. As there is insufficient air contained within the detonation chamber to support complete combustion of the detonation products, the result is a pyrolysis reaction, which breaks down the detonation gases to simple compounds which are then further treated in the OCT system.~~

~~III K D-1b(1) Transportation of Material for Treatment~~

~~Transportation details for WMM to be treated at the SDC facility are discussed in Section IV B-5 and IV D-1k(3).~~

~~III K D-1b(2) Treatment of Explosive Elements~~

~~The munition or munition components will be placed in ammunition trays. The trays are placed on a loading system which takes them one at the time into the SDC. The transport procedure is remotely started from the control room once the loading activities are complete.~~

~~The trays are individually transported to the lift and delivered to loading chamber 1. The gastight gate at the entrance of loading chamber 1 is opened and the tray is pushed into the chamber. Gate one is closed. The second gastight gate between loading chamber 1 and 2 is opened and the tray is pushed into the cradle inside loading chamber 2. Gate 2 is then closed. When needed, loading chamber 1 may be filled with flush tank solution, pressing any gas that may have leaked from the package through a pipe into loading chamber 2. The fragment valve and cradle are rotated 90° and the tray falls down into the SDC. The fragment valve and cradle are then rotated back into the loading position with the fragment valve located over the entrance to the SDC to act as a shield for loading chamber 2. If present, the flush tank liquid is then emptied from loading chamber 1. A valve in the pipe leading to loading chamber 2 is closed and another valve is opened to let fresh air into loading chamber 1 eliminating the risk of leakage. A description of these items is described below.~~

~~Conveyor System~~

~~The conveyor system is electrically powered and consists of:~~

- ~~A series of conveyors which transport the ammunition trays to the lift~~
- ~~A Lift which lifts the trays up to loading chamber 1~~
- ~~A electrical pusher which pushes the tray in to loading chamber 1~~

~~Gate 1~~

~~Gate 1 is the inlet hatch to loading chamber 1. It is a sliding gate and operated hydraulically. The gate is sealed gastight with 1 pneumatic seal. An electric pusher is mounted on gate 1 which pushes the package into loading chamber 2.~~

~~Loading Chamber 1~~

~~Loading chamber 1 is a sluice part before loading chamber 2. Between loading chamber 1 and 2 there is a gastight gate. Loading chamber 1 may be filled with a water based flush tank solution after any loading sequence in order to evacuate gases to the treatment system.~~

~~Gate 2~~

~~Gate 2 is the inlet gate to loading chamber 2. It is a sliding gate and operated hydraulically. The gate is sealed gastight with 2 pneumatic seals. It is designed to withstand explosions up to 6.6 lbs TNT equivalent.~~

~~Loading Chamber 2 and Cradle~~

~~Loading chamber 2 has a built in hydraulic powered cradle. The cradle is designed to withstand the pressure and the fragments from the detonation chamber. When the tray has been pushed in loading position the cradle turns 90° in clock wise direction and the package falls down into the detonation chamber. The cradle then turns back and a fragment valve provides a fragment shield by means of a hydraulically operated cone that seals off loading chamber 2 against the SDC. Both positions of the cradle may be monitored by cameras so that both a successful loading of the tray and a successful fall into the SDC can be assured.~~

~~Destruction of munitions in the SDC~~

~~The munition is dumped into the detonation chamber and lands on the hot scrap material at the bottom of the chamber. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy fill material without the presence of explosives. The munitions are heated until, deflagration or detonation and the explosives in the munitions are destroyed. The destruction process is identified either by the dynamic pressure sensor and/or the static pressure sensor, aided by a sound sensor.~~

~~The heat is generated by heating elements in the space between the chamber and the shell. During the destruction process, pressure and temperature inside the SDC are monitored and recorded in the control room. Heated sweep air is continuously added to the detonation chamber during operation. The gases from the destruction process will be transferred into and cleaned by the OGT system.~~

~~To eliminate potential overpressure peaks coming from the SDC, the off gases shall pass through a buffer tank in order to reduce such pressure peaks before the gases are transferred to the downstream OGT system.~~

~~Upper Detonation Chamber (UDC)~~

~~The upper part of the SDC is mounted to the outlet flange of loading chamber 2. Connections for incoming process air, outlet exhaust gases, temperature sensors and pressure gauges are placed on the SDCs upper part.~~

~~Lower Detonation Chamber (LDC)~~

~~The lower part of the SDC has an inner fragment shield and an outer chamber. The space between the chamber and scrap chute is filled with insulation. Electrical resistance heating elements are located in the bottom.~~

~~Elevating and Turning System~~

~~When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks that make up the SDC lifting system (DCLS). The rotation of the LDC is made by a hydraulic motor, connected to the LDC with a chain which makes up the SDC Rotating System (DCRS).~~

~~Locking and Sealing System~~

~~The upper and lower parts of the SDC are locked to each other with a locking ring during destruction. The locking ring is maneuvered by two hydraulic cylinders. For the emptying procedure the locking ring is turned to the open position and lower part of the SDC is lowered and turned. The connection between upper and lower part of the SDC is sealed by three pressurized pneumatic gaskets during destruction.~~

~~Hydraulic Power Unit~~

~~The hydraulic power unit (HYPU) provides power to operate the following systems:~~

- ~~The elevating and turning system for the SDC (DCLS)~~
- ~~The tilting unit (DCRS)~~
- ~~Gates 1 and 2~~
- ~~The locking ring (DCLS)~~
- ~~The pushers~~

~~It has a built in backup pump which is driven by the uninterrupted power supply (UPS) of the SDC facility.~~

~~Scrap **Chute and Scrap Conveyor**~~

~~When ANAD determines (based on the material being fed) the SDC should be emptied of treated material, the LDC is lowered and then turned 180° so the scrap material can fall down the scrap chute to the scrap conveyor.~~

~~**Scrap Conveyor System**~~

~~a) Scrap conveyor 1 transports the scrap material to scrap conveyor 2.~~

~~b) Scrap conveyor 2 moves the scrap onto the vibration table. Scrap conveyor 1 and 2 are slow moving and allow the scrap to cool to a temperature where the material may be inspected.~~

~~c) The vibration table distributes the scrap evenly and delivers it onto the scrap inspection conveyor. It also separates dust from the scrap which is collected underneath in a basket.~~

~~d) The scrap inspection conveyor allows visual inspections of WMM after treatment has occurred in the SDC.~~

~~Detonation Chamber Air Heater~~

~~The air heater heats the process air. This hot air is led into the SDC to aid the destruction process.~~

~~Reserve Flush Tank~~

~~The reserve tank contains the water based solution which may be used to flush loading chamber 1 as needed after any loading sequence. Process air provides the needed pressure to drive the solution into loading chamber 1. When necessary, the solution can be emptied from loading chamber 1 into the SDC for destruction. Otherwise it will be led back into the reserve flush tank.~~

~~Off-Gas Treatment System (OGT)~~

~~The OGT system consist of a buffer or equalization tank which smoothes out pressure pulses caused by detonation within the SDC, followed by an orifice or a control valve which also helps to smooth the flow going to downstream components of the system. Following this orifice or control valve the gas is heated to approximately 2000 °F for at least 2 seconds, then cooled by a quench followed by a dry scrubber filter and then remaining contaminants are removed by two wet scrubber stages. The last step is a multistage exhaust filtration system, which acts as a safeguard backing up the OGT system before releasing the off gas to the environment. It should be noted that the entire OGT system is maintained at adequate temperature to reduce condensation. Descriptions of these items are provided below.~~

~~Buffer (equalization) Tank~~

~~This unit is designed to smooth gas pressure and volume surges from the SDC that occur whenever a munition detonates or deflagrates within the SDC. By smoothing surges the design of downstream equipment is simplified and the equipment is better able to operate near its optimum design flow rate. This allows more consistent removal of contaminants. The buffer tank is comprised of a cone bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section and are periodically and automatically removed~~

~~using a lock hopper type rotary valve for recycle to the SDC. The entire tank and all piping are maintained at a temperature using electric heaters and insulation.~~

~~Orifice / Control Valve~~

~~An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between two pipe flanges. The control valve may be operated automatically or by operator input to provide pressure control to downstream equipment. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.~~

~~Process Ventilation Cyclone, Filter, and Fan~~

~~The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.~~

~~Thermal Oxidizer~~

~~The off gases resulting from the pyrolysis process in the SDC are transferred to a thermal oxidizer. The thermal oxidizer is designed to accept all gases resulting from one feed cycle to the SDC. The thermal oxidizer is oversized for this peak flow and is actually able to accommodate twice the flow that is anticipated. The OGT is sufficiently designed to accommodate feed rates greater than the design for the SDC.~~

~~The thermal oxidizer uses natural gas or propane as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of 2 seconds or more at approximately 2000 °F for the peak load expected from the upstream SDC. An additional flow of secondary air is automatically added to ensure an oxidizing environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.~~

~~Spray Dryer~~

~~The off gas coming from the thermal oxidizer exits with a temperature of approximately 2000 °F. This off gas is quickly cooled to approximately 350 °F by the injection of water into the gas stream. The injected water will evaporate and the energy needed for the evaporation is taken from the off gas so that the gas will rapidly cool. The water injection or quench takes place in a spray dryer that is positioned at the inlet of the next treatment stage, the acid scrubber. The spray dryer uses spent scrubber liquids for the water feed and subsequently evaporates this water, leaving dry salts and particulates for disposal and removing the need for a water treatment system to process spent scrubber solutions. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a rotary lock hopper type valve for disposal.~~

~~Bag House Filter~~

~~A bag house filter is located after the spray dryer. This unit is comprised of a filter system where the bags have a layer of absorbent material added to them which is automatically renewed on a periodic basis. Most of the dust and heavy metals are removed in this unit. The removal occurs in a zone on the inside of the bags where a material suitable for control of the system (for example: sodium bicarbonate) is added. The ratio of the material may be adjusted to fit the application. The powdered mixture is fed continuously from a hopper by a screw feeder and pneumatic feed system to the baghouse where it adds to the layer of spent material on the inside of the bags. This allows a fresh surface to be presented to the incoming gases at all times. Periodically when the pressure drop across the filter exceeds a set point, the bags are emptied using a pulse jet, and the spent solids with the collected process dust is processed through a rotary lock hopper valve into a drum for disposal.~~

~~Quench Venturi~~

~~In the next step the air is cooled from approximately 350 °F to 170 °F. This is done with scrubber solution water from the acid scrubber. The water remaining from this step is cooled and recycled to the acid scrubber sump.~~

~~Acid Scrubber~~

~~The off gas in the acid scrubber will be further cooled to the operating temperature of the scrubber, which is approximately 150 °F. The acid scrubber is a counter current design where the scrubber liquid flows counter current to the gas flow. The acid scrubber will remove several contaminants from the off gas. Initially, dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off gas. These components will dissolve in the scrubber liquid making it acidic. The scrubber pH will be controlled by a pH controller that ensures that the liquid has a sufficiently high pH value to obtain the necessary concentration gradient to wash the gases. The resistivity of the scrubber liquid will be monitored. In case of a low resistivity value indicating a high dissolved salt content the scrubber liquid will be partly replaced by fresh water. Excess scrubber liquid is then transferred to the spray dryer for evaporation and salt removal. Scrubber liquid is pumped from the bottom of the scrubber column to the top and is distributed inside the column by spray nozzles. The off gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure and adequate mixing and contact between the liquid and the gas, the columns are filled with a column packing material. As a safeguard, the temperature of the off gas inlet will be monitored. In case of a high temperature off gas, due to a quench malfunction, an emergency water injection will be switched on.~~

~~Neutral Scrubber~~

~~After the acid scrubber the off gas is fed to the neutral scrubber. The neutral scrubber removes any residual contaminants that passed through the dry and acid scrubbers. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber also operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.~~

~~The scrubber liquid is monitored by a pH controller. Two solutions may be used to maintain the proper neutral pH. One is a NaOH solution and the other is an HCl solution. The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.~~

~~To obtain a constant quality in the scrubber a continuous waste stream is taken out through the column sump, which goes into the spray dryer. This stream is replaced by fresh caustic solution as needed.~~

~~Induced Fans (ID Fans)~~

~~The ID fans are located downstream after the particle filter. The ID fans ensure that the pressure of the off gas is slightly below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. The control of the pressure ensures that no contaminated off gas above emissions limitations is released into the environment. The ID fans work continuously during the operation of the plant. Two redundant fans are installed. If one fails, the other will automatically take over.~~

~~Safeguard Filter~~

~~The safeguard system is an exhaust filtration unit. The exhaust unit is designed and built in accordance with the requirements by the U.S. Army's Chemical Demilitarization program. The filter system is designed as a series of filters each performing a duty as described below:~~

- ~~Prefilter: removes particulates remaining in the gas stream that may cause blinding or clogging of the down stream HEPA filter~~
- ~~HEPA: removes particulates down to 0.3 microns~~
- ~~Charcoal: removes contaminants such as volatile and semi-volatile heavy metals~~
- ~~A space is included between the charcoal filters which allows for monitoring.~~
- ~~Charcoal: serves as a backup for the first charcoal filter described above~~
- ~~HEPA: ensures that there are no emissions of potentially contaminated particulates released to the atmosphere~~

~~The exhaust filter system housings are made of stainless steel and are equipped with differential pressure monitors on all filters to ensure adequate flow and to monitor for when a filter needs to be replaced. Filters within the unit use a bag in / bag out system so that the operator changing the filters never comes~~

~~in contact with the actual filter media. The systems include an ID fan to provide negative pressure in the system to protect against leakage.~~

~~Stack~~

~~The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist (ACGIH) industrial ventilation manual.~~

~~III K D-1b(3) Monitoring~~

~~The treated off gas is released to the downstream safeguard filter. Analytical gas analyzers will be placed after the safeguard filters. These analyzers will control and record parameters of the off gas so that the quality may be maintained and recorded. CEMS monitoring will be conducted in accordance with the SDC CEMS Certification Plan. The following materials will be monitored:~~

- ~~Carbon monoxide (CO)~~
- ~~Oxygen (%)~~

~~III K D-1c Miscellaneous Unit Wastes~~

~~ADEM Admin. Code 335-14-5-.24(2)(a)1, 335-14-5-.24(2)(b)1, and 335-14-5-.24(2)(c)1~~

~~The characteristics of the components of the WMM are described in Section IV C of the ANAD RCRA Application. The wastes generated from the SDC facility are described in Section III K C.~~

~~III K D-1d Applicable Performance Standard~~

~~The applicable performance standards considered to be appropriate for the SDC unit are the miscellaneous unit standards under AAC 335-14-5-.24. The SDC facility has demonstrated a DRE of 99.9999 percent (%) for Mustard Agent and Monochlorobenzene.~~

~~III K D-1e Provisions to Prevent Releases of Hazardous Waste or Hazardous Waste Constituents Into the Groundwater or Subsurface Environment, or into Surface Water, or Wetlands or on the Soil Surface~~

~~ADEM Admin. Code 335-14-5-.24(2)(b) and (c), and 335-14-8-.02(14)(b) and (c)~~

~~To prevent releases into the groundwater or subsurface environment, surface water, wetlands, or on the soil surface, a containment system will be provided that conforms with the requirements of AAC 335-14-5-.09(6)(b). Refer to the ANAD RCRA Permit Application for information regarding to the hydrologic conditions and precipitation information at ANAD. The following sections describe the containment system at the SDC Facility.~~

~~III K D-1e(1) Basic Design Parameters, Dimensions, and Materials of Construction of the Containment System~~

~~ADEM Admin. Code 335-14-5-.09(6)(b)(1), and 335-14-8-.02(6)(a)(1)~~

~~The treatment process is performed inside the SDC facility. For the processing of munitions the SDC design incorporates triple redundant containment with the primary containment consisting of the SDC itself, a secondary containment consisting of a structure around the SDC up to the thermal~~

~~oxidizer, and a tertiary containment which consists of a sprung structure, which is an engineered stress membrane structure.~~

~~The first containment consists of the SDC including the loading system, the buffer tank, and the off gas piping up to the thermal oxidizer of the off gas treatment system. All equipment of the first containment area is built to be gastight.~~

~~The three containers which are holding the loading system and the SDC are equipped with a ventilation system which ensures a negative pressure. The containers and SDC equipment are also designed to enable decontamination. The buffer tank as well as the off-gas piping leading from the SDC to the buffer tank and from the buffer tank to the thermal oxidizer are encapsulated and connected to the process ventilation system.~~

~~Though not required for WMM operations, the sprung structure may also be equipped with a negative air pressure carbon filtration unit. The structure is equipped with an airlock type vestibule. The vestibule is connected to the ventilation system so that it is kept under negative pressure when the outer door is closed and preserves the negative pressure inside the main containment when the outer door is opened.~~

~~III K D-1e(2) Containment System Drainage~~

~~ADEM Admin. Code 335-14-5-.09(6)(b)(2), and 335-14-8-.02(6)(a)(1)~~

~~The floor of the structure will be concrete and will include containment (diked / bermed areas) where liquids may be present in the treatment process. Where containment is required, the floor will be coated with an appropriate sealant to ensure any liquids released to the secondary containment are captured. The floors within the diked / bermed areas will be sloped to allow for collection of liquids.~~

~~III K D-1e(3) Containment Capacity~~

~~ADEM Admin. Code 335-14-5-.09(6)(b)(3), and 335-14-8-.02(6)(a)(3)~~

~~Containment capacity will be sufficiently sized to capture the entire liquid contents of the OGT system for the SDC. Estimated total volume is 700 gallons.~~

~~III K D-1e(4) Control of Run-On~~

~~ADEM Admin. Code 335-14-5-.09(6)(b)(4), and 335-14-8-.02(6)(a)(4)~~

~~The SDC facility will be constructed approximately 850 feet above sea level, and the area surrounding this facility is adequately sloped. The sprung structure has a sloped roof that facilitates rainwater drainage away from the building. The facility is located in an area that is not known to be flooded and is not in a 100-year flood plain. The storm drainage is designed for a 10-year storm capacity.~~

~~III K D-1e(5) Removal of Liquids from Containment System~~

~~ADEM Admin. Code 335-14-5-.09(6)(b)(5), and 335-14-8-.02(6)(a)(5)~~

~~All spills and leaks are reported in accordance with the ANAD Integrated Contingency Plan.~~

~~III K D-1fProvisions to Prevent Release into the Air~~

~~ADEM Admin. Code 335-14-5-.24(2)(c), and 335-14-8-.02(14)(b) and (c)~~

~~During normal operations at the SDC facility, emissions will be below the limitations imposed on the facility. The elaborate OGT system adequately serves to minimize emissions. In the event of equipment upsets, the system is designed to allow for closing off the system to restrict emissions while necessary corrective actions are performed.~~

~~III K D-1f(1) ADEM Administrative Code Standards~~

~~ADEM Admin. Code 335-14-5-.27~~

~~The facility has no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or stream stripping operations that manage hazardous wastes. Therefore, AAC 335-14-5-.27 is not applicable.~~

~~ADEM Admin. Code 335-14-5-.28~~

~~The facility also has no pumps, compressors, pressure relief devices, sampling connecting systems, open-ended valves or lines, valves in gas/vapor or light liquid service, or pumps, valves, flanges, and other connectors in heavy liquid service associated with processing of the munitions. Therefore, AAC 335-14-5-.28 is not applicable.~~

~~ADEM Admin. Code 335-14-5-.29~~

~~The average volatile concentration of wastes generated is less than 100 parts per million by weight (ppmw). Therefore, analysis of the volatile organic concentration, in accordance with the analytical methods specified in AAC 335-14-6, is not required.~~

~~The standards, which may be appropriate to the processing of munitions, are the container standards specified in AAC 335-14-5. The standards apply to containers having design capacities greater than 0.1 cubic meters (approximately 26 gallons). The maximum quantity of fill material in any WMM to be processed at the SDC will contain less than 0.1 cubic meters as the system is not capable of accepting WMM at that size. Therefore, the munitions qualify for exemption from the container standards. Wastes contained in drums are managed under the less than 90-day generator requirements at the SDC facility, including compliance with AAC 335-14-6 air emission standards for containers.~~

~~The SDC facility is equipped with a ventilation system leading to a carbon filtration system. A description of the ventilation system is provided in Section III K D-1f(2). Operating and monitoring requirements are described in Section III K D-1g.~~

~~III K D-1f(2) Design Parameters of Closed Vent System – Heating, Ventilation, and Air Conditioning System~~

~~No volatile organic compounds (VOC) are carried within valved or piped systems for the SDC facility; therefore, a closed vent system is not required.~~

~~III K D-1f(3) Air Quality~~

~~According to the ADEM, the air quality in the Anniston area meets the National Ambient Air Quality Standards (NAAQS) set to protect public health and welfare [Environmental Impact Statement (EIS) 1991]. Dugger Mountain Wilderness Area, 30 miles northeast of the ANAD location, is classified as a Prevention of Significant Deterioration (PSD) Class I area, where additional degradation of local air quality is severely restricted. This is the closest PSD Class I area to the SDC facility. (EIS 1991).~~

~~No significant emissions are expected from treatment operations. ANAD is over 30 miles away from the Dugger Mountain Wilderness PSD Class I area and since there are no emissions expected from SDC facility, there is no likelihood of the treatment operation impacting this PSD Class I area.~~

~~Emissions in the southeast industrial area of ANAD from natural gas-fired boilers (one 61.5 million British thermal units (BTUs), two 21 million BTUs each, two 9 million BTUs each, two 12.52 million BTUs each and two 90 million BTUs each) are of sufficient magnitude to designate the ANAD as a major stationary source of air emissions.~~

~~III K D-1f(4) Operation of Closed Vent System~~

~~No volatile organic compounds (VOC) are carried within valved or piped systems for the SDC facility; therefore, a closed vent system is not required.~~

~~III K D-1g Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action~~

~~ADEM Admin. Code 335-14-5-.24, and 335-14-8-.02(14)(a)2~~

~~III K D-1g(1) Monitoring Equipment~~

~~The SDC will be equipped with Continuous Emissions Monitoring devices (CEMS). The CEMS unit will monitor for carbon monoxide and oxygen.~~

~~III K D-1g(2) Location of Monitoring Devices~~

~~Location of monitoring devices in the SDC unit will be after the OGT system.~~

~~The SDC Facility will remain available to process recovered rounds from within the State of Alabama. Should the need arise to monitor a chemical fill round, the Permittee must await concurrence from the Department prior to receipt of the munition to ensure that any additional requirements which the Department may require have been communicated. The Department may respond with additional conditions that may be applicable for the receipt, storage and processing of recovered items to include additional monitoring requirements.~~

~~III K D-1g(3) Operation of Monitoring Devices~~

~~Monitoring devices will remain in operation in accordance with regulatory requirements during hazardous waste processing within the SDC.~~

~~III K D-1g(4) Quality Assurance/Quality Control (QA/QC) Requirements~~

~~If a suspect munition is found, the person in charge of the project determines the course of action. It is up to his/her discretion to confer with the Quality Assurance/ Safety Officer and request an evaluation of the round(s) in question.~~

~~III K D-1g(5) Response Procedures~~

~~In the event of an emergency, all personnel will follow the SDC Contingency Procedures and the ANAD Integrated Contingency Plan. The attachments for treatment operations at the SDC facility have been incorporated into the ANAD Integrated Contingency Plan for munitions' treatment.~~

~~III K D-1g(6) Inspection and Preventive Maintenance~~

~~Refer to Table III K-3 for inspection and preventive maintenance procedures for the monitoring equipment.~~

~~III K D-2 CONTAINER DESIGN~~

~~Hazardous wastes that are stored in containers at the SDC facility, including the service magazines and storage igloos, include: primary waste and secondary waste. Primary waste is defined as WMMs. Secondary waste is defined as all hazardous waste that is not defined as primary waste. Primary and secondary waste will be managed in accordance with Section III K C of the ANAD RCRA Permit Application.~~

~~There is one permitted storage area located outside and adjacent to the SDC facility. These are the Service Magazines (712, 713, and 714). The WMM may be stored in the Service Magazine while waiting to be processed through the SDC. Secondary waste generated from SDC operations may also be stored in the Service Magazine or another permitted storage area or igloo prior to shipment off site in accordance with applicable regulations.~~

~~III K D-2a Description of Containers and the Service Magazine and Igloos at the SDC Facility~~

~~The wastes stored in the service magazines or igloos are primary or secondary wastes. WMM and secondary waste associated with the operation of the SDC facility will be stored in either of these locations. Waste will be stored in appropriate containers and will be labeled accordingly. WMM and Recovered WMM may not be containerized and will not be labeled.~~

~~III K D-2a(1) SDC facility Service Magazines and Storage Igloos~~

~~The service magazines (see Figure III K-5) are actually one structure with three separate storage bays and doors. The magazine is an earthen covered steel reinforced concrete structure that is 29 feet deep and 17 feet high at the highest and approximately 170 feet wide. This structure was constructed in accordance with Department of Defense Explosive Safety Board (DDESB) standards and satisfies the Military Munitions Rule (MMR) requirements. The SDC facility Service Magazine will be maintained in accordance with DDESB requirements.~~

~~The storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and will serve as the primary storage for WMM prior to them being offered to the SDC for treatment. The igloos are primarily being permitted to allow for storage of hazardous waste material contaminated with energetics that is delivered for treatment at the SDC from DoD facilities, for storage of Recovered WMM that have been declared as hazardous waste or for storage of WMM that have previously been declared to be hazardous waste.~~

~~III K E Groundwater Monitoring~~

~~ADEM Admin. Code 335-14-8-.02(5)(c), 5, 6, 7, and 8~~

~~The groundwater monitoring requirements of AAC 335-14-5-.06 apply to surface impoundments, waste piles, land treatment units, and landfills. None of these types of hazardous waste management units will be included in SDC facility; therefore, groundwater monitoring is not required.~~

~~III K FSecurity~~

~~ADEM Admin Code 335-14-5-.02(5) and 335-14-8-.02(5)(b)4~~

~~This section contains information concerning procedures to prevent hazards in accordance with ADEM Admin. Code R.335-14-5-.02(5). These regulations require a description of the security procedures and equipment, inspection schedules, justification for a waiver of preparedness and prevention requirements, spill prevention containment and countermeasures plan, and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.~~

~~III K F-1 SECURITY PROCEDURES AND EQUIPMENT~~

~~ADEM Admin. Code 335-14-5-.02(5) and 335-14-8-.02(5)(b)4~~

~~Security is addressed in Section II F-1a. The SDC facility is located within the Ammunition Limited Area (ALA) of ANAD. Access to this area requires passage through an additional fence/gate system.~~

~~III K F-1a Twenty-Four Hour Surveillance System~~

~~ADEM Admin. Code 335-14-5-.02(5)(b)1~~

~~Surveillance systems are addressed in Section II F-1a.~~

~~III K F-1b Barrier and Means to Control Entry~~

~~ADEM Admin. Code 335-14-5-.02(5)(b)2~~

~~III K F-1b(1) Barrier~~

~~ADEM Admin. Code 335-14-5-.02(5)(b)2(i)~~

~~The SDC facility area is surrounded by two 7-foot high chain link security fences. These fences are separated by 30 feet. Each fence is topped with three strands of barbed wire. The perimeter is completely lighted. No space in the fence is greater than 4 inches wide. The bottom of the fence is blocked by cement curbing.~~

~~III K F-1b(2) Means to Control Entry~~

~~ADEM Admin. Code 335-14-5-.02(5)(b)2(ii)~~

~~Entrance to the ANAD is through one of three gates, all of which are attended 24 hours per day by armed guards. Entrance to the SDC facility area is through the ALA, which is accessible through controlled points of entry within the ANAD. All personnel are required to wear identification badges when reporting for work and while on the premises. Visitors are not permitted on the facility premises without first registering and receiving the proper badge, which must be displayed at all times.~~

~~Visitors to the SDC facility area are always accompanied during their visit and are subject to security checks.~~

~~III K F-1b(3) Warning Signs~~

~~ADEM Admin. Code 335-14-5-.02(5)(c)~~

~~Signs warning that the area is restricted and dangerous, and that unauthorized entry is illegal, are posted along the perimeter fence surrounding the ANAD at~~

~~numerous locations and near all access gates. These signs are approximately 18 inches by 24 inches and are easily visible at a distance of 25 feet. Large signs describing the "Conditions of Entry" are posted at each gate. These signs are approximately 4 feet by 6 feet in size, and warn of the possible consequences of unauthorized entry.~~

~~III K F-1c Waiver~~

~~ADEM Admin. Code 335-14-5-.02(5)(a)~~

~~A waiver is not being sought; therefore, this section is not applicable.~~

~~III K F-1d Injury to Intruder and Violation Caused By Intruder~~

~~ADEM Admin. Code 335-14-5-. 02(5) a 1 and 2~~

~~Section III K F-1 and III K 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. Section III K F-1b (1) and (2) will not apply, and therefore will not be addressed.~~

~~III K F-2 INSPECTION SCHEDULE~~

~~ADEM Admin. Code 335-14-5-.02(6), 335-14-5-.24(3), and 335-14-8-.02(5)(b)5~~

~~III K F-2aGeneral Inspection Requirements~~

~~ADEM Admin. Code 335-14-5-.02(6)(a) and (b), 335-14-5-.03(4), and 335-14-8-.02(5)(b)5~~

~~The SDC facility area is inspected according to a prescribed inspection schedule designed to detect equipment deterioration and prevent possible equipment malfunctions that can potentially cause a release of hazardous wastes to the environment or pose a threat to human health. The inspection schedule document and inspection records will be located at the SDC facility. The inspection program will include inspections of the equipment such as those listed in Table III K-3[5]. Example inspection frequencies are also shown in Table III K-3. Inspection requirements will not be performed while the SDC facility is not in operation. This does not apply to any wastes that are in storage. Inspection of waste storage areas will be conducted at all times in accordance with regulatory requirements when waste is present.~~

~~III K F-2a(1) Types of Problems~~

~~ADEM Admin. Code 335-14-5-.02(6)(b)3~~

~~The types of problems looked for during inspections are identified in Table III K-3 in the "Types of Problems" column.~~

~~III K F-2a(2) Frequency of Inspection~~

~~ADEM Admin. Code 335-14-5-.02(6)(b)4, and 335-14-5-.15(8)(c)~~

~~The frequency of inspection is given in Table III K-3 in the "Frequency" column. The frequency of inspection is based on 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. The inspections are performed often enough to allow~~

~~[5] All tables are located at the end of this section.~~

~~identification of problems in time to correct them before they harm human health or the environment.~~

~~Where appropriate, inspection frequencies have been developed from operational knowledge. Manufacturer recommendations, Army SOPs, Occupational Safety and Health Administration (OSHA) regulations, and specified regulated unit requirements are also adhered to.~~

~~III K F-2bSpecific Process Inspection Requirements~~

~~ADEM Admin. Code 335-14-5-.02(6)(b)4, and 335-14-8-.02(5)(b)5~~

~~III K F-2b(1) Miscellaneous Unit Inspection~~

~~ADEM Admin. Code 335-14-5-.24(3) and 335-14-8-.02(5)(b)5~~

~~The inspection records will be kept at the SDC facility until the completion of closure of the SDC facility.~~

~~Inspections of operating and structural equipment, security devices, safety and emergency equipment, loading/unloading areas, monitoring equipment, secondary containment systems and the HVAC system at the facility are included in Table III K-3.~~

~~III K F-2b(2) Inspection for Process Vents~~

~~ADEM Admin. Code 335-14-5-.27~~

~~The requirements of this section are not applicable because SDC facility does not operate any distillation/fractionation, thin-film evaporation, or solvent extraction units, nor does it conduct air or steam stripping operations.~~

~~III K F-2b(3) Inspection Procedures for Equipment Leaks~~

~~ADEM Admin. Code 335-14-5-.28~~

~~Inspections of operating equipment at the SDC facility are included in Table III K-3~~

~~III K F-2b(4) Inspection for Air Emission Standards for Tanks, Surface Impoundments, and Containers~~

~~ADEM Admin. Code 335-14-5-.29~~

~~As described in Section III K D-1, the munitions are exempt from the requirements of AAC 335-14-5-.29.~~

~~Inspections of the HVAC system and monitoring devices are conducted and are specified in Table III K-3.~~

~~III K F-2c Remedial Action~~

~~ADEM Admin. Code 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. Remedial actions and required notifications for emergencies associated with the SDC facility area are detailed in the ANAD Integrated Contingency Plan.~~

~~If during routine inspection a drum is noted that has deteriorated or is beginning to leak (rusted, severely dented, lid fitting improperly, etc.), the drum will be~~

~~transferred to a new container or overpacked in place. Any spilled material will be cleaned up immediately.~~

~~III K F-2d Inspection Records~~

~~ADEM Admin. Code 335-14-5-. 05 (4)(b) 5~~

~~Inspection records that are used at the SDC facility area will identify name of inspector, observations made, and date and nature of repairs or remedial action taken. Inspection records will be on file at the SDC facility.~~

~~III K F-3 DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS~~

~~ADEM Admin. Code 335-14-8-.02(5)(B)6~~

~~The Army is not requesting any waivers for the preparedness and prevention requirements of AAC 335-14-5-.03(3) and 335-14-5-.03(6).~~

~~III K F-3aEquipment Requirements~~

~~ADEM Admin. Code 335-14-5-.03(3)~~

~~The following paragraphs describe the internal and external communication system, emergency equipment, and water for fire control that is available at SDC facility.~~

~~III K F-3a(1) Internal Communications~~

~~ADEM Admin. Code 335-14-5-.03(3)(a)~~

~~Telephones and public address loudspeakers are available at SDC facility in case of emergencies. The telephone system is available for internal as well as external communications.~~

~~III K F-3a(2) External Communications~~

~~ADEM Admin. Code 335-14-5-.03(3)(b)~~

~~The telephone system at the SDC facility is available for external communication with the ANAD and the surrounding areas.~~

~~III K F-3a(3) Emergency Equipment~~

~~ADEM Admin. Code 335-14-5-.03(3)(c)~~

~~SDC facility maintains an adequate inventory of emergency equipment. Portable fire extinguishers and a sprinkler system are available to minimize the threat of fire, as noted in Table III K-3. A list of the emergency equipment and inspection requirements is found in Table III K-3.~~

~~III K F-3a(4) Water for Fire Control~~

~~ADEM Admin. Code 335-14-5-.03(3)(d)~~

~~Sufficient water exists for fire control as part of the water distribution system.~~

~~III K F-3b Aisle Space Requirements~~

~~ADEM Admin. Code 335-14-5-.03(6)~~

~~The SDC facility Service Magazine is a permitted storage unit under the MMR to store munitions. Sufficient aisle space (24 inches) is maintained in the service magazines to allow unobstructed movement of personnel, fire protection equipment, and spill control or decontamination equipment.~~

~~Storage of WMM and recovered WMM in the SDC igloos will be in accordance with DDESB standards. Storage of other waste items will ensure sufficient aisle space is maintained to be at least 24 inches.~~

~~III K F-4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8~~

~~III K F-4aUnloading Operations~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8(i)~~

~~The three categories of wastes managed at the SDC facility include: (1) WMM to include recovered items, (2) Explosives and propellants, including waste material contaminated with energetics and (3) treatment residues, ash, cleaning solutions, ventilation filters. (See Sections III K C-1 and III K C-2 for more detail.)~~

~~Unloading operations for Hazardous WMM are described in Section IV F-4a of the ANAD RCRA Permit Application.~~

~~Treatment residues, ash, and other treated solid dunnage will be discharged directly to collection containers. Containers will be properly classified, labeled, and placed into storage awaiting off-site treatment and disposal. Ventilation filters will be removed by personnel in adequate PPE and placed in appropriate containers. Ventilation filters will be disposed of in accordance with Table III K-5.~~

~~Cleaning solutions generated during clean up activities will be collected in appropriate containers stored in the proper location prior to disposal.~~

~~Spills that occur during loading or unloading operations are unlikely; however, in the event of an accident, they are immediately cleaned up. Standard industrial absorbents, absorbent booms, pads, sand and dirt are used for clean up of spilled materials. Spill residues are placed in containers,~~

~~properly classified, labeled, and placed into storage awaiting off-site treatment and disposal.~~

~~III K F-4bRunoff~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8(ii)~~

~~Runoff from hazardous waste handling areas is prevented by the SDC design features. Waste handling takes place in an enclosed structure. Since the waste propellants and explosives are effectively destroyed during SDC operations and remaining residue is collected from the treatment, the process itself eliminates the potential for run-off.~~

~~III K F-4cWater Supplies~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8(iii)~~

~~The processing of all hazardous waste at the SDC facility takes place in an enclosed structure with a concrete base that will prevent the downward percolation of liquids. The SDC facility is not in a flood plain. Any spills of hazardous materials are cleaned up in accordance with procedures and if necessary the ANAD Integrated Contingency Plan. Therefore, prevention of contamination to waters supplies is achieved.~~

~~III K F-4dEquipment and Power Failure~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8(iv)~~

~~In the event of an electrical failure, an automatic transfer switch will start a diesel generator and will automatically transfer the essential load to the generator. The generator connected load will consist of the exhaust filter unit for the SDC facility to maintain pressure, cameras and electronics, and interior and exterior lighting.~~

~~III K F-4ePersonal Protection Equipment~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)8(v)~~

~~ANAD regulations establish Occupational Safety and Health requirements necessary to protect workers from unhealthful conditions. Levels of PPE for workers will vary throughout the installation and are based upon the specific task to be performed. A job safety hazard analysis will be generated for hazardous tasks at the installation. These identify work practices, protective clothing, and procedures necessary to protect the worker from potential hazards.~~

~~III K F-5 PREVENTION OF IGNITION OR REACTION OF IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES~~

~~ADEM Admin. Code 335-14-8-.02(5)(B)9~~

~~III K F-5aPrecautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste~~

~~ADEM Admin. Code 335-14-5-.02(8)(a), (b), (c), and 335-14-8-.02(5)(b)9~~

~~No ignitable or reactive waste will stored at the SDC facility. These wastes are moved to the facility at the time of treatment. No matches, lighters, or other flame-producing instruments are allowed in the possession of personnel at the SDC facility. WMM are, therefore, adequately protected from ignition. The SDC facility will be equipped with a sprinkler system designed to meet the special needs of individual areas.~~

~~III K F-5bGeneral Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste~~

~~ADEM Admin. Code 335-14-5-.02(8)(b), (c), and 335-14-8-.02(5)(b)9~~

~~General precautions for the SDC facility include:~~

- ~~SDC operations will be under the direct supervision of an experienced and trained supervisor charged with responsibility for all activities within the area. During the supervisor's absence, a competent qualified person is designated to be in charge. This competent person is also charged with sole custody of ignition devices. Prior to the treatment process, all personnel, including the supervisor or designee, are evacuated out of the structure.~~
- ~~No personnel return inside the facility until evidence of treatment is satisfied.~~
- ~~The number of personnel involved in SDC operations will be kept to a minimum to limit exposure of personnel for a minimum time to a minimum amount of hazardous material consistent with safe and efficient operations. However, at no times will fewer than two personnel be present when SDC operations are conducted.~~
- ~~Anyone entering the SDC facility area while operations are ongoing will report to the Control Room.~~

~~III K F-5cManagement of Ignitable or Reactive Wastes in Miscellaneous Units~~

~~ADEM Admin. Code 335-14-5-.24~~

~~Management of reactive wastes is addressed in IV F-5a, b, and c of the ANAD RCRA Permit Application.~~

~~III K F-5d Management of Incompatible Waste in Containers~~

~~ADEM Admin. Code 335-14-5-. 09(8)(a), (b) & (c) and 335-14-8-.02(6)(d)~~

~~Any incompatible wastes that may be generated will not be placed in the same container. All waste will be placed into new and/or cleaned containers for storage and off-site transportation/disposal or for disposal at a TSDF.~~

~~III K G Contingency Plan~~

~~ADEM Admin. Code 335-14-5-.03(8), 335-14-5-.04(1) through 335-14-5-.04(7), and 335-14-8-.02(5)(b)7~~

~~Contingency requirements for the Anniston Army Depot (ANAD), including the SDC facility treatment activities, are found in the ANAD Integrated Contingency Plan.~~

~~III K-H Personnel Training~~

~~ADEM Admin. Code 335-14-5-.02(7) and 335-14-8-.02(5)(b)12~~

~~The SDC facility Training Program provides SDC treatment personnel with the necessary knowledge and skills to perform hazardous waste duties safely, efficiently, and in an environmentally sound manner. The purpose of this training program is to prepare SDC facility personnel for treatment operations, with emphasis on reducing potential risks that may threaten human health or the environment. This is accomplished by ensuring that the SDC facility personnel handling hazardous waste can properly perform their assigned duties and responsibilities. In addition to providing training in the mechanics of the job functions, this training program provides SDC facility personnel with a thorough understanding of the treatment operations, including the safety and emergency response operations. Refresher training will be conducted, as necessary, to update workers on new methods or equipment.~~

~~This training program meets the requirements in AAC 335-14-5-.02(7), and 335-14-8-.02(5)(b)12 by:~~

- ~~Providing specific training for various hazardous waste management positions~~
- ~~Ensuring that all personnel involved in ammunition operations and planning complete the training program prior to being assigned to duties involving ammunitions or explosives~~
- ~~Providing training that ensures SDC facility personnel are able to respond effectively to emergencies~~
- ~~Ensuring that the SDC facility training program is directed by qualified persons trained in hazardous waste management practices~~
- ~~Maintaining required documentation at the SDC facility~~
- ~~Maintaining training records on current SDC facility personnel for at least 3 years from the date last worked.~~

~~III K-H-1 OUTLINE OF TRAINING PROGRAM~~

~~The SDC facility Training Program has been designed to ensure that personnel will be able to perform their specific job assignments. The training program consists of both onsite training and additional courses that apply to specific job functions.~~

~~Section III K-H-1a provides the job titles and job descriptions for the SDC facility personnel involved in hazardous waste operations. Section III K-H-1b describes the training content, frequency, and techniques. Section III K-H-1c describes the responsibilities of the appropriate supervisor, who coordinates training of the SDC facility personnel. Section III K-H-1d describes the~~

~~relevance of the training to the job positions, and Section III K H-1e describes training for emergency response.~~

~~III K H-1a Job Titles and Duties~~

~~ADEM Admin. Code 335-14-5-.02(7)(d)1 and 2~~

~~Complete job descriptions, including title, office, person reporting to, duties, and minimum qualifications/training for each position related to hazardous waste management shall be maintained at the AFO-SDC or at ANAD. Job titles and duties will be consistent with the current ANAD duties and responsibilities for safely treating explosive components from WMM in accordance with applicable OSHA, RCRA and military requirements.~~

~~In general, all personnel working at the SDC facility will be required to:~~

- ~~Demonstrate the ability to understand and apply both oral and written instructions at a level appropriate to the assigned job~~
- ~~Possess the aptitude and attitude necessary to ensure compliance with environmental, safety and job requirements~~
- ~~Be physically capable of doing the work.~~

~~III K H-1b Training Content, Frequency, and Techniques~~

~~ADEM Admin. Code 335-14-5-.02(7)(a)3, 335-14-5-.02(7)(c), and 335-14-5-.02(7)(d)3~~

~~The training program provides both initial and continuing training of all supervisors, operators, and all personnel involved in the waste management unit operations. The principal objectives of the training program are to train personnel to safely operate, maintain, and monitor the SDC facility operation. The training program includes job orientation, safety procedures, and basic work principles.~~

~~At a minimum, all SDC facility personnel involved in hazardous waste management operations have or will have received training in the following areas:~~

- ~~Hazard Communications (HAZCOM)~~
- ~~Hazardous Waste Operations and Emergency Response (HAZWOPER)/ 24-hour Occupational Safety and Health Administration (OSHA) 1910.120~~
- ~~RCRA Compliance~~

~~The SDC facility personnel are qualified to meet the minimum requirements outlined in OSHA standard 29 Code of Federal Regulations (CFR) 1910.120 covering HAZWOPER training for operations conducted under RCRA. Qualification records for the SDC facility personnel are maintained by the SDC facility operator. This minimum training includes:~~

- ~~24 hours of initial training, consisting of classroom and hands-on experience, in the use of PPE, implementation of the emergency response plan, safe operating practices, identification of potential hazards or hazardous situations, etc., in accordance with the OSHA standards~~
- ~~8 hours of annual refresher training in addition to the 24-hour HAZWOPER training~~

~~In accordance with U.S. Army Materiel Command (AMC) Regulation 350-4, any new personnel involved with the handling of WMM, as required for the download and reconfiguration, are required to meet certain training~~

~~requirements prior to their being assigned duties associated with the SDC facility operation. All personnel must successfully complete 18 hours of instruction. This is the minimum qualification. Additional course work may be required based on actual duties. The training director will determine if additional training is required. The following 18-hour block of instruction or equivalent constitutes the minimum training required:~~

- ~~Characteristics and Hazards of Explosives ..... 2 hrs~~
- ~~Explosives Safety ..... 2 hrs~~
- ~~Industrial Safety 2 hrs~~
- ~~Protective Clothing and Equipment ..... 2 hrs~~
- ~~Standing Operating Procedures ..... 2 hrs~~
- ~~Material Handling Equipment ..... 2 hrs~~
- ~~Specialized Training* ..... 4 hrs~~
- ~~Examination and Critique ..... 2 hrs~~

~~* This training is to acquaint the employee with conditions, procedures, and regulations as they apply to the specific job and local environment.~~

~~Personnel operating monitoring equipment are required to complete the same training as required by ANAD. Personnel maintaining monitoring equipment such as CEMS are required to complete the same training as required by ANAD.~~

~~III K H-1c Training Supervisor~~
~~ADEM Admin. Code 335-14-5-.02(7)(a)2~~

~~The appropriate supervisor is responsible for the training of the SDC facility personnel. The responsibilities of the Training Supervisor are to:~~

- ~~Coordinate training of the SDC facility personnel in the proper operation of the facility in accordance with Federal, state, Army, and installation regulations.~~
- ~~Coordinate continuing training, as necessary, to inform personnel of new procedures, provide refresher training, and provide training for new personnel.~~
- ~~Ensure that training records are maintained in accordance with 40 CFR 264.16(d) and (e).~~
- ~~Ensure that the SDC facility personnel are trained in hazardous waste management and contingency plan implementation, including emergency procedures, and ensure that personnel receive training appropriate to their positions.~~

~~III K H-1d Relevance of Training to Job Position~~
~~ADEM Admin. Code 335-14-5-.02(7)(a)2~~

~~The SDC facility personnel receive training relevant to the duties and responsibilities entailed by their positions.~~

~~III K H-1e Training for Emergency Response~~

~~ADEM Admin. Code 14-5-.02(7)(a)3~~

~~Emergency response training is designed and structured to ensure that all SDC facility personnel are trained to respond properly to emergency situations, as outlined in the ANAD Integrated Contingency Plan, and to maintain compliance, during emergencies, with applicable permit requirements and environmental regulations.~~

~~This training addresses non-routine situations that could lead to emergency involving hazardous wastes, if proper responses are not implemented, such as:~~

- ~~Procedures for using, inspecting, repairing, and replacing the SDC facility emergency and monitoring equipment~~
- ~~Communication and alarm systems~~
- ~~Implementation of the contingency plan and appropriate emergency notifications~~
- ~~Shutdown of operations and evacuation~~
- ~~Response to fires, explosions, or other releases~~

~~Additional topics covered during emergency response training include:~~

- ~~The chemical characteristics of the wastes personnel will be assigned to manage, that is, reactivity, toxicity characteristics~~
- ~~Knowledge of what to do in the event of a spill or leak~~
- ~~The types of protective equipment, which may include gloves, hard hat, eye protection, and splash resistant clothing.~~

~~Introductory training and annual review sessions will be offered to these personnel.~~

~~III K H-2 IMPLEMENTATION OF TRAINING PROGRAM~~

~~ADEM Admin. Code 335-14-5-.02(7)(b), and 335-14-5-.02(7)(d)4, and 335-14-5-.02(7)(e)~~

~~All personnel are trained prior to beginning work at the SDC facility. All the SDC facility personnel are required to complete the training program specific to his/her job assignment and will not work unsupervised until training has been successfully completed.~~

~~Training records for the SDC facility personnel are maintained onsite, and will include, at a minimum:~~

- ~~Job title for each position related to hazardous waste management operation and activities, and the name of each employee filling the position~~
- ~~Job description specifying duties for each position, minimum qualifications required to fill the position, and required training for the position~~
- ~~Description of the type and amount of introductory and continuing training that will be given to each employee~~
- ~~Date each employee started working at the SDC facility~~
- ~~Course enrollment, attendance, and successful completion information.~~

~~All training records and documentation on current SDC facility personnel are kept until closure of the building. Training records on former SDC facility personnel will be kept for at least 3 years from the date last worked.~~

~~III K IClosure Plan, Post-Closure Plan, and Financial Assurances~~

~~AAC 335-14-5-.07(1) through 335-14-5-.07(11), 335-14-5-.08(1) through 335-14-5-.08(12), 335-14-8-.02(5)(b)13 through 335-14-8-.02(5)(b)18, 335-14-5-.09(9), and 335-14-5-.10(8)~~

~~ANCDF performed decontamination of this facility at completion of the operational phase for chemical agent (mustard) operations. With the completion of chemical agent operations and based on the decontamination and monitoring records provided in the SDC Decontamination Report, the SDC unit, facilities, and service magazines are now classified as chemical agent free.~~

~~Since decontamination has occurred and proven that the facility is not agent contaminated, the operational process for the SDC facility may continue to be governed by Section III K or Section IV J of the ANAD RCRA Application. It is within Section IV J I where the detailed closure requirements for this facility are contained. Section III K will not address all closure requirements as a result.~~

~~III K I-1 CLOSURE PLAN~~

~~ADEM Admin. Code 335-14-5-.07(3), 335-14-8-.02(5)(b)13~~

~~During activities in the SDC facility, storage igloos or the service magazines, any identified hazardous waste spill will be remediated and containerized immediately. Records of all spills and cleanup activities will be recorded in an operating record.~~

~~Upon completion of operations, all hazardous waste and hazardous waste residues that may be in secondary containment will be removed. Equipment and structures will be decontaminated, if necessary, using an appropriate decontamination and water washing in accordance with the treatment technology requirements specified in 40 CFR 268.45. The decontamination residues will be placed into drums and may be stored at an ANAD storage igloo prior to being transferred off-site for disposal or for treatment in accordance with applicable regulations.~~

~~III K I-1a Closure Performance Standards~~

~~ADEM Admin. Code 335-14-5-.07(2)~~

~~Closure performance standards are presented in Section IV J I. Decontamination efforts for the SDC facility to transition from chemical agent operations to long term processing of WMMs has been conducted to verify that the facility is not agent contaminated.~~

~~After decontamination, ANCDF provided ADEM with professional engineering (PE) certification and notification of completion of the decontamination of~~

~~the SDC facility. The SDC Agent Decontamination Report was submitted in April of 2012 and approved by the ADEM on July 22, 2013.~~

~~III K I-1b Partial Closure and Final Closure Activities~~

~~ADEM Admin. Code 335-14-5-. 07(3)(b)~~

~~At this point, there is no date anticipated for implementation of closure for the SDC facility. Final closure should be completed within 180 days of completion of SDC activities.~~

~~Certification of Closure~~

~~The AFO-SDC will provide documentation of completion of closure activities at completion of the WMM processing phase for the SDC facility.~~

~~III K I-1c Maximum Waste Inventory~~

~~ADEM Admin. Code 335-14-5-.07(3)(b)3~~

~~The maximum waste munition inventory to be held in the SDC facility at any given time will be determined by approval of the site safety submittal by the DDESB.~~

~~III K I-1d Schedule for Closure~~

~~ADEM Admin. Code 335-14-5-.07(3)(b)2 and 6~~

~~At this time no specific date has been scheduled for implementation of closure for the SDC facility. The ADEM will be notified in writing at least 45 days prior to the date that any final closure operations are scheduled to begin. Final closure will occur when all operations are complete and final certification is received and approved by the Department. All hazardous waste including any spill cleanup material and decontamination residues will be removed from the facility within the 90-day time limit.~~

~~III K I-1d(1) Environmental Protection~~

~~Closure of the SDC facility will be performed in a manner that controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, 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, all necessary steps will be taken 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). The Permittees will comply with all applicable laws and regulations to ensure protection for human health and the environment.~~

~~III K I-1e Closure Procedures~~

~~ADEM Admin. Code 335-14-5-. 07(3), 335-14-5-.07(5) and 335-14-8-.02(5)(b)13~~

~~Prior to closure, any hazardous waste in the SDC facility may be sent to a permitted storage igloo prior to shipment off-site. Waste generated during the closure activities will be characterized in accordance with applicable regulations and disposed of accordingly.~~

~~III K I-2 POST-CLOSURE PLAN~~

~~ADEM Admin. Code 335-14-5-.07(9), and 335-14-8-.02(5)(b)13, and 335-14-5-.24(4)~~

~~Since the SDC facility is not a disposal site, and any residual hazardous contamination will be removed prior to closure, a postclosure plan is not required.~~

~~III K I-3 CERTIFICATION OF CLOSURE~~

~~ADEM Admin. Code 335-14-5-.07(6)~~

~~Within 60 days of completion of final closure procedures, a certification will be signed by a PE and then submitted by the Permittee, that the SDC facility has been closed in accordance with the closure plan and all applicable regulations. Should the government leave the equipment in place, ANCDF will certify closure from the controls of Section III of this application and transfer any follow on operational activities to Section IV J of the ANAD RCRA Permit Application.~~

~~III K I-4 CLOSURE COST ESTIMATE~~

~~ADEM Admin. Code 335-14-5-.08(3) and 335-14-8-.02(5)(b)15~~

~~Since the SDC facility will continue operations with WMMs' at the completion of the chemical agent campaign, and any residual hazardous contamination was removed prior to this transition, no closure cost estimate is required.~~

~~III K I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE~~

~~ADEM Admin. Code 335-14-5-.08(4), 335-14-8-.02(5)(b)15, and 335-14-5-.08(12)~~

~~No financial assurance mechanism for the closure of storage areas is required. AAC 335-14-5-.08(1) exempts States and Federal government from the financial requirements of AAC 335-14-5.~~

~~III K I-6 POST-CLOSURE COST ESTIMATE~~

~~ADEM Admin. Code 335-14-5-.08(5) and 335-14-8-.02(5)(b)16~~

~~No postclosure plan is required (see Section III K I-2); therefore, no postclosure estimate is required.~~

~~III K I-7 FINANCIAL ASSURANCE MECHANISM FOR POSTCLOSURE CARE~~

~~ADEM Admin. Code 335-14-5-.08(6), 335-14-8-.02(5)(b)16, and 335-14-5-.08(12)~~

~~No postclosure plan is required (see Section III K I-2); therefore, no financial assurance mechanism for postclosure care is required.~~

~~III K I-8 LIABILITY REQUIREMENTS~~

~~ADEM Admin. Code 335-14-8-.02(5)(b)17 and 335-14-5-.08(8)(a) and (b)~~

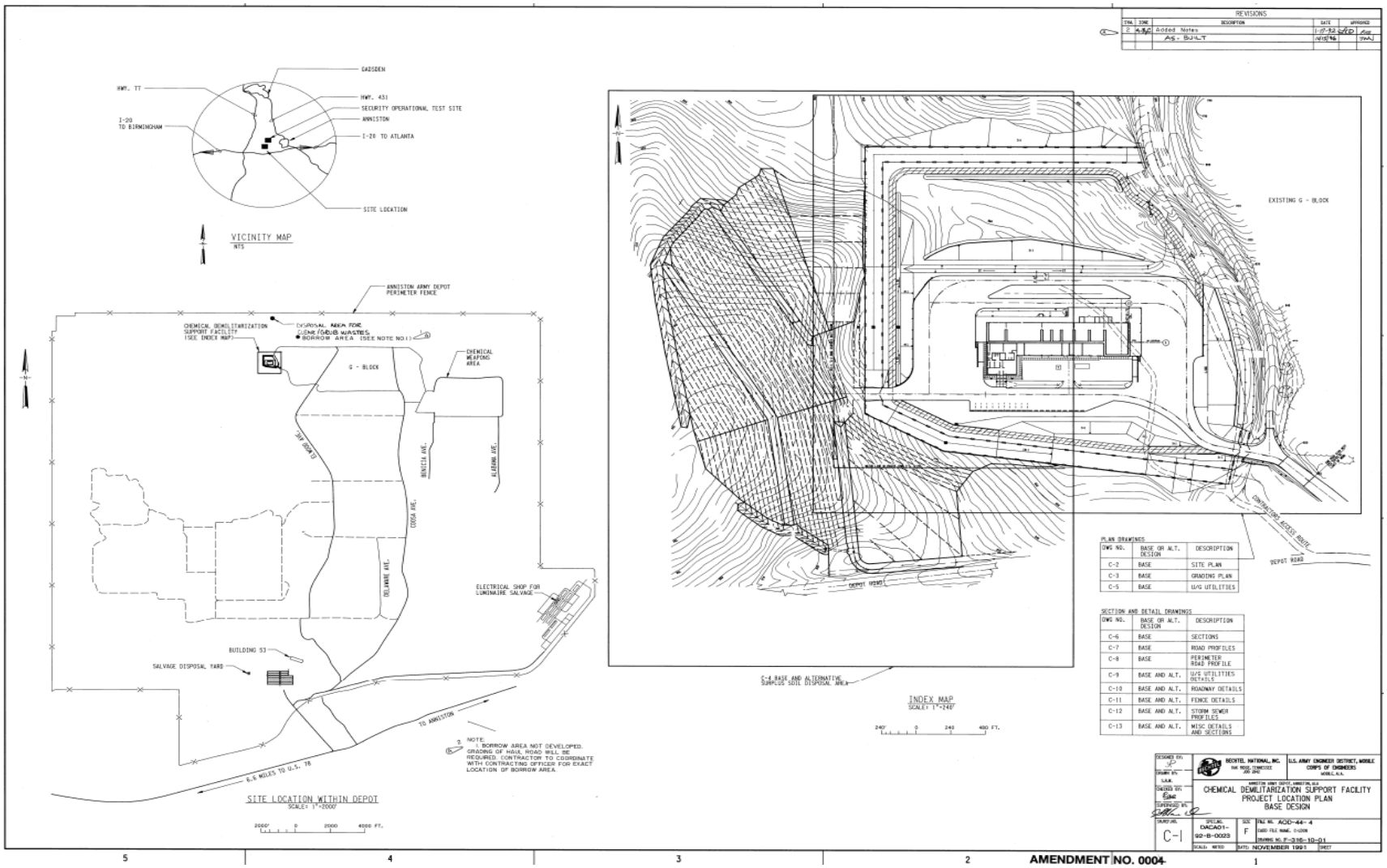
~~The Federal government owns the SDC facility; therefore, pursuant to AAC 14-5-.08(1)(d), it is exempt from the liability insurance requirements.~~

~~III K I-9 STATE FINANCIAL MECHANISM~~

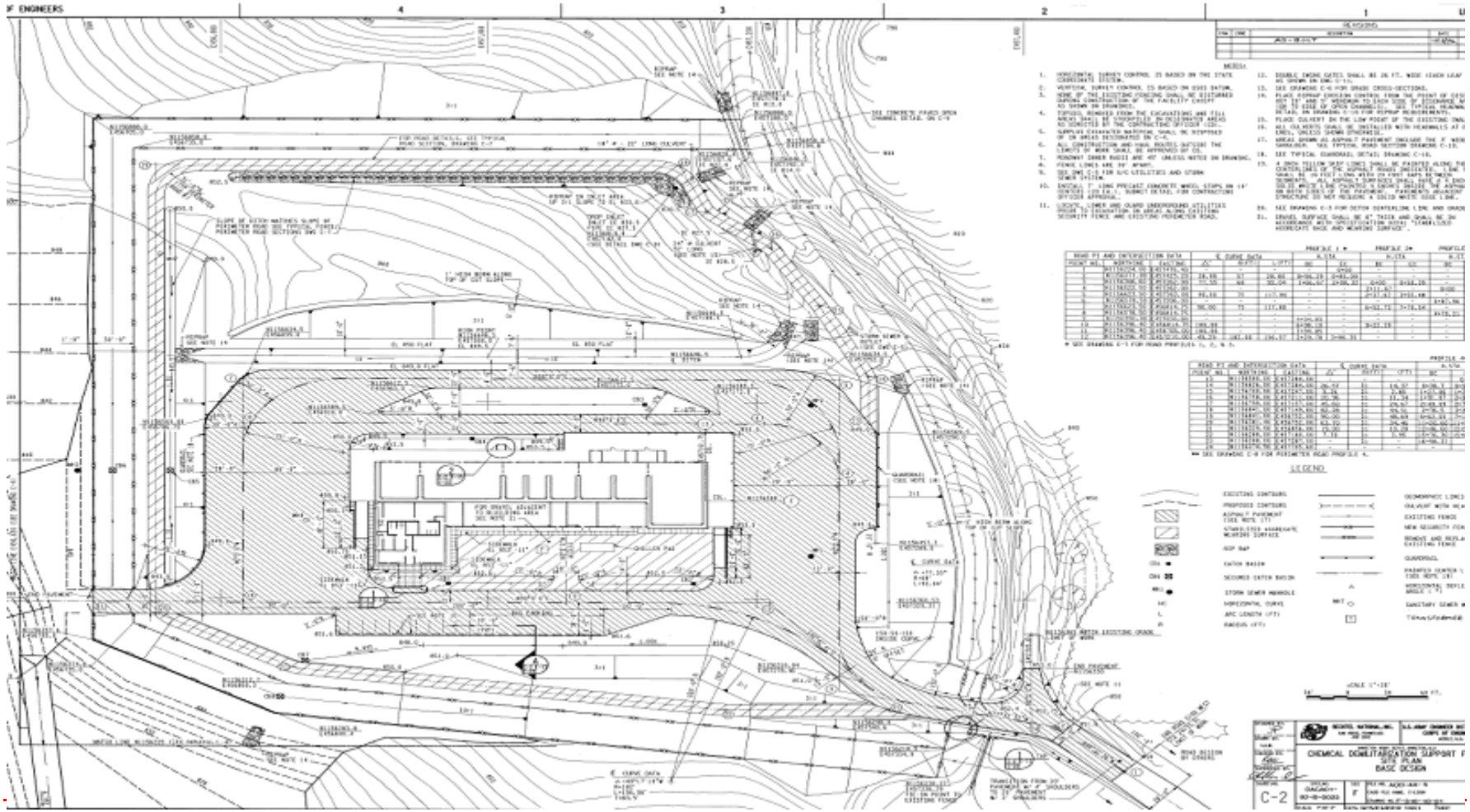
~~ADEM Admin. Code 335-14-8-.02(5)(b)18~~

~~Proof of coverage by a state financial mechanism is not required for the SDC facility because no financial assurance mechanism for the closure of the facility is~~

~~required. AAC 335-14-5-.08(1)(d) exempts states and the Federal government from the financial requirements of AAC 335-14-5.~~



~~Figure III K-1~~



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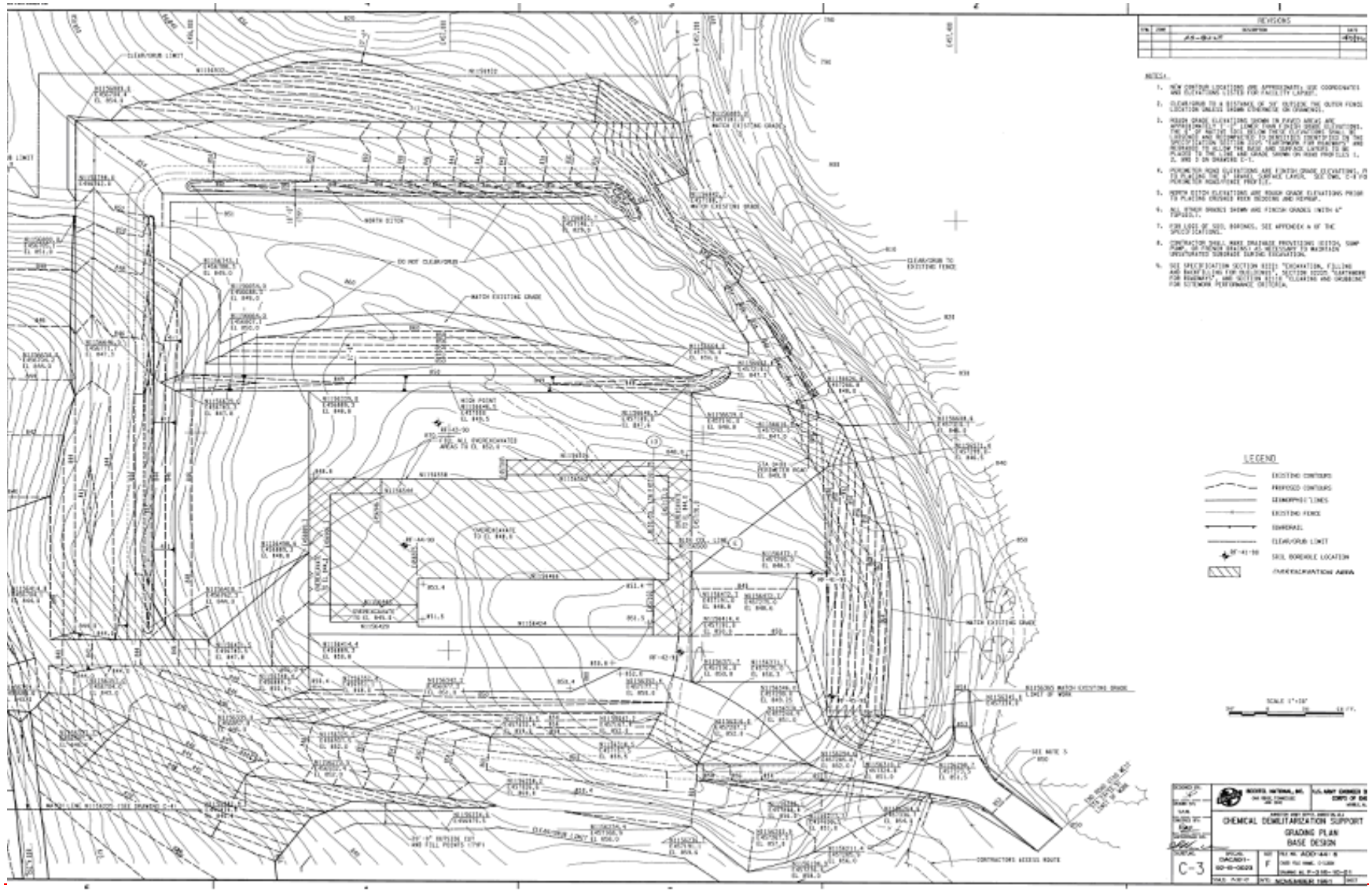

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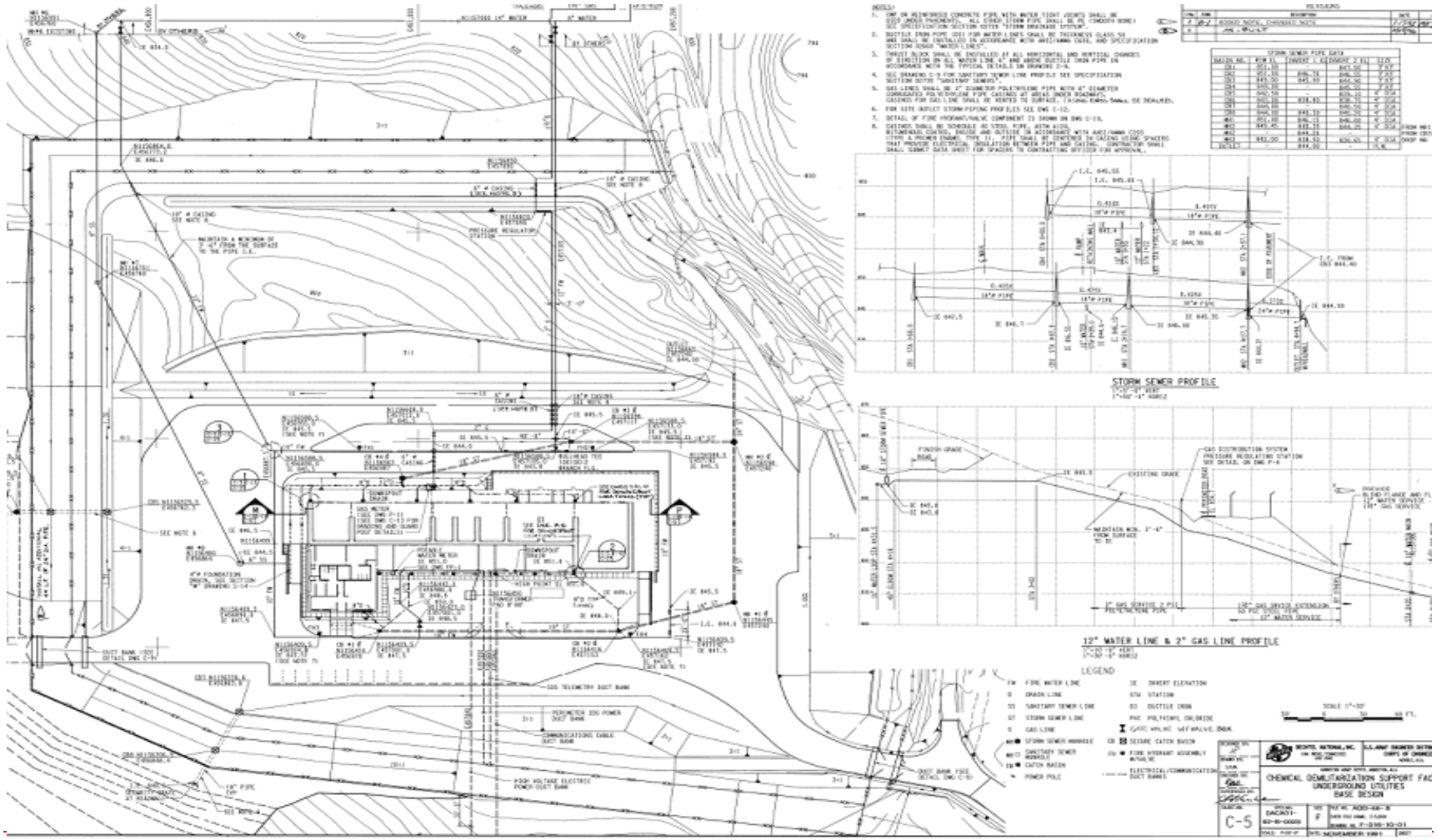

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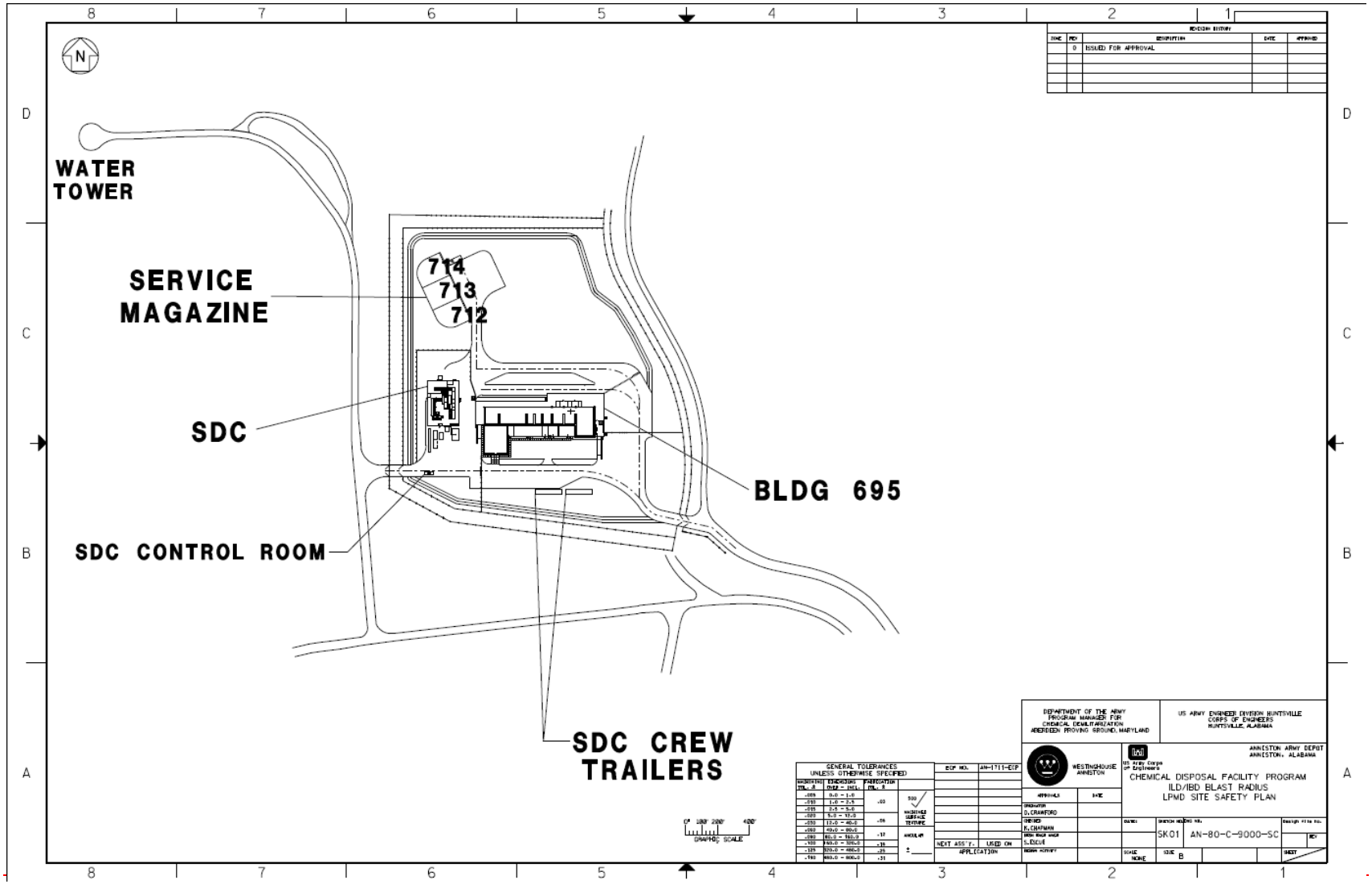

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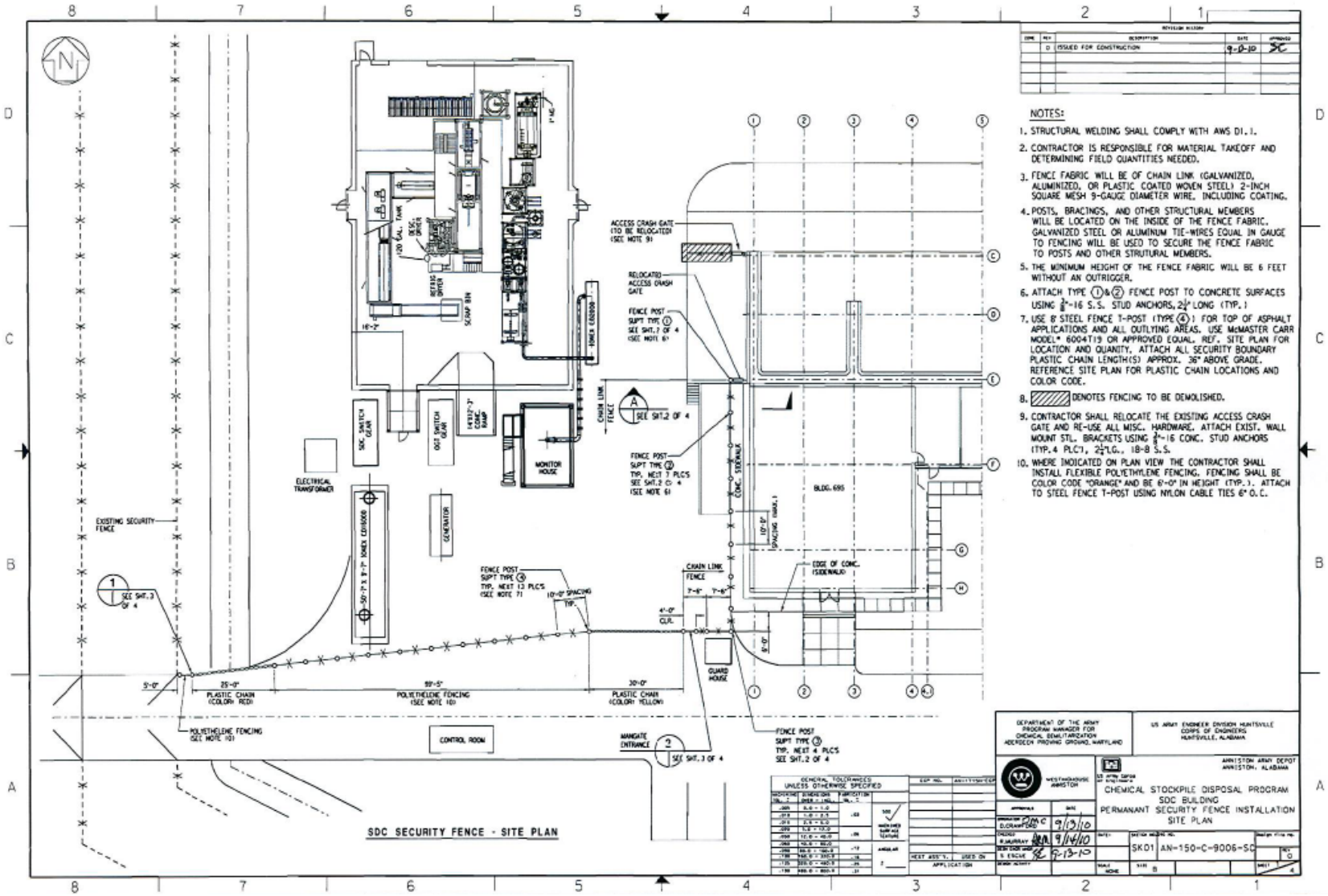

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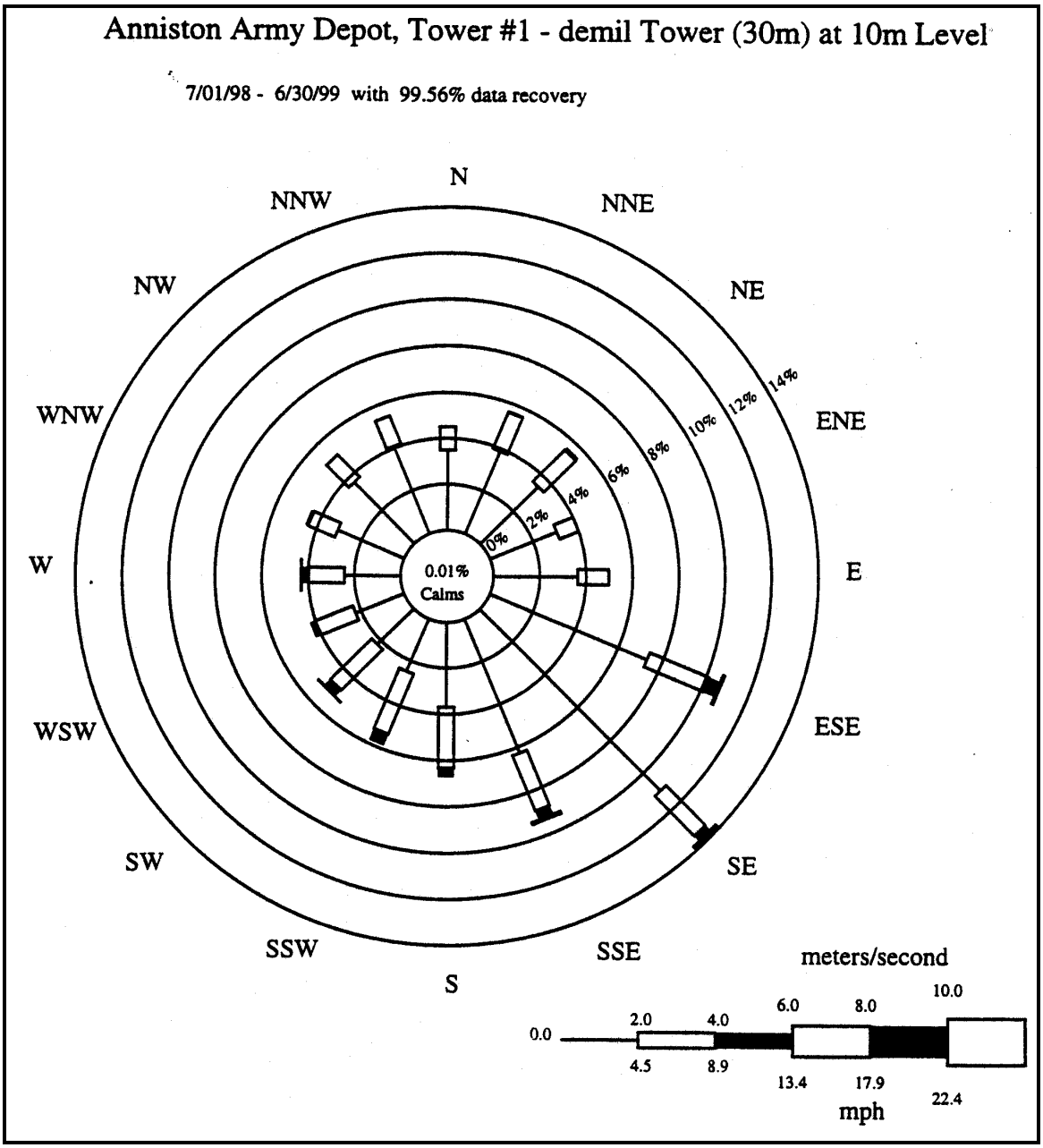
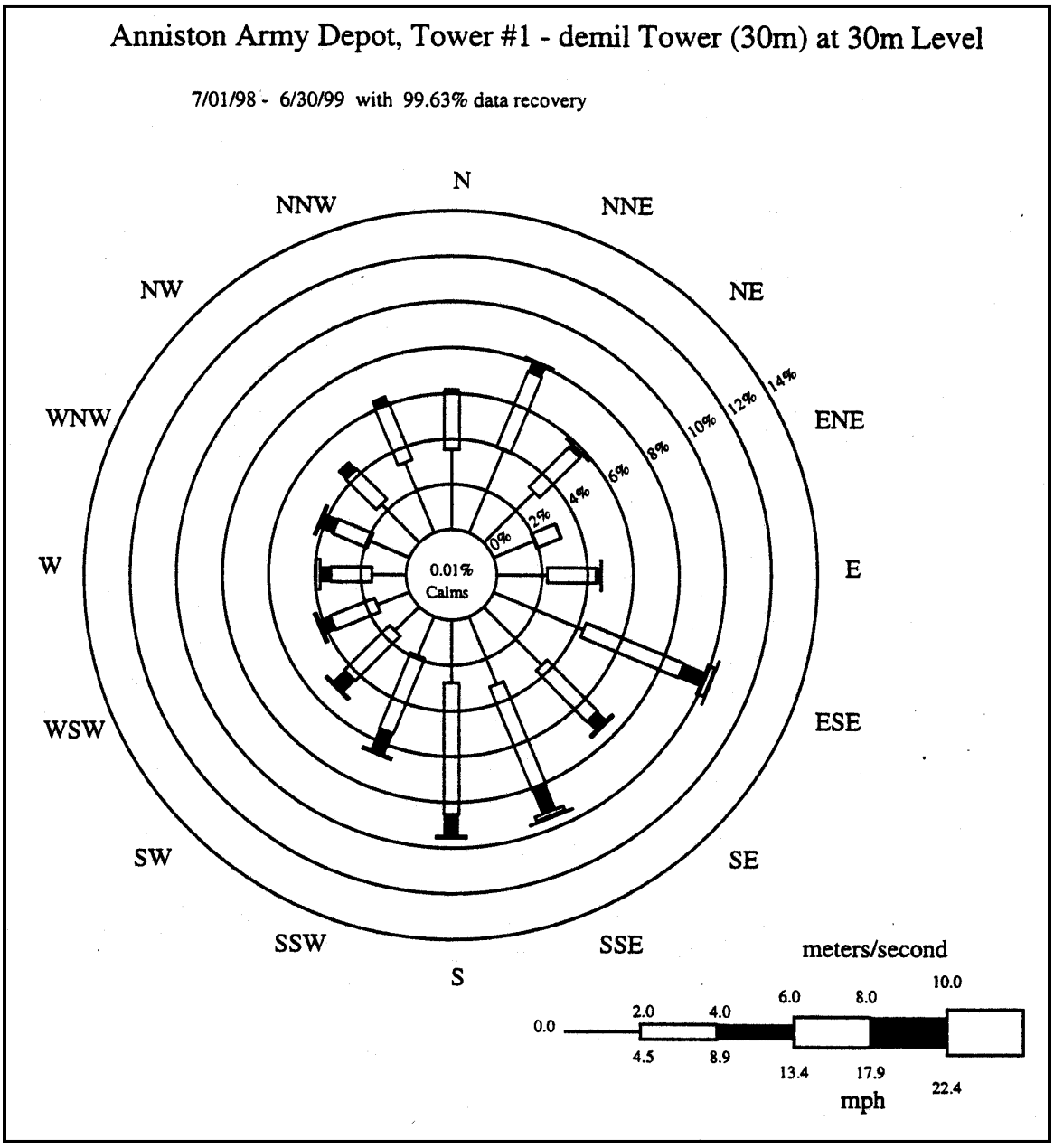


~~Figure III K-7: 10m Level Wind Rose at ANAD~~



~~Figure III K-8: 30m Level Wind Rose at ANAD~~

~~Table III K-1: Parameters and Rationale~~

~~WAP Section Number~~	~~Waste Stream~~	~~Parameters for Analysis~~	~~Determination Methods~~	~~Frequency of Analysis/ Characterization(3)~~	~~Sampling Method~~	~~Disposal Limits~~	~~Disposal Requirements[2]~~
~~III K C-2a(1)(a)~~	~~Scrap Metal~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~
~~III K C-2a(1)(a)~~	~~Ash from Treated Scrap Metal from the SDC~~	~~TCLP Organics~~ ~~TCLP Metals~~	~~See Table III K-2~~	~~As necessary to characterize for disposal~~	~~Grab or composite sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~
~~III K C-2a(1)(b)~~	~~Dust Material from the Buffer Tank, Cyclone and Dust Collection System~~	~~TCLP Organics~~ ~~TCLP Metals~~	~~See Table III K-2~~	~~As necessary to characterize for disposal~~	~~Grab or composite sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~

~~Table III K-1: Parameters and Rationale~~

~~WAP Section Number~~	~~Waste Stream~~	~~Parameters for Analysis~~	~~Determination Methods~~	~~Frequency of Analysis/ Characterization(3)~~	~~Sampling Method~~	~~Disposal Limits~~	~~Disposal Requirements[2]~~
~~III K C 2 a (1) (c)~~	~~Spent Solids from the Bag House Filter~~	~~Analysis based on sample results of characterized waste streams processed through SDC~~	~~Generator knowledge~~	~~As necessary~~	~~Grab sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~
~~III K C 2 a (1) (d)~~	~~Salts from Water Recycle System~~	~~TCLP Organics~~ ~~TCLP Metals~~	~~See Table III K-2~~	~~As necessary or as characterized from processing specific waste streams~~	~~Grab sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~
~~III K C-~~	~~Filter Units from the~~	~~TCLP Organics~~	~~See Table III K-2~~	~~In the event of filter~~	~~Representative~~	~~IAW applicable AAC or~~	~~Disposal requirements based on~~

~~Table III K-1: Parameters and Rationale~~

~~WAP Section Number~~	~~Waste Stream~~	~~Parameters for Analysis~~	~~Determination Methods~~	~~Frequency of Analysis/ Characterization(3)~~	~~Sampling Method~~	~~Disposal Limits~~	~~Disposal Requirements[2]~~
~~2a(1)(e)~~	~~Exhaust Filter[1]~~	~~TCLP Metals~~		~~replacement~~	~~sample~~	~~EPA regulations~~	~~analytical results~~
~~III K-C-2a(1)(f)~~	~~Explosives and Propellants~~	~~See Section IV C of ANAD RCRA Application for detailed information on explosives and propellants~~	~~Generator knowledge/ Manufacturer's specifications~~	~~Not Applicable~~	~~Not Applicable~~	~~IAW Section IV C of ANAD RCRA Application~~	~~Treatment in SDC~~
~~III K-C-2a~~	~~Miscellaneous Solid Waste[1]~~	~~Total Metals~~ ~~Total Organics~~	~~See Table III K-2~~	~~As necessary to characterize for~~	~~Grab sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~

~~Table III K-1: Parameters and Rationale~~

~~WAP Section Number~~	~~Waste Stream~~	~~Parameters for Analysis~~	~~Determination Methods~~	~~Frequency of Analysis/ Characterization(3)~~	~~Sampling Method~~	~~Disposal Limits~~	~~Disposal Requirements[2]~~
~~(1)(g)~~		~~TCLP Metals~~		~~disposal~~			
		~~TCLP Organics~~					
		~~Ignitability~~					
		~~Reactivity~~	~~Generator knowledge~~		~~Not Applicable~~		
~~III K C-2a(1)(h)~~	~~Refractory Brick~~	~~TCLP Metals~~	~~See Table IV J C-2~~	~~Each Batch~~	~~Composite Sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal offsite~~
~~III K C-2a(2)(a)~~	~~OGT System Brines[1]~~	~~TCLP Organics~~	~~See Table III K-2~~	~~As necessary to characterize for disposal~~	~~Composite Sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~
		~~TCLP Metals~~					
		~~pH~~					
~~III K C-~~	~~Miscellaneous Liquid~~	~~TCLP Metals~~	~~See Table III K-2~~	~~As necessary to~~	~~Grab Sample~~	~~IAW applicable AAC or~~	~~Disposal requirements based on~~

~~Table III K-1: Parameters and Rationale~~

~~WAP Section Number~~	~~Waste Stream~~	~~Parameters for Analysis~~	~~Determination Methods~~	~~Frequency of Analysis/ Characterization(3)~~	~~Sampling Method~~	~~Disposal Limits~~	~~Disposal Requirements[2]~~
~~2a(2)(b)~~	~~Waste[1]~~	~~TCLP Organics~~ ~~pH~~		~~characterize for disposal~~		~~EPA regulations~~	~~analytical results~~
~~III K-C-2a(3)(a)~~	~~Brine Sludge[1]~~	~~TCLP Metals~~ ~~TCLP Organics~~ ~~pH~~	~~See Table III K-2~~	~~As necessary to characterize for disposal~~	~~Grab Sample~~	~~IAW applicable AAC or EPA regulations~~	~~Disposal requirements based on analytical results~~

~~Notes:~~

~~a Sample containers and preservation techniques, if any, will be in accordance with individual method of analysis (see Section IV C of ANAD RCRA Application).~~

~~Footnotes:~~

~~(1) Generator knowledge will be used, if possible, to establish the presence of a parameter and approximate concentration. Determination methods are listed in this table, if concentrations of the parameter are required for disposal.~~

~~(2) Disposal offsite will be IAW all applicable AAC and EPA regulations or IAW Section IV C of the ANAD RCRA Application.~~

~~(3) Similar waste streams may be profiled for disposal in accordance with this table for continued disposal.~~

~~Table III K-2: 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~~	~~Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—gaseous hydride~~	~~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~~
~~Cadmium~~	~~Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration~~	~~SW-846 Method 6010B/7000 or EPA 213.1~~
~~Chromium~~	~~Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration~~	~~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~~	~~Inductively-coupled plasma atomic emissions spectrometry or atomic absorption~~	~~SW-846 Method 6010B/7000 or E200.7~~
~~Vanadium~~	~~Inductively-coupled plasma atomic emissions spectrometry or atomic absorption~~	~~SW-846 Method 6010B/7000 or E200.7~~
~~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~~ ~~Paper~~	~~SW-846 Method 9040B/9045 or EPA 150.1~~ ~~SW-846 Method 9041A~~
~~Ignitability~~	~~Pensky-Martens closed cup method for determining ignitability; Ignitability of solids~~	~~SW-846 Method 1010A/1030~~

~~Note:~~
~~(1) The most current approved analytical method will be used.~~

~~Abbreviations:~~
~~EPA Environmental Protection Agency~~
~~GC Gas Chromatography~~
~~HPLC High Performance Liquid Chromatography~~

1 ~~Table III K-3 Inspection Schedule~~

~~Item [264.15(b)(1)]~~	~~Frequency[1] [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
~~General Area~~	~~W~~	~~Inspect the Floor for Areas that Indicate Excessive Wear or Deterioration of Protective Coating (where applicable).~~
~~General Area~~	~~M~~	~~Exits are clearly identified and marked.~~
~~General Area~~	~~D~~	~~Examine Floor for Apparent Drips, Spills, or Leaks from the Munitions.~~
~~SDC Equipment~~		
~~Elevator~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Lift Area for Apparent Leaks from Equipment.~~
~~Pushers~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Hatches~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Loading Chambers~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Tilting Unit~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~SDC Upper~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~SDC Lower~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Elevating System~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Turning System~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Locking Ring~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Area for Apparent Leaks from Equipment.~~
~~Conveyors~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Areas for Apparent Drips, Spills, or Leaks.~~
~~Waste Feed Cutoff Mechanisms~~	~~W~~	~~Test Control Circuits and Document Waste Feed Cutoff.~~

2 ~~Table III K-3 Inspection Schedule~~

~~Item [264.15(b)(1)]~~	~~Frequency[1] [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
~~SDC~~	~~A~~	~~Take unit offline. Perform a detailed inspection/maintenance operation.~~
~~POLLUTION CONTROL EQUIPMENT~~		
~~Stack Monitors~~	~~D~~	~~Check Calibration.~~
~~Induced Draft Fans~~	~~D~~	~~Visually inspect for loss of lubrication, check for excessive vibration, and loss of performance by use of operator console data for operating parameters.~~
~~Quench Unit~~	~~M~~	~~Visually inspect shell for corrosion.~~
~~Scrubbers~~	~~M~~	~~Visually inspect shell for corrosion.~~
~~Spray Dryer~~	~~M~~	~~Visually inspect shell for corrosion.~~

~~Item [264.15(b)(1)]~~	~~Frequency(1) [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
~~Bag House~~	~~W~~	~~Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.~~
~~Cyclone~~	~~W~~	~~Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.~~
~~Exhaust Filter~~	~~W~~	~~Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.~~
~~Scrap Handling System~~		
~~Scrap Funnel~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Areas for Apparent Drips, Spills, or Leaks.~~
~~Scrap Box~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Areas for Apparent Drips, Spills, or Leaks.~~
~~Scrap Conveyors~~	~~W~~	~~Observe equipment in operation to determine any loss of performance. Inspect Areas for Apparent Drips, Spills, or Leaks.~~
~~Ash Collection and Containers~~	~~D~~	~~Visually inspect for Leaks, Spills, and Containers out of Place~~
~~FIRE PROTECTION SYSTEM~~		
~~Extinguishers (Manual)~~	~~M~~	~~Check for Condition and Gauge Pressure. Check expiration dates.~~
~~Sprinkler System~~	~~A~~	~~Inspect in Accordance with Fire Codes and Regulations.~~
	~~Q~~	~~Using test valve, assure that the system functions and a signal is received by ANAD fire department.~~

1 ~~Table III K-3 Inspection Schedule~~

~~Item [264.15(b)(1)]~~	~~Frequency(1) [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
~~BUILDING VENTILATION~~		
~~General Ventilation System~~	~~M~~	~~Visually Inspect for Evidence of Corrosion, Malfunctions, Leaks, or Excessive Wear.~~
~~Pressure Gauges~~	~~D~~	~~Check that Gauge is Reading in Appropriate Range.~~
~~Internal Mechanical~~	~~When filters are changed~~	~~Visually Inspect for Evidence of Corrosion, and Excessive Wear.~~
~~UNINTERRUPTIBLE POWER SUPPLY~~		
~~Invertor Input Voltage~~	~~M~~	~~Check meter for proper voltage.~~
~~Invertor Input Current~~	~~M~~	~~Check meter for proper current.~~
~~Battery Current~~	~~M~~	~~Check meter for proper reading.~~
~~Alternating Current Voltage~~	~~M~~	~~Check meter for proper voltage.~~
~~Frequency~~	~~M~~	~~Check meter for proper frequency.~~
~~Uninterruptable Power Supply Output Current~~	~~M~~	~~Check meter for proper current.~~
~~Primary Input Voltage~~	~~M~~	~~Check meter for proper voltage.~~
~~EMERGENCY GENERATOR~~		
~~Engine / Generator~~	~~S~~	~~Visually inspect for loose drive belts, oil leaks, coolant leaks, lube oil level, mechanical integrity, crankcase containment and air motors; observe operation and inspect for loss of performance.~~
~~Emergency Equipment~~		
~~Emergency Response Items~~	~~M~~	~~Visually inspect to ensure proper inventory is in place and not damaged.~~
~~(Item)~~		~~(Quantity)~~
~~Spill Kit~~		~~3~~
~~Safety Shower/Eyewash Stations (Portable)~~		~~2~~
~~Handheld Radios~~		~~5~~
~~Tychem Apron~~		~~4~~
~~Respirator~~		~~2~~
~~Gloves, rubber~~		~~4 pair~~
~~Gloves, latex~~		~~4 pair~~
~~Gloves, leather~~		~~4 pair~~

2 ~~Table III K-3 Inspection Schedule~~

~~Item [264.15(b)(1)]~~	~~Frequency(1) [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
~~Drum, 55 gallon~~		~~4~~
~~Drum, 110 gallon~~		~~2~~
~~Coveralls, Explosive Handler~~		~~4~~
~~(Item)~~		~~(Quantity)~~
~~Coverall, Tyvek with Hood~~		~~4~~
~~Absorbent pads, rags, etc.~~		~~1 box~~
~~First Aid/Trauma Kit~~		~~1~~
~~Flashlight~~		~~1~~
~~Hammer~~		~~1~~
~~Screwdriver~~		~~1~~
~~Shovel~~		~~1~~
~~Broom~~		~~1~~
~~Plastic bags~~		~~1 box~~
~~Duct Tape~~		~~1 roll~~
~~PERMITTED STORAGE AREAS~~		
~~Service Magazine~~	~~A~~	~~Inspect Magazine for proper storage of materials, good housekeeping, and condition of magazine doors, vents and maintenance of fire breaks.~~

~~Item [264.15(b)(1)]~~	~~Frequency(1) [264.15(b)(4)]~~	~~Types of Problems [264.15(b)(3)]~~
	~~S~~	~~Visual inspect the condition of lightning protection system~~
	~~B~~	~~Check components of the lightning protection system for electrical continuity.~~
	~~W~~	~~Visually inspect for proper storage of materials, proper labeling and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.~~
~~Storage Igloos~~	~~W~~	~~Visually inspect for proper storage of materials, proper labeling and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.~~
	~~Q~~	~~Inspect WMM and Recovered WMM in storage to ensure compliance with DDESB storage controls~~
	~~A~~	~~Conduct inventory or WMM and Recovered WMM in storage in accordance with DDESB and Military Munition Rule requirements.~~

~~Table III K-3 Inspection Schedule~~

~~NOTES:~~

~~a D-daily (once every calendar day).~~
~~W-weekly (once every calendar week).~~
~~M-monthly (once every calendar month.)~~
~~S-semiannually (once every six (6) calendar months.)~~
~~A-annually (once every twelve (12) calendar months.)~~
~~Q-Quarterly (once every three (3) calendar months.)~~
~~B-biennially (once every two (2) years.)~~

~~Footnote:(1) Inspection requirements will not be performed while the SDC facility is not in operation.~~

~~TABLE III K-4 RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)~~

~~Waste Material~~	~~RCRA Hazardous Waste Designation (Number)~~	~~RCRA Hazardous Waste Definition Regulatory Citation~~	~~Basis for Designation~~
~~Fill Material~~			~~Hazardous wastes to be processed in the SDC will be characterized using available government sources of information such as the MARB, MIDAS or other source of information relative to the items being processed.~~
~~Explosives~~			
~~Composition B and Tetrytol~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Contains Class A explosives, Tetryl and TNT, as per 49 CFR 173.53.~~
~~Tetryl~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Is a Class A explosive as per 49 CFR 173.53.~~
~~Fuzes (M8, M557, and M51A5, M603, M508, M57)~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Contains a Class A explosive, tetryl, as per 49 CFR 173.53.~~
~~Bursters (M5, M6, M14, M40A1, M71, M83 and M22 Booster)~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Contains Class A explosives, tetryl and TNT, as per 49 CFR 173.53.~~
~~Activator (M1)~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Contains Class A explosives, Igniter Mix, Lead Azide and Tetryl, as per 49 CFR 173.53.~~
~~Propellants~~			
~~M28, M6, and M67~~	~~Reactive (D003)~~	~~AAC-14-2-.03(4)(a)8~~	~~Contains a Class A explosive, nitrocellulose, as per 49 CFR Subpart C.~~
~~M6 and M67~~	~~Reactive (D003)~~ ~~TC organic (D030)~~	~~AAC-14-2-.03(4)(a)8~~ ~~AAC-14-2-.03, Table 1~~	~~Contains a Class A explosive, 2,4-dinitrotoluene, as per 49FR Subpart C.~~
~~Other Miscellaneous Wastes~~			
~~OGT HEPA filters and prefilters (from ventilation system)~~	~~Potentially Reactive (D003)~~ ~~Toxicity characteristic metals (D004 through D011)(If found to be present)~~	~~AAC-14-2-.03(4)(a)4~~ ~~AAC-14-2-.03, Table 1~~	~~These filters may be contaminated with heavy metals and / or organics. The waste is not expected to be toxicity characteristic. Sampling and analysis will be used to identify other contaminants that may be subject to RCRA regulations.~~

~~TABLE III K-4 RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)~~

~~Notes:~~

~~[a] Memorandum from Matthew A. Straus, Acting Chief, Waste Identification Branch, U.S. Environmental Protection Agency (EPA), to Jon P. Yeagley, Chief, State Programs Section, U.S. EPA; June 4, 1984.~~

~~Footnote:~~

~~(1) Explosives, propellants, and fuzes may contain the following:~~

~~D004 arsenic~~

~~D005 barium~~

~~D006 cadmium~~

~~D007 chromium~~
~~D008 lead~~
~~D009 mercury~~
~~D010 selenium~~
~~D011 silver~~
~~(2) The explosives and propellants listed are examples of the items that may be processed at the SDC. A more extensive list is contained in Section IV C of the ANAD RCRA Application. All energetic material processed at the SDC will be in accordance with approved feed rates and limitations contained in the RCRA Permit.~~

~~TABLE III K-5 RATIONALE FOR SELECTION OF ANALYSIS TO PERFORM ON WASTE MATERIALS~~

~~Waste~~	~~Analysis~~	~~Rationale~~
~~Explosives in Munitions~~	~~None~~	~~Sampling and analysis is not conducted because the explosives were manufactured and loaded to government standards and sufficient information is available for proper characterization. These wastes are managed as RCRA hazardous wastes.~~
~~Propellants~~	~~None~~	~~Sampling and analysis is not conducted because the propellants were manufactured and loaded to government standards and sufficient information is available for proper characterization. These wastes are managed as RCRA hazardous wastes.~~
~~Energetic Contaminated Waste~~	~~None~~	~~Generator knowledge as described in section III K-C-1 above will be applied for the energetic contaminated waste.~~
~~Other Miscellaneous Wastes (OGT HEPA Filter and Prefilters)~~	~~TC metals~~ ~~TC organics~~	~~Spent filters may be generated occasionally at the SDC Facility but are not stored, treated, or disposed of at this location. The filters will be disposed of as ordinary solid waste if no heavy metal or organics exposure has occurred with respect to the filters as is demonstrated by applicable analysis.~~

III K Facility Description

[RESERVED]

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~~III K~~IV J B FACILITY DESCRIPTION

This section provides a general description of the Static Detonation Chamber (SDC) at the Building 695 Complex on the Anniston Army Depot (ANAD)~~Anniston Field Office (AFO)~~ in Anniston, Alabama.

Permitting of the SDC was originally pursued to support the destruction of waste military munitions (WMM) containing mustard agent. Munitions originally ~~to be~~ processed at the SDC included over-packed munitions, reject munitions, munitions with limited safety features, and munitions for demonstration testing such as emissions testing or feasibility assessments. Since mustard munitions also involve conventional explosives, the SDC application includes language to support permitting the SDC to destroy conventional munitions deemed appropriate or needed while this unit is being operated ~~within controls of Section III of this application~~.

Mustard munitions processing at the SDC ~~facility~~ was completed on September 18, 2011. The Anniston Chemical Agent Disposal Facility (ANCDF) completed chemical agent decontamination of all SDC equipment and structures in accordance with (IAW) the ANCDF RCRA Closure Plan. The SDC Decontamination Report was submitted on April 5, 2012, and the SDC unit and facilities are now classified as chemical agent free under the ANCDF clean closure standards defined in the closure plan. Approval of the closure~~this~~ report was received on July 22, 2013.

The SDC is an explosive detonation chamber designed to dispose of WMM. The SDC unit located at the ANAD ~~site~~ may be used to process munitions that are not defined as chemical munitions or contaminated with chemical agent from both inside and outside of the State of Alabama. Recovered WMM received from areas inside the State of Alabama may also be processed. The SDC may also treat conventional munitions components from chemical weapons which have been verified agent free and received from outside the State of Alabama.

WMM may include items containing fill material such as white phosphorus, smoke rounds, tear gas, riot control agents, tracers, illumination and incendiary munitions, liquid-filled conventional munitions, liquid contaminated explosive components, etc., and related items. Related items may include shipping and storage containers, packing materials, and personal protective equipment (PPE). These items will be characterized prior to treatment in the same manner as WMM~~s~~. The feed limitations demonstrated during emissions testing to the unit (e.g., chlorine, metals, sulfur, etc.) will be adhered to at all times and the completion of reaction of the previously fed items will be ensured by monitoring of system response to verify~~ensure~~ that feed durations are controlled IAW~~in accordance with~~ procedural and permit requirements.

IAW~~n accordance with~~ the Alabama Department of Environmental Management (ADEM) Administrative Code (AAC) 335-14-8-.02(5)(b)1, Section ~~III K~~IV J B-1 provides the general description of the SDC and an overview of the treatment operations proposed for WMM~~s~~ currently stored at ANAD~~,~~ or recovered from areas within the State of Alabama.

Section ~~III K~~IV J B-2 provides and discusses the ANAD and SDC topographic map required by AAC 335-14-8-.02(5)(b)19 and other facility related information.

Section ~~III K~~IV J B-3 addresses the location information requirements of AAC 335-14-8-.02(5)(b)11.

Section ~~III K~~IV J B-4 describes the ANAD and SDC traffic patterns as required by AAC 335-14-8-.02(5)(b)10.

~~III K~~IV J B-1 General Description

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(a) and 335-14-8-.02(5)(b)1

The SDC ~~facility where WMM treatment will take place~~ is located within the Ammunition Limited Area (ALA) on the west side of G block within ANAD. The description of ANAD is located in Section II B~~ of the ANAD RCRA application~~. The SDC ~~facility~~ is designed for destruction or treatment of WMM ~~munitions~~ and ~~munitions~~ components which are either explosively or non-explosively configured. The SDC ~~facility~~ does not require the use of explosive counter charges to destroy munitions. Over-packed munitions can be processed without being removed from the over-pack container. This reduces the risk of accidental explosions and unexpected environmental release. The system is very flexible, and is able to destroy many types and sizes of munitions. It can also decontaminate equipment, scrap or soil.

A detailed description of the SDC ~~facility~~ is contained in Section ~~III K~~IV J D.

~~III K~~IV J B-1a Overview of the SDC ~~Facility~~ Operations

WMM, including recovered items, will be brought to the SDC by truck or appropriate transportation vehicle and may be stored in the three permitted service magazines, 34 permitted storage igloos, or delivered directly to the loading area. WMM will be transported in appropriate packaging to ensure the safety of the workers and ~~the~~ environment.

Once processing is to begin, the WMM will be brought to the facility by forklift or appropriate transportation vehicle and placed in the loading area~~room~~. In the loading area~~room~~ the munitions are placed in~~on~~ ammunition trays and loaded onto the feed conveyor. A lifting assist device may be used for this operation. Once the munitions have been placed on the feed conveyer, no further handling is required. The munitions are fed to the SDC automatically under remote control and observation. The munitions heat up and any explosive present deflagrates or detonates and is destroyed. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy any fill materials, such as riot control agents or tear gas without the presence of explosives. No counter charges, detonators, or munitions handling is needed. All gases from the treatment of WMM are treated in the pollution control system, all under automatic control.~~ No one is required to be present within the sprung structure during these operations~~.

The unit is able to treat any type of WMM provided permitted limits are not exceeded and dimensional limitations are adhered to for each feed event. Generally, c~~C~~hanges in munition feeds do not require modification of the system. The ~~, and the~~ system can handle

mixed feeds. If a munition contains fill materials such as smokes, illumination mixtures, white phosphorous, or a fuze, these are destroyed at the same time that the explosive is destroyed, without the need for donor charges, and with an absolute minimum of munitions handling.

~~III K~~IV J B-1b Hazardous Wastes Managed / Generated at the SDC

The SDC receives munitions for treatment (see Figure ~~III K~~IV J-1 for the general facility layout)[1]. Munitions may be stored in one of three service magazines, 34 permitted storage igloos, or delivered directly to loading area of the SDC prior to being processed. The ~~hazardous~~ wastes managed or generated at the SDC include:

- WMM,
- Recovered WMM from within the State of Alabama,
- Energetic contaminated material,
- Scrap metals from munitions after treatment process,
- Miscellaneous liquid wastes,
- Brines and Off-Gas Treatment (OGT) System fluids,
- Solids generated during the treatment process, and
- Miscellaneous solid waste / dunnage.

Detailed descriptions of the materials to be processed and wastes generated are provided in Section ~~III K~~IV J C-1~~, "Chemical and Physical Analysis."~~

The three service magazines and 34 igloos for storage of WMM are located within the ALA and ~~are~~ constructed IAW~~in accordance with~~ Department of Defense Explosives Safety Board (DDESB) standards. This satisfies AAC~~ADEM Admin. Code R.~~ 335-14, the Military Munitions Rule (MMR), ~~and~~ requirements for WMM ~~munitions~~ storage.

~~III K~~IV J B-1c Hazardous Waste Management Unit to be Permitted

The hazardous waste management unit addressed in this section of the permit application is considered a Miscellaneous Unit (40 Code of Federal Regulations (CFR) 264 Subpart X). Wastes generated during SDC operations are accumulated in containers. The containers will not remain in the Sprung Structure~~building~~ longer than 90 days. This permit application does not seek permitting of the SDC ~~facility~~, as less than (<) 90-day storage areas are exempt from permitting requirements [40 CFR 262.34(a)]. However, the s~~S~~ervice m~~M~~agazines and storage igloos used for waste storage are permitted IAW~~in accordance with~~ the MMR~~Military Munitions Rule~~.

A detailed description of operations to be conducted at the SDC ~~facility~~ is provided in Section ~~III K~~IV J D-1.

~~III K~~IV J B-2 Topographic Map

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)1

[1] All figures are located at the end of this section.

~~III K~~IV J B-2a General Requirements

IAW~~n accordance with~~ the requirements of AAC 335-14-8-.02(5)(b)19, a topographic map and other maps are used to detail the location of the SDC and the surrounding area. The information includes the following: contour maps, the location of surface waters, a wind rose, surrounding land use, and facility area designations.

The topographic map (Figure ~~III K~~IV J-1)[2] depicts a distance of approximately (~) 1,000 feet around the SDC. The map's scale is 1 inch equals 240 feet. Topographic contours are displayed at 2-foot intervals. There are no legal boundaries shown for the SDC ~~facility~~ because it is totally self-contained within the ANAD. Legal boundaries for the ANAD are shown in Figure ~~III K~~IV J-1. The service magazines (Buildings 712, 713 and 714) near the SDC ~~facility~~ are shown on Figure ~~III K~~IV J-5.

Additional Drawings (Figures ~~III K~~IV J-2, ~~III K~~IV J-3, and ~~III K~~IV J-4), each with a scale of 1 inch equals 30 feet, show contours, locations of catch basins, manholes, storm sewers, sanitary sewers, drain lines, culverts, fences, guard rails, gas lines, fire water lines, hydrants, power poles, access roads, and road surfaces in relation to the SDC ~~facility~~. The SDC will be the only S~~s~~olid W~~w~~aste M~~m~~anagement U~~u~~nit within the boundary of Building 695 Complex.

Wind roses for the ANAD are included in Figures ~~III K~~IV J-7 and ~~III K~~IV J-8. Figure ~~III K~~IV J-7 shows the average wind speed and direction for the 12 months ending June 30, 1999, at a height of 10 meters (m). Figure ~~III K~~IV J-8 shows the average wind speed and direction for the same period at the 30-m level. Average total wind speed at the ANAD for the 12 months ending June 30, 1999, was 1.6 meters per second at the 10-m level and 2.3 meters per second at the 30-m level, with winds common from the east-southeast, southeast, and south-southeast.

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.

For the twelve-month period ending June 30, 1999, 55 inches of precipitation were recorded at ANAD. The highest rainfall (9.4 inches) was recorded in June. The lowest rainfall (1.1 inches) was recorded in September of that period.

The Building 695 Complex~~SDC facility~~ is not located in the 100-year floodplain. Section II of the storage permit application contains a copy of the Federal Insurance Agency Flood Hazard Boundary Map, Community-Panel Number 010013 0250 B, Panel Number 250 of 300. Zone "A" depicts the 100-year floodplain. The figure clearly shows that SDC ~~Facility~~ is not in the 100-year floodplain.

There are no surface waters within 1,000 feet of SDC ~~facility~~.
The Building 695 Complex~~SDC facility~~ does not have any process sewage systems. Sanitary sewage is piped to the existing sewage treatment plant located in the southeast portion of the ANAD.

---

[2] All drawings are located at the end of this section.

There are no injection wells on the ANAD, or within 1,000 feet of Building 695 Complex~~the SDC facility~~. There are groundwater monitoring wells located at several locations within the ANAD around closed disposal sites, and withdrawal wells at three groundwater treatment facilities. None of the monitoring or withdrawal wells are located in the vicinity of Building 695 Complex~~the SDC facility~~.

Storm drainage from upslope areas is diverted around Building 695 Complex~~the SDC facility area~~ by the use of berms, swales, and ditches, thereby preventing any run-on. Storm drainage from the roof and paved areas is directed to catch basins and storm sewers and discharged north of the building using a combination of swales, ditches, and culverts. The runoff is directed to existing offsite drainage courses. 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 small community of Bynum is located on the 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.

~~III K~~IV J B-3 Location Information

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)11

~~III K~~IV J B-3a Floodplain Standard

AAC~~ADEM Admin. Code~~ 335-14-5-.02(9)-(b), and 335-14-8-.02(5)-(b)-11-(iii)

The ANAD is located in Calhoun County in northeastern Alabama within the valley and ridge province of the Appalachian Highlands. The ANAD occupies 15,246 acres of land. None of the land within 1,000 feet of Building 695 Complex~~the SDC~~ is in the 100-year floodplain.

~~III K~~IV J B-4 Traffic Information

~~ADEM Admin. Code~~ AAC 335-14-8-.02-(5)-(b)-10

The transport of WMM is described in Section IV B-5 of the ANAD RCRA Permit Application.

The locations of the roads connecting Building 695 Complex~~SDC facility~~ to the ANAD ALA are shown in Figure ~~III K~~IV J-1. All main access routes to Building 695 Complex~~SDC facility~~ are paved, all-weather roads meeting Department of the Army (DA) road design standards. Construction of ANAD roads meet the technical requirements contained in Army Technical Manuals (TM~~s~~) 5-822-2 and TM 5-822-5. The roads have 10-foot wide lanes with a minimum cross-slope of 2 percent~~and 6-foot wide gravel shoulders with a minimum cross-slope of 6 percent~~.

~~III K~~IV J B-4a Description of Existing Roads

The largest portion of the ANAD is used for munitions storage and, therefore, has only minimal traffic. The ANAD road system consists of 113 miles of paved roads and 104 miles of unpaved roads with most of the unpaved roads located in the Ammunition Restricted Area and ~~the~~ Munition Demolition 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.

~~III K~~IV J B-4b External Access

The major highways serving the ANAD are I-20 and U.S. 78, running east and west, and U.S. 431, running north and south. The main access to the ANAD is from Alabama State Highway 202 by way of a 24-foot wide concrete road with 10-foot shoulders through the Main Gate. This road is used by most employees and by all commercial trucks. Two alternate gates are used for incoming and outgoing employee traffic during shift changes. Eastbound employees exit through the Eulat~~i~~on Gate. All other gates are normally closed to traffic. ~~An additional access way has been constructed to support operations at the AFO-SDC. The road enters at Gate 5 at the northeast corner of the ANAD and passes just north of the ALA.~~

At present, there are ~~approximately~~ 2,500 privately owned vehicles entering and leaving the ANAD each day. In addition, ~~approximately~~ 3,200 truck shipments leave and 1,100 truck shipments are received at the ANAD each year. Essentially, all civilian and truck traffic occurs on weekdays.

~~III K~~IV J B-4c Traffic Control

Traffic on the ANAD 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.

~~III K~~IV J C WASTE CHARACTERISTICS

The chemical and physical characteristics of the wastes that are managed at the SDC ~~facility~~ are discussed in this section. Section ~~III K~~IV J C-1 describes the chemical and physical properties of the wastes to be processed in the SDC. Section ~~III K~~IV J C-2 presents the Waste Analysis Plan (WAP) that details the methodologies for sampling, testing, and evaluating all wastes generated from the treatment process to ensure that sufficient information is available for their proper characterization and safe management. This information is also used to ensure that all wastes are treated IAW~~in accordance with~~ best-demonstrated available technology (BDAT) to maintain compliance with the land disposal restrictions (LDR~~s~~). Section ~~III K~~IV J C-3 addresses waste analysis requirements pertaining to LDR~~s~~.

~~III K~~IV J C-1 Chemical and Physical Analysis

AAC~~ADEM Admin. Code~~ 335-14-5-.02(4), and 335-14-8-.02(5)(b)2

The SDC ~~facility~~ will be used to thermally treat WMM or waste material contaminated with energetics. Other wastes that may be generated and treated include PPE, dunnage, rags, towels, mops, and sampling equipment.

Table ~~III K~~IV J-1[3] and ~~III K~~IV J-4 identify each known and potential hazardous waste managed or generated at the SDC ~~facility~~ along with the appropriate analysis method for determining RCRA hazardous waste designation, ~~the~~ EPA waste codes, ~~the~~ RCRA regulatory citation for the relevant definition or criteria for designating the waste as hazardous, and ~~the~~ specific data or rationale relating the waste to the respective criterion or definition. Specific physical and chemical information on the wastes managed or generated at the SDC ~~facility~~ are provided in Section ~~III K~~IV J C-1a~~, "Volume and Composition of Wastes in Miscellaneous Treatment Units."~~

Illumination, smoke, phosphorous items, other such items, and other WMM, to include recovered WMM, are also available for destruction within the SDC. Detailed information for each of these types of items not addressed in Section IV C, as applicable, will be assessed per feed event to ensure compliance with limitations demonstrated as a result of the emissions tests conducted at the SDC. WMM may be properly categorized using the Munitions Items Disposition Action System (MIDAS), ~~the~~ Material Assessment Review Board (MARB), or other appropriate source of data for the munition type. These systems identify the constituents contained within WMM found in the demilitarization stockpile, including recovered WMM, and allow for accurate characterization for control of feed parameters for the operation of the SDC. For items not listed in Sections ~~III K~~IV J C or IV C, concurrence for processing will be received from both ADEM Air and Land divisions prior to processing within the SDC.

[3] Reference Table ~~III K~~IV J-4 for more details.

~~III K~~IV J C-1a Volume and Composition of Waste in Miscellaneous Treatment Units

AAC~~ADEM Admin. Code~~ 335-14-5-.24(2), and 335-14-8-.02(14)

The volume of WMM treated at the SDC ~~facility~~ fluctuates based on the disposal needs of the Department of Defense (DoD). The SDC system is designed to accept a maximum gross weight of up to 330.7 pounds (lb) per feed event including the feed tray.

The explosive capacity for the SDC ~~facility~~ is up to:

- ~~Up to~~ 6.7 lb~~s~~ of mass detonating explosive material (TNT equivalent, Net Explosive Weight [NEW]), or
- 23 lb of non-mass detonating explosive material per feed cycle.

For the purposes of destruction in the SDC most C~~c~~lass 1.1 materials that are not confined and C~~c~~lass 1.2 and 1.3 materials confined or unconfined are considered non mass detonating as they typically deflagrate in the SDC. Exceptions are the primary C~~c~~lass 1.1 explosives, which normally mass detonate whether confined or not. The NEW of a munition represents the combined explosive weight of all energetics contained in a munition item or items. Section IV C~~ of the ANAD RCRA Application~~ includes detailed information about WMM and any associated breakdown products.

~~III K~~IV J C-1a(1)Fill Materials

The munitions treated in the SDC operations may contain fill materials, such as riot control agents, tear gas, smokes, illumination mixtures, phosphorous mixtures, etc. The Army recognizes the toxic nature of these fill materials and the need to implement strict and conservative management practices to facilitate effective processing at minimal risk to human health and the environment. Therefore, the Army is minimizing the handling of these wastes by limiting handling to designated locations and by employing, where possible, automated handling and conveyance systems. Section IV C~~ of the ANAD RCRA Application~~ includes detailed information about the fill materials and any associated breakdown products.

~~III K~~IV J C-1a(2)Explosives and Propellants

The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured and loaded IAW~~according to~~ strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from manufacture and quality control for these materials have been used with engineering knowledge to characterize and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV C~~ of the ANAD RCRA application~~. Examples of the various explosives and propellants that are contained in the WMM demilitarized at the SDC~~ facility~~ are identified in Table ~~III K~~IV J-4 or are identified in Section IV C~~ of the ANAD RCRA Application~~. For items not listed in Section IV C, detailed product composition will be reviewed prior to treatment within the SDC to ensure compliance with established limitations.

~~III K~~IV J C-1a(3) Wastes Contaminated with Energetic Material

Demilitarization of WMM is typically performed using mechanical equipment which may come in contact with energetic components of the WMM. This process can leave a portion of the energetic material affixed to the equipment which in turn requires cleaning to ensure that subsequent operations are conducted safely. Cleaning of the equipment or tools used to demilitarize WMM therefore will generate items such as PPE, rags, mops, etc. that will potentially be contaminated with energetic material. The SDC is capable of processing these items, under approved feed limitations based on characterization of the material, to ensure that the energetic material is destroyed prior to release of the resultant ash or process waste for disposal.

~~III K~~IV J C-1b Containerized Waste

The storage of WMM is addressed as container storage with regards to the hazardous waste regulations [AAC 14-5-.09 and 14-8-.02(6)]. Refer to Section II ~~of the ANAD RCRA Permit Application~~ for further detail on container storage of hazardous waste.

Waste material collected post-treatment at the SDC ~~facility~~ is containerized and removed from the units, managed, and disposed. These materials include, but are not limited to, scrap metal, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, and filter units from the exhaust filter. Waste material may be temporarily stored at an appropriate hazardous waste storage location at ANAD prior to disposal offsite or treatment onsite.

Sections ~~III K~~IV J C-1b(1) through ~~–~~ ~~III K~~IV J C-1b(5) discuss the major waste streams to be containerized.

~~III K~~IV J C-1b(1) Treated Scrap Material from the SDC

Waste resulting from emptying the SDC consists mainly of scrap metal from munitions processing and over-packs which have been treated ~~by the SDC~~. Treated materials that are discharged from the SDC may be fed back into the system for reprocessing if necessary. Inorganic waste material may remain as a dust from treatment of feed trays, munition boxes (if fed with the munitions), or waste contaminated with energetics. This waste can be characterized as scrap after cooling to room temperature. The scrap is a mix of the above fractions. The content of the fractions may differ depending on the type of material initially fed to the SDC.

Excess scrap material is collected, visually inspected, certified as "free of explosive hazard", and sent to the DRMO onsite for further management and recycling or disposed of IAW applicable regulations.

~~III K~~IV J C-1c Waste in Tanks

There is no waste stored in tanks at the SDC ~~facility~~; therefore the requirements for this section are not applicable.

~~III K~~IV J C-1d Waste in Piles

AAC~~ADEM Admin. Code~~ 14-5-.12(c)1

The SDC ~~facility~~ will not have waste piles; therefore the requirements for this section are not applicable.

~~III K~~IV J C-1e Landfilled Wastes

AAC~~ADEM Admin. Code~~ 14-8-.14

The SDC ~~facility~~ will not have landfilled wastes; therefore the requirements for this section are not applicable.

~~III K~~IV J C-1f ~~Waste Incinerated and~~ Waste Used in Performance Tests

AAC~~ADEM Admin. Code~~ 14-8-.06(2)(b~~B~~)2.(i)

~~Waste to be treated in the SDC facility:~~

~~WASTE INPUT~~

~~1. WMM, including liquid filled, and/or recovered items~~

~~2. Explosives and Propellants~~

~~3. Fuzes and Bursters~~

~~4. Miscellaneous solid and liquid waste, including waste material contaminated with energetics~~

~~TREATMENT RESIDUE~~

~~1. Scrap metal~~

~~2. Ash~~

~~3. Off Gas Treatment System Solids (spent carbon, HEPA and pre-filters)~~

~~4. Off-Gas Treatment System liquids~~

Various physical and chemical properties of fill materials, explosives and propellants are summarized in Section IV C. Information on each of the materials used in performance tests may be found in the respective SDC Emissions Test Report.

The ~~ANCDF~~ SDC conducted emissions testing for conventional WMM (Condition 1) from December 3 to 7, 2010, surrogates and metal oxides (Condition 2) from February 1 to 4, 2011, and (Condition 3) from February 8 to 9, 2011, mustard at a reduced feed rate (Condition 4a) from July 5 to 8, 2011, and mustard-filled munitions (Condition 4b) from August 9 to 13,

2011. A confirmatory emissions test was conducted using conventional WMM and surrogates on February 25 to 27, 2014.

~~III K~~IV J C-1g Miscellaneous Components

Please refer to Section IV C for miscellaneous components.

~~III K~~IV J C-1h Hazardous Waste Treatment

The SDC may also process hazardous waste in the form of recovered WMM or other items associated with the management of recovered WMM and components that may be classified as hazardous waste. Waste to be treated in the SDC:

WASTE INPUT

1. WMM, including liquid filled, and/or recovered items
2. Explosives and Propellants
3. Fuzes and Bursters
4. Miscellaneous solid and liquid waste, including waste material contaminated with energetics

TREATMENT RESIDUE

1. Scrap metal
2. Ash
3. OGT System Solids (spent carbon, high-efficiency particulate air (HEPA) filters, and pre-filters) and liquids

Any items classified as hazardous waste should arrive under manifest at the ANAD or SDC. If manifests accompany items to be processed, appropriate records to include final copies of the manifest will be returned to the necessary agencies upon receipt and completion of the treatment process.

Hazardous wastes to be processed in the SDC will be characterized using available government sources of information such as the MARB, MIDAS, or other source of information relative to the items being processed. These actions will be completed to ensure that the feed control for any items processed is allowed under the approved feed rates for the SDC. Characterization of waste material contaminated with energetics will be based on generator knowledge of the energetics to which the item was exposed.

~~III K~~IV J C-1i Waste to be Land Treated

AAC~~ADEM Admin. Code~~ 14-5-.13(3)(a) and 14-5.13(3)(c)1.(i)

The SDC ~~facility~~ has no land treatment units; ~~. T~~therefore, the requirements of this section are not applicable.

~~III K~~IV J C-1j Wastes in Miscellaneous Treatment Units

AAC~~ADEM Admin. Code~~ 14-5-.24(2) and 14-8-.02(14)

The SDC is a~~ANAD treats WMM in~~ miscellaneous treatment unit used for processing WMM~~s using the SDC~~. Military munitions are defined in AAC~~ADEM Admin. Code R.~~ 335-14-1-.02. These munitions require disposal because the ANAD has determined that they cannot otherwise be reused or recycled. These military munitions become WMM when removed from the various storage igloos at ANAD and offered for disposal at the SDC.

Section IV C~~ of the ANAD RCRA Application~~ contains detailed information about WMM and any associated breakdown products.

~~III K~~IV J C-2 Waste Analysis Plan (WAP)

AAC~~ADEM Admin. Code~~ 335-14-5-.02(4)(b) and (c), 335-14-5-.02(8), 335-14-8-.02(5)(b)3, and 335-14-9-.01(7)

The following sections address the various components of the SDC-specific WAP~~facility Waste Analysis Plan~~. These components include: analytical parameters and the rationale for their selection, test methods, sampling methods, frequency of analyses, additional requirements for wastes generated offsite, and additional requirements for ignitable, reactive, or incompatible wastes. In effect, the WAP~~Waste Analysis Plan~~ delineates the waste parameters that are determined prior to treatment of waste during SDC~~ facility~~ operations. Waste streams from the operation of the SDC~~ facility~~ include, but are not limited to, scrap metal, ash, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, filter units from the exhaust filters, OGT brines, and sludges. Other miscellaneous wastes that may be generated include PPE, dunnage, rags, towels, mops, cardboard dunnage, banding / box hardware, and sampling equipment.

The Army is using production knowledge, quality assurance and analytical data, and engineering judgment to characterize wastes processed in the SDC~~ facility~~. The Army is both the WMM manufacturer and ~~the~~ SDC owner. The SDC was engineered to achieve the treatment requirements for WMM ~~munitions~~ treatment and is operated with attention directed to minimizing the risk associated with all WMM activities conducted at the SDC.

~~III K~~IV J C-2a Parameters and Rationale

AAC~~ADEM Admin. Code~~ 14-5-.02(4)(b)1

The analytical parameters and rationale for their selection are described by waste category in the paragraphs below and have been divided into three groups – solids, liquids, and sludges. This information is summarized in Table ~~III K~~IV J-1[4].

~~III K~~IV J C-2a(1)Solids

~~III K~~IV J C-2a(1)(a) Ash from Treated Scrap Material from the SDC

This waste stream consists of ash from metal munitions and miscellaneous parts that have been thermally treated in the SDC. A grab sample will be collected from the residue of

[4] All tables are located at the end of this section.

waste streams processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) organics and ~~TCLP~~ metals. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(1)(b) Dust Material from the Buffer Tank, Cyclone, and Dust Collection System

Dust material is generated during regular operation of the SDC and during maintenance activities associated with the buffer tank, cyclone, and dust collection equipment. A grab sample will be collected from the residue of each waste stream processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for TCLP organics and ~~TCLP~~ metals. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(1)(c) Spent Solids from the Bag House Filter

The bag house is utilized for particulate and semi-volatile metal collection. A grab sample will be collected from the spent solids for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to clean out. The residues will be analyzed for TCLP organics and metals. The disposal requirements will be based on the analysis results.~~Therefore, generator knowledge will be used to evaluate this waste stream based upon sample results of the characterized waste streams processed through the SDC.~~

~~III K~~IV J C-2a(1)(d) Salts from Water Recycle System

This waste stream comes from the water recycling operation (acid and neutral scrubbers) and consists of residual salts with collected dust particles~~ from scrubber operation~~. A grab sample will be collected from the residual salts for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to clean out. The residues will be analyzed for TCLP organics and metals. ~~Samples will be tested for TCLP organics and TCLP metals. Profiles for these solids may be used to characterize waste for disposal for specific waste streams.~~The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(1)(e) ~~Filter Units from the~~ Exhaust Filter Units

This waste is comprised of prefilters, HEPA filters, and carbon filters from the exhaust filter system. The filter system is designed as a backup for the ~~SDC~~ OGT ~~S~~system. Due to the efficiency of the particulate removal devices upstream of this filter unit, it is not expected that this system will ever be exposed to pollutants that will require filter replacement. In the event the filters are replaced, spent filters will be properly stored in containers and analyzed for TCLP organics and ~~TCLP~~ metals. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(1)(f) Explosives and Propellants

The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured according to strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from the manufacturer and quality control for these materials have been used with engineering knowledge for proper characterization and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV~~ of the ANAD RCRA application~~.

~~III K~~IV J C-2a(1)(g) Miscellaneous Solid Waste

Miscellaneous solid waste includes, but is not limited to, valves, pumps, gearboxes, conveyors, belts, piping, hoses, flanges, thermocouples, pH probes, nuts, bolts, gaskets, and other waste removed from the SDC equipment or generated during operation of the SDC ~~submitted for disposal~~. Miscellaneous solid waste will be characterized by generator knowledge and/or analysis. Analysis may be limited to a particular hazardous waste code or series of codes, such as TCLP metals, or it may be extensive as necessary to adequately characterize and profile the waste. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(1)(h) Refractory Material~~Brick~~

Refractory material~~brick~~ from the thermal oxidizer exit duct may be periodically removed and replaced. A batch consists of all the refractory material~~brick~~ removed during one periodic change out. Each batch of discarded refractory material~~brick~~ will be analyzed for TCLP metals. Table ~~III K~~IV J-1 details the analyses that may be needed for sufficient characterization and the associated disposal requirements. The disposal requirements are based on the analysis results.

~~III K~~IV J C-2a(2)Liquids

~~III K~~IV J C-2a(2)(a) OGT System Brines

OGT System brines are generated from the treatment of munitions in the SDC. A composite sample will be analyzed for TCLP organics/metals and ~~TCLP organics and~~ pH~~ as necessary~~ to properly characterize the brine. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(2)(b) Miscellaneous Liquid Waste

Miscellaneous liquid waste such as, but not limited to, clean up fluids, reserve flush tank solution, hydraulic fluid, and lubricating oil will be generated periodically during operations at the SDC~~ facility~~. This waste stream is typically characterized by generator knowledge. Miscellaneous liquid waste that is not characterized by generator knowledge will be analyzed for TCLP organics/metals and ~~TCLP organics and~~ pH ~~as necessary~~ for proper characterization~~ with the exception of the process fluids from the reserve flush tank~~. The disposal requirements will be based on the analysis results.

~~III K~~IV J C-2a(3)Brine Sludges

III KIV J C-2a(3)(a) Brine Sludge

Brine sludge generated from the operation of the SDC OGT Ssystem will be tested for TCLP organics/metals and TCLP organics and pH as necessary for proper characterization. The disposal requirements will be based on the analysis results.

III KIV J C-2b Test Methods

AACADEM Admin. Code 335-14-5-.02(4)(b)2

Process knowledge during waste treatment will be incorporated to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes at the SDC facility. The methods used to test the parameters for WMM treated and treatment residues are described in Table III KIV J-2 of the RCRA application.

III KIV J C-2c Sampling Methods

AACADEM Admin. Code 335-14-5-.02(4)(b)3 and 335-14-2, Appendix I

Sampling, when required, will be performed IAWin accordance with Tables III KIV J-1 and Table III KIV J-2.

III KIV J C-2d Frequency of Analysis

AACADEM Admin. Code 335-14-5-.02(4)(b)4

Frequency of analysis will be performed IAWas described in Tables III KIV J-1 and Table III KIV J-2.

III KIV J C-2e Additional Requirements for Wastes Generated Offsite

AACADEM Admin. Code 335-14-5-.02(4)(a),(b) and (c), 335-14-5-.02(5), and 335-14-5-.05(4)(a) and (b)

ANAD and the SDC may accept conventional munitions from offsite DoD facilities. Only WMM that are permitted for treatment at the SDCANAD will be accepted from off-site DoD facilities. WMM shipments to ANAD are coordinated well in advance with Anniston Munitions Center (ANMC) Ammunition Maintenance Division (AMD). WMM shipments to ANAD are characterized by the generating unit and are accompanied by an EPA shipping manifest or appropriate DoD shipping controls as defined by the MMRMilitary Munitions Rule. TheAmmunition handlers from the generating activity will provide all necessary information, including National Stock Number (NSN) and DoD Identification Code. No unknown wastes or unidentified wastes will beare accepted.

III KIV J C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

AACADEM Admin. Code 335-14-5-.02(4)(b)6. and 335-14-5-.02(8)

The majority of hazardous wastes treated at the SDC facility are reactive (D003). Some of the wastes may be ignitable (D001) as well. These characteristics are the primary RCRA characteristics of concern. Therefore, the waste characterization procedures were developed considering the reactivity, ignitability, and potential incompatibilities of

munitions/explosives. There are no additional waste characterization requirements to be addressed.

~~III K~~IV J C-3 Waste analysis requirements pertaining to Land Disposal Restrictions (LDR)

AAC~~ADEM Admin. Code~~ 335-14-9, 335-14-8-.02(5)(b)3, 335-14-5-.02(4)(a)1, and 335-14-5-.02(4)(b)6

The Hazardous and Solid Waste Amendments of RCRA prohibit land disposal of certain types of wastes and establish concentration limits and treatment standards for certain restricted wastes before land disposal. Information provided in this section describes the identification, characterization, documentation, and certification of wastes that are subject to LDR~~s~~.

The SDC treats reactive hazardous wastes onsite to remove the reactivity characteristic. The WAP (Section IV J C-2) is designed to provide all information required to comply with the LDR in the event that tests of the SDC treatment residues show the residues possess the RCRA toxicity characteristic.

Treatment residue from the SDC unit will be analyzed to determine whether it is a hazardous waste due to exceeding a toxicity characteristic constituent limit. These analyses are also used to determine whether federal LDR treatment standards are met. Treatment residue is analyzed by TCLP to determine whether the treatment standard for toxicity characteristic metals and organic waste are exceeded. Additional analyses of the residues for reactivity are not required because all reactive material is destroyed in the treatment process.

If the treatment residue does not meet the LDR treatment standards for toxicity characteristic metals or organics, with each shipment of waste, ANAD will notify, in writing, the facility receiving the waste of the appropriate treatment standards.

~~III K~~IV J C-3a Waste Characterization

AAC~~ADEM Admin. Code~~ 335-14-9-.01(7)

Wastes to be managed during SDC operation are characterized as described in Sections ~~III K~~IV J C-1 ~~, "Chemical and Physical Analysis,"~~ and ~~Section III K~~IV J-C-2~~, "Waste Analysis Plan."~~. The information provided by this characterization allows for determinations of LDR applicability and compliance with LDR treatment standards, concentration limits, or notification and certification requirements for LDR constituents and underlying LDR constituents. Specific analysis required to determine whether the waste is an LDR restricted waste and whether the waste is being managed properly under the land disposal requirements of AAC 335-14-9 are discussed in this section.

The following paragraphs describe the analysis requirements pertaining to LDR regulations for each waste stream.

~~III K~~IV J C-3a(1)Treatment Residues and Other Miscellaneous Wastes Generated

Treatment residue from the SDC ~~facility~~ is limited to waste such as ash and metal fragments. These materials are generated as dry solids, with the exception of OGT System fluids (brine), and containerized properly for temporary storage. Other miscellaneous waste may be characterized based on generator knowledge and/or analysis. Disposal of these items will be based on analysis results or IAW~~in accordance with~~ applicable regulation.

~~III K~~IV J C-3a(2)-Explosives and Propellants

The explosives and other energetic components of the munitions, as described in Section ~~III K~~IV J C-1, are characterized as reactive wastes (D003).

In addition to the reactivity characteristic (D003), wastes treated at the SDC ~~facility~~ may also be classified as hazardous due to the hazardous characteristics of ignitability (D001), corrosivity (D002), and/or toxicity codes based on munition type.

Other waste codes associated with WMM~~s~~ or components of WMM~~s~~ have been included in Section I Part A ~~of this Permit Application~~. Section IV C ~~of the ANAD RCRA Application~~ includes detailed information about WMM~~s~~ and any associated breakdown products.

For the reactive waste code D003, the applicable treatment standard is deactivation and requires meeting the concentration limits in AAC 335-14-9 for underlying hazardous constituents. Disposal of these items will be based on analysis results or IAW~~in accordance with~~ applicable regulation.

~~III K~~IV J C-3b Notification and Certification Requirements

AAC~~ADEM Admin. Code~~ 335-14-9~~5~~-.01~~2(5)~~(7)~~, and (9)~~

The SDC ~~facility~~ may be a generator of wastes subject to LDR~~s~~. ANAD will comply with all generator notification requirements applicable to SDC operations including a notification IAW~~in accordance with~~ AAC 335-14-9-.01(7). All supporting data and waste analysis data will be retained for a period of at least 3~~5~~ years. Copies of all notices, certifications,

demonstrations, and other documentation produced to support the determination for restricted waste treated, stored, or disposed of at an approved hazardous waste Treatment Storage and Disposal Facility (TSDF) will also be retained.

~~III K~~IV J C-3c Requirements Pertaining to the Storage of Restricted Wastes

AAC~~ADEM Admin. Code~~ 335-14-9-.05

The ~~AFO~~ SDC does not store restricted waste.

~~III K~~IV J C-3d Exemptions, Extensions, and Variances to Land Disposal Restrictions

AAC~~ADEM Admin. Code~~ 335-14-9-.01(5) and (6), and 335-14-9-.04(5)

The applicant is not seeking any case-by-case extensions, or petitions to allow land disposal of a prohibited waste, or variances from treatment standards.

~~III K~~IV J C-4 Waste Transportation and Offsite Treatment, Storage, and Disposal

AAC-14-3
~~AAC~~~~ADEM Admin. Code 14-3~~

All waste disposed offsite will be transported offsite and disposed IAW applicable regulations. Information concerning transportation procedures for hazardous waste can be found in Section II B-5.

~~III K~~IV J D MISCELLANEOUS UNITS

AAC~~ADEM Admin Code~~ 335-14-5-.24(1) to (4)
and 335-14-8-.02(14)

Section ~~III K~~IV J D, addresses the treatment of WMM inside the SDC at the ANAD. This section describes the SDC treatment processes. The SDC ~~facility~~ does not fit the definition for other types of treatment units and is therefore categorized as a miscellaneous treatment unit under the RCRA.

~~III K~~IV J D-1 Description of Miscellaneous Unit

AAC~~ADEM Admin. Code~~ 335-14-8-.02(14)(a)1~~,~~ and 335-14-8-.02(14)(a)2

The SDC unit is designed to destroy WMM ~~munitions~~ which are either explosively or non-explosively configured. The SDC does not require the use of explosive donor or counter charges to destroy munitions. The unit is able to handle various types of munitions. Generally, c~~C~~hanges in munition feeds do not require reconfiguration of the system, and the system can handle mixed feeds. Munitions that have been over-packed can be processed without being removed from the over-pack container. If a munition contains smoke, illumination mixtures, white phosphorus, or a fuze, these are destroyed at the same time that the explosive is destroyed. The unit is designed and built in such a way as to eliminate worker or public exposure to explosive or environmental hazards at any time during operations, and to produce products that are environmentally acceptable. The system is designed with interlocks and redundant systems where required, for safety and to prevent release of untreated products.

A description for the SDC ~~facility~~, including service magazines and storage igloos, is described in Section ~~III K~~IV J D-1b. ~~A description of the service magazines and storage igloos is also included.~~

~~III K~~IV J D-1a Physical Characteristics

AAC~~ADEM Admin. Code~~ 335-14-8-.02(14)(a)1

This section describes the physical characteristics of the SDC ~~facility~~. The layout of the SDC ~~facility~~ is shown in Figure ~~III K~~IV J-6[1]. The conceptual design of the SDC ~~facility~~ is discussed below.

The SDC and ~~the~~ service magazines are located on the west side of G block and just north of the Demolition Pit road and next to B~~b~~uilding 695. The storage igloos are located in G block. For safety, the buildings are at least 1,250 feet south of SDC. The SDC is also 1,200 feet from the nearest storage igloo in G block. Access roadways are provided for trucks, buses, forklifts, and service vehicles. Access roads are provided to G block on the east and to the emergency egress road on the west. Refer to Section ~~III K~~IV J B for a detailed description of the location of the SDC.

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[1] All figures are located at the end of this section.

The SDC unit is contained in a sprung structure, which is an engineered stress membrane structure. The sprung structure is constructed of extruded aluminum arches, connected to an all–weather outer membrane which will cover the loading area~~room~~, SDC equipment, and OGT equipment. Neither ~~T~~the ~~S~~sprung ~~S~~structure nor its ventilation system are~~is not~~ required for treatment of WMM.

The SDC ~~S~~system is designed and built as a mobile system, able to be transported over road, rail or by sea using containers which are configured as standard ISO specification containers. Each container is equipped with a frame, dimensions and lifting points per ISO standards and contains parts of the SDC ~~S~~system preconfigured and installed, ready to place and bolt together with a minimum of connections. The unit remains installed within the containers for use. Installation of the system occurs at the point of use. The various containers are received at the location and placed in the proper location using a crane. Once in place the containers are bolted together into a rigid structure using rigid connectors, and then the inter-container process piping and electrical connections are made. All electrical connections are brought to one junction box per container to facilitate connections and plug in connectors are used to the extent possible. Process piping interconnectors are flange type prefabricated junctions, and piping meant to contain potentially hazardous materials are double wall construction. Where required expansion joints are provided in the process piping to accommodate temperature swings. The process for erection is as follows:

a) Containers are unloaded and placed according to the erection plan;
b) Side walls are removed for easy access where not necessary;
c) Necessary stairs and platforms are connected;
d) Process connections are made between the containers;
e) Power and bus cables are connected;
f) Cameras and PA speakers external to the containers are mounted;
g) Sprung structure is erected, filters connected, external cameras mounted;
h) Consumables are connected with flexible double wall hose to the process containers;
i) Electrical and process checks are performed according to a defined check list; and
j) Leakage test is done for the whole system before start up.

An exhaust filtration unit, though not required for WMM operations, may be connected to the ~~S~~sprung ~~S~~structure to provide negative pressure within the structure with respect to the outside. The minimum footprint for sprung structure is 70 x 100 feet. The footprint may be adjusted for ancillary equipment outside of the sprung structure (e.g., generators, carbon filtration units, airlocks, control room, waste water treatment, etc.).

The SDC ~~S~~system is contained within a series of containers which are trucked to the site and placed using a crane. After placement, the ~~S~~sprung ~~S~~structure wa~~i~~s erected around the system which acts as a tertiary containment (primary containment is afforded by the system itself, and secondary containment is afforded by the ISO sea containers). ~~For processing mustard munitions the tertiary containment is kept under negative pressure by a series of~~

~~activated carbon/HEPA filters attached to ID fans.~~ Blast protection panels are incorporated into the sea containers as necessary. The SDC loading container, detonation chamber container and scrap bin container are located in three sea containers whichh~~h~~ are stacked one on top of the other for operations. The OGT System is housed in another three containers with additional containers for the loading and scrap handling operations, and two~~an~~ electrical switchgear utility containers.

~~The SDC facility is a heated, armored, double shell retort, which operates at high temperature. The inner chamber is heat resistant stainless steel excellent at high temperatures which is able to withstand the mechanical stress loads caused by detonation pressures. The inner and outer chambers are separated from one another by an air space which serves to decouple detonation stresses from the inner to the outer chamber, thus enhancing the overall safety and reliability of the unit. Placed within the bottom of the outer chamber are electric resistance heaters, which supply heat to the unit. The outer chamber also includes thermal insulation for efficiency. This enclosure serves as an additional barrier between the chamber and process room and protects workers from burns and dust, as well as providing additional vapor containment in the highly unlikely event that both chambers are breached.~~

~~During operations the chambers are mated to a flange which is attached to the loading system. The connection uses metal gaskets backed up with triple redundant inflatable seal rings to ensure a leak tight seal. The loading system is composed of a loading conveyer, a munitions lift, and two airlock type loading chambers equipped with gates. The loading conveyer begins in the munitions loading room and ends at the munitions lift.~~

~~III K~~IV J D-1a(1)Munitions Limitations

In addition, all types of explosive containing material ~~such as small arms, projectiles, cartridges, mines, rockets, grenades, pyrotechnics, and explosives contaminated material, toxic containing materials, fuzes, detonators etc~~ can be processed in the system as long as the following boundary conditions per feed cycle are not exceeded:

- Chlorine <~~below~~ 11.1 lb~~s~~,
- Sulf~~ph~~ur <~~below~~ 6.3 lb~~s~~,
- Mass Detonating Explosives < ~~below~~ 6.7 lb~~s~~ (TNT equivalent),
- Non Mass Detonating Explosives <~~below~~ 23 lb (TNT equivalent),
- No shape charges unless shape charge function is defeated prior to feeding, and
- Overall weight <~~of~~ 330.7 lb~~s~~ (including feed tray).

All feed events (e.g., miscellaneous solid waste, dunnage, process fluids) will be bound by the feed rates contained in the RCRA Permit.

~~III K~~IV J D-1a(2)Description of the Service Magazines and Storage Igloos

~~The service magazines are actually one structure with three separate storage bays and doors. The~~ Each service magazine is an earthen covered steel reinforced concrete structure

and located within Building 695 Complex. The structure~~s~~ ~~are~~is 29 feet deep and 17 feet high ~~at the highest~~ and ~ ~~approximately~~ 170 -feet wide and is divided into three sections.

The storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and will serve as the primary storage for munitions per the MMR and WMM prior to ~~them~~ being offered to the SDC for treatment. The igloos are also being permitted to allow for storage of hazardous waste material contaminated with energetics that is delivered for treatment at the SDC from DoD facilities and for storage of r~~R~~ecovered WMM that have been declared as hazardous waste. The SDC-dedicated s~~S~~ervice m~~M~~agazines are designated as 712, 713, and 714. The SDC-dedicated storage igloos ~~following is a list of igloos numbers~~ which may be used for storage are as follows~~by the SDC~~:

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	

~~III K~~IV J D-1a(3)Fire Protection

The F~~f~~ire P~~p~~rotection S~~s~~ystem is~~will be~~ an automatic sprinkler system that complies with the requirements as stated in United Fire Code ~~UFC~~ 3-600-01 (6-10.5), Table 4-1 for Ordinary Hazard Group 2.

~~III K~~IV J D-1a(4)Utility System

A 1,500-kilovolt ampere ~~(kVA)~~, pad-mounted transformer is used~~provided~~ to supply electrical power to the SDC ~~facility~~. Natural gas ~~or Propane will be~~ is used~~supplied~~ to heat the thermal oxidizer and boilers. Water is received from ANAD via pipeline and distributed to points of consumption throughout SDC ~~facility~~. The system also supplies water to the required process systems.

~~III K~~IV J D-1b Process Descriptions

AAC~~ADEM Admin. Code~~ 335-14-8-.02(14)(a)2

The loading area~~room~~ is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor transfer~~movement~~. After the loading conveyor is loaded, ~~the loading operator leaves the area and the loading conveyor~~it moves one tray at a time to the lift~~into the SDC~~. The lift~~As each item is conveyed from the loading room to the SDC for destruction the loading conveyor conveys it over to the munitions lift where it is~~ then~~and~~ transfers~~elevated~~ the tray to the level of the first loading chamber (LC1). From the lift, the item is then transferred~~conveyed~~ to the apron of LC1~~the first loading chamber~~. All trays must be configured to pass through the ~~Due to the shape of the round inlet opening~~18.1

inches in diameter opening of the SDC~~ the maximum package diameter shall not exceed 18 inches (in.). The maximum size of the feed tray is 59 in. (Length) x 16 in. (Width) x 16 in. (Height). Diagrams and equipment drawings may be found in Attachment K-1 of this application.~~

At this point the loading system pauses until the C~~c~~ontrol R~~r~~oom (CON) O~~o~~perator (CRO) initiates staging of a tray into LC1~~acknowledges that the tray is ready to load into the SDC~~. All movements from the loading conveyors to LC1~~the first loading chamber~~ are automatic. However, the CRO~~control room operator~~ has full control of all movements and can abort or reverse the movements as required. The loading conveyors and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.

Staging of a tray consists of deflating a pneumatic seal in the gate leading to LC1 and then raising the gate. An electrically operated ram, equipped with sensors to detect misfeeds and other problems, pushes the tray into the LC1 and then retracts. The gate is lowered and pneumatic seal inflated forming a gas-tight boundary. Staging of a tray into LC1 can occur while the previous tray is being processed in the DC.

When conditions are verified acceptable for initiating feed to the DC, the CRO initiates the loading sequence for staging the next tray into the second loading chamber (LC2). The actions of transferring a tray to the DC are automatic but are monitored in the CON and can be manually interrupted. The seals on both sides of the gate leading to LC2 are deflated and the gate is raised. The hydraulically operated ram pushes the tray into a cradle located in LC2 and then retracts. The gate leading to LC2 is lowered and the seals on both sides of the gate are inflated. This gate is rated to withstand blast pressures of the DC.

~~Once at the apron of the first loading chamber and after the operator gives the go-ahead for the loading operation, the first loading chamber gate is opened to admit the tray. The first loading chamber gate is equipped with an inflatable gasket seal which prevents leakage from the first loading chamber. After the gate is opened, the tray containing the munition item is pushed into the munition feed tray located in the first loading chamber by an electrically operated ram equipped with sensors to detect misfeeds and other problems. After the tray is inserted, the ram withdraws and the first loading gate is closed and sealed. Next the second feed gate (which is also fitted with inflatable seals to prevent leakage) opens and a hydraulically operated ram pushes the munition into the second loading chamber. The ram is withdrawn and the second loading gate closes. If~~When needed, LC1~~the first loading chamber~~ may then be filled with flush tank solution to ensure that no air which may contain contamination remains~~ in the first loading chamber~~. Air displaced by this operation is fed to the DC~~SDC main chamber~~ for treatment. Flush tank solution may either be fed into the DC~~SDC~~ for treatment or recycled back to the reserve flush tank for re-use.

The cradle and fragment valve within LC2 move as one unit but are located perpendicular to each other. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90 degrees (°) and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated

back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

~~To transfer the WMM from the second loading chamber to the SDC, the cradle and fragment valve rotate 90 degrees (°) as a unit. The fragment valve is a round circular plug shaped device that is positioned above the entrance to the SDC to prevent fragments from impacting the second loading chamber. When rotated, the fragment valve moves out of the opening to the SDC and the cradle is aligned discharging the munitions to the SDC. Once the munitions have been delivered to the SDC, the cradle and fragment valve are rotated in the opposite direction, lining up the fragment valve over the opening to the SDC and the cradle to receive the next load. Once over the SDC, a hydraulic piston presses down on the fragment valve to hold it in position. Loading chamber gates are configured and designed to contain detonations or fragments within them equal to the design limit of the rest of the chamber.~~

Upon entering the DC, the munitions are heated ~~After the munitions are fed to the inner detonation chamber the items heat~~ resulting in a detonation and/or deflagration. The increase of pressure within the munition casing caused by t~~T~~he ambient heat of the DC~~SDC chamber~~ alone is adequate to open the munition case and destroy fill material without the presence of explosives. ~~As there is insufficient air contained within the detonation chamber to support complete combustion of the detonation products, the result is a pyrolysis reaction, which breaks down the detonation gases to simple compounds which are then further treated in the OGT system.~~

Detonations within the SDC occur inside a detonation chamber (DC). The DC consists of an upper portion (UDC) which is fixed to the loading system and a lower portion (LDC) which can separate from the UDC. During detonation, the UDC and LDC portions of the DC are sealed by means of a locking ring, rope gasket and six pneumatic seals (three on the top side of the locking ring, sealing to the UDC, and three underneath the locking ring, sealing the LDC).

To empty the DC, the pneumatic seals are deflated and locking ring is partially twisted to free the LDC. The LDC can then be lowered and tilted to empty the scrap. Following scrap removal, the LDC is returned to the upright position and raised. The locking ring is twisted in the opposite direction to lock the UDC and LDC together and the pneumatic seals on both sides of the locking ring are inflated to seal the locking to each respective portion of the DC.

The LDC contains electric heaters to maintain the DC at high temperatures. Both the UDC and LDC are constructed of heat resistant steel which can withstand the mechanical stress loads caused by detonation pressures at high temperatures. Inside the LDC, a fragment shield acts as a sacrificial plate to absorb impacts from fragmentation.

The OGT S~~s~~ystem consist of a buffer ~~or equalization~~ tank which absorbs pressure ~~pertabations~~perturbations~~smoothes out pressure pulses~~ caused by blast waves ~~detonation~~ within the ~~S~~DC, followed by an orifice or ~~a~~ control valve which also helps to equalize ~~smooth~~ the flow going to downstream components of the system. Following the~~is~~ orifice or

control valve, the gas is heated to a minimum of 1,741~~approximately 2000~~ degrees Fahrenheit (-°F) for at least 2 -seconds.

Off-gases from the detonation and/or deflagration are further treated in the OGT System which is comprised of a thermal oxidizer, spray dryer, bag house filter, quench venturi, acid scrubber, and neutral scrubber. Off-gases received from the thermal oxidizer are ~~then~~ cooled by a spray dryer~~quench~~ followed by a baghouse~~dry scrubber filter~~ to remove salts and particulates. The ~~and then~~ remaining contaminants are removed by the acid and neutralization scrubbers~~two wet scrubber stages~~. The last step is a multistage exhaust filtration system, which acts as a safeguard to~~backing up~~ the OGT S~~s~~ystem prior~~before~~ to releasing the off gas to the environment.

~~It should be noted that the entire OGT system is maintained at adequate temperature to reduce condensation. Descriptions of these items are provided below.~~

~~III K~~IV J D-1b(1) Transportation of Material for Treatment

Transportation details for WMM to be treated at the SDC ~~facility~~ are discussed in Section IV B-5 and IV D-1k(3).

~~III K~~IV J D-1b(2) Equipment Descriptions~~Treatment of Explosive Elements~~

A detailed description specific equipment and systems included in the SDC is discussed in the following sections.

~~The munition or munition components will be placed in ammunition trays. The trays are placed on a loading system which takes them one at the time into the SDC. The transport procedure is remotely started from the control room once the loading activities are complete.~~
~~The trays are individually transported to the lift and delivered to loading chamber 1. The gastight gate at the entrance of loading chamber 1 is opened and the tray is pushed into the chamber. Gate one is closed. The second gastight gate between loading chamber 1 and 2 is opened and the tray is pushed into the cradle inside loading chamber 2. Gate 2 is then closed. When needed, loading chamber 1 may be filled with flush tank solution, pressing any gas that may have leaked from the package through a pipe into loading chamber 2. The fragment valve and cradle are rotated 90° and the tray falls down into the SDC. The fragment valve and cradle are then rotated back into the loading position with the fragment valve located over the entrance to the SDC to act as a shield for loading chamber 2. If present, the flush tank liquid is then emptied from loading chamber 1. A valve in the pipe leading to loading chamber 2 is closed and another valve is opened to let fresh air into loading chamber 1 eliminating the risk of leakage. A description of these items is described below.~~

Conveyor System

The conveyor system is electrically powered and consists of ~~:~~

- ~~A~~a series of conveyors which transport the ~~ammunition~~ trays to the lift, a
- ~~A~~ Lift which elevates~~lifts~~ the trays up to LC1~~loading chamber 1~~, and an
- ~~A~~ electrical pusher which propels~~pushes~~ the trays in-to LC1~~loading chamber 1~~.

Gate 1

Gate 1 is a hydraulically operated sliding gate located at the inlet ~~hatch~~ to LC1~~loading chamber 1~~. ~~It is a sliding gate and operated hydraulically.~~ Gate 1~~The gate~~ is sealed gastight

with a~~1~~ pneumatic seal. An electric pusher propels~~pushes~~ the package into LC1~~loading chamber 2~~.

Loading Chamber 1 (LC1)

LC1~~Loading chamber 1~~ is a staging location prior to~~sluice part before~~ LC2~~loading chamber 2~~. ~~Between loading chamber 1 and 2 there is a gastight gate.~~ If required, LC1~~Loading chamber 1~~ may be filled with a water-~~-~~based flush ~~tank~~ solution after any loading sequence in order to evacuate gases for further treatment~~to the treatment system~~.

Gate 2

Gate 2 is a hydraulically operated sliding gate located at the inlet ~~gate~~ to LC2~~loading chamber 2~~ from LC1. ~~It is a sliding gate and operated hydraulically.~~ Gate 2~~The gate~~ is sealed gastight with four~~2~~ pneumatic seals which are designed to withstand design blast pressures within the DC. ~~It is designed to withstand explosions up to 6.6 lbs TNT equivalent.~~

Loading Chamber 2 (LC2) and Cradle

LC2~~Loading chamber 2~~ has a built-~~-~~in hydraulically powered cradle and fragment valve which move as a single unit. ~~The cradle is designed to withstand the pressure and the fragments from the detonation chamber. When the tray has been pushed in loading position the cradle turns 90° in clock wise direction and the package falls down into the detonation chamber. The cradle then turns back and a fragment valve provides a fragment shield by means of a hydraulically operated cone that seals off loading chamber 2 against the SDC. Both positions of the cradle may be monitored by cameras so that both a successful loading of the tray and a successful fall into the SDC can be assured.~~

With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90° and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

~~Destruction of munitions in the SDC~~

~~The munition is dumped into the detonation chamber and lands on the hot scrap material at the bottom of the chamber. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy fill material without the presence of explosives. The munitions are heated until, deflagration or detonation and the explosives in the munitions are destroyed. The destruction process is identified either by the dynamic pressure sensor and/or the static pressure sensor, aided by a sound sensor.~~

~~The heat is generated by heating elements in the space between the chamber and the shell. During the destruction process, pressure and temperature inside the SDC are monitored and recorded in the control room. Heated sweep air is continuously added to the detonation chamber during operation. The gases from the destruction process will be transferred into and cleaned by the OGT system.~~

~~To eliminate potential overpressure peaks coming from the SDC, the off gases shall pass through a buffer tank in order to reduce such pressure peaks before the gases are transferred to the downstream OGT system.~~

Upper Detonation Chamber (UDC)

The UDC~~upper part of the SDC~~ is mounted to the outlet flange of LC2~~loading chamber 2~~. Connections for incoming process air, outlet exhaust gases, temperature sensors, and pressure gauges are placed on the UDC~~SDCs upper part~~.

Lower Detonation Chamber (LDC)

The LDC~~lower part of the SDC~~ has an inner fragment shield and ~~an~~ outer chamber. ~~The space between the chamber and scrap chute is filled with insulation.~~ Electrical resistance heating elements are located on~~in~~ the LDC~~bottom~~.

Elevating and Turning System

When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks ~~that make up the SDC lifting system (DCLS)~~. The rotation of the LDC is made by a hydraulic motor, connected to the LDC by a gearbox and roller ~~with a~~ chain ~~which makes up the SDC Rotating System (DCRS)~~.

Locking and Sealing System

The UDC and LDC~~upper and lower parts of the SDC~~ are locked to each other with a locking ring during destruction. The locking ring is maneuvered by two hydraulic cylinders. For the emptying procedure the locking ring is turned to the open position and the LDC~~lower part of the SDC~~ is lowered and tilted~~turned~~. The connection between UDC and LDC~~upper and lower part of the SDC~~ is sealed by three pressurized pneumatic gaskets during destruction.

Hydraulic Power Unit

The hydraulic power unit ~~(HYPU)~~ provides power to operate the lifting jacks, tilting motor, gates 1 and 2, locking ring, and pushers. ~~following systems:~~

- ~~The elevating and turning system for the SDC (DCLS)~~
- ~~The tilting unit (DCRS)~~
- ~~Gates 1 and 2~~
- ~~The locking ring (DCLS)~~
- ~~The pushers~~

It also has a built in backup pump which is driven by the uninterrupted power supply ~~(UPS)~~ of the SDC ~~facility~~.

Scrap Chute and Scrap Conveyor

When removal of scrap material is required, ~~When ANAD determines (based on the material being fed) the SDC should be emptied of treated material,~~ the LDC is lowered and rotated~~then turned 180º~~ so the scrap material can be transferred to the scrap conveyor via the scrap chute~~fall down the scrap chute to the scrap conveyor~~.

Scrap Conveyor System

Scrap conveyors 201, 202, and 203 are vibration conveyors which use gravity to transfer material. The scrap conveyors are separated by gates and can be operated independently of each other. Dust is removed and collected in a drum between scrap conveyers 202 and 203 when the scrap passes over a wire mesh. Scrap conveyor 203 allows visual inspections of WMM after treatment.

~~a) Scrap conveyor 1 transports the scrap material to scrap conveyor 2.~~
~~b) Scrap conveyor 2 moves the scrap onto the vibration table. Scrap conveyor 1 and 2 are slow moving and allow the scrap to cool to a temperature where the material may be inspected.~~
~~c) The vibration table distributes the scrap evenly and delivers it onto the scrap inspection conveyor. It also separates dust from the scrap which is collected underneath in a basket.~~
~~d) The scrap inspection conveyor allows visual inspections of WMM after treatment has occurred in the SDC.~~

Detonation Chamber Air Heater

Air heaters are used to raise the temperature of the process air which is used to aid the destruction process.~~The air heater heats the process air. This hot air is led into the SDC to aid the destruction process.~~

~~Reserve Flush Tank~~
~~The reserve tank contains the water based solution which may be used to flush loading chamber 1 as needed after any loading sequence. Process air provides the needed pressure to drive the solution into loading chamber 1. When necessary, the solution can be emptied from loading chamber 1 into the SDC for destruction. Otherwise it will be led back into the reserve flush tank.~~

~~Off-Gas Treatment System (OGT)~~
Buffer ~~(equalization)~~ Tank

The buffer tank~~is unit~~ is designed to smooth gas pressure and volume surges from the DC~~SDC~~ that occur when~~ever~~ a munition detonates or deflagrates ~~within the SDC~~. By smoothing surges to downstream equipment, ~~the design of downstream equipment is simplified and~~ the equipment is better able to operate near ~~its~~ optimum design flow rates which ~~. This~~ allows for a more consistent removal of contaminants. The buffer tank is comprised of a cone-bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section. The bottom of the buffer tank has two slide valves that operate pneumatically. These valves periodically open and solids are collected in a drum for disposal ~~and are periodically and automatically removed using a lock hopper type rotary valve for recycle to the SDC~~. The entire tank and associated~~all~~ piping are maintained at a predetermined temperature using electric heaters and insulation.

Orifice Plate and ~~/~~Control Valve

An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between two pipe flanges. The control valve may be operated automatically to bypass the orifice except when in a destruction cycle~~or by operator input to provide pressure control to downstream equipment~~. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.

Process Ventilation Cyclone, Filter, and Fan

The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.

Thermal Oxidizer

The off gases resulting from the detonation/deflagration~~pyrolysis~~ process in the ~~S~~DC are transferred to a thermal oxidizer. The thermal oxidizer is designed to accept all gases resulting from one feed cycle to the ~~S~~DC. The thermal oxidizer (and OGT System) is oversized for this peak flow and ~~is actually~~ able to accommodate twice the flow that is anticipated.~~ The OGT is sufficiently designed to accommodate feed rates greater than the design for the SDC.~~

The thermal oxidizer uses natural gas ~~or propane~~ as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of a minimum of 2 seconds~~ or more~~ at greater than 1,741~~approximately 2000~~ °F for the peak load expected from the upstream SDC. An additional flow of combustion~~secondary~~ air is automatically added to ensure an oxygen rich~~oxidizing~~ environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.

Spray Dryer

~~The off gas coming from the thermal oxidizer exits with a temperature of approximately 2000 °F.~~ The~~is~~ off gas from the thermal oxidizer is quickly cooled to ~~approximately~~ ~350 °F in the spray dryer by the injection of spent scrubber liquid~~water~~ into the gas stream. ~~The injected water will evaporate and the energy needed for the evaporation is taken from the off gas so that the gas will rapidly cool. The water injection or quench takes place in a spray dryer that is positioned at the inlet of the next treatment stage, the acid scrubber.~~ Evaporation of the spent scrubber liquid generates~~The spray dryer uses spent scrubber liquids for the water feed and subsequently evaporates this water, leaving~~ dry salts and particulates~~ for disposal and removing the need for a water treatment system to process spent scrubber solutions~~. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a screw feeder and slide gate ~~rotary lock hopper type~~ valve for disposal.

Bag House Filter

~~A bag house filter is located after the spray dryer.~~ The~~is~~ bag house~~unit~~ is comprised of a filter system which uses~~where the~~ bags ~~have a~~ layered with sodium bicarbonate, or similar, as the absorbent to remove ~~of absorbent material added to them which is automatically renewed on a periodic basis. Most of the~~ dust and heavy metals from the off gas~~are removed in this unit~~. ~~The removal occurs in a zone on the inside of the bags where a material suitable for control of the system (for example: sodium bicarbonate) is added.~~ The ratio of the absorbent~~material~~ may be adjusted to fit the application. The absorbent~~powdered mixture~~ is fed ~~continuously~~ from a hopper by a ~~screw feeder and~~ pneumatic feed system to the ~~to the baghouse where it adds to the layer of spent material on the~~ outside~~inside~~ of the bags providing ~~. This allows~~ a fresh surface to ~~be presented to~~ the incoming gases ~~at all times~~. Periodically when the pressure drop across the filter exceeds a predetermined set point, the bags are cleaned~~emptied~~ using a pulse jet~~,~~ and the spent solids are collected in a drum for disposal using a screw feeder and slide gate valve~~with the collected process dust is processed through a rotary lock hopper valve into a drum for disposal~~.

Quench Venturi

The quench venturi cools the off gas from ~~In the next step the air is cooled from approximately~~~ 350~~ °F~~ to 170~~-~~°F by injecting ~~. This is done with scrubber~~ solution water from the acid scrubber. Any ~~The water~~ remaining solution water ~~from this step~~ is cooled and recycled to the acid scrubber sump.

Acid Scrubber

The acid scrubber cools the off gas from ~ 170 to 150°F. ~~The off gas in the acid scrubber will be further cooled to the operating temperature of the scrubber, which is approximately 150 °F.~~ The acid scrubber is ~~a counter current~~ designed where the scrubber liquid flows counter current to the gas flow. ~~The acid scrubber will remove several contaminants from the off gas. Initially, d~~Dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off gas by ~~.~~ ~~These components will~~ dissolvinge in the scrubber liquid making it acidic. ~~The scrubber pH will be controlled by a pH controller that ensures that the liquid has a sufficiently high pH value to obtain the necessary concentration gradient to wash the gases.~~

~~—~~The conductivity~~resistivity~~ of the scrubber liquid is~~will be~~ also monitored. Raising of conductivity is an indication of increasing dissolved salt content in the~~In case of a low resistivity value indicating a high dissolved salt content the~~ scrubber liquid. To counter act this, fresh water is added ~~will be partly replaced by fresh water~~. Excess scrubber liquid is then transferred to the bleed water tank for mixing and pH correction~~spray dryer for evaporation and salt removal~~.

Scrubber liquid is pumped from the bottom of the scrubber column to the top and ~~is~~ distributed inside the column by a distribution pan~~spray nozzles~~. The off gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure ~~and~~ adequate mixing and contact between the liquid and ~~the~~ gas, the columns are filled with a column packing material. As a safeguard, the temperature of the off gas inlet is~~will be~~ monitored. In case of a high temperature off gas, due to a spray dryer~~quench~~ malfunction, an emergency water injection is used~~will be switched on~~.

Neutral Scrubber

~~After the acid scrubber the off gas is fed to the neutral scrubber.~~ The neutral scrubber removes any residual contaminants that passed through the spray dryer and acid scrubber. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.

The scrubber liquid is monitored by a pH controller. Sodium hydroxide is ~~Two solutions may be~~ used to maintain the proper neutral pH. ~~One is a NaOH solution and the other is an HCl solution.~~ The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.

To obtain a constant quality in the scrubber, ~~-~~spent scrubber liquid is periodically removed based on level and conductivity~~a continuous~~ and sent to the spray dryer where it acts as a cooling agent. ~~waste stream is taken out through the column sump, which goes into the spray dryer.~~ Scrubber liquid is refreshed by the addition of ~~This stream is replaced by fresh~~ caustic solution as needed.

Induced Draft (ID) Fans ~~(ID Fans)~~

The two ID fans are located between the neutral scrubber and inlet to the safeguard filter.~~downstream after the particle filter.~~ Should an ID fan fail, the other will automatically assume the load. The ID fans ensure that the pressure of the off gas in the thermal oxidizer is maintained ~~slightly~~ below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. ~~The control of the pressure ensures that no contaminated off gas above emissions limitations is released into the environment.~~ The ID fans work continuously during the operations. ~~of the plant. Two redundant fans are installed. If one fails, the other will automatically take over.~~

Safeguard Filter

The safeguard filter system is an exhaust filtration unit. The exhaust filtration unit is designed as a series of filters and built IAW~~in accordance with~~ the requirements by the U.S. Army's Chemical Demilitarization program. The function of the filter units is ~~The filter system is designed as a series of filters each performing a duty as~~ described below:

- Prefilter: R~~r~~emoves particulates remaining in the gas stream that may cause blinding or clogging of the down-stream HEPA filter;
- HEPA Filter: R~~r~~emoves particulates down to 0.3 microns;
- Charcoal: R~~r~~emoves contaminants such as volatile and semi-volatile heavy metals;

~~• A space is included between the charcoal filters which allows for monitoring.~~

- Charcoal: S~~s~~erves as a backup for the first charcoal filter described above;
- HEPA Filter: E~~e~~nsures that there are no emissions of potentially contaminated particulates released to the atmosphere.

The ~~exhaust~~ filter ~~system~~ housings are made of stainless steel and ~~are~~ equipped with differential pressure monitors on all filters to ensure adequate flow and ~~to~~ monitor for when a filter needs to be replaced. ~~Filters within the unit use a bag in / bag out system so that the operator changing the filters never comes in contact with the actual filter media.~~ The safeguard filter system~~s~~ includes an ID fan to maintain ~~provide~~ negative pressure within~~in the~~ system to protect against leakage.

Stack

The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist (ACGIH) I~~i~~ndustrial V~~v~~entilation M~~m~~anual.

~~III K~~IV J D-1b(3) Monitoring

Continuous Emissions Monitoring Systems (CEMS) monitor the off gas for carbon monoxide and oxygen. The CEMS are located after the safeguard filter unit in the Monitoring House. ~~The treated off gas is released to the downstream safeguard filter. Analytical gas analyzers will be placed after the safeguard filters. These analyzers will control and record parameters of the off gas so that the quality may be maintained and recorded.~~ CEMS monitoring is~~will be~~ conducted IAW~~in accordance with~~ the SDC CEMS Certification Plan. ~~The~~

~~following materials will be monitored:~~

- ~~Carbon monoxide (CO)~~
- ~~Oxygen (%)~~

~~III K~~IV J D-1c Miscellaneous Unit Wastes

AAC~~ADEM Admin. Code~~ 335-14-5-.24(2)(a)1, 335-14-5-.24(2)(b)1, and 335-14-5-.24(2)(c)1

The characteristics of the components of the WMM are described in Section IV C~~ of the ANAD RCRA Application~~. The wastes generated from the SDC~~ facility~~ are described in Section ~~III K~~IV J C.

~~III K~~IV J D-1d Applicable Performance Standard

The applicable performance standards considered to be appropriate for the SDC~~ unit~~ are the miscellaneous unit standards under AAC 335-14-5-.24. The SDC~~ facility~~ has demonstrated a destruction and removal efficiency~~DRE~~ of 99.9999 percent (%) for m~~M~~ustard a~~A~~gent~~ and Monochlorobenzene~~.

~~III K~~IV J D-1e Provisions to Prevent Releases of Hazardous Waste or Hazardous Waste Constituents Into the Groundwater or Subsurface Environment, or into Surface Water, or Wetlands or on the Soil Surface

AAC~~ADEM Admin. Code~~ 335-14-5-.24(2)(b) and (c)~~,~~ and 335-14-8-.02(14)(b) and (c)

To prevent releases into the groundwater or subsurface environment, surface water, wetlands, or on the soil surface, a containment system will be provided that conforms with the requirements of AAC 335-14-5-.09(6)(b). Refer to the ANAD RCRA Permit Application for information regarding to the hydrologic conditions and precipitation information at ANAD. The following sections describe the containment system at the SDC~~ Facility~~.

~~III K~~IV J D-1e(1)Basic Design Parameters, Dimensions, and Materials of Construction of the Containment System

AAC~~ADEM Admin. Code~~ 335-14-5-.09(6)(b)(1)~~,~~ and 335-14-8-.02(6)(a)(1)

The treatment process is performed inside the Sprung Structure~~SDC facility~~. For the processing of munitions the SDC design incorporates triple redundant containment with the primary containment consisting of the SDC itself, a secondary containment consisting of the ISO containers which house components of the SDC and OGT System~~a structure around the SDC up to the thermal oxidizer~~, and a tertiary containment which consists of a bermed concrete floor in the S~~s~~prung S~~s~~tructure~~, which is an engineered stress membrane structure~~.

~~The first containment consists of the SDC including the loading system, the buffer tank, and the off gas piping up to the thermal oxidizer of the off gas treatment system. All equipment of the first containment area is built to be gastight.~~
~~The three containers which are holding the loading system and the SDC are equipped with a ventilation system which ensures a negative pressure. The containers and SDC equipment are also designed to enable decontamination. The buffer tank as well as the off-gas piping leading from the SDC to the buffer tank and from the buffer tank to the thermal oxidizer are encapsulated and connected to the process ventilation system.~~

~~Though not required for WMM operations, the sprung structure may also be equipped with a negative air pressure carbon filtration unit. The structure is equipped with an airlock type vestibule. The vestibule is connected to the ventilation system so that it is kept under negative pressure when the outer door is closed and preserves the negative pressure inside the main containment when the outer door is opened.~~

~~III K~~IV J D-1e(2)Containment System Drainage

AAC~~ADEM Admin. Code~~ 335-14-5-.09(6)(b)(2)~~,~~ and 335-14-8-.02(6)(a)(1)

The floor of the structure is~~will be~~ concrete and ~~will~~ includes containment (diked / bermed areas) where liquids may be present in the treatment process. Where containment is required, the floor is~~will be~~ coated with an appropriate sealant to ensure any liquids released to the secondary containment are captured. The floors within the diked / bermed areas are~~will be~~ sloped to allow for collection of liquids.

~~III K~~IV J D-1e(3)Containment Capacity

AAC~~ADEM Admin. Code~~ 335-14-5-.09(6)(b)(3)~~,~~ and 335-14-8-.02(6)(a)(3)

Containment capacity is~~will be sufficiently~~ sized to capture the entire liquid contents of the OGT S~~s~~ystem ~~for the SDC~~ with an e~~. E~~stimated total volume of~~is~~ 700 gallons.

~~III K~~IV J D-1e(4)Control of Run-On

AAC~~ADEM Admin. Code~~ 335-14-5-.09(6)(b)(4)~~,~~ and 335-14-8-.02(6)(a)(4)

The SDC ~~facility~~ is~~will be~~ constructed ~~approximately~~ 850 feet above sea level~~,~~ and the area surrounding this facility is adequately sloped. The S~~s~~prung S~~s~~tructure has a sloped roof that facilitates rainwater drainage away from the building. The facility is located in an area that is not known to be flooded and ~~is~~ not in a 100-year flood plain. The storm drainage is designed for a 10-year storm capacity.

~~III K~~IV J D-1e(5)Removal of Liquids from Containment System

AAC~~ADEM Admin. Code~~ 335-14-5-.09(6)(b)(5)~~,~~ and 335-14-8-.02(6)(a)(5)

All spills and leaks are reported IAW~~in accordance with~~ the ANAD Integrated Contingency Plan (ICP).

~~III K~~IV J D-1f Provisions to Prevent Release into the Air

AAC~~ADEM Admin. Code~~ 335-14-5-.24(2)(c)~~,~~ and 335-14-8-.02(14)(b) and (c)

During normal operations ~~at the SDC facility~~, emissions are~~will be~~ below the limitations imposed on the facility. The ~~elaborate~~ OGT S~~s~~ystem ~~adequately~~ serves to minimize emissions. In the event of equipment upsets, the system is designed to allow for ~~closing off the system to~~ restricting emissions while necessary corrective actions are performed.

Though not required for non-agent operations, the Sprung Structure is also be equipped with a Carbon Filtration Unit (IONEX 16000) capable of maintaining negative air pressure within the structure.

~~III K~~IV J D-1f(1) Process Vents~~ADEM Administrative Code Standards~~

AAC~~ADEM Admin. Code~~ 335-14-5-.27

The SDC~~facility~~ has no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or stream stripping operations that manage hazardous wastes. Therefore, AAC 335-14-5-.27 is not applicable.

IV J D-1f(2) Equipment Leaks

AAC~~ADEM Admin. Code~~ 335-14-5-.28

The SDC~~facility~~ ~~also~~ has no pumps, compressors, pressure relief devices, sampling connecting systems, open-ended valves or lines, valves in gas/vapor or light liquid service, or pumps, valves, flanges, and other connectors in heavy liquid service associated with processing of the munitions. Therefore, AAC 335-14-5-.28 is not applicable.

IV J D-1f(3) Tanks, Surface Impoundments, and Containers

AAC~~ADEM Admin. Code~~ 335-14-5-.29

The average volatile concentration of wastes generated is <~~less than~~ 100 parts per million by weight (ppmw). Therefore, analysis of the volatile organic concentration, IAW~~in accordance with~~ the analytical methods specified in AAC 335-14-6, is not required.

The standards, which may be appropriate to the processing of munitions, are the container standards specified in AAC 335-14-5. The standards apply to containers having design capacities greater than (>) 0.1 cubic meters (m^3) (~~approximately~~ 26 gallons). The maximum quantity of fill material in any WMM to be processed at the SDC ~~will~~ contains <~~less than~~ 0.1 m^3~~cubic meters~~ as the system is not capable of accepting WMM at that size. Therefore, the munitions qualify for exemption from the container standards. Wastes contained in drums are managed IAW ~~under~~ the <~~less than~~ 90-day generator requirements at the SDC ~~facility~~, including compliance with AAC 335-14-6 air emission standards for containers.

~~The SDC facility is equipped with a ventilation system leading to a carbon filtration system. A description of the ventilation system is provided in Section III K D-1f(2). Operating and monitoring requirements are described in Section III K D-1g.~~

~~III K~~IV J D-1f(4~~2~~) Design Parameters of Closed Vent System – Heating, Ventilation, and Air Conditioning System

No volatile organic compounds ~~(VOC)~~ are carried within valved or piped systems for the SDC ~~facility~~; therefore, a closed vent system is not required.

~~III K~~IV J D-1f(5~~3~~) Air Quality

According to the ADEM, the air quality in the Anniston area meets the National Ambient Air Quality Standards (NAAQS) set to protect public health and welfare [Environmental Impact Statement (EIS) 1991]. Dugger Mountain Wilderness Area, 30 miles northeast of the ANAD location, is classified as a Prevention of Significant Deterioration (PSD) Class I area,

where additional degradation of local air quality is severely restricted. This is the closest PSD Class I area to the SDC ~~facility~~. (EIS 1991).

No significant emissions are expected from treatment operations. ANAD is over 30 miles away from the Dugger Mountain Wilderness PSD Class I area and since there are no emissions expected from SDC ~~facility~~, there is no likelihood of the treatment operation impacting this PSD Class I area.

Emissions in the southeast industrial area of ANAD from natural gas-fired boilers (one 61.5 million British thermal units (BTU~~s~~), two 21 million BTU~~s~~ each, two 9 million BTU~~s~~ each, two 12.52 million BTU~~s~~ each and two 90 million BTU~~s~~ each) are of sufficient magnitude to designate the ANAD as a major stationary source of air emissions.

III KIV J D-1f(64) Operation of Closed Vent System

No volatile organic compounds (VOC) are carried within valved or piped systems for the SDC facility; therefore, a closed vent system is not required.

III KIV J D-1g Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action

AACADEM Admin. Code 335-14-5-.24, and 335-14-8-.02(14)(a)2

The SDC fFacility iswill remain available to process recovered rounds from within the State of Alabama. Should the need arise to monitor a chemical fill round, the Permittee must await concurrence from the Department prior to receipt of the munition to ensure that any additional requirements which the Department may require have been incorporatedcommunicated. The Department may respond with additional conditions that may be applicable for the receipt, storage, and processing of recovered items to include additional monitoring requirements.

III KIV J D-1g(1) Monitoring Equipment

The SDC will be equipped with Continuous Emissions Monitoring devices (CEMS) which . The CEMS unit will monitor the off gas for carbon monoxide and oxygen.

III KIV J D-1g(2) Location of Monitoring Devices

The CEMS for the SDC are located after the safeguard filter systemLocation of monitoring devices in the SDC unit will be after the OGT system.

The SDC Facility will remain available to process recovered rounds from within the State of Alabama. Should the need arise to monitor a chemical fill round, the Permittee must await concurrence from the Department prior to receipt of the munition to ensure that any additional requirements which the Department may require have been communicated. The Department may respond with additional conditions that may be applicable for the receipt, storage and processing of recovered items to include additional monitoring requirements.

III KIV J D-1g(3) Operation of Monitoring Devices

The CEMSMonitoring devices will remain in operation IAWin accordance with regulatory requirements during hazardous waste processing within the SDC.

III KIV J D-1g(4) Quality Assurance/Quality Control (QA/QC) Requirements

If a suspect munition is found, the SDC Plant Managerperson in charge of the project determines the course of action. It is up to his/her discretion to confer with the Quality Assurance/ Safety Officer and request an evaluation of the round(s) in question.

III KIV J D-1g(5) Response Procedures

In the event of an emergency, all personnel will follow the SDC Contingency Procedures and the ANAD ICPIntegrated Contingency Plan. The attachments for treatment operations at the SDC facility have been incorporated into the ANAD ICPIntegrated Contingency Plan for munitions' treatment.

~~III K~~IV J D-1g(6) Inspection and Preventive Maintenance

Refer to Table ~~III K~~IV J-3 for inspection and preventive maintenance procedures for the monitoring equipment.

~~III K~~IV J D-2 Container Design

Hazardous wastes that are stored in containers at the SDC ~~facility~~, including the service magazines and storage igloos, include WMM offered for disposal and ~~: primary waste and~~ secondary waste. ~~Primary waste is defined as WMMs. Secondary waste is defined as all hazardous waste that is not defined as primary waste.~~ Hazardous waste ~~Primary and secondary waste~~ will be managed IAW~~in accordance with~~ Section ~~III K~~IV J C ~~of the ANAD RCRA Permit Application~~.

~~There is one permitted storage area located outside and adjacent to the SDC facility. These are the Service Magazines (712, 713, and 714). The WMM may be stored in the Service Magazine while waiting to be processed through the SDC. Secondary waste generated from SDC operations may also be stored in the Service Magazine or another permitted storage area or igloo prior to shipment off site in accordance with applicable regulations.~~

~~**III K D-2a Description of Containers and the Service Magazine and Igloos at the SDC Facility**~~

WMM and secondary waste may be ~~The wastes~~ stored in the SDC-dedicated service magazines or storage igloos ~~are primary or secondary wastes~~. ~~WMM and secondary waste associated with the operation of the SDC facility will be stored in either of these locations.~~ Secondary w~~W~~aste will be stored in appropriate containers and ~~will be~~ labeled accordingly. WMM ~~and Recovered WMM~~ may not be containerized or~~and~~ ~~will not be~~ labeled.

IV J D-3 Service Magazine and Storage Igloo Description

~~**III K D-2a(1)** SDC facility Service Magazines and Storage Igloos~~
~~The service magazines (see Figure III K-5) are actually one structure with three separate storage bays and doors. Each~~ The magazine is an earthen covered steel reinforced concrete structure that is 29 feet (length)~~deep~~, ~~and~~ 17 feet (height)~~high, at the highest~~ and ~~approximately~~ 170 feet (width)~~wide~~ separated into three sections. The~~ese~~is structure ~~were~~was constructed IAW~~in accordance with~~ ~~Department of Defense Explosive Safety Board (~~DDESB~~)~~ standards and satisfies the ~~Military Munitions Rule (~~MMR~~)~~ requirements. The SDC-dedicated ~~facility~~ s~~S~~ervice m~~M~~agazines will be maintained IAW~~in accordance with~~ DDESB requirements.

The storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and ~~will~~ serve as the primary storage for WMM prior to ~~them~~ being offered ~~to the SDC~~ for treatment. The igloos are primarily used ~~being permitted to allow~~ for storage of hazardous waste material contaminated with energetics and WMM ~~that is~~ delivered for treatment at the SDC ~~from DoD facilities, for~~

~~storage of Recovered WMM that have been declared as hazardous waste or for storage of WMM that have previously been declared to be hazardous waste~~.

III KIV J E GROUNDWATER MONITORING

AACADEM Admin. Code 335-14-8-.02(5)(c), 5, 6, 7, and 8

The groundwater monitoring requirements of AAC 335-14-5-.06 apply to surface impoundments, waste piles, land treatment units, and landfills. None of these types of hazardous waste management units are present at the will be included in SDC facility; therefore, groundwater monitoring is not required.

~~III K~~IV J F SECURITY

AAC~~ADEM Admin Code~~ 335-14-5-.02(5)
and 335-14-8-.02(5)(b)4

This section contains information concerning procedures to prevent hazards IAW~~in accordance with~~ AAC~~ADEM Admin. Code R.~~335-14-5-.02(5). These regulations require a description of the security procedures and equipment, inspection schedules, justification for a waiver of preparedness and prevention requirements, spill prevention containment and countermeasures plan, and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

~~III K~~IV J F-1 Security Procedures and Equipment

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5) and 335-14-8-.02(5)(b)4

Security is addressed in Section II F-1a. The SDC ~~facility~~ is located within the ~~Ammunition Limited Area (~~ALA~~)~~ of ANAD. Access to this area requires passage through an additional fence/gate system.

~~III K~~IV J F-1a Twenty-Four Hour Surveillance System

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(b)1

Surveillance systems are addressed in Section II F-1a.

~~III K~~IV J F-1b Barrier and Means to Control Entry

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(b)2

~~III K~~IV J F-1b(1) Barrier

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(b)2(i)

The SDC ~~facility~~ area is surrounded by two 7-foot high chain link security fences. These fences are separated by 30 feet. Each fence is topped with three strands of barbed wire. The perimeter is completely lighted. No space in the fence is greater than 4 inches wide. The bottom of the fence is blocked by cement curbing.

~~III K~~IV J F-1b(2) Means to Control Entry

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(b)2(ii)

Entrance to the ANAD is through one of two~~three~~ gates, all of which are attended 24 hours per day by armed guards. Entrance to the SDC ~~facility~~ area is through the ALA, which is accessible through controlled points of entry within the ANAD. All personnel are required to wear identification badges when reporting for work and while on the premises. Visitors are not permitted on the facility premises without first registering and receiving the proper badge, which must be displayed at all times.

Visitors to the SDC ~~facility area~~ are always accompanied during their visit and are subject to security checks.

~~III K~~IV J F-1b(3) Warning Signs

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(c)

Signs warning that the area is restricted and dangerous, and that unauthorized entry is illegal, are posted along the perimeter fence surrounding the ANAD at numerous locations and near all access gates. These signs are ~~approximately~~ 18 ~~inches~~x ~~by~~ 24 inches and are easily visible at a distance of 25 feet. Large signs describing the "Conditions of Entry" are posted at each gate. These signs are ~~approximately~~ 4 x ~~feet by~~ 6 feet in size, and warn of the possible consequences of unauthorized entry.

~~III K~~IV J F-1c Waiver

AAC~~ADEM Admin. Code~~ 335-14-5-.02(5)(a)

A waiver is not being sought; therefore, this section is not applicable.

~~III K~~IV J F-1d Injury to Intruder and Violation Caused By Intruder

AAC~~ADEM Admin. Code~~ 335-14-5-.~~-~~02(5) a 1 and 2

Sections ~~III K~~IV J F-1 and ~~III K~~IV J 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. Section ~~III K~~IV J F-1b (1) and (2) will not apply, and therefore will not be addressed.

~~III K~~IV J F-2 Inspection Schedule

AAC~~ADEM Admin. Code~~ 335-14-5-.02(6), 335-14-5-.24(3), and 335-14-8-.02(5)(b)5

~~III K~~IV J F-2a General Inspection Requirements

AAC~~ADEM Admin. Code~~ 335-14-5-.02(6)(a) and (b), 335-14-5-.03(4), and 335-14-8-.02(5)(b)5

The SDC ~~facility~~ area is inspected according to a prescribed inspection schedule designed to detect equipment deterioration and prevent possible equipment malfunctions that can potentially cause a release of hazardous wastes to the environment or pose a threat to human health. The inspection schedule document and inspection records will be located at the SDC ~~facility~~. The inspection program will include inspections of the equipment, including frequency, such as those listed in Table ~~III K~~IV J-3[5]. ~~Example inspection frequencies are also shown in Table III K-3.~~ Inspection requirements will not be performed while the SDC ~~facility~~ is not in operation. This does not apply to any wastes that are in storage. Inspection of waste storage areas will be conducted at all times IAW~~in accordance with~~ regulatory requirements when waste is present.

~~III K~~IV J F-2a(1) Types of Problems

AAC~~ADEM Admin. Code~~ 335-14-5-.02(6)(b)3

[5] All tables are located at the end of this section.

The types of problems looked for during inspections are identified in Table ~~III K~~IV J-3~~ in the "Types of Problems" column~~.

~~III K~~IV J F-2a(2) Frequency of Inspection

AAC~~ADEM Admin. Code~~ 335-14-5-.02(6)(b)4~~,~~ and 335-14-5-.15(8)(c)

The frequency of inspection, as listed~~ is given~~ in Table ~~III K~~IV J-3, ~~in the "Frequency" column. The frequency of inspection~~ is based on 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. The inspections are performed often enough to allow identification of problems in time to correct them before they harm human health or the environment.

Where appropriate, inspection frequencies have been developed from operational knowledge. Manufacturer recommendations, Army SOP~~s~~, Occupational Safety and Health Administration (OSHA) regulations, and specified regulated unit requirements are also adhered to.

~~III K~~IV J F-2b Specific Process Inspection Requirements

AAC~~ADEM Admin. Code~~ 335-14-5-.02(6)(b)4~~,~~ and 335-14-8-.02(5)(b)5

~~III K~~IV J F-2b(1) Miscellaneous Unit Inspection

AAC~~ADEM Admin. Code~~ 335-14-5-.24(3) and 335-14-8-.02(5)(b)5

The inspection records will be kept at the SDC~~ facility~~ for a minimum of 3 years~~until the completion of closure of the SDC facility~~.

Inspections of operating and structural equipment, security devices, safety and emergency equipment, loading/unloading areas, monitoring equipment, secondary containment systems and the HVAC system at the facility are included in Table ~~III K~~IV J-3.

~~III K~~IV J F-2b(2) Inspection for Process Vents

AAC~~ADEM Admin. Code~~ 335-14-5-.27

The requirements of this section are not applicable because SDC~~ facility~~ does not operate any distillation/fractionation, thin-film evaporation, or solvent extraction units, nor does it conduct air or steam stripping operations.

~~III K~~IV J F-2b(3) Inspection Procedures for Equipment Leaks

AAC~~ADEM Admin. Code~~ 335-14-5-.28

Inspections of operating equipment at the SDC~~ facility~~ are included in Table ~~III K~~IV J-3

~~III K~~IV J F-2b(4) Inspection for Air Emission Standards for Tanks, Surface Impoundments, and Containers

AAC~~ADEM Admin. Code~~ 335-14-5-.29

As described in Section ~~III K~~IV J D-1, the munitions are exempt from the requirements of AAC 335-14-5-.29. Inspections of the HVAC system and monitoring devices are conducted as~~and are~~ specified in Table ~~III K~~IV J-3.

~~III K~~IV J F-2c Remedial Action

AAC~~ADEM Admin. Code~~ 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. Remedial actions and required notifications for emergencies associated with the SDC~~ facility~~ area are detailed in the ANAD ICP~~Integrated Contingency Plan~~.

If during routine inspection a drum is noted that has deteriorated or is beginning to leak (rusted, severely dented, lid fitting improperly, etc.), the drum will be transferred to a new container or over-packed in place. Any spilled material will be cleaned up immediately.

~~III K~~IV J F-2d Inspection Records

AAC~~ADEM Admin. Code~~ 335-14-5-.~~-~~05~~-~~(4)(b)~~-~~5

Inspection records that are used at the Building 695 Complex~~SDC facility area~~ ~~will~~ identify the name of inspector, observations made, ~~and~~ date, and nature of repairs or remedial action taken. Inspection records will be on file at the SDC~~ facility~~ for a minimum of three years.

~~III K~~IV J F-3 Documentation of Preparedness and Prevention Requirements

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)6

The Army is not requesting any waivers for the preparedness and prevention requirements of AAC 335-14-5-.03(3) and 335-14-5-.03(6).

~~III K~~IV J F-3a Equipment Requirements

AAC~~ADEM Admin. Code~~ 335-14-5-.03(3)

The following paragraphs describe the internal and external communication system, emergency equipment, and water for fire control that is available at SDC~~ facility~~.

~~III K~~IV J F-3a(1) Internal Communications

AAC~~ADEM Admin. Code~~ 335-14-5-.03(3)(a)

Telephones and public address loudspeakers are available at SDC~~ facility~~ in case of emergencies. The telephone system is available for internal as well as external communications.

III KIV J F-3a(2) External Communications

AACADEM Admin. Code 335-14-5-.03(3)(b)

The telephone system at the SDC facility is available for external communication with the ANAD and the surrounding areas.

~~III K~~IV J F-3a(3) Emergency Equipment

AAC~~ADEM Admin. Code~~ 335-14-5-.03(3)(c)

Internal /external communications and emergency equipment are included in the ANAD ICP. Safety equipment necessary for first responder activities as listed in the SDC Contingency Procedures are included in the weekly inspection logs for the applicable areas (see Table IV J-3).~~SDC facility maintains an adequate inventory of emergency equipment. Portable fire extinguishers and a sprinkler system are available to minimize the threat of fire, as noted in Table III K-3. A list of the emergency equipment and inspection requirements is found in Table III K-3.~~

~~III K~~IV J F-3a(4) Water for Fire Control

AAC~~ADEM Admin. Code~~ 335-14-5-.03(3)(d)

Sufficient water exists for fire control as part of the water distribution system.

~~III K~~IV J F-3b Aisle Space Requirements

AAC~~ADEM Admin. Code~~ 335-14-5-.03(6)

The SDC~~ facility~~ s~~S~~ervice m~~M~~agazines are~~is a~~ permitted storage units under the MMR to store munitions. Sufficient aisle space (minimum 24 inches) is maintained in the service magazines to allow unobstructed movement of personnel, fire protection equipment, and spill control or decontamination equipment.

Storage of WMM and recovered WMM in the SDC-dedicated storage igloos is IAW~~will be in accordance with~~ DDESB standards. Like the service magazines, sufficient aisle space (24 inches) is maintained to allow unobstructed movement of personnel, fire protection equipment, and spill control or decontamination equipment~~Storage of other waste items will ensure sufficient aisle space is maintained to be at least 24 inches~~.

~~III K~~IV J F-4 Preventive Procedures, Structures, and Equipment

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8

~~III K~~IV J F-4a Unloading Operations

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8(i)

The three categories of wastes managed at the SDC ~~facility~~ include: (1) WMM to include recovered items, (2) e~~E~~xplosives and propellants, including waste material contaminated with energetics and (3) treatment residues, ash, cleaning solutions, ventilation filters. (See Sections ~~III K~~IV J C-1 and ~~III K~~IV J C-2 for more detail.)

Unloading operations for h~~H~~azardous WMM are described in Section IV F-4a ~~of the ANAD RCRA Permit Application~~.

Treatment residues, ash, and other treated solid dunnage will be discharged directly to collection containers. Containers will be properly classified, labeled, and placed into storage awaiting off-site treatment and disposal. Ventilation filters will be removed by personnel in adequate PPE and placed in appropriate containers. Ventilation filters will be disposed of IAW~~in accordance with~~ Table ~~III K~~IV J-5.

Cleaning solutions generated during cleanup activities will be collected in appropriate containers stored in the proper location prior to disposal.

Spills that occur during loading or unloading operations are unlikely; however, in the event of an accident, they are immediately cleaned up. Standard industrial absorbents, absorbent booms, pads, sand and dirt are used for clean-up of spilled materials. Spill residues are placed in containers, properly classified, labeled, and placed into storage awaiting off-site treatment and disposal.

~~III K~~IV J F-4b Runoff

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8(ii)

Runoff from hazardous waste handling areas is prevented by the SDC design features. Waste handling takes place in an enclosed structure. Since the waste propellants and explosives are effectively destroyed during SDC operations and remaining residue is collected from the treatment, the process itself eliminates the potential for run-off.

~~III K~~IV J F-4c Water Supplies

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8(iii)

The processing of all hazardous waste at the SDC ~~facility~~ takes place in an enclosed structure with a concrete base that will prevent the downward percolation of liquids. The SDC ~~facility~~ is not in a flood plain. Any spills of hazardous materials are cleaned up IAW~~in accordance with~~ site procedures and, if necessary, the ANAD Integrated Contingency Plan. Therefore, prevention of contamination to water~~s~~ supplies is achieved.

~~III K~~IV J F-4d Equipment and Power Failure

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8(iv)

In the event of an electrical failure, an automatic transfer switch will start a diesel generator and will automatically transfer the essential load to the generator. The generator connected load will consist of the exhaust filter unit for the SDC ~~facility~~ to maintain pressure, cameras and electronics, and interior and exterior lighting.

~~III K~~IV J F-4e Personal Protection Equipment

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)8(v)

~~ANAD regulations establish Occupational Safety and Health requirements necessary to protect workers from unhealthful conditions.~~ Levels of PPE for workers will vary throughout the installation and are based upon the specific task to be performed. A job safety hazard analysis will be generated for hazardous tasks at the installation. These identify work practices, protective clothing, and procedures necessary to protect the worker from potential hazards.

~~III K~~IV J F-5 Prevention of Ignition or Reaction of Ignitable, Reactive, or Incompatible Wastes

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)9

~~III K~~IV J F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

AAC~~ADEM Admin. Code~~ 335-14-5-.02(8)(a),~~-~~(b),~~-~~(c), and 335-14-8-.02(5)(b)9

No ignitable or reactive waste will stored at the SDC ~~facility~~. These wastes are moved to the facility at the time of treatment. No matches, lighters, or other flame-producing instruments are allowed in the possession of personnel at the SDC ~~facility~~. WMM are, therefore, adequately protected from ignition. The SDC ~~facility~~ will be equipped with a sprinkler system designed to meet the special needs of individual areas.

~~III K~~IV J F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

AAC~~ADEM Admin. Code~~ 335-14-5-.02(8)(b),~~-~~(c), and 335-14-8-.02(5)(b)9

General precautions for the SDC ~~facility~~ include:

- SDC operations will be under the direct supervision of an experienced and trained supervisor charged with responsibility for all activities within the area. During the supervisor's absence, a competent qualified person is designated to be in charge. This competent person is also charged with sole custody of ignition devices. ~~Prior to the treatment process, all personnel, including the supervisor or designee, are evacuated out of the structure.~~
- ~~No personnel return inside the facility until evidence of treatment is satisfied.~~

- The number of personnel involved in SDC operations will be kept to a minimum to limit exposure of personnel for a minimum time to a minimum amount of hazardous material consistent with safe and efficient operations. ~~However, at no times will fewer than two personnel be present when SDC operations are conducted.~~
- Anyone entering the SDC ~~facility area~~ while operations are ongoing will report to the Control Room.

~~III K~~IV J F-5c Management of Ignitable or Reactive Wastes in Miscellaneous Units

AAC~~ADEM Admin. Code~~ 335-14-5-.24

Management of reactive wastes is addressed in Sections IV F-5a, b, and c ~~of the ANAD RCRA Permit Application~~.

~~III K~~IV J F-5d Management of Incompatible Waste in Containers

AAC~~ADEM Admin. Code~~ 335-14-5-.~~-~~09(8)(a),~~-~~(b) & (c) and 335-14-8-.02(6)(d)

Any incompatible wastes that may be generated will not be placed in the same container. All waste will be placed into new and/or cleaned containers for storage and off-site transportation/disposal or for disposal at a TSDF.

III KIV J G CONTINGENCY PLAN

AACADEM Admin. Code 335-14-5-.03(8), 335-14-5-.04(1) through 335-14-5-.04(7), and 335-14-8-.02(5)(b)7

Contingency requirements for the Anniston Army Depot (ANAD), including the Building 695 ComplexSDC facility treatment activities, are found in the ANAD ICPIntegrated Contingency Plan.

~~III K~~IV J H PERSONNEL TRAINING

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)
and 335-14-8-.02(5)(b)12

The ~~SDC facility~~ t~~T~~raining p~~P~~rogram for the SDC provides ~~SDC treatment~~ personnel, depending on job descriptions, with the necessary knowledge and skills to perform hazardous waste duties safely, efficiently, and in an environmentally sound manner. The purpose of this training program is to prepare SDC ~~facility~~ personnel for treatment operations, with emphasis on reducing potential risks that may threaten human health or the environment. This is accomplished by ensuring that the SDC ~~facility~~ personnel handling hazardous waste can properly perform their assigned duties and responsibilities. In addition to providing training in the mechanics of the job functions, this training program provides SDC ~~facility~~ personnel with a thorough understanding of the treatment operations, including the safety and emergency response operations. Refresher training will be conducted, as necessary, to update workers on new methods or equipment.

This training program meets the requirements in AAC 335-14-5-.02(7)~~,~~ and 335-14-8-.02(5)(b)12 by:

- Providing specific training for various hazardous waste management positions;
- Ensuring that all personnel involved in ammunition operations and planning complete the training program prior to being assigned ~~to~~ duties involving ammunitions or explosives;
- Providing training that ensures SDC ~~facility~~ personnel are able to respond effectively to emergencies;
- Ensuring that the ~~SDC facility~~ training program is directed by qualified persons trained in hazardous waste management practices;
- Maintaining required documentation at the Building 695 Complex~~SDC facility~~; and
- Maintaining training records on current SDC ~~facility~~ personnel for at least 3 years from the date last worked.

~~III K~~IV J H-1 Outline of Training Program

The SDC ~~facility~~ Training Program has been designed to ensure that personnel will be able to perform their specific job assignments. The training program consists of both onsite training and additional courses that apply to specific job functions.

Section ~~III K~~IV J H-1a provides the job titles and ~~job~~ descriptions for the SDC ~~facility~~ personnel involved in hazardous waste operations. Section ~~III K~~IV J H-1b describes the training content, frequency, and techniques. Section ~~III K~~IV J H-1c describes the responsibilities of the appropriate supervisor, who coordinates training of the SDC ~~facility~~ personnel. Section ~~III K~~IV J H-1d describes the relevance of the training to the job positions, and Section ~~III K~~IV J H-1e describes training for emergency response.

~~III K~~IV J H-1a Job Titles and Duties

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)(d)1 and 2

Complete job descriptions, including title, office, person reporting to, duties, and minimum qualifications/training for each position related to hazardous waste management shall be maintained at the ~~AFO~~ SDC and/or ~~at~~ ANAD Directorate of Risk Management. Job titles and duties will be consistent with the current ~~ANAD~~ duties and responsibilities for safely treating explosive components from WMM IAW~~in accordance with~~ applicable OSHA, RCRA, and military requirements.

In general, all personnel working at the SDC ~~facility~~ will be required to:

- Demonstrate the ability to understand and apply both oral and written instructions at a level appropriate to the assigned job;
- Possess the aptitude and attitude necessary to ensure compliance with environmental, safety and job requirements; and
- Be physically capable of doing the work.

~~III K~~IV J H-1b Training Content, Frequency, and Techniques

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)(a)3, 335-14-5-.02(7)(c) ~~,~~ and 335-14-5-.02(7)(d)3

The training program provides both initial and continuing training of ~~all~~ supervisors, operators, and ~~all~~ personnel involved in the waste management unit operations. The principal objectives of the training program are to train personnel to safely operate, maintain, and monitor the SDC ~~facility~~ operation. The training program includes job orientation, safety procedures, and basic work principles.

At a minimum, ~~all~~ SDC ~~facility~~ personnel involved in hazardous waste management operations have or will have received training in the following areas, as determined by the position and additional duties to which they are assigned:

- Hazard Communications (HAZCOM),
- Hazardous Waste Operations and Emergency Response (HAZWOPER)/ 24-hour Occupational Safety and Health Administration (OSHA) 1910.120,
- RCRA Compliance,
- Explosive Safety, and
- Material Handling Equipment Operator Certification.

~~The~~ SDC ~~facility~~ personnel are qualified to meet the minimum requirements outlined in 29 CFR ~~OSHA standard 29 Code of Federal Regulations (CFR)~~ 1910.120 covering HAZWOPER training for operations conducted under RCRA. Qualification records for the SDC ~~facility~~ personnel are maintained by the SDC Training Coordinator~~SDC facility operator~~. This minimum training includes:

- 24 hours of initial training, consisting of classroom and hands-on experience, in the use of PPE, implementation of the emergency response plan, safe operating practices, identification of potential hazards or hazardous situations, etc., IAW~~in accordance with the~~ OSHA standards and
- 8 hours of annual refresher training~~ in addition to the 24-hour HAZWOPER training.~~

IAW~~n accordance~~ with U.S. Army Materiel Command (AMC)-Regulation 350-4, any new personnel involved with the handling of WMM, as required for the download and reconfiguration, are required to meet certain training requirements prior to their being assigned duties associated with the SDC ~~facility~~ operation. All personnel must successfully complete the following training as determined by their assigned position and additional duties:~~18 hours of instruction. This is the minimum qualification. Additional course work may be required based on actual duties. The training director will determine if additional training is required. The following 18-hour block of instruction or equivalent constitutes the minimum training required:~~

- Characteristics and Hazards of Explosives~~ 2 hrs~~
- Explosives Safety~~ 2 hrs~~
- Industrial Safety~~ 2 hrs~~
- Protective Clothing and Equipment~~ 2 hrs~~
- Standing Operating Procedures~~ 2 hrs~~
- Material Handling Equipment~~ 2 hrs~~
- Specialized Training (Acquaint the employee with conditions, procedures, and regulations as they apply to the specific job and local environment.)~~* 4 hrs~~
- Examination and Critique~~ 2 hrs~~
- ~~* This training is to acquaint the employee with conditions, procedures, and regulations as they apply to the specific job and local environment.~~

This information may be included as a component of the HAZWOPER training. Additional course work may be required based on actual duties as determined by the Training Coordinator.

Personnel operating or maintaining monitoring equipment, such as CEMS, are required to complete the same training as required by ANAD.~~ Personnel maintaining monitoring equipment such as CEMS are required to complete the same training as required by ANAD.~~

~~III K~~IV J H-1c Training Supervisor (SDC Training Coordinator)

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)(a)2

The SDC Training Coordinator~~The appropriate supervisor~~ is responsible for the training of the SDC ~~facility~~ personnel. The responsibilities of the Training Coordinator~~Supervisor~~ are to:

- Coordinate training of the SDC ~~facility~~ personnel in the proper operation of the facility IAW~~in accordance with~~ Federal, S~~s~~tate, Army, and installation regulations;~~.~~
- Coordinate continuing training, as necessary, to inform personnel of new procedures, provide refresher training, and provide training for new personnel;~~.~~
- Ensure that training records are maintained IAW~~in accordance with~~ 40 CFR 264.16(d) and (e);~~.~~ and
- Ensure that ~~the~~ SDC ~~facility~~ personnel are trained in hazardous waste management and contingency plan implementation, including emergency procedures, and ensure that personnel receive training appropriate to their positions.

~~III K~~IV J H-1d Relevance of Training to Job Position

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)(a)2

The SDC ~~facility~~ personnel receive training relevant to the duties and responsibilities entailed by their positions.

~~III K~~IV J H-1e Training for Emergency Response

AAC~~ADEM Admin. Code~~ 14-5-.02(7)(a)3

Emergency response training is designed and structured to ensure that all SDC ~~facility~~ personnel are trained to respond properly to emergency situations, as outlined in the ANAD ICP~~Integrated Contingency Plan~~, and to maintain compliance, during emergencies, with applicable permit requirements and environmental regulations.

This training addresses non-routine situations that could lead to emergency involving hazardous wastes, if proper responses are not implemented, such as:

- Procedures for using, inspecting, repairing, and replacing the SDC ~~facility~~ emergency and monitoring equipment,
- Communication and alarm systems,
- Implementation of the contingency plan and appropriate emergency notifications,
- Shutdown of operations and evacuation, and
- Response to fires, explosions, or other releases.

Additional topics covered during emergency response training include:

- ~~The c~~Chemical characteristics of the wastes personnel will be assigned to manage, that is, reactivity and~~,~~ toxicity characteristics,
- Knowledge of what to do in the event of a spill or leak, and
- ~~The t~~Types of protective equipment, which may include gloves, hard hat, eye protection, and splash resistant clothing.

Introductory training and annual review sessions will be completed by~~offered to~~ these personnel.

~~III K~~IV J H-2 Implementation of Training Program

AAC~~ADEM Admin. Code~~ 335-14-5-.02(7)(b), ~~and~~ 335-14-5-.02(7)(d)4, and 335-14-5-.02(7)(e)

All personnel are trained prior to beginning work at the SDC ~~facility~~. All of the SDC ~~facility~~ personnel are required to complete the training program specific to his/her job assignment and will not work unsupervised until training has been successfully completed.

Training records for the SDC ~~facility~~ personnel are maintained electronically, onsite, and will include, at a minimum:

- Job title for each position related to hazardous waste management operation and activities, and the name of each employee filling the position;

- Job description specifying duties for each position, minimum qualifications required to fill the position, and required training for the position;
- Description of the type and amount of introductory and continuing training that will be given to each employee;
- Date each employee started working at the SDC~~ facility~~; and
- Course enrollment, attendance, and successful completion information.

All training records and documentation on current SDC ~~facility~~ personnel will be~~are~~ kept until closure of the facility~~building~~. Training records on former SDC ~~facility~~ personnel will be kept for at least 3 years from the date last worked.

~~III K~~IV J I CLOSURE PLAN, POST-CLOSURE PLAN, AND FINANCIAL ASSURANCES

AAC 335-14-5-.07(1) through 335-14-5-.07(11),
335-14-5-.08(1) through 335-14-5-.08(12),
335-14-5-.09(9), 335-14-5-.10(8), and
335-14-8-.02(5)(b)13 through 335-14-8-.02(5)(b)18~~,~~
~~335-14-5-.09(9), and 335-14-5-.10(8)~~

ANCDF performed decontamination of this facility at completion of the operational phase for chemical agent (mustard) operations. With the completion of chemical agent operations and based on the decontamination and monitoring records provided in the SDC Decontamination Report, the SDC unit, facilities, and service magazines are now classified as chemical agent free.

After decontamination, ANCDF provided ADEM with professional engineering (PE) certification and notification of completion of the decontamination of the SDC. The SDC Agent Decontamination Report was submitted in April of 2012 and approved by the ADEM on July 22, 2013.

This closure plan has been developed IAW AAC 335-14-5-.07(3) and specifies performance standards and procedures for the closure of the SDC. The closure performance standards of AAC 335-14-5-.07(2) are designed to minimize the need for further maintenance by removing all hazardous waste and hazardous waste constituents from the SDC. 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.

~~Since decontamination has occurred and proven that the facility is not agent contaminated, the operational process for the SDC facility may continue to be governed by Section III K or Section IV J of the ANAD RCRA Application. It is within Section IV J I where the detailed closure requirements for this facility are contained. Section III K will not address all closure requirements as a result.~~

~~III K~~IV J I-1 Closure Plan

AAC~~ADEM Admin. Code~~ 335-14-5-.07(3) and~~,~~ 335-14-8-.02(5)(b)13

During activities in the SDC ~~facility~~, storage igloos, or the service magazines, any identified hazardous waste spill will be remediated and containerized immediately. Records of all spills and cleanup activities will be recorded in an operating record. If there is no evidence or record of an igloo being used to store waste or WMM, closure will be limited to making an administrative (record keeping) activity report.

Upon completion of operations, all hazardous waste and hazardous waste residues that may be in secondary containment will be removed. Equipment and structures will be decontaminated, if necessary, using an appropriate decontamination and water washing in

accordance with the treatment technology requirements specified in 40 CFR 268.45. ~~The decontamination residues will be placed into drums and may be stored at an ANAD storage igloo prior to being transferred off-site for disposal or for treatment in accordance with applicable regulations.~~

~~III K~~IV J I-1a Closure Performance Standards

AAC~~ADEM Admin. Code~~ 335-14-5-.07(2)

This closure plan specifies performance standards and describes procedures for the closure of the SDC. This closure plan is designed to provide for closure in a manner that will minimize the need for further maintenance and 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 will accomplish the goals of the closure performance standards, noted above by: (1) processing the entire inventory of WMM 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 management units.

Post-closure maintenance or monitoring is not anticipated since no hazardous wastes or hazardous constituents are expected to remain above clean closure target levels following final closure.

After final closure, certification, and acceptance of closure by the ADEM has been completed, the areas will no longer be classified as a hazardous waste management unit.~~Closure performance standards are presented in Section IV J I. Decontamination efforts for the SDC facility to transition from chemical agent operations to long term processing of WMMs has been conducted to verify that the facility is not agent contaminated.~~

~~After decontamination, ANCDF provided ADEM with professional engineering (PE) certification and notification of completion of the decontamination of the SDC facility. The SDC Agent Decontamination Report was submitted in April of 2012 and approved by the ADEM on July 22, 2013.~~

~~III K~~IV J I-1b Partial Closure and Final Closure Activities

AAC~~ADEM Admin. Code~~ 335-14-5-.-07(3)(b)

~~At this point, t~~There is no date anticipated for implementation of closure for the SDC ~~facility~~. Once an anticipated closure date is established, f~~F~~inal closure should be completed within 180 -days of completion of SDC activities.

~~Certification of Closure~~

~~The AFO-SDC will provide documentation of completion of closure activities at completion of the WMM processing phase for the SDC facility.~~

~~III K~~IV J I-1c Maximum Waste Inventory

AAC~~ADEM Admin. Code~~ 335-14-5-.07(3)(b)3

The maximum waste munition inventory to be held in the SDC ~~facility~~ at any given time will be determined by approval of the site safety submittal by the DDESB.

~~III K~~IV J I-1d Schedule for Closure

AAC~~ADEM Admin. Code~~ 335-14-5-.07(3)(b)2 and 6

~~At this time~~ N~~n~~o specific date has been scheduled for implementation of closure for the SDC ~~facility~~. The ADEM will be notified in writing at least 45 days prior to the date that any final closure operations are scheduled to begin. Final closure will occur when all operations are complete and final certification is received and approved by the Department. All hazardous waste including any spill cleanup material and decontamination residues will be removed from the facility within the 90-day time limit.

~~III K~~IV J I-1d~~(1)~~ Environmental Protection

Closure of the SDC ~~facility~~ will be performed in a manner that controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, 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, all necessary steps will be taken 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). The Permittees will comply with all applicable laws and regulations to ensure protection for human health and the environment.

~~III K~~IV J I-1e Closure Procedures

AAC~~ADEM Admin. Code~~ 335-14-5-.~~-~~07(3), 335-14-5-.07(5), and 335-14-8-.02(5)(b)13

Prior to closure, any hazardous waste in the SDC ~~facility~~ may be sent to a permitted storage igloo prior to shipment off-site. Waste generated during the closure activities will be characterized IAW~~in accordance with~~ applicable regulations and disposed of accordingly.

~~III K~~IV J I-2 POST-CLOSURE PLAN

AAC~~ADEM Admin. Code~~ 335-14-5-.07(9), ~~and~~ 335-14-8-.02(5)(b)13, and 335-14-5-.24(4)

Since the SDC ~~facility~~ is not a disposal site, and any residual hazardous contamination will be removed prior to closure, a post-closure plan is not required.

III KIV J I-3 Certification of Closure

AACADEM Admin. Code 335-14-5-.07(6)

Within 60 days of completion of final closure procedures, a certification will be signed by a PE and then submitted by the Permittee, that the SDC facility has been closed IAWin accordance with the closure plan and all applicable regulations. Since there are no regulated disposal units, only certification of final closure of the facility will be submitted. In the event that clean closure cannot be achieved, a post-closure care permit application will be submitted to the ADEM. Should the government leave the equipment in place, ANCDF will certify closure from the controls of Section III of this application and transfer any follow on operational activities to Section IV J of the ANAD RCRA Permit Application.

III KIV J I-4 Closure Cost Estimate

AACADEM Admin. Code 335-14-5-.08(3) and 335-14-8-.02(5)(b)15

The Permittee will submit a closure cost estimate to the ANAD DRK for inclusion with the ANAD's closure estimate. The closure cost estimate will be prepared IAW AAC 335-14-8-.02(5)(b)(15). The Permittee will adjust the closure cost estimate annually for inflation. ANAD DRK will submit the closure cost estimate to the ADEM no later than June 1st of each calendar year.

Since the SDC facility will continue operations with WMMs' at the completion of the chemical agent campaign, and any residual hazardous contamination was removed prior to this transition, no closure cost estimate is required.

III KIV J I-5 Financial Assurance Mechanism for Closure

AACADEM Admin. Code 335-14-5-.08(4), 335-14-8-.02(5)(b)15,
and 335-14-5-.08(12)

No financial assurance mechanism for the closure of storage areas is required. AAC 335-14-5-.08(1) exempts States and Federal government from the financial requirements of AAC 335-14-5.

III KIV J I-6 Post-Closure Estimate

AACADEM Admin. Code 335-14-5-.08(5) and 335-14-8-.02(5)(b)16

No post-closure plan is required (see Section III K I-2); therefore, no post-closure estimate is required.

III KIV J I-7 Financial Assurance Mechanism for Post-Closure Care

AACADEM Admin. Code 335-14-5-.08(6), 335-14-8-.02(5)(b)16,
and 335-14-5-.08(12)

No post-closure plan is required (see Section III K I-2); therefore, no financial assurance mechanism for post-closure care is required.

III KIV J I-8 Liability Requirements

AACADEM Admin. Code 335-14-8-.02(5)(b)17 and 335-14-5-.08(8)(a) and (b)

The Federal government owns the SDC ~~facility~~; therefore, pursuant to AAC 14-5-.08(1)(d), it is exempt from the liability insurance requirements.

~~III K~~IV J I-9 State Financial Mechanism

AAC~~ADEM Admin. Code~~ 335-14-8-.02(5)(b)18

Proof of coverage by a state financial mechanism is not required for the SDC ~~facility~~ because no financial assurance mechanism for the closure of the facility is required. AAC 335-14-5-.08(1)(d) exempts states and the Federal government from the financial requirements of AAC 335-14-5.

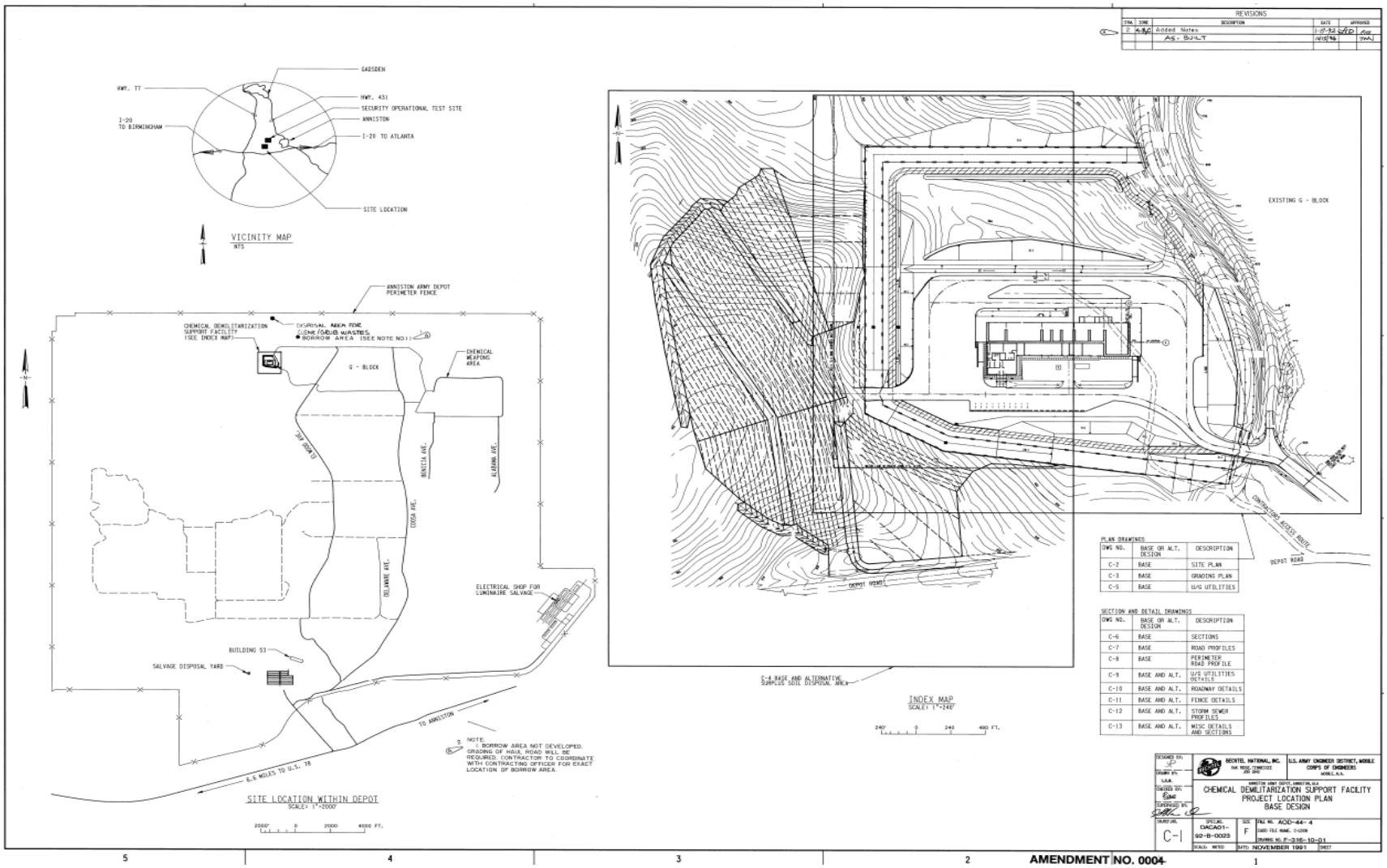

REVISIONS
Added Notes
AS-BUILT
GADSDEN
HWY. 77
HWY. 431
SECURITY OPERATIONAL TEST SITE
ANNISTON
I-20 TO BIRMINGHAM
I-20 TO ATLANTA
SITE LOCATION
VICINITY MAP
NTS
ANNISTON ARMY DEPOT PERIMETER FENCE
CHEMICAL DEMILITARIZATION SUPPORT FACILITY (SEE INDEX MAP)
DISPOSAL AREA FOR CLEAN/DEBIS WASTES
BORROW AREA (SEE NOTE NO.1)
CHEMICAL WEAPONS AREA
G - BLOCK
ELECTRICAL SHOP FOR LUMINAIRE SALVAGE
BUILDING 53
SALVAGE DISPOSAL YARD
TO ANNISTON
6.6 MILES TO U.S. 78
NOTE:
1. BORROW AREA NOT DEVELOPED. GRADING OF HAUL ROAD WILL BE REQUIRED. CONTRACTOR TO COORDINATE WITH CONTRACTING OFFICER FOR EXACT LOCATION OF BORROW AREA.
SITE LOCATION WITHIN DEPOT
SCALE: 1"=2000'
EXISTING G - BLOCK
CONTRACTOR ACCESS ROUTE
DEPOT ROAD
C-4 BASE AND ALTERNATIVE SURPLUS SOIL DISPOSAL AREA
INDEX MAP
SCALE: 1"=240'
PLAN DRAWINGS
DWG NO. | BASE OR ALT. DESIGN | DESCRIPTION
C-2 | BASE | SITE PLAN
C-3 | BASE | GRADING PLAN
C-5 | BASE | U/G UTILITIES
SECTION AND DETAIL DRAWINGS
DWG NO. | BASE OR ALT. DESIGN | DESCRIPTION
C-6 | BASE | SECTIONS
C-7 | BASE | ROAD PROFILES
C-8 | BASE | PERIMETER ROAD PROFILE
C-9 | BASE AND ALT. | U/G UTILITIES DETAILS
C-10 | BASE AND ALT. | ROADWAY DETAILS
C-11 | BASE AND ALT. | FENCE DETAILS
C-12 | BASE AND ALT. | STORM SEWER PROFILES
C-13 | BASE AND ALT. | MISC DETAILS AND SECTIONS
BECHTEL NATIONAL, INC.
U.S. ARMY ENGINEER DISTRICT, MOBILE CORPS OF ENGINEERS
CHEMICAL DEMILITARIZATION SUPPORT FACILITY
PROJECT LOCATION PLAN
BASE DESIGN
C-1
DACA01-92-B-0023
AOD-44-4
DRAWING NO. F-396-10-01
NOVEMBER 1991
AMENDMENT NO. 0004

Figure IV J- 1

~~Figure III K~~IV J-~~1~~

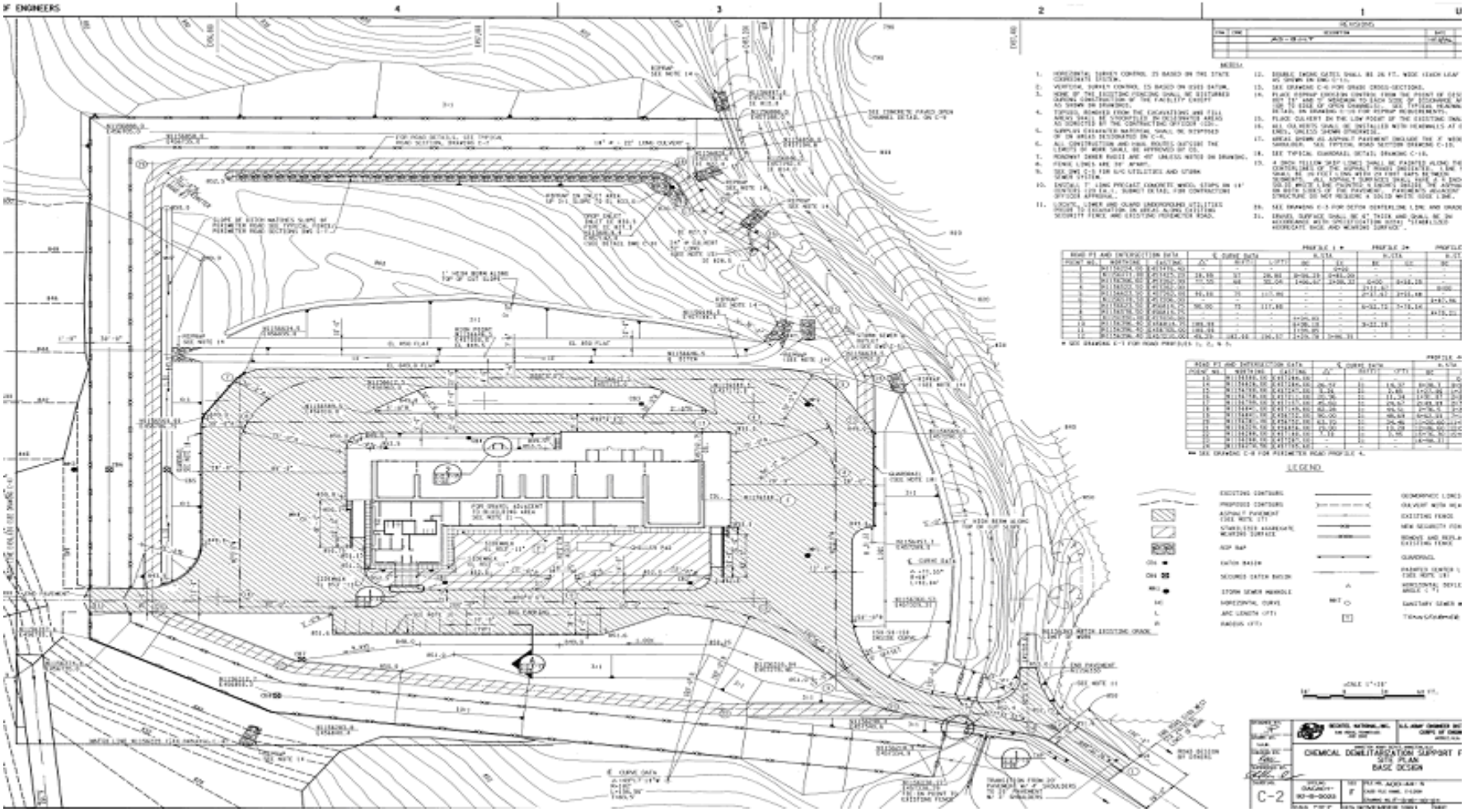


Figure IV J- 2

~~Figure III K~~IV J-2

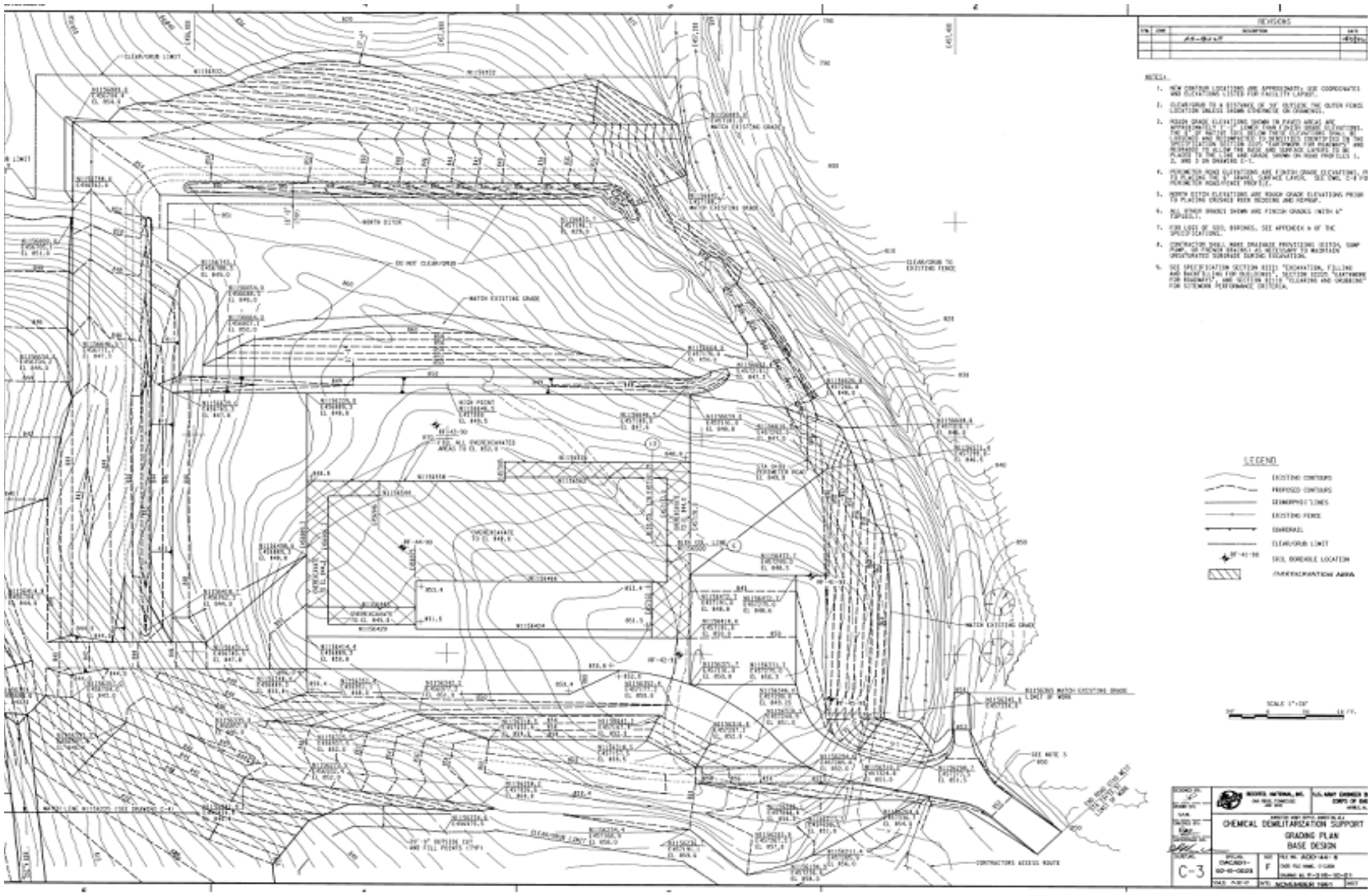


Figure IV J- 3

~~Figure III K~~IV J-3

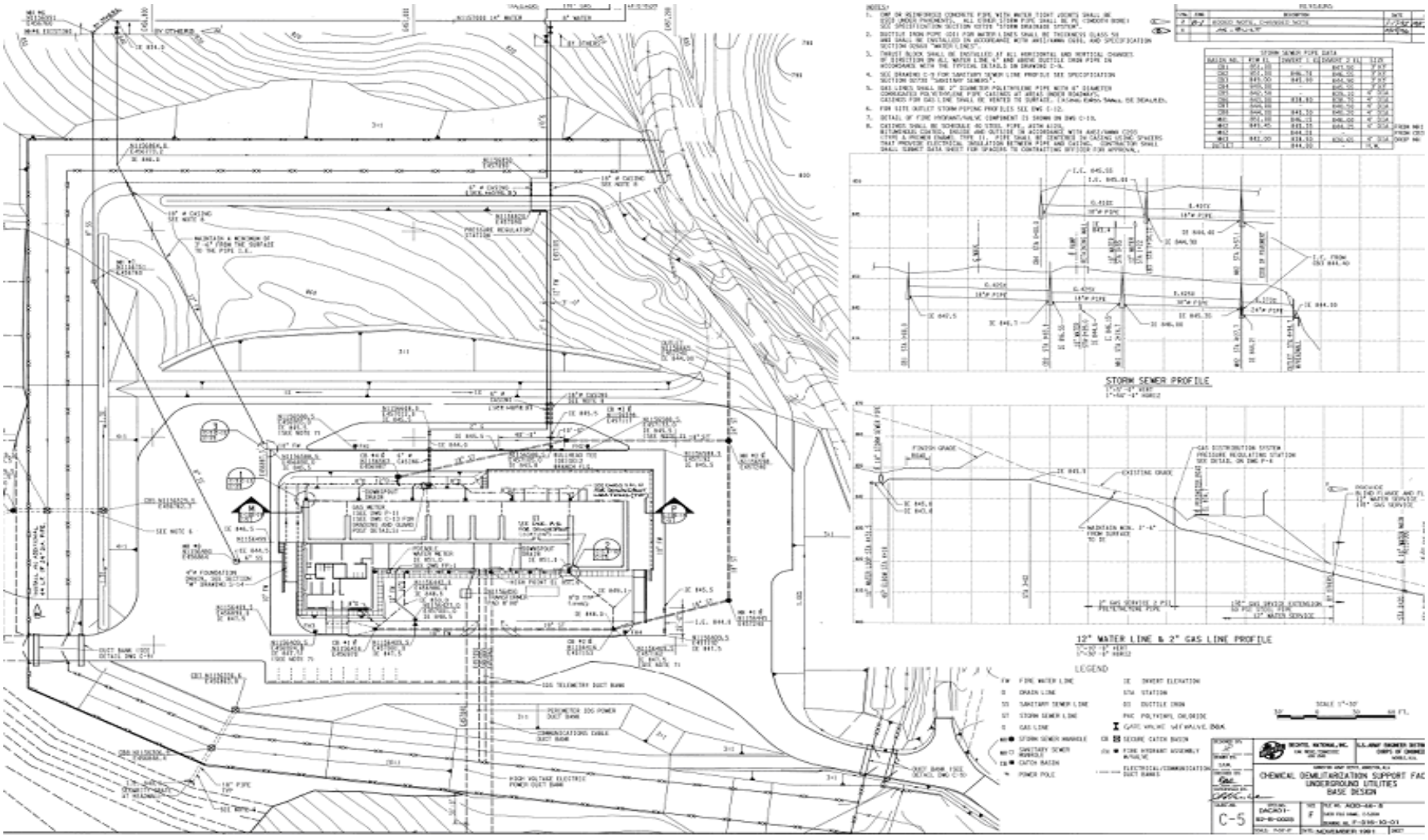
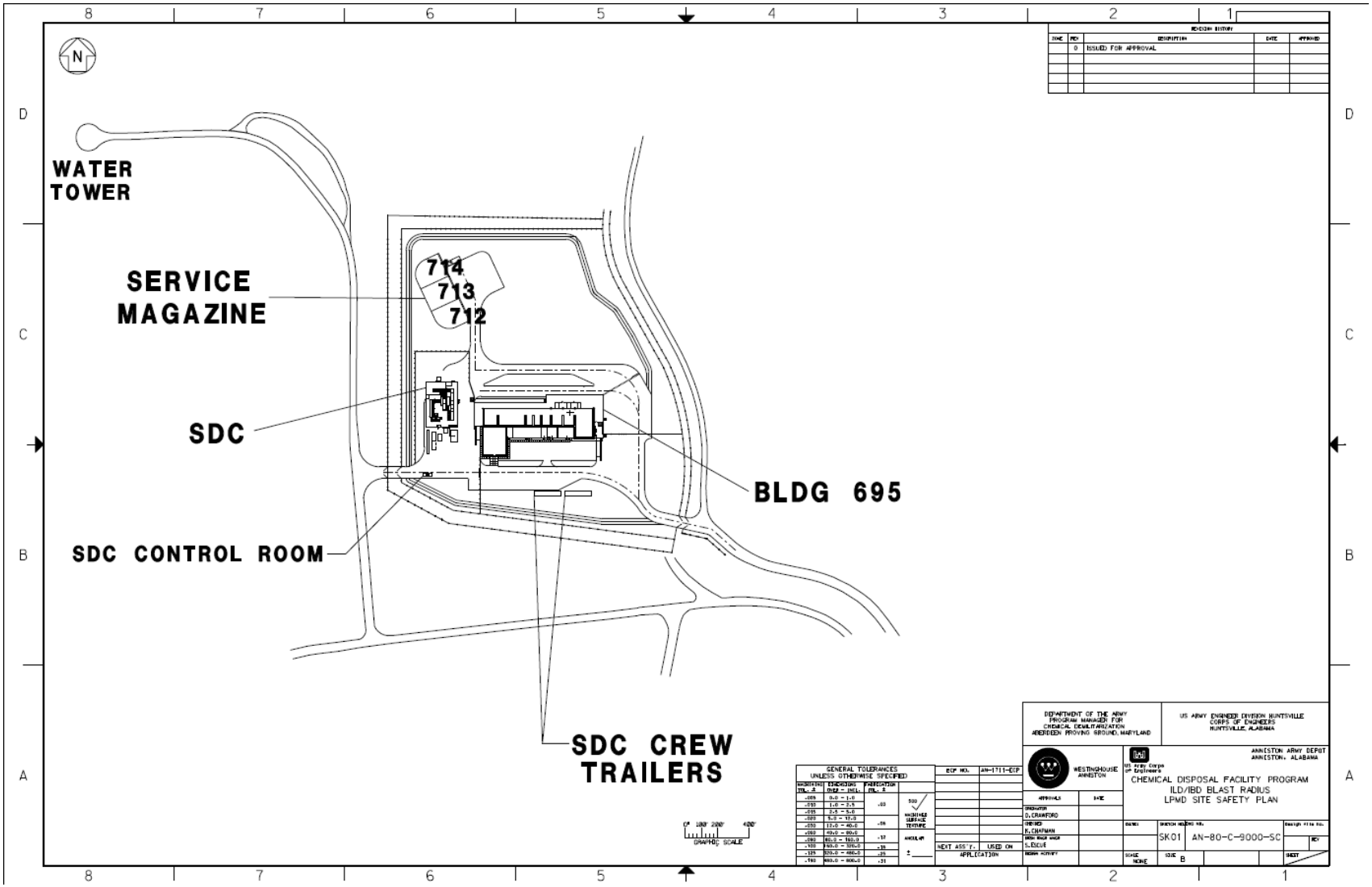


Figure IV J- 4

Figure III KIV J-4



~~Figure~~ Figure IV J- 5~~III K~~~~IV J-5~~

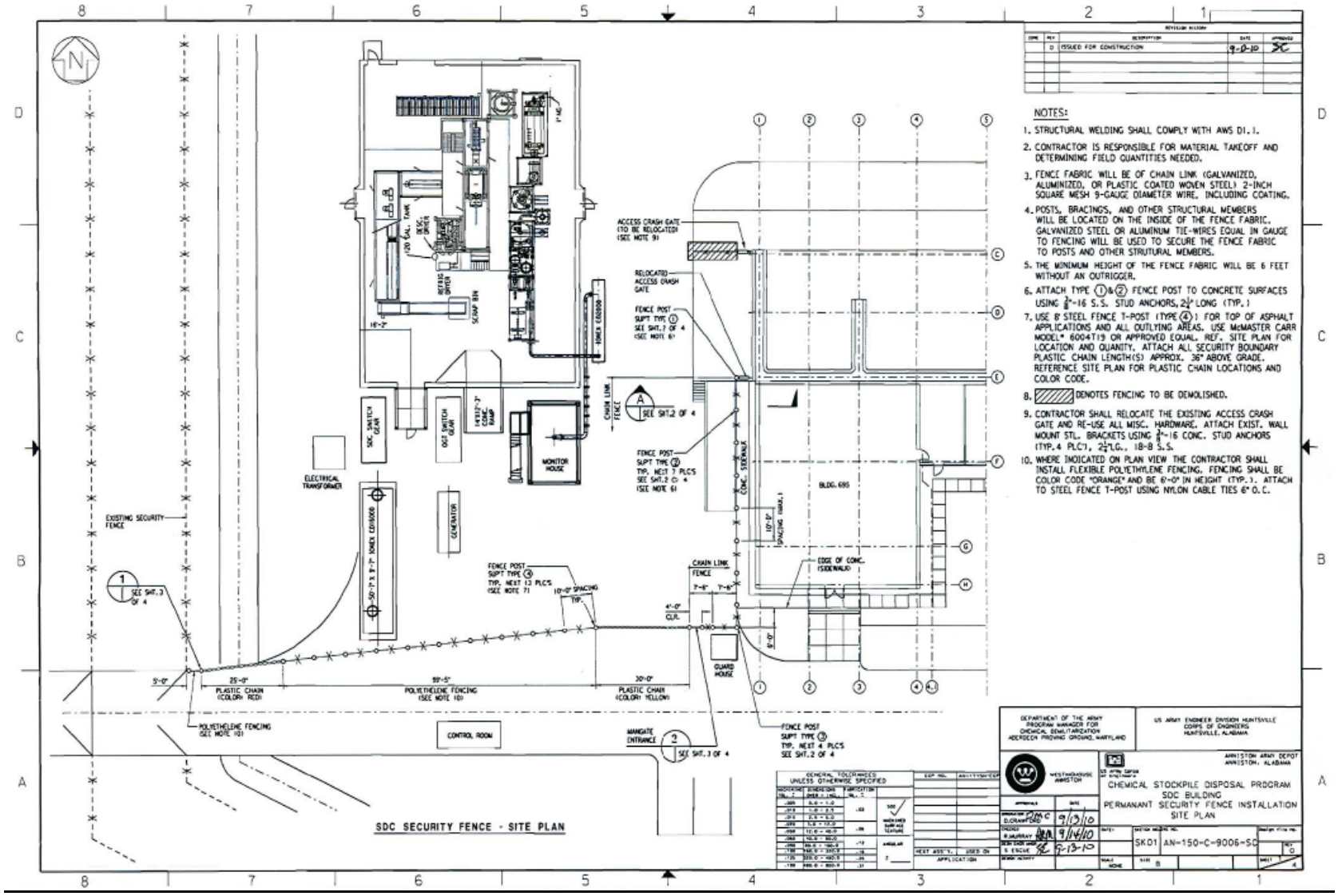


Figure IV J- 6~~Figure III K~~~~IV J-6~~

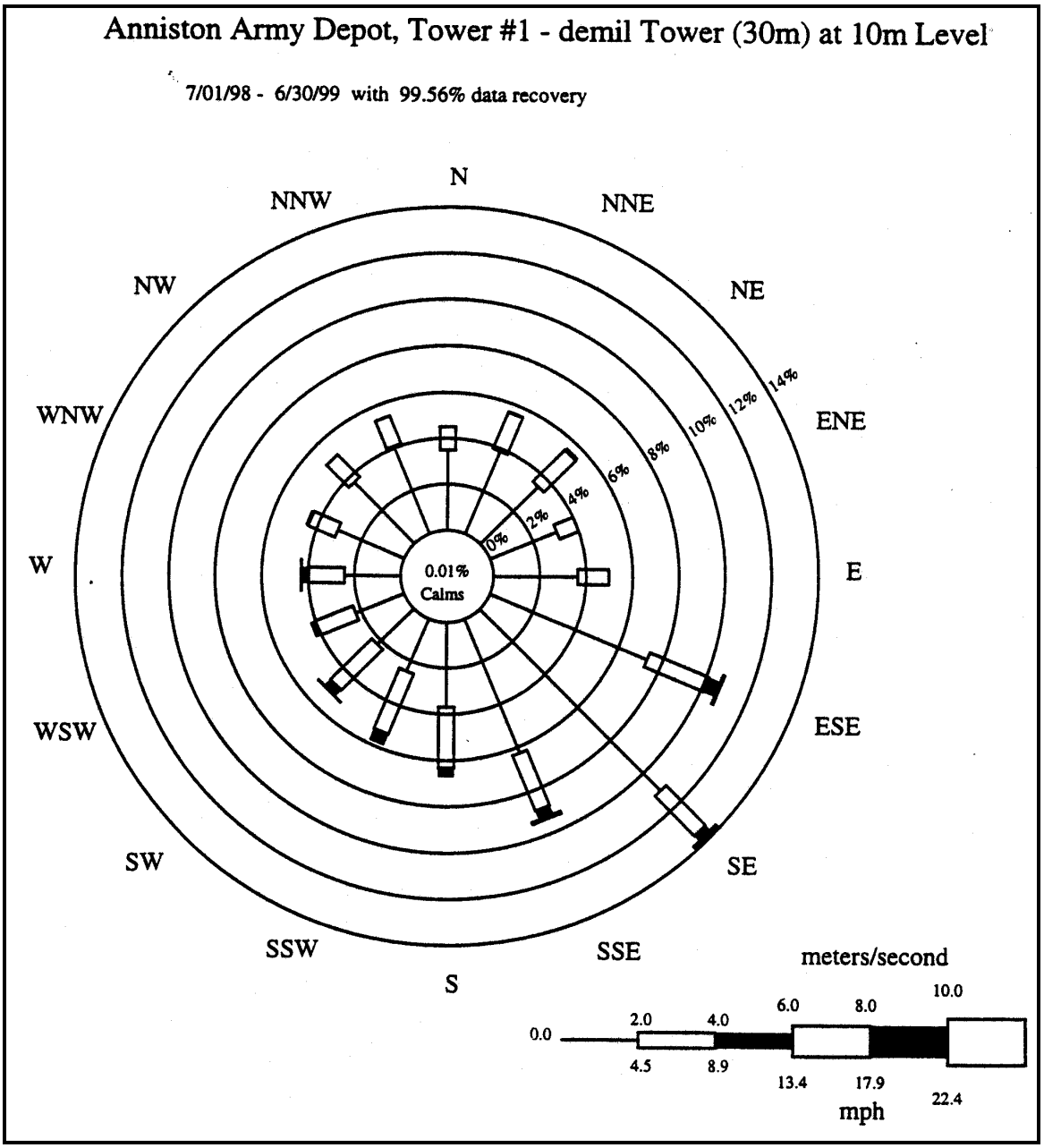


Figure IV J- 7~~Figure~~ :~~III K~~IV J-7: 10m Level Wind Rose at ANAD

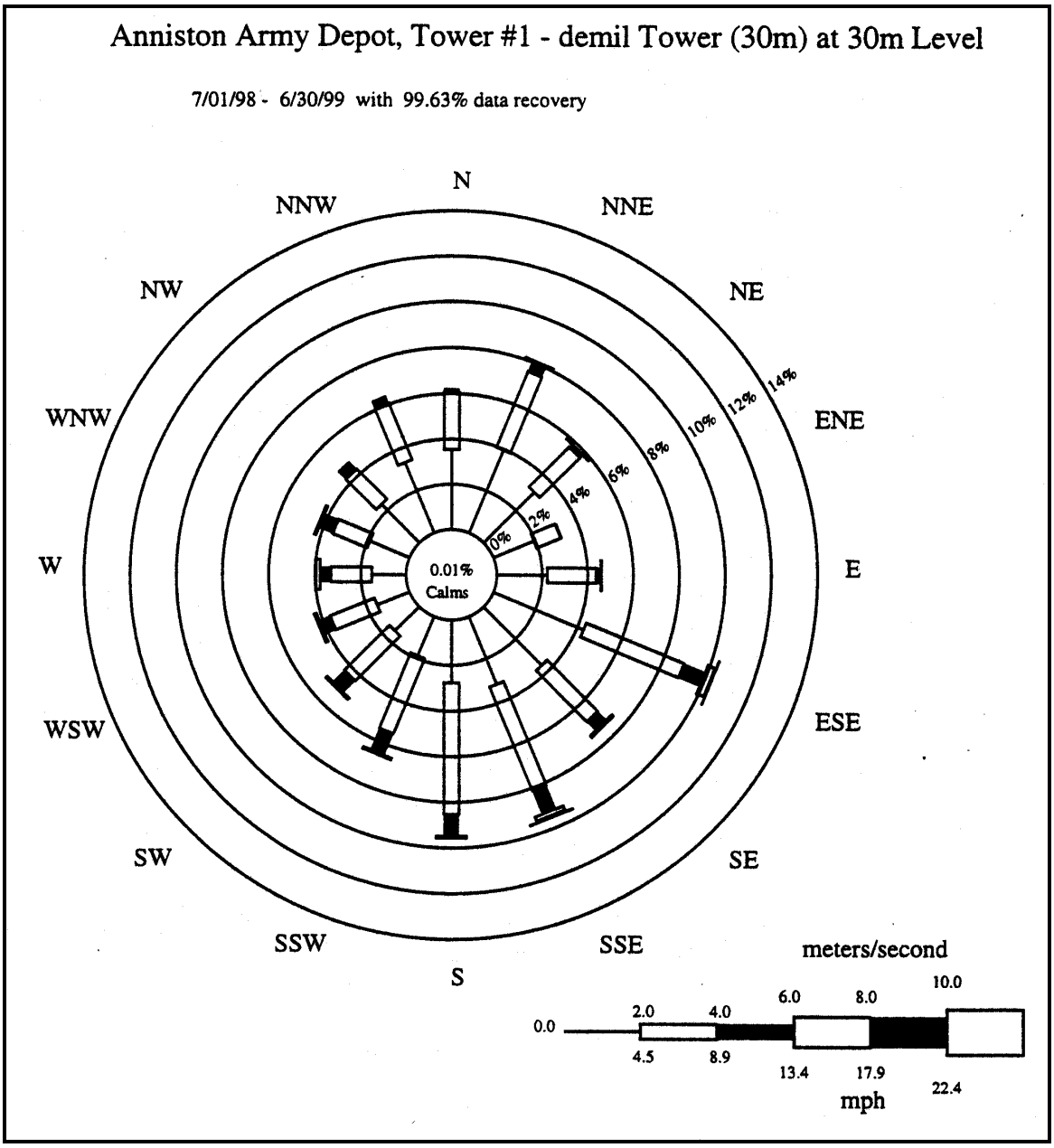


Figure IV J- 8 :~~Figure III K~~~~IV J-8: 33~~0m Level Wind Rose at ANAD

1 ~~Table III K~~IV J~~-1:~~Table IV J- 1 : –Parameters and Rationale

WAP Section Number	Waste Stream	Parameters for Analysis	Determination Methods	Frequency of Analysis/ Characterization[1~~3~~]	Sampling Method[~~2~~]	Disposal Limits	Disposal Requirements[2]
~~III K~~IV J C-2a(1)(a)	Scrap Metal	Not Applicable~~N/A~~	Not Applicable~~N/A~~	Not Applicable~~N/A~~	Not Applicable ~~N/A~~	Not Applicable~~N/A~~	Not Applicable~~N/A~~
~~III K~~IV J C-2a(1)(a)	Ash from Treated Scrap Metal from the SDC	TCLP Organics and Metals	See Table ~~III K~~IV J-2	Annually or a~~A~~s necessary to characterize for disposal	Grab or C~~c~~omposite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
~~III K~~IV J C-2a(1)(b)	Dust Material from the Buffer Tank, Cyclone and Dust Collection System	TCLP Organics and Metals	See Table ~~III K~~IV J-2	Annually or a~~A~~s necessary to characterize for disposal	Grab or C~~c~~omposite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
~~III K~~IV J C-2a(1)(c)	Spent Solids from the Bag House Filter	TCLP Organics and Metals~~Analysis based on sample results of characterized waste streams processed through SDC~~	See Table IV J-2 ~~Generator knowledge~~	Annually or as necessary to characterize for disposal ~~As necessary~~	Grab or Composite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
~~III K~~IV J C-2a(1)(d)	Salts from Water Recycle System	TCLP Organics and Metals	See Table ~~III K~~IV J-2	Annually or as necessary to characterize for disposal ~~As necessary or as characterized from processing specific waste streams~~	Grab or Composite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
~~III K~~IV J C-2a(1)(e)	Filter Units from the Exhaust Filter[1]	TCLP Organics and Metals	See Table ~~III K~~IV J-2	In the event of filter replacement	Representative sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results

WAP Section Number	Waste Stream	Parameters for Analysis	Determination Methods	Frequency of Analysis/ Characterization[(13)]	Sampling Method[(2)]	Disposal Limits	Disposal Requirements[2]
~~III K~~IV J C-2a(1)(f)	Explosives and Propellants	See Section IV C ~~of ANAD RCRA Application for detailed information on explosives and propellants~~	Generator knowledge/ Manufacturer's specifications	Not Applicable	Not Applicable	IAW Section IV C ~~of ANAD RCRA Application~~	Treatment in SDC
~~III K~~IV J C-2a(1)(g)	Miscellaneous Solid Waste[1]	Total Organics and Metals	See Table ~~III K~~IV J-2	As necessary to characterize for disposal	Grab or Composite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		TCLP Organics and Metals					
		Ignitability					
		Reactivity	Generator knowledge		Not Applicable		
~~III K~~IV J C-2a(1)(h)	Refractory Material~~Brick~~	TCLP Metals	See Table IV J-2~~IV J C-2~~	Each Batch	Composite Sample	IAW applicable AAC or EPA regulations	Disposal offsite
~~III K~~IV J C-2a(2)(a)	OGT System Brines[1]	TCLP Organics and Metals	See Table ~~III K~~IV J-2	Annually or as necessary to characterize for disposal ~~As necessary to characterize for disposal~~	Composite Sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		pH					
~~III K~~IV J C-2a(2)(b)	Miscellaneous Liquid Waste[1]	TCLP Organics and Metals	See Table ~~III K~~IV J-2	As necessary to characterize for disposal	Grab or Composite Sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		pH					
~~III K~~IV J C-2a(3)(a)	Brine Sludge[1]	TCLP Organics and Metals	See Table ~~III K~~IV J-2	As necessary to characterize for disposal	Grab or Composite Sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		pH					

~~Notes:~~
~~a Sample containers and preservation techniques, if any, will be in accordance with individual method of analysis (see Section IV C of ANAD RCRA Application).~~
Footnotes~~s~~:
~~(1) Generator knowledge will be used, if possible, to establish the presence of a parameter and approximate concentration. Determination methods are listed in this table, if concentrations of the parameter are required for disposal.~~

~~(2) Disposal offsite will be IAW all applicable AAC and EPA regulations or IAW Section IV C of the ANAD RCRA Application.~~

(1~~3~~) Similar waste streams may be profiled for disposal IAW~~in accordance with~~ this table for continued disposal.

(2) Sample containers and preservation techniques, if any, will be IAW individual method of analysis (see Section IV C).

Table IV J- 2 :Table III KIV J-2: 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	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—gaseous hydride	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
Cadmium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	SW-846 Method 6010B/7000 or EPA 213.1
Chromium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption—direct aspiration	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	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7000 or E200.7
Vanadium	Inductively-coupled plasma atomic emissions spectrometry or atomic absorption	SW-846 Method 6010B/7000 or E200.7
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

FootnNote:
(1) The most current approved analytical method will be used.

Abbreviations:
EPA..... Environmental Protection Agency
GC..... Gas Chromatography
HPLC High Performance Liquid Chromatography

1 **~~Table III KIV J-3 Inspection Schedule~~**

Table IV J- 3 : Inspection Schedule		
Item ~~**[264.15(b)(1)]**~~	**Frequency**[1] ~~**[264.15(b)(4)]**~~	**Types of Problems** ~~**[264.15(b)(3)]**~~
General Area	W	Inspect the f~~F~~loor for a~~A~~reas that i~~I~~ndicate e~~E~~xcessive w~~W~~ear or d~~D~~eterioration of p~~P~~rotective c~~C~~oating (where applicable).
General Area	M	Exits are clearly identified and marked.
General Area	D	Examine f~~F~~loor for a~~A~~pparent ~~D~~drips, s~~S~~pills, or l~~L~~eaks ~~from the Munitions~~.
SDC EQUIPMENT~~Equipment~~		
Elevator	W	Observe equipment in operation to determine any loss of performance. Inspect l~~L~~ift a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Pushers	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Hatches	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Loading Chambers	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Tilting Unit	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
~~SDC~~ Upper DC	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
~~SDC~~ Lower DC	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Elevating System	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.
Turning System	W	Observe equipment in operation to determine any loss of performance. Inspect a~~A~~rea for a~~A~~pparent l~~L~~eaks from e~~E~~quipment.

Table IV J- 3 : Inspection Schedule		
Item [264.15(b)(1)]	**Frequency**[1] [264.15(b)(4)]	**Types of Problems** [264.15(b)(3)]
Locking Ring	W	Observe equipment in operation to determine any loss of performance. Inspect aArea for aApparent lLeaks from eEquipment.
Conveyors	W	Observe equipment in operation to determine any loss of performance. Inspect aAreas for aApparent dDrips, sSpills, or lLeaks.
FPIWaste Feed Cutoff Mechanisms	W	Test cControl cCircuits and dDocument wWaste-fFeed cCutoff.
Detonation ChamberSDC	A	Bring detonation chamber to ambient temperature and pTake unit offline. erform a detailed inspection/maintenance operation.
POLLUTION CONTROL EQUIPMENT		
Stack Monitors	D	Check Calibration.
IDInduced Draft Fans	D	Visually inspect for loss of lubrication, check for excessive vibration, and loss of performance by use of operator console data for operating parameters.
Quench Unit	M	Visually inspect shell for corrosion.
Scrubbers	M	Visually inspect shell for corrosion.
Spray Dryer	M	Visually inspect shell for corrosion.
Bag House	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
Cyclone	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
Exhaust Filter	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
SCRAP HANDLING SYSTEMScrap Handling System		
Scrap Funnel	W	Observe equipment in operation to determine any loss of performance. Inspect aAreas for aApparent dDrips, sSpills, or lLeaks.
Scrap Box	W	Observe equipment in operation to determine any loss of performance. Inspect aAreas for aApparent dDrips, sSpills, or lLeaks.
Scrap Conveyors	W	Observe equipment in operation to determine any loss of performance. Inspect aAreas for aApparent dDrips, sSpills, or lLeaks.

Table IV J- 3 : Inspection Schedule		
Item [264.15(b)(1)]	**Frequency**[1] [264.15(b)(4)]	**Types of Problems** [264.15(b)(3)]
Ash Collection and Containers	D	Visually inspect for Leaks, sSpills,s and level of waste in cContainers out of Place.
FIRE PROTECTION SYSTEM		
Extinguishers (Manual)	M	Check for cCondition and gGauge pPressure. Check expiration dates.
Sprinkler System	A	Inspect IAWIn Accordance With Fire Codes and Regulations.
	Q	Using test valve, assure that the system functions and a signal is received by ANAD Ffire Ddepartment.
BUILDING VENTILATION		
General Ventilation System	M	Visually Inspect for Evidence of Corrosion, Malfunctions, Leaks, or Excessive Wear.
Pressure Gauges	D	Check that Gauge is Reading in Appropriate Range.
Internal Mechanical	When filters are changed	Visually Inspect for Evidence of Corrosion, and Excessive Wear.
UNINTERRUPTIBLE POWER SUPPLY		
Input Voltage, L-L and L-NInvertor Input Voltage	M	Check meter for proper voltage.
Input AmpsInvertor Input Current	M	Check meter for proper current.
Input HertzBattery Current	M	Check meter for proper frequencyreading.
Output VAC, L-L and L-N Alternating Current Voltage	M	Check meter for proper voltage.
Output HertzFrequency	M	Check meter for proper frequency.
Output AmpsUninterruptable Power Supply Output Current	M	Check meter for proper current.
Battery VDCPrimary Input Voltage	M	Check meter for proper voltage.
EMERGENCY GENERATOR		
Engine / Generator	S	Visually inspect for loose drive belts, oil leaks, coolant leaks, lube oil level, mechanical integrity, crankcase containment and air motors; observe operation and inspect for loss of performance.
FIRST RESPONDER EMERGENCY EQUIPMENTEmergency Equipment		
Spill Control Material	W	Visually verify that safety equipment

Table IV J- 3 : Inspection Schedule			
Item [264.15(b)(1)]	**Frequency[1]** [264.15(b)(4)]	**Types of Problems** [264.15(b)(3)]	
Fire Extinguishers Eyewash Stations (Portable) Safety Shower		necessary for first responder activities is available and/or operational. These activities may be included on inspection logs for the applicable area(s).	
Emergency Response Items	M	Visually inspect to ensure proper inventory is in place and not damaged	
(Item)	(Quantity)	(Item)	(Quantity)
Spill Kit	3	Drum, 55 gallon	4
Safety Shower/Eyewash Stations (Portable)	2	Drum, 110 gallon	2
Handheld Radios	5	Coveralls, Explosive Handler	4
Tychem Apron	4	Coverall, Tyvek with Hood	4
Respirator	2	Absorbent pads, rags, etc.	1 box
Gloves, rubber	4 pair	First Aid/Trauma Kit	1
Gloves. Latex	4 pair	Flashlight	1
Gloves, leather	4 pair	Hammer	1
Screwdriver	1	Plastic Bag	1 box
Shovel	1	Duct Tape	1 roll
Broom	1		
PERMITTED STORAGE AREAS			
Service Magazines	A	Inspect Magazine for proper storage of materials, good housekeeping, and condition of magazine doors, vents and maintenance of fire breaks.	
	S	Visual inspect the condition of Llightning Pprotection Ssystem.	
	B	Check components of the Llightning Pprotection Ssystem for electrical continuity.	
	W	Visually inspect for proper storage of materials, proper labeling, and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.	
Storage Igloos	W	Visually inspect for proper storage of materials, proper labeling and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.	

Table IV J- 3 : Inspection Schedule		
Item [264.15(b)(1)]	**Frequency(1)** [264.15(b)(4)]	**Types of Problems** [264.15(b)(3)]
	Q	Inspect WMM and Recovered WMM in storage IAWto ensure compliance with DDESB storage controls.
	A	Conduct inventory ofr WMM and rRecovered WMM in storage IAWin accordance with DDESB and MMRMilitary Munition Rule requirements.

Table III KIV J-3 Inspection Schedule

Table III KIV J-3 Inspection Schedule

Table III KIV J-3 Inspection Schedule

PERMITTED STORAGE AREAS		
Service Magazines	A	Inspect Magazine for proper storage of materials, good housekeeping, and condition of magazine doors, vents and maintenance of fire breaks.
	S	Visual inspect the condition of Llightning P protection Ssystem.
	B	Check components of the Llightning Pprotection Ssystem for electrical continuity.
	W	Visually inspect for proper storage of materials, proper labeling, and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.
Storage Igloos	W	Visually inspect for proper storage of materials, proper labeling and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.
	Q	Inspect WMM and Recovered WMM in storage IAWto ensure compliance with DDESB storage controls.
	A	Conduct inventory ofr WMM and rRecovered WMM in storage IAWin accordance with DDESB and MMRMilitary Munition Rule requirements.

Table IV J-3 : Inspection Schedule

Table III KIV J-3 Inspection Schedule

Footnotes:

(1) Inspection requirements will not be performed while the SDC facility is not in operation.
(2) Frequency definitions are as follows:

- D - daily (once every calendar day)
- W - weekly (once every calendar week)
- M - monthly (once every calendar month)
- S - semiannually (once every six (6) calendar months)
- A - annually (once every twelve (12) calendar months)
- Q - quarterly (once every three (3) calendar months)
- B - biennially (once every two (2) years)

Table IV J- 4 :~~TABLE III K~~~~IV J-4~~ RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)

Waste Material	RCRA Hazardous Waste Designation (Number)	RCRA Hazardous Waste Definition Regulatory Citation	Basis for Designation
Fill Material			Hazardous wastes to be processed in the SDC will be characterized using available Government sources of information such as the MARB, MIDAS, or other sources of information relative to the items being processed.
Explosives			
Composition B and Tetrytol	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains Class A explosives, t~~T~~etryl, and TNT IAW~~, as per~~ 49 CFR 173.53.
Tetryl	Reactive (D003)	AAC-14-2-.03(4)(a)8	Is a Class A explosive IAW~~as per~~ 49 CFR 173.53.
Fuzes (M8, M557, and M51A5, M603, M508, M57)	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains a Class A explosive, tetryl, IAW~~as per~~ 49 CFR 173.53.
Bursters (M5, M6, M14, M40A1, M71, M83 and M22 Booster)	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains Class A explosives, tetryl and TNT, IAW~~as per~~ 49 CFR 173.53.
Activator (M1)	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains Class A explosives, i~~I~~gniter m~~M~~ix, l~~L~~ead a~~A~~zide and t~~T~~etryl, IAW~~as per~~ 49 CFR 173.53.
Propellants			
M28, M6, and M67	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains a Class A explosive, nitrocellulose, IAW~~as per~~ 49 CFR Subpart C.
M6 and M67	Reactive (D003) TC organic (D030)	AAC-14-2-.03(4)(a)8 AAC-14-2-.03, Table 1	Contains a Class A explosive, -2,4-dinitrotoluene, IAW~~as per~~ 49FR Subpart C.
Other Miscellaneous Wastes			
OGT HEPA filters and prefilters (from ventilation system)	Potentially Reactive (D003) Toxicity characteristic metals (D004 through D011)(If found to be present)	AAC-14-2-.03(4)(a)4 AAC-14-2-.03, Table 1	These filters may be contaminated with heavy metals and / or -organics. The waste is not expected to be toxicity characteristic. Sampling and analysis will be used to identify other contaminants that may be subject to RCRA regulations.

TABLE ~~III K~~IV J-4 RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)

Note:
~~Notes:~~
(a) Memorandum from Matthew A. Straus, Acting Chief, Waste Identification Branch, U.S. Environmental Protection Agency (EPA), to Jon P. Yeagley, Chief, State Programs Section, U.S. EPA; June 4, 1984.

Footnotes:
(1) Explosives, propellants, and fuzes may contain the following:

D004	arsenic
D005	barium
D006	cadmium
D007	chromium
D008	lead
D009	mercury
D010	selenium
D011	silver

(2) The explosives and propellants listed are examples of the items that may be processed at the SDC. A more extensive list is contained in Section IV C~~ of the ANAD RCRA Application~~. All energetic material processed at the SDC will be IAW~~in accordance with~~ approved feed rates and limitations contained in the RCRA Permit.

Table IV J- 5 :~~TABLE~~ ~~III K~~IV J-5 ~~-~~RATIONALE FOR SELECTION OF ANALYSIS TO PERFORM ON WASTE MATERIALS

Waste	Analysis	Rationale
Explosives in Munitions	None	Sampling and analysis is not conducted because the explosives were manufactured and loaded to government standards and sufficient information is available for proper characterization. These wastes are managed as RCRA hazardous wastes.
Propellants	None	Sampling and analysis is not conducted because the propellants were manufactured and loaded to government standards and sufficient information is available for proper characterization. These wastes are managed as RCRA hazardous wastes.
Energetic Contaminated Waste	None	Generator knowledge as described in S~~s~~ection -IV J~~III K~~ -C-~~-~~1 above will be applied for the energetic contaminated waste.
Other Miscellaneous Wastes (OGT HEPA Filter and Prefilters)	TC Organics and M~~m~~etals ~~TC organics~~	Spent filters may be generated occasionally at the SDC~~ Facility~~ but are not stored, treated, or disposed of at this location. The filters will be disposed of as ordinary solid waste if no heavy metal or organics exposure has occurred with respect to the filters as is demonstrated by applicable analysis.

1 IV J B FACILITY DESCRIPTION ---------- **1**

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4 IV J B-1b Hazardous Wastes Managed / Generated at the SDC ---------- 3

5 IV J B-1c Hazardous Waste Management Unit to be Permitted ---------- 3

6 *IV J B-2 Topographic Map* ---------- *3*

7 IV J B-2a General Requirements ---------- 3

8 *IV J B-3 Location Information* ---------- *5*

9 IV J B-3a Floodplain Standard ---------- 5

10 *IV J B-4 Traffic Information* ---------- *5*

11 IV J B-4a Description of Existing Roads ---------- 5

12 IV J B-4b External Access ---------- 5

13 IV J B-4c Traffic Control ---------- 6

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IV J B FACILITY DESCRIPTION

This section provides a general description of the Static Detonation Chamber (SDC) at the Building 695 Complex on the Anniston Army Depot (ANAD)in Anniston, Alabama.

Permitting of the SDC was originally pursued to support the destruction of waste military munitions (WMM) containing mustard agent. Munitions originally processed at the SDC included over-packed munitions, reject munitions, munitions with limited safety features, and munitions for demonstration testing such as emissions testing or feasibility assessments. Since mustard munitions also involve conventional explosives, the SDC application includes language to support permitting the SDC to destroy conventional munitions deemed appropriate or needed while this unit is being operated.

Mustard munitions processing at the SDC was completed on September 18, 2011. The Anniston Chemical Agent Disposal Facility (ANCDF) completed chemical agent decontamination of all SDC equipment and structures in accordance with (IAW) the ANCDF RCRA Closure Plan. The SDC Decontamination Report was submitted on April 5, 2012, and the SDC unit and facilities are now classified as chemical agent free under the ANCDF clean closure standards defined in the closure plan. Approval of the closure report was received on July 22, 2013.

The SDC is an explosive detonation chamber designed to dispose of WMM. The SDC unit located at the ANAD may be used to process munitions that are not defined as chemical munitions or contaminated with chemical agent from both inside and outside of the State of Alabama. Recovered WMM received from areas inside the State of Alabama may also be processed. The SDC may also treat conventional munitions components from chemical weapons which have been verified agent free and received from outside the State of Alabama.

WMM may include items containing fill material such as white phosphorus, smoke rounds, tear gas, riot control agents, tracers, illumination and incendiary munitions, liquid-filled conventional munitions, liquid contaminated explosive components, etc., and related items. Related items may include shipping and storage containers, packing materials, and personal protective equipment (PPE). These items will be characterized prior to treatment in the same manner as WMM. The feed limitations demonstrated during emissions testing to the unit (e.g., chlorine, metals, sulfur, etc.) will be adhered to at all times and the completion of reaction of the previously fed items will be ensured by monitoring of system response to verify that feed durations are controlled IAW procedural and permit requirements.

IAW the Alabama Department of Environmental Management (ADEM) Administrative Code (AAC) 335-14-8-.02(5)(b)1, Section IV J B-1 provides the general description of the SDC and an overview of the treatment operations proposed for WMM currently stored at ANAD or recovered from areas within the State of Alabama.

Section IV J B-2 provides and discusses the ANAD and SDC topographic map required by AAC 335-14-8-.02(5)(b)19 and other facility related information.

Section IV J B-3 addresses the location information requirements of AAC 335-14-8-.02(5)(b)11.

Section IV J B-4 describes the ANAD and SDC traffic patterns as required by AAC 335-14-8-.02(5)(b)10.

IV J B-1 General Description

AAC 335-14-8-.02(5)(a) and 335-14-8-.02(5)(b)1

The SDC is located within the Ammunition Limited Area (ALA) on the west side of G block within ANAD. The description of ANAD is located in Section II B. The SDC is designed for destruction or treatment of WMM and components which are either explosively or non-explosively configured. The SDC does not require the use of explosive counter charges to destroy munitions. Over-packed munitions can be processed without being removed from the over-pack container. This reduces the risk of accidental explosions and unexpected environmental release. The system is very flexible, and is able to destroy many types and sizes of munitions. It can also decontaminate equipment, scrap or soil.

A detailed description of the SDC is contained in Section IV J D.

IV J B-1a Overview of the SDC Operations

WMM, including recovered items, will be brought to the SDC by truck or appropriate transportation vehicle and may be stored in the three permitted service magazines, 34 permitted storage igloos, or delivered directly to the loading area. WMM will be transported in appropriate packaging to ensure the safety of the workers and environment.

Once processing is to begin, the WMM will be brought to the facility by forklift or appropriate transportation vehicle and placed in the loading area. In the loading area the munitions are placed in ammunition trays and loaded onto the feed conveyor. A lifting assist device may be used for this operation. Once the munitions have been placed on the feed conveyer, no further handling is required. The munitions are fed to the SDC automatically under remote control and observation. The munitions heat up and any explosive present deflagrates or detonates and is destroyed. The ambient heat of the SDC chamber alone is adequate to open the munition case and destroy any fill materials, such as riot control agents or tear gas without the presence of explosives. No counter charges, detonators, or munitions handling is needed. All gases from the treatment of WMM are treated in the pollution control system, all under automatic control..

The unit is able to treat any type of WMM provided permitted limits are not exceeded and dimensional limitations are adhered to for each feed event. Generally, changes in munition feeds do not require modification of the system. The system can handle mixed feeds. If a munition contains fill materials such as smokes, illumination mixtures, white phosphorous, or a fuze, these are destroyed at the same time that the explosive is destroyed, without the need for donor charges, and with an absolute minimum of munitions handling.

IV J B-1b Hazardous Wastes Managed / Generated at the SDC

The SDC receives munitions for treatment (see Figure IV J-1 for the general facility layout)[1]. Munitions may be stored in one of three service magazines, 34 permitted storage igloos, or delivered directly to loading area of the SDC prior to being processed. The wastes managed or generated at the SDC include:

- WMM,
- Recovered WMM from within the State of Alabama,
- Energetic contaminated material,
- Scrap metals from munitions after treatment process,
- Miscellaneous liquid wastes,
- Brines and Off-Gas Treatment (OGT) System fluids,
- Solids generated during the treatment process, and
- Miscellaneous solid waste / dunnage.

Detailed descriptions of the materials to be processed and wastes generated are provided in Section IV J C-1.

The three service magazines and 34 igloos for storage of WMM are located within the ALA and constructed IAW Department of Defense Explosives Safety Board (DDESB) standards. This satisfies AAC 335-14, the Military Munitions Rule (MMR), requirements for WMM storage.

IV J B-1c Hazardous Waste Management Unit to be Permitted

The hazardous waste management unit addressed in this section of the permit application is considered a Miscellaneous Unit (40 Code of Federal Regulations (CFR) 264 Subpart X). Wastes generated during SDC operations are accumulated in containers. The containers will not remain in the Sprung Structure longer than 90 days. This permit application does not seek permitting of the SDC, as less than (<) 90-day storage areas are exempt from permitting requirements [40 CFR 262.34(a)]. However, the service magazines and storage igloos used for waste storage are permitted IAW the MMR.

A detailed description of operations to be conducted at the SDC is provided in Section IV J D-1.

IV J B-2 Topographic Map

AAC 335-14-8-.02(5)(b)1

IV J B-2a General Requirements

IAW the requirements of AAC 335-14-8-.02(5)(b)19, a topographic map and other maps are used to detail the location of the SDC and the surrounding area. The information includes the following: contour maps, the location of surface waters, a wind rose, surrounding land use, and facility area designations.

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[1] All figures are located at the end of this section.

The topographic map (Figure IV J-1)[2] depicts a distance of approximately (~) 1,000 feet around the SDC. The map's scale is 1 inch equals 240 feet. Topographic contours are displayed at 2-foot intervals. There are no legal boundaries shown for the SDC because it is totally self-contained within the ANAD. Legal boundaries for the ANAD are shown in Figure IV J-1. The service magazines (Buildings 712, 713 and 714) near the SDC are shown on Figure IV J-5.

Additional Drawings (Figures IV J-2, IV J-3, and IV J-4), each with a scale of 1 inch equals 30 feet, show contours, locations of catch basins, manholes, storm sewers, sanitary sewers, drain lines, culverts, fences, guard rails, gas lines, fire water lines, hydrants, power poles, access roads, and road surfaces in relation to the SDC. The SDC will be the only Solid Waste Management Unit within the boundary of Building 695 Complex.

Wind roses for the ANAD are included in Figures IV J-7 and IV J-8. Figure IV J-7 shows the average wind speed and direction for the 12 months ending June 30, 1999, at a height of 10 meters (m). Figure IV J-8 shows the average wind speed and direction for the same period at the 30-m level. Average total wind speed at the ANAD for the 12 months ending June 30, 1999, was 1.6 meters per second at the 10-m level and 2.3 meters per second at the 30-m level, with winds common from the east-southeast, southeast, and south-southeast.

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.

For the twelve-month period ending June 30, 1999, 55 inches of precipitation were recorded at ANAD. The highest rainfall (9.4 inches) was recorded in June. The lowest rainfall (1.1 inches) was recorded in September of that period.

The Building 695 Complex is not located in the 100-year floodplain. Section II of the storage permit application contains a copy of the Federal Insurance Agency Flood Hazard Boundary Map, Community-Panel Number 010013 0250 B, Panel Number 250 of 300. Zone "A" depicts the 100-year floodplain. The figure clearly shows that SDC is not in the 100-year floodplain.

There are no surface waters within 1,000 feet of SDC.
The Building 695 Complex does not have any process sewage systems. Sanitary sewage is piped to the existing sewage treatment plant located in the southeast portion of the ANAD.

There are no injection wells on the ANAD, or within 1,000 feet of Building 695 Complex. There are groundwater monitoring wells located at several locations within the ANAD around closed disposal sites, and withdrawal wells at three groundwater treatment facilities. None of the monitoring or withdrawal wells are located in the vicinity of Building 695 Complex.

Storm drainage from upslope areas is diverted around Building 695 Complex by the use of berms, swales, and ditches, thereby preventing any run-on. Storm drainage from the roof and paved areas is directed to catch basins and storm sewers and discharged north of the

[2] All drawings are located at the end of this section.

building using a combination of swales, ditches, and culverts. The runoff is directed to existing offsite drainage courses. 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 small community of Bynum is located on the 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.

IV J B-3 Location Information

AAC 335-14-8-.02(5)(b)11

IV J B-3a Floodplain Standard

AAC 335-14-5-.02(9)(b), and 335-14-8-.02(5)(b)11(iii)

The ANAD is located in Calhoun County in northeastern Alabama within the valley and ridge province of the Appalachian Highlands. The ANAD occupies 15,246 acres of land. None of the land within 1,000 feet of Building 695 Complex is in the 100-year floodplain.

IV J B-4 Traffic Information

AAC 335-14-8-.02(5)(b)10

The transport of WMM is described in Section IV B-5 of the ANAD RCRA Permit Application.

The locations of the roads connecting Building 695 Complex to the ANAD ALA are shown in Figure IV J-1. All main access routes to Building 695 Complex are paved, all-weather roads meeting Department of the Army (DA) road design standards. Construction of ANAD roads meet the technical requirements contained in Army Technical Manuals (TM) 5-822-2 and TM 5-822-5. The roads have 10-foot wide lanes with a minimum cross-slope of 2 percent.

IV J B-4a Description of Existing Roads

The largest portion of the ANAD is used for munitions storage and, therefore, has only minimal traffic. The ANAD road system consists of 113 miles of paved roads and 104 miles of unpaved roads with most of the unpaved roads located in the Ammunition Restricted Area and Munition Demolition 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.

IV J B-4b External Access

The major highways serving the ANAD are I-20 and U.S. 78, running east and west, and U.S. 431, running north and south. The main access to the ANAD is from Alabama State Highway 202 by way of a 24-foot wide concrete road with 10-foot shoulders through the Main Gate. This road is used by most employees and by all commercial trucks. Two alternate gates are used for incoming and outgoing employee traffic during shift changes. Eastbound employees exit through the Eulaton Gate. All other gates are normally closed to traffic.

At present, there are ~ 2,500 privately owned vehicles entering and leaving the ANAD each day. In addition, ~ 3,200 truck shipments leave and 1,100 truck shipments are received at the ANAD each year. Essentially, all civilian and truck traffic occurs on weekdays.

IV J B-4c Traffic Control

Traffic on the ANAD 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.

IV J C WASTE CHARACTERISTICS

The chemical and physical characteristics of the wastes that are managed at the SDC are discussed in this section. Section IV J C-1 describes the chemical and physical properties of the wastes to be processed in the SDC. Section IV J C-2 presents the Waste Analysis Plan (WAP) that details the methodologies for sampling, testing, and evaluating all wastes generated from the treatment process to ensure that sufficient information is available for their proper characterization and safe management. This information is also used to ensure that all wastes are treated IAW best-demonstrated available technology (BDAT) to maintain compliance with the land disposal restrictions (LDR). Section IV J C-3 addresses waste analysis requirements pertaining to LDR.

IV J C-1 Chemical and Physical Analysis

AAC 335-14-5-.02(4), and 335-14-8-.02(5)(b)2

The SDC will be used to thermally treat WMM or waste material contaminated with energetics. Other wastes that may be generated and treated include PPE, dunnage, rags, towels, mops, and sampling equipment.

Table IV J-1[3] and IV J-4 identify each known and potential hazardous waste managed or generated at the SDC along with the appropriate analysis method for determining RCRA hazardous waste designation, EPA waste codes, RCRA regulatory citation for the relevant definition or criteria for designating the waste as hazardous, and specific data or rationale relating the waste to the respective criterion or definition. Specific physical and chemical information on the wastes managed or generated at the SDC are provided in Section IV J C-1a.

Illumination, smoke, phosphorous items, other such items, and other WMM, to include recovered WMM, are also available for destruction within the SDC. Detailed information for each of these types of items not addressed in Section IV C, as applicable, will be assessed per feed event to ensure compliance with limitations demonstrated as a result of the emissions tests conducted at the SDC. WMM may be properly categorized using the Munitions Items Disposition Action System (MIDAS), Material Assessment Review Board (MARB), or other appropriate source of data for the munition type. These systems identify the constituents contained within WMM found in the demilitarization stockpile, including recovered WMM, and allow for accurate characterization for control of feed parameters for the operation of the SDC. For items not listed in Sections IV J C or IV C, concurrence for processing will be received from both ADEM Air and Land divisions prior to processing within the SDC.

[3] Reference Table IV J-4 for more details.

IV J C-1a Volume and Composition of Waste in Miscellaneous Treatment Units AAC 335-14-5-.24(2), and 335-14-8-.02(14)

The volume of WMM treated at the SDC fluctuates based on the disposal needs of the Department of Defense (DoD). The SDC system is designed to accept a maximum gross weight of up to 330.7 pounds (lb) per feed event including the feed tray. The explosive capacity for the SDC is up to:

- 6.7 lb of mass detonating explosive material (TNT equivalent, Net Explosive Weight [NEW]), or
- 23 lb of non-mass detonating explosive material per feed cycle.

For the purposes of destruction in the SDC most Class 1.1 materials that are not confined and Class 1.2 and 1.3 materials confined or unconfined are considered non mass detonating as they typically deflagrate in the SDC. Exceptions are the primary Class 1.1 explosives, which normally mass detonate whether confined or not. The NEW of a munition represents the combined explosive weight of all energetics contained in a munition item or items.

Section IV C includes detailed information about WMM and any associated breakdown products.

IV J C-1a(1) Fill Materials

The munitions treated in the SDC operations may contain fill materials, such as riot control agents, tear gas, smokes, illumination mixtures, phosphorous mixtures, etc. The Army recognizes the toxic nature of these fill materials and the need to implement strict and conservative management practices to facilitate effective processing at minimal risk to human health and the environment. Therefore, the Army is minimizing the handling of these wastes by limiting handling to designated locations and by employing, where possible, automated handling and conveyance systems. Section IV C includes detailed information about the fill materials and any associated breakdown products.

IV J C-1a(2) Explosives and Propellants

The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured and loaded IAW strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from manufacture and quality control for these materials have been used with engineering knowledge to characterize and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV C. Examples of the various explosives and propellants that are contained in the WMM demilitarized at the SDC are identified in Table IV J-4 or are identified in Section IV C. For items not listed in Section IV C, detailed product composition will be reviewed prior to treatment within the SDC to ensure compliance with established limitations.

IV J C-1a(3) Wastes Contaminated with Energetic Material

Demilitarization of WMM is typically performed using mechanical equipment which may come in contact with energetic components of the WMM. This process can leave a portion

of the energetic material affixed to the equipment which in turn requires cleaning to ensure that subsequent operations are conducted safely. Cleaning of the equipment or tools used to demilitarize WMM therefore will generate items such as PPE, rags, mops, etc. that will potentially be contaminated with energetic material. The SDC is capable of processing these items, under approved feed limitations based on characterization of the material, to ensure that the energetic material is destroyed prior to release of the resultant ash or process waste for disposal.

IV J C-1b Containerized Waste

The storage of WMM is addressed as container storage with regards to the hazardous waste regulations [AAC 14-5-.09 and 14-8-.02(6)]. Refer to Section II for further detail on container storage of hazardous waste.

Waste material collected post-treatment at the SDC is containerized and removed from the units, managed, and disposed. These materials include, but are not limited to, scrap metal, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, and filter units from the exhaust filter. Waste material may be temporarily stored at an appropriate hazardous waste storage location at ANAD prior to disposal offsite or treatment onsite.

Sections IV J C-1b(1) through IV J C-1b(5) discuss the major waste streams to be containerized.

IV J C-1b(1) Treated Scrap Material from the SDC

Waste resulting from emptying the SDC consists mainly of scrap metal from munitions processing and over-packs which have been treated. Treated materials that are discharged from the SDC may be fed back into the system for reprocessing if necessary. Inorganic waste material may remain as a dust from treatment of feed trays, munition boxes (if fed with the munitions), or waste contaminated with energetics. This waste can be characterized as scrap after cooling to room temperature. The scrap is a mix of the above fractions. The content of the fractions may differ depending on the type of material initially fed to the SDC.

Excess scrap material is collected, visually inspected, certified as “free of explosive hazard”, and sent to the DRMO onsite for further management and recycling or disposed of IAW applicable regulations.

IV J C-1c Waste in Tanks

There is no waste stored in tanks at the SDC; therefore the requirements for this section are not applicable.

IV J C-1d Waste in Piles

AAC 14-5-.12(c)1

The SDC will not have waste piles; therefore the requirements for this section are not applicable.

IV J C-1e Landfilled Wastes

AAC 14-8-.14

The SDC will not have landfilled wastes; therefore the requirements for this section are not applicable.

IV J C-1f Waste Used in Performance Tests

AAC 14-8-.06(2)(b)2.(i)

Various physical and chemical properties of fill materials, explosives and propellants are summarized in Section IV C. Information on each of the materials used in performance tests may be found in the respective SDC Emissions Test Report.

The SDC conducted emissions testing for conventional WMM (Condition 1) from December 3 to 7, 2010, surrogates and metal oxides (Condition 2) from February 1 to 4, 2011, and (Condition 3) from February 8 to 9, 2011, mustard at a reduced feed rate (Condition 4a) from July 5 to 8, 2011, and mustard-filled munitions (Condition 4b) from August 9 to 13, 2011. A confirmatory emissions test was conducted using conventional WMM and surrogates on February 25 to 27, 2014.

IV J C-1g Miscellaneous Components

Please refer to Section IV C for miscellaneous components.

IV J C-1h Hazardous Waste Treatment

The SDC may also process hazardous waste in the form of recovered WMM or other items associated with the management of recovered WMM and components that may be classified as hazardous waste. Waste to be treated in the SDC:

<u>WASTE INPUT</u>

1. WMM, including liquid filled, and/or recovered items
2. Explosives and Propellants
3. Fuzes and Bursters
4. Miscellaneous solid and liquid waste, including waste material contaminated with energetics

<u>TREATMENT RESIDUE</u>

1. Scrap metal
2. Ash
3. OGT System Solids (spent carbon, high-efficiency particulate air (HEPA) filters, and pre-filters) and liquids

Any items classified as hazardous waste should arrive under manifest at the ANAD or SDC. If manifests accompany items to be processed, appropriate records to include final copies of the manifest will be returned to the necessary agencies upon receipt and completion of the treatment process.

Hazardous wastes to be processed in the SDC will be characterized using available government sources of information such as the MARB, MIDAS, or other source of information relative to the items being processed. These actions will be completed to ensure that the feed control for any items processed is allowed under the approved feed rates for the SDC. Characterization of waste material contaminated with energetics will be based on generator knowledge of the energetics to which the item was exposed.

IV J C-1i Waste to be Land Treated

AAC 14-5-.13(3)(a) and 14-5.13(3)(c)1.(i)

The SDC has no land treatment units; therefore, the requirements of this section are not applicable.

IV J C-1j Wastes in Miscellaneous Treatment Units

AAC 14-5-.24(2) and 14-8-.02(14)

The SDC is a miscellaneous treatment unit used for processing WMM. Military munitions are defined in AAC 335-14-1-.02. These munitions require disposal because the ANAD has determined that they cannot otherwise be reused or recycled. These military munitions become WMM when removed from the various storage igloos at ANAD and offered for disposal at the SDC.

Section IV C contains detailed information about WMM and any associated breakdown products.

IV J C-2 Waste Analysis Plan (WAP)

AAC 335-14-5-.02(4)(b) and (c), 335-14-5-.02(8), 335-14-8-.02(5)(b)3, and 335-14-9-.01(7)

The following sections address the various components of the SDC-specific WAP. These components include: analytical parameters and the rationale for their selection, test methods, sampling methods, frequency of analyses, additional requirements for wastes generated offsite, and additional requirements for ignitable, reactive, or incompatible wastes. In effect, the WAP delineates the waste parameters that are determined prior to treatment of waste during SDC operations. Waste streams from the operation of the SDC include, but are not limited to, scrap metal, ash, dust material from the buffer tank, cyclone, and dust collection system, spent bag house material, salts from water recycle system, filter units from the exhaust filters, OGT brines, and sludges. Other miscellaneous wastes that may be generated include PPE, dunnage, rags, towels, mops, cardboard dunnage, banding / box hardware, and sampling equipment.

The Army is using production knowledge, quality assurance and analytical data, and engineering judgment to characterize wastes processed in the SDC. The Army is both the WMM manufacturer and SDC owner. The SDC was engineered to achieve the treatment requirements for WMM treatment and is operated with attention directed to minimizing the risk associated with all WMM activities conducted at the SDC.

IV J C-2a Parameters and Rationale

AAC 14-5-.02(4)(b)1

The analytical parameters and rationale for their selection are described by waste category in the paragraphs below and have been divided into three groups – solids, liquids, and sludges. This information is summarized in Table IV J-1[4].

IV J C-2a(1) Solids

IV J C-2a(1)(a) Ash from Treated Scrap Material from the SDC

This waste stream consists of ash from metal munitions and miscellaneous parts that have been thermally treated in the SDC. A grab sample will be collected from the residue of waste streams processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) organics and metals. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(b) Dust Material from the Buffer Tank, Cyclone, and Dust Collection System

Dust material is generated during regular operation of the SDC and during maintenance activities associated with the buffer tank, cyclone, and dust collection equipment. A grab sample will be collected from the residue of each waste stream processed for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to cleanout. The residues will be analyzed for TCLP organics and metals. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(c) Spent Solids from the Bag House Filter

The bag house is utilized for particulate and semi-volatile metal collection. A grab sample will be collected from the spent solids for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been processed prior to clean out. The residues will be analyzed for TCLP organics and metals. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(d) Salts from Water Recycle System

This waste stream comes from the water recycling operation (acid and neutral scrubbers) and consists of residual salts with collected dust particles. A grab sample will be collected from the residual salts for the purposes of characterization and profile development. During clean out activities, a composite sample will be collected from the total amount of residue generated and characterized unless a profile exists for the wastes that had been

[4] All tables are located at the end of this section.

processed prior to clean out. The residues will be analyzed for TCLP organics and metals. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(e) Exhaust Filter Units

This waste is comprised of prefilters, HEPA filters, and carbon filters from the exhaust filter system. The filter system is designed as a backup for the OGT System. Due to the efficiency of the particulate removal devices upstream of this filter unit, it is not expected that this system will ever be exposed to pollutants that will require filter replacement. In the event the filters are replaced, spent filters will be properly stored in containers and analyzed for TCLP organics and metals. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(f) Explosives and Propellants

The explosives, propellants, and related compounds are not tested prior to or during processing. These materials were manufactured according to strict government specifications and standards; therefore, sufficient information is available on their composition. Data available from the manufacturer and quality control for these materials have been used with engineering knowledge for proper characterization and to develop and assess effective treatment processes. Detailed information concerning explosives and propellants can be found in Section IV.

IV J C-2a(1)(g) Miscellaneous Solid Waste

Miscellaneous solid waste includes, but is not limited to, valves, pumps, gearboxes, conveyors, belts, piping, hoses, flanges, thermocouples, pH probes, nuts, bolts, gaskets, and other waste removed from the SDC equipment or generated during operation of the SDC. Miscellaneous solid waste will be characterized by generator knowledge and/or analysis. Analysis may be limited to a particular hazardous waste code or series of codes, such as TCLP metals, or it may be extensive as necessary to adequately characterize and profile the waste. The disposal requirements will be based on the analysis results.

IV J C-2a(1)(h) Refractory Material

Refractory material from the thermal oxidizer exit duct may be periodically removed and replaced. A batch consists of all the refractory material removed during one periodic change out. Each batch of discarded refractory material will be analyzed for TCLP metals. Table IV J-1 details the analyses that may be needed for sufficient characterization and the associated disposal requirements. The disposal requirements are based on the analysis results.

IV J C-2a(2) Liquids

IV J C-2a(2)(a) OGT System Brines

OGT System brines are generated from the treatment of munitions in the SDC. A composite sample will be analyzed for TCLP organics/metals and pH to properly characterize the brine. The disposal requirements will be based on the analysis results.

IV J C-2a(2)(b) Miscellaneous Liquid Waste

Miscellaneous liquid waste such as, but not limited to, clean up fluids, reserve flush tank solution, hydraulic fluid, and lubricating oil will be generated periodically during operations at the SDC. This waste stream is typically characterized by generator knowledge. Miscellaneous liquid waste that is not characterized by generator knowledge will be analyzed for TCLP organics/metals and pH for proper characterization. The disposal requirements will be based on the analysis results.

IV J C-2a(3) Brine Sludges

Brine sludge generated from the operation of the OGT System will be tested for TCLP organics/metals and pH for proper characterization. The disposal requirements will be based on the analysis results.

IV J C-2b Test Methods

AAC 335-14-5-.02(4)(b)2

Process knowledge during waste treatment will be incorporated to obtain the necessary chemical and physical information to properly treat reactive hazardous wastes at the SDC. The methods used to test the parameters for WMM treated and treatment residues are described in Table IV J-2.

IV J C-2c Sampling Methods

AAC 335-14-5-.02(4)(b)3 and 335-14-2, Appendix I

Sampling, when required, will be performed IAW Tables IV J-1 and IV J-2.

IV J C-2d Frequency of Analysis

AAC 335-14-5-.02(4)(b)4

Frequency of analysis will be performed IAW Tables IV J-1 and IV J-2.

IV J C-2e Additional Requirements for Wastes Generated Offsite

AAC 335-14-5-.02(4)(a),(b) and (c), 335-14-5-.02(5), and 335-14-5-.05(4)(a) and (b)

Only WMM that are permitted for treatment at the SDC will be accepted from off-site DoD facilities. WMM shipments to ANAD are coordinated well in advance with Anniston Munitions Center (ANMC) Ammunition Maintenance Division (AMD). WMM shipments to ANAD are characterized by the generating unit and accompanied by an EPA shipping manifest or appropriate DoD shipping controls as defined by the MMR. The generating activity will provide all necessary information, including National Stock Number (NSN) and DoD Identification Code. No unknown wastes or unidentified wastes will be accepted.

IV J C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

AAC 335-14-5-.02(4)(b)6 and 335-14-5-.02(8)

The majority of hazardous wastes treated at the SDC are reactive (D003). Some of the wastes may be ignitable (D001) as well. These characteristics are the primary RCRA characteristics of concern. Therefore, the waste characterization procedures were developed considering the reactivity, ignitability, and potential incompatibilities of munitions/explosives. There are no additional waste characterization requirements to be addressed.

IV J C-3 Waste analysis requirements pertaining to Land Disposal Restrictions (LDR)

AAC 335-14-9, 335-14-8-.02(5)(b)3, 335-14-5-.02(4)(a)1, and 335-14-5-.02(4)(b)6

The Hazardous and Solid Waste Amendments of RCRA prohibit land disposal of certain types of wastes and establish concentration limits and treatment standards for certain restricted wastes before land disposal. Information provided in this section describes the identification, characterization, documentation, and certification of wastes that are subject to LDR.

The SDC treats reactive hazardous wastes onsite to remove the reactivity characteristic. The WAP (Section IV J C-2) is designed to provide all information required to comply with the LDR in the event that tests of the SDC treatment residues show the residues possess the RCRA toxicity characteristic.

Treatment residue from the SDC unit will be analyzed to determine whether it is a hazardous waste due to exceeding a toxicity characteristic constituent limit. These analyses are also used to determine whether federal LDR treatment standards are met. Treatment residue is analyzed by TCLP to determine whether the treatment standard for toxicity characteristic metals and organic waste are exceeded. Additional analyses of the residues for reactivity are not required because all reactive material is destroyed in the treatment process.

If the treatment residue does not meet the LDR treatment standards for toxicity characteristic metals or organics, with each shipment of waste, ANAD will notify, in writing, the facility receiving the waste of the appropriate treatment standards.

IV J C-3a Waste Characterization

AAC 335-14-9-.01(7)

Wastes to be managed during SDC operation are characterized as described in Sections IV J C-1 and IV JC-2. The information provided by this characterization allows for determinations of LDR applicability and compliance with LDR treatment standards, concentration limits, or notification and certification requirements for LDR constituents and underlying LDR constituents. Specific analysis required to determine whether the waste is an LDR restricted waste and whether the waste is being managed properly under the land disposal requirements of AAC 335-14-9 are discussed in this section.

The following paragraphs describe the analysis requirements pertaining to LDR regulations for each waste stream.

IV J C-3a(1) Treatment Residues and Other Miscellaneous Wastes Generated

Treatment residue from the SDC is limited to waste such as ash and metal fragments. These materials are generated as dry solids, with the exception of OGT System fluids (brine), and containerized properly for temporary storage. Other miscellaneous waste may be characterized based on generator knowledge and/or analysis. Disposal of these items will be based on analysis results or IAW applicable regulation.

IV J C-3a(2) Explosives and Propellants

The explosives and other energetic components of the munitions, as described in Section IV J C-1, are characterized as reactive wastes (D003).

In addition to the reactivity characteristic (D003), wastes treated at the SDC may also be classified as hazardous due to the hazardous characteristics of ignitability (D001), corrosivity (D002), and/or toxicity codes based on munition type.

Other waste codes associated with WMM or components of WMM have been included in Section I Part A. Section IV C includes detailed information about WMM and any associated breakdown products.

For the reactive waste code D003, the applicable treatment standard is deactivation and requires meeting the concentration limits in AAC 335-14-9 for underlying hazardous constituents. Disposal of these items will be based on analysis results or IAW applicable regulation.

IV J C-3b Notification and Certification Requirements

AAC 335-14-9-.01(7)

The SDC may be a generator of wastes subject to LDR. ANAD will comply with all generator notification requirements applicable to SDC operations including a notification IAW AAC 335-14-9-.01(7). All supporting data and waste analysis data will be retained for a period of at least 3 years. Copies of all notices, certifications, demonstrations, and other documentation produced to support the determination for restricted waste treated, stored, or disposed of at an approved hazardous waste Treatment Storage and Disposal Facility (TSDF) will also be retained.

IV J C-3c Requirements Pertaining to the Storage of Restricted Wastes

AAC 335-14-9-.05

The SDC does not store restricted waste.

IV J C-3d Exemptions, Extensions, and Variances to Land Disposal Restrictions

AAC 335-14-9-.01(5) and (6), and 335-14-9-.04(5)

The applicant is not seeking any case-by-case extensions, or petitions to allow land disposal of a prohibited waste, or variances from treatment standards.

IV J C-4 Waste Transportation and Offsite Treatment, Storage, and Disposal

AAC-14-3

All waste disposed offsite will be transported offsite and disposed IAW applicable regulations. Information concerning transportation procedures for hazardous waste can be found in Section II B-5.

IV J D MISCELLANEOUS UNITS

AAC 335-14-5-.24(1) to (4) and 335-14-8-.02(14)

Section IV J D, addresses the treatment of WMM inside the SDC at the ANAD. This section describes the SDC treatment processes. The SDC does not fit the definition for other types of treatment units and is therefore categorized as a miscellaneous treatment unit under the RCRA.

IV J D-1 Description of Miscellaneous Unit

AAC 335-14-8-.02(14)(a)1 and 335-14-8-.02(14)(a)2

The SDC unit is designed to destroy WMM which are either explosively or non-explosively configured. The SDC does not require the use of explosive donor or counter charges to destroy munitions. The unit is able to handle various types of munitions. Generally, changes in munition feeds do not require reconfiguration of the system, and the system can handle mixed feeds. Munitions that have been over-packed can be processed without being removed from the over-pack container. If a munition contains smoke, illumination mixtures, white phosphorus, or a fuze, these are destroyed at the same time that the explosive is destroyed. The unit is designed and built in such a way as to eliminate worker or public exposure to explosive or environmental hazards at any time during operations, and to produce products that are environmentally acceptable. The system is designed with interlocks and redundant systems where required, for safety and to prevent release of untreated products.

A description for the SDC, including service magazines and storage igloos, is described in Section IV J D-1b.

IV J D-1a Physical Characteristics

AAC 335-14-8-.02(14)(a)1

This section describes the physical characteristics of the SDC. The layout of the SDC is shown in Figure IV J-6[1]. The conceptual design of the SDC is discussed below.

The SDC and service magazines are located on the west side of G block and just north of the Demolition Pit road and next to Building 695. The storage igloos are located in G block. For safety, the buildings are at least 1,250 feet south of SDC. The SDC is also 1,200 feet from the nearest storage igloo in G block. Access roadways are provided for trucks, buses, forklifts, and service vehicles. Access roads are provided to G block on the east and to the emergency egress road on the west. Refer to Section IV J B for a detailed description of the location of the SDC.

The SDC unit is contained in a sprung structure, which is an engineered stress membrane structure. The sprung structure is constructed of extruded aluminum arches, connected to an all-weather outer membrane which will cover the loading area, SDC equipment, and OGT equipment. Neither the Sprung Structure nor its ventilation system are required for treatment of WMM.

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[1] All figures are located at the end of this section.

The SDC System is designed and built as a mobile system, able to be transported over road, rail or by sea using containers which are configured as standard ISO specification containers. Each container is equipped with a frame, dimensions and lifting points per ISO standards and contains parts of the SDC System preconfigured and installed, ready to place and bolt together with a minimum of connections. The unit remains installed within the containers for use. Installation of the system occurs at the point of use. The various containers are received at the location and placed in the proper location using a crane. Once in place the containers are bolted together into a rigid structure using rigid connectors, and then the inter-container process piping and electrical connections are made. All electrical connections are brought to one junction box per container to facilitate connections and plug in connectors are used to the extent possible. Process piping interconnectors are flange type prefabricated junctions, and piping meant to contain potentially hazardous materials are double wall construction. Where required expansion joints are provided in the process piping to accommodate temperature swings. The process for erection is as follows:

a) Containers are unloaded and placed according to the erection plan;

b) Side walls are removed for easy access where not necessary;

c) Necessary stairs and platforms are connected;

d) Process connections are made between the containers;

e) Power and bus cables are connected;

f) Cameras and PA speakers external to the containers are mounted;

g) Sprung structure is erected, filters connected, external cameras mounted;

h) Consumables are connected with flexible double wall hose to the process containers;

i) Electrical and process checks are performed according to a defined check list; and

j) Leakage test is done for the whole system before start up.

An exhaust filtration unit, though not required for WMM operations, may be connected to the Sprung Structure to provide negative pressure within the structure with respect to the outside. The minimum footprint for sprung structure is 70 x 100 feet. The footprint may be adjusted for ancillary equipment outside of the sprung structure (e.g., generators, carbon filtration units, airlocks, control room, waste water treatment, etc.).

The SDC System is contained within a series of containers which are trucked to the site and placed using a crane. After placement, the Sprung Structure was erected around the system which acts as a tertiary containment (primary containment is afforded by the system itself, and secondary containment is afforded by the ISO sea containers). Blast protection panels are incorporated into the sea containers as necessary. The SDC loading container, detonation chamber container and scrap bin container are located in three sea containers which are stacked one on top of the other for operations. The OGT System is housed in

another three containers with additional containers for the loading and scrap handling operations, and two electrical switchgear utility containers.

IV J D-1a(1) Munitions Limitations

In addition, all types of explosive containing material can be processed in the system as long as the following boundary conditions per feed cycle are not exceeded:

- Chlorine < 11.1 lb,
- Sulfur < 6.3 lb,
- Mass Detonating Explosives < 6.7 lb (TNT equivalent),
- Non Mass Detonating Explosives < 23 lb (TNT equivalent),
- No shape charges unless shape charge function is defeated prior to feeding, and
- Overall weight < 330.7 lb (including feed tray).

All feed events (e.g., miscellaneous solid waste, dunnage, process fluids) will be bound by the feed rates contained in the RCRA Permit.

IV J D-1a(2) Description of the Service Magazines and Storage Igloos

Each service magazine is an earthen covered steel reinforced concrete structure and located within Building 695 Complex. The structure is 29 feet deep and 17 feet high and ~ 170 feet wide and is divided into three sections.

The storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and will serve as the primary storage for munitions per the MMR and WMM prior to being offered to the SDC for treatment. The igloos are also being permitted to allow for storage of hazardous waste material contaminated with energetics that is delivered for treatment at the SDC from DoD facilities and for storage of recovered WMM that have been declared as hazardous waste. The SDC-dedicated service magazines are designated as 712, 713, and 714. The SDC-dedicated storage igloos which may be used 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	

IV J D-1a(3) Fire Protection

The Fire Protection System is an automatic sprinkler system that complies with the requirements as stated in United Fire Code 3-600-01 (6-10.5), Table 4-1 for Ordinary Hazard Group 2.

IV J D-1a(4) Utility System

A 1,500-kilovolt ampere, pad-mounted transformer is used to supply electrical power to the SDC. Natural gas is used to heat the thermal oxidizer and boilers. Water is received from ANAD via pipeline and distributed to points of consumption throughout SDC. The system also supplies water to the required process systems.

IV J D-1b Process Descriptions

AAC 335-14-8-.02(14)(a)2

The loading area is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor transfer. After the loading conveyor is loaded, it moves one tray at a time to the lift. The lift then transfers the tray to the level of the first loading chamber (LC1). From the lift, the item is then transferred to the apron of LC1. All trays must be configured to pass through the 18.1 inches in diameter opening of the SDC.

At this point the loading system pauses until the Control Room (CON) Operator (CRO) initiates staging of a tray into LC1. All movements from the loading conveyors to LC1 are automatic. However, the CRO has full control of all movements and can abort or reverse the movements as required. The loading conveyors and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.

Staging of a tray consists of deflating a pneumatic seal in the gate leading to LC1 and then raising the gate. An electrically operated ram, equipped with sensors to detect misfeeds and other problems, pushes the tray into the LC1 and then retracts. The gate is lowered and pneumatic seal inflated forming a gas-tight boundary. Staging of a tray into LC1 can occur while the previous tray is being processed in the DC.

When conditions are verified acceptable for initiating feed to the DC, the CRO initiates the loading sequence for staging the next tray into the second loading chamber (LC2). The actions of transferring a tray to the DC are automatic but are monitored in the CON and can be manually interrupted. The seals on both sides of the gate leading to LC2 are deflated and the gate is raised. The hydraulically operated ram pushes the tray into a cradle located in LC2 and then retracts. The gate leading to LC2 is lowered and the seals on both sides of the gate are inflated. This gate is rated to withstand blast pressures of the DC.

If needed, LC1 may then be filled with flush tank solution to ensure that no air which may contain contamination remains. Air displaced by this operation is fed to the DC for treatment. Flush tank solution may either be fed into the DC for treatment or recycled back to the reserve flush tank for re-use.

The cradle and fragment valve within LC2 move as one unit but are located perpendicular to each other. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90 degrees (^{o}) and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upon entering the DC, the munitions are heated resulting in a detonation and/or deflagration. The increase of pressure within the munition casing caused by the ambient heat of the DC alone is adequate to open the munition case and destroy fill material without the presence of explosives.

Detonations within the SDC occur inside a detonation chamber (DC). The DC consists of an upper portion (UDC) which is fixed to the loading system and a lower portion (LDC) which can separate from the UDC. During detonation, the UDC and LDC portions of the DC are sealed by means of a locking ring, rope gasket and six pneumatic seals (three on the top side of the locking ring, sealing to the UDC, and three underneath the locking ring, sealing the LDC).

To empty the DC, the pneumatic seals are deflated and locking ring is partially twisted to free the LDC. The LDC can then be lowered and tilted to empty the scrap. Following scrap removal, the LDC is returned to the upright position and raised. The locking ring is twisted in the opposite direction to lock the UDC and LDC together and the pneumatic seals on both sides of the locking ring are inflated to seal the locking to each respective portion of the DC.

The LDC contains electric heaters to maintain the DC at high temperatures. Both the UDC and LDC are constructed of heat resistant steel which can withstand the mechanical stress loads caused by detonation pressures at high temperatures. Inside the LDC, a fragment shield acts as a sacrificial plate to absorb impacts from fragmentation.

The OGT System consist of a buffer tank which absorbs pressure perturbations caused by blast waves within the DC, followed by an orifice or control valve which also helps to equalize the flow going to downstream components of the system. Following the orifice or control valve, the gas is heated to a minimum of 1,741 degrees Fahrenheit (°F) for at least 2 seconds.

Off-gases from the detonation and/or deflagration are further treated in the OGT System which is comprised of a thermal oxidizer, spray dryer, bag house filter, quench venturi, acid scrubber, and neutral scrubber. Off-gases received from the thermal oxidizer are cooled by a spray dryer followed by a baghouse to remove salts and particulates. The remaining contaminants are removed by the acid and neutralization scrubbers. The last step is a multistage exhaust filtration system, which acts as a safeguard to the OGT System prior to releasing the off gas to the environment.

IV J D-1b(1) Transportation of Material for Treatment

Transportation details for WMM to be treated at the SDC are discussed in Section IV B-5 and IV D-1k(3).

IV J D-1b(2) Equipment Descriptions

A detailed description specific equipment and systems included in the SDC is discussed in the following sections.

Conveyor System

The conveyor system is electrically powered and consists of a series of conveyors which transport the trays to the lift, a Lift which elevates the trays up to LC1, and an electrical pusher which propels the trays into LC1.

Gate 1

Gate 1 is a hydraulically operated sliding gate located at the inlet to LC1. Gate 1 is sealed gastight with a pneumatic seal. An electric pusher propels the package into LC1.

Loading Chamber 1 (LC1)

LC1 is a staging location prior to LC2. If required, LC1 may be filled with a water-based flush solution after any loading sequence in order to evacuate gases for further treatment.

Gate 2

Gate 2 is a hydraulically operated sliding gate located at the inlet to LC2 from LC1. Gate 2 is sealed gastight with four pneumatic seals which are designed to withstand design blast pressures within the DC.

Loading Chamber 2 (LC2) and Cradle

LC2 has a built-in hydraulically powered cradle and fragment valve which move as a single unit.

With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90° and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upper Detonation Chamber (UDC)

The UDC is mounted to the outlet flange of LC2. Connections for incoming process air, outlet exhaust gases, temperature sensors, and pressure gauges are placed on the UDC.

Lower Detonation Chamber (LDC)

The LDC has an inner fragment shield and outer chamber. Electrical resistance heating elements are located on the LDC.

Elevating and Turning System

When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks. The rotation of the LDC is made by a hydraulic motor, connected to the LDC by a gearbox and roller chain.

Locking and Sealing System

The UDC and LDC are locked to each other with a locking ring during destruction. The locking ring is maneuvered by two hydraulic cylinders. For the emptying procedure the

locking ring is turned to the open position and the LDC is lowered and tilted. The connection between UDC and LDC is sealed by three pressurized pneumatic gaskets during destruction.

Hydraulic Power Unit

The hydraulic power unit provides power to operate the lifting jacks, tilting motor, gates 1 and 2, locking ring, and pushers. It also has a built in backup pump which is driven by the uninterrupted power supply of the SDC.

Scrap Chute and Scrap Conveyor

When removal of scrap material is required, the LDC is lowered and rotated so the scrap material can be transferred to the scrap conveyor via the scrap chute.

Scrap Conveyor System

Scrap conveyors 201, 202, and 203 are vibration conveyors which use gravity to transfer material. The scrap conveyors are separated by gates and can be operated independently of each other. Dust is removed and collected in a drum between scrap conveyers 202 and 203 when the scrap passes over a wire mesh. Scrap conveyor 203 allows visual inspections of WMM after treatment.

Detonation Chamber Air Heater

Air heaters are used to raise the temperature of the process air which is used to aid the destruction process.

Buffer Tank

The buffer tank is designed to smooth gas pressure and volume surges from the DC that occur when a munition detonates or deflagrates. By smoothing surges to downstream equipment, the equipment is better able to operate near optimum design flow rates which allows for a more consistent removal of contaminants. The buffer tank is comprised of a cone-bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section. The bottom of the buffer tank has two slide valves that operate pneumatically. These valves periodically open and solids are collected in a drum for disposal. The entire tank and associated piping are maintained at a predetermined temperature using electric heaters and insulation.

Orifice Plate and Control Valve

An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between two pipe flanges. The control valve may be operated automatically to bypass the orifice except when in a destruction cycle. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.

Process Ventilation Cyclone, Filter, and Fan

The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.

Thermal Oxidizer

The off gases resulting from the detonation/deflagration process in the DC are transferred to a thermal oxidizer. The thermal oxidizer is designed to accept all gases resulting from one feed cycle to the DC. The thermal oxidizer (and OGT System) is oversized for this peak flow and able to accommodate twice the flow that is anticipated.

The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of a minimum of 2 seconds at greater than 1,741°F for the peak load expected from the upstream SDC. An additional flow of combustion air is automatically added to ensure an oxygen rich environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.

Spray Dryer

The off gas from the thermal oxidizer is quickly cooled to ~ 350°F in the spray dryer by the injection of spent scrubber liquid into the gas stream. Evaporation of the spent scrubber liquid generates dry salts and particulates. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a screw feeder and slide gate valve for disposal.

Bag House Filter

The bag house is comprised of a filter system which uses bags layered with sodium bicarbonate, or similar, as the absorbent to remove dust and heavy metals from the off gas. The ratio of the absorbent may be adjusted to fit the application. The absorbent is fed from a hopper by a pneumatic feed system to the outside of the bags providing a fresh surface to the incoming gases. Periodically when the pressure drop across the filter exceeds a predetermined set point, the bags are cleaned using a pulse jet and the spent solids are collected in a drum for disposal using a screw feeder and slide gate valve.

Quench Venturi

The quench venturi cools the off gas from ~ 350 to 170°F by injecting solution water from the acid scrubber. Any remaining solution water is cooled and recycled to the acid scrubber sump.

Acid Scrubber

The acid scrubber cools the off gas from ~ 170 to 150°F. The acid scrubber is designed where the scrubber liquid flows counter current to the gas flow. Dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off gas by dissolving in the scrubber liquid making it acidic.

The conductivity of the scrubber liquid is also monitored. Raising of conductivity is an indication of increasing dissolved salt content in the scrubber liquid. To counter act this, fresh water is added. Excess scrubber liquid is then transferred to the bleed water tank for mixing and pH correction.

Scrubber liquid is pumped from the bottom of the scrubber column to the top and distributed inside the column by a distribution pan. The off gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure adequate mixing and contact between the liquid and gas, the columns are filled with a column packing material. As a safeguard, the temperature of the off gas inlet is monitored. In case of a high temperature off gas, due to a spray dryer malfunction, an emergency water injection is used.

Neutral Scrubber

The neutral scrubber removes any residual contaminants that passed through the spray dryer and acid scrubber. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.

The scrubber liquid is monitored by a pH controller. Sodium hydroxide is used to maintain the proper neutral pH. The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.

To obtain a constant quality in the scrubber, spent scrubber liquid is periodically removed based on level and conductivity and sent to the spray dryer where it acts as a cooling agent. Scrubber liquid is refreshed by the addition of caustic solution as needed.

Induced Draft (ID) Fans

The two ID fans are located between the neutral scrubber and inlet to the safeguard filter. Should an ID fan fail, the other will automatically assume the load. The ID fans ensure that the pressure of the off gas in the thermal oxidizer is maintained below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. The ID fans work continuously during the operations.

Safeguard Filter

The safeguard filter system is an exhaust filtration unit. The exhaust filtration unit is designed as a series of filters and built IAW the requirements by the U.S. Army's Chemical Demilitarization program. The function of the filter units is described below:

- Prefilter: Removes particulates remaining in the gas stream that may cause blinding or clogging of the downstream HEPA filter;
- HEPA Filter: Removes particulates down to 0.3 microns;
- Charcoal: Removes contaminants such as volatile and semi-volatile heavy metals;
- Charcoal: Serves as a backup for the first charcoal filter described above;
- HEPA Filter: Ensures that there are no emissions of potentially contaminated particulates released to the atmosphere.

The filter housings are made of stainless steel and equipped with differential pressure monitors on all filters to ensure adequate flow and monitor for when a filter needs to be replaced. The safeguard filter system includes an ID fan to maintain negative pressure within system to protect against leakage.

Stack

The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist (ACGIH) Industrial Ventilation Manual.

IV J D-1b(3) Monitoring

Continuous Emissions Monitoring Systems (CEMS) monitor the off gas for carbon monoxide and oxygen. The CEMS are located after the safeguard filter unit in the Monitoring House. CEMS monitoring is conducted IAW the SDC CEMS Certification Plan.

IV J D-1c Miscellaneous Unit Wastes

AAC 335-14-5-.24(2)(a)1, 335-14-5-.24(2)(b)1, and 335-14-5-.24(2)(c)1

The characteristics of the components of the WMM are described in Section IV C. The wastes generated from the SDC are described in Section IV J C.

IV J D-1d Applicable Performance Standard

The applicable performance standards considered to be appropriate for the SDC are the miscellaneous unit standards under AAC 335-14-5-.24. The SDC has demonstrated a destruction and removal efficiency of 99.9999 percent (%) for mustard agent.

IV J D-1e Provisions to Prevent Releases of Hazardous Waste or Hazardous Waste Constituents Into the Groundwater or Subsurface Environment, or into Surface Water, or Wetlands or on the Soil Surface

AAC 335-14-5-.24(2)(b) and (c) and 335-14-8-.02(14)(b) and (c)

To prevent releases into the groundwater or subsurface environment, surface water, wetlands, or on the soil surface, a containment system will be provided that conforms with the requirements of AAC 335-14-5-.09(6)(b). Refer to the ANAD RCRA Permit Application for information regarding to the hydrologic conditions and precipitation information at ANAD. The following sections describe the containment system at the SDC.

IV J D-1e(1) Basic Design Parameters, Dimensions, and Materials of Construction of the Containment System

AAC 335-14-5-.09(6)(b)(1) and 335-14-8-.02(6)(a)(1)

The treatment process is performed inside the Sprung Structure. For the processing of munitions the SDC design incorporates triple redundant containment with the primary containment consisting of the SDC itself, a secondary containment consisting of the ISO containers which house components of the SDC and OGT System, and a tertiary containment which consists of a bermed concrete floor in the Sprung Structure.

IV J D-1e(2) Containment System Drainage
AAC 335-14-5-.09(6)(b)(2) and 335-14-8-.02(6)(a)(1)

The floor of the structure is concrete and includes containment (diked / bermed areas) where liquids may be present in the treatment process. Where containment is required, the floor is coated with an appropriate sealant to ensure any liquids released to the secondary containment are captured. The floors within the diked / bermed areas are sloped to allow for collection of liquids.

IV J D-1e(3) Containment Capacity
AAC 335-14-5-.09(6)(b)(3) and 335-14-8-.02(6)(a)(3)

Containment capacity is sized to capture the entire liquid contents of the OGT System with an estimated total volume of 700 gallons.

IV J D-1e(4) Control of Run-On
AAC 335-14-5-.09(6)(b)(4) and 335-14-8-.02(6)(a)(4)

The SDC is constructed ~ 850 feet above sea level and the area surrounding this facility is adequately sloped. The Sprung Structure has a sloped roof that facilitates rainwater drainage away from the building. The facility is located in an area that is not known to be flooded and not in a 100-year flood plain. The storm drainage is designed for a 10-year storm capacity.

IV J D-1e(5) Removal of Liquids from Containment System
AAC 335-14-5-.09(6)(b)(5) and 335-14-8-.02(6)(a)(5)

All spills and leaks are reported IAW the ANAD Integrated Contingency Plan (ICP).

IV J D-1f Provisions to Prevent Release into the Air
AAC 335-14-5-.24(2)(c) and 335-14-8-.02(14)(b) and (c)

During normal operations, emissions are below the limitations imposed on the facility. The OGT System serves to minimize emissions. In the event of equipment upsets, the system is designed to allow for restricting emissions while necessary corrective actions are performed.

Though not required for non-agent operations, the Sprung Structure is also be equipped with a Carbon Filtration Unit (IONEX 16000) capable of maintaining negative air pressure within the structure.

IV J D-1f(1) Process Vents
AAC 335-14-5-.27

The SDC has no process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or stream stripping operations that manage hazardous wastes. Therefore, AAC 335-14-5-.27 is not applicable.

IV J D-1f(2) Equipment Leaks
AAC 335-14-5-.28

The SDC has no pumps, compressors, pressure relief devices, sampling connecting systems, open-ended valves or lines, valves in gas/vapor or light liquid service, or pumps, valves,

flanges, and other connectors in heavy liquid service associated with processing of the munitions. Therefore, AAC 335-14-5-.28 is not applicable.

IV J D-1f(3) Tanks, Surface Impoundments, and Containers AAC 335-14-5-.29

The average volatile concentration of wastes generated is < 100 parts per million by weight (ppmw). Therefore, analysis of the volatile organic concentration, IAW the analytical methods specified in AAC 335-14-6, is not required.

The standards, which may be appropriate to the processing of munitions, are the container standards specified in AAC 335-14-5. The standards apply to containers having design capacities greater than (>) 0.1 cubic meters (m^3) (~ 26 gallons). The maximum quantity of fill material in any WMM to be processed at the SDC contains < 0.1 m^3 as the system is not capable of accepting WMM at that size. Therefore, the munitions qualify for exemption from the container standards. Wastes contained in drums are managed IAW the < 90-day generator requirements at the SDC, including compliance with AAC 335-14-6 air emission standards for containers.

IV J D-1f(4) Design Parameters of Closed Vent System – Heating, Ventilation, and Air Conditioning System

No volatile organic compounds are carried within valved or piped systems for the SDC; therefore, a closed vent system is not required.

IV J D-1f(5) Air Quality

According to the ADEM, the air quality in the Anniston area meets the National Ambient Air Quality Standards (NAAQS) set to protect public health and welfare [Environmental Impact Statement (EIS) 1991]. Dugger Mountain Wilderness Area, 30 miles northeast of the ANAD location, is classified as a Prevention of Significant Deterioration (PSD) Class I area, where additional degradation of local air quality is severely restricted. This is the closest PSD Class I area to the SDC. (EIS 1991).

No significant emissions are expected from treatment operations. ANAD is over 30 miles away from the Dugger Mountain Wilderness PSD Class I area and since there are no emissions expected from SDC, there is no likelihood of the treatment operation impacting this PSD Class I area.

Emissions in the southeast industrial area of ANAD from natural gas-fired boilers (one 61.5 million British thermal units (BTU), two 21 million BTU each, two 9 million BTU each, two 12.52 million BTU each and two 90 million BTU each) are of sufficient magnitude to designate the ANAD as a major stationary source of air emissions.

IV J D-1f(6) Operation of Closed Vent System

No volatile organic compounds are carried within valved or piped systems for the SDC; therefore, a closed vent system is not required.

IV J D-1g Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action

AAC 335-14-5-.24 and 335-14-8-.02(14)(a)2

The SDC facility is available to process recovered rounds from within the State of Alabama. Should the need arise to monitor a chemical fill round, the Permittee must await concurrence from the Department prior to receipt of the munition to ensure that any additional requirements which the Department may require have been incorporated. The Department may respond with additional conditions that may be applicable for the receipt, storage, and processing of recovered items to include additional monitoring requirements.

IV J D-1g(1) Monitoring Equipment

The SDC will be equipped with CEMS which monitor the off gas for carbon monoxide and oxygen.

IV J D-1g(2) Location of Monitoring Devices

The CEMS for the SDC are located after the safeguard filter system.

IV J D-1g(3) Operation of Monitoring Devices

The CEMS will remain in operation IAW regulatory requirements during hazardous waste processing within the SDC.

IV J D-1g(4) Quality Assurance/Quality Control (QA/QC) Requirements

If a suspect munition is found, the SDC Plant Manager determines the course of action. It is up to his/her discretion to request an evaluation of the round(s) in question.

IV J D-1g(5) Response Procedures

In the event of an emergency, all personnel will follow the SDC Contingency Procedures and ANAD ICP. The attachments for treatment operations at the SDC have been incorporated into the ANAD ICP.

IV J D-1g(6) Inspection and Preventive Maintenance

Refer to Table IV J-3 for inspection and preventive maintenance procedures for the monitoring equipment.

IV J D-2 Container Design

Hazardous wastes that are stored in containers at the SDC, including the service magazines and storage igloos, include WMM offered for disposal and secondary waste. Hazardous waste will be managed IAW Section IV J C.

WMM and secondary waste may be stored in the SDC-dedicated service magazines or storage igloos. Secondary waste will be stored in appropriate containers and labeled accordingly. WMM may not be containerized or labeled.

IV J D-3 Service Magazine and Storage Igloo Description

The magazine is an earthen covered steel reinforced concrete structure that is 29 feet (length), 17 feet (height), and ~ 170 feet (width) separated into three sections. This structure was constructed IAW DDESB standards and satisfies the MMR requirements. The SDC-dedicated service magazines will be maintained IAW DDESB requirements.

The storage igloos are also steel reinforced concrete structures that vary in size and dimension. Each of the igloos are sized and rated by DDESB to store significantly more explosive material than the service magazines and serve as the primary storage for WMM prior to being offered for treatment. The igloos are primarily used for storage of hazardous waste material contaminated with energetics and WMM delivered for treatment at the SDC.

IV J E GROUNDWATER MONITORING

AAC 335-14-8-.02(5)(c), 5, 6, 7, and 8

The groundwater monitoring requirements of AAC 335-14-5-.06 apply to surface impoundments, waste piles, land treatment units, and landfills. None of these types of hazardous waste management units are present at the SDC; therefore, groundwater monitoring is not required.

IV J F SECURITY

AAC 335-14-5-.02(5) and 335-14-8-.02(5)(b)4

This section contains information concerning procedures to prevent hazards IAW AAC335-14-5-.02(5). These regulations require a description of the security procedures and equipment, inspection schedules, justification for a waiver of preparedness and prevention requirements, spill prevention containment and countermeasures plan, and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

IV J F-1 Security Procedures and Equipment

AAC 335-14-5-.02(5) and 335-14-8-.02(5)(b)4

Security is addressed in Section II F-1a. The SDC is located within the ALA of ANAD. Access to this area requires passage through an additional fence/gate system.

IV J F-1a Twenty-Four Hour Surveillance System

AAC 335-14-5-.02(5)(b)1

Surveillance systems are addressed in Section II F-1a.

IV J F-1b Barrier and Means to Control Entry

AAC 335-14-5-.02(5)(b)2

IV J F-1b(1) Barrier

AAC 335-14-5-.02(5)(b)2(i)

The SDC area is surrounded by two 7-foot high chain link security fences. These fences are separated by 30 feet. Each fence is topped with three strands of barbed wire. The perimeter is completely lighted. No space in the fence is greater than 4 inches wide. The bottom of the fence is blocked by cement curbing.

IV J F-1b(2) Means to Control Entry

AAC 335-14-5-.02(5)(b)2(ii)

Entrance to the ANAD is through one of two gates, all of which are attended 24 hours per day by armed guards. Entrance to the SDC area is through the ALA, which is accessible through controlled points of entry within the ANAD. All personnel are required to wear identification badges when reporting for work and while on the premises. Visitors are not permitted on the facility premises without first registering and receiving the proper badge, which must be displayed at all times.

Visitors to the SDC are always accompanied during their visit and are subject to security checks.

IV J F-1b(3) Warning Signs

AAC 335-14-5-.02(5)(c)

Signs warning that the area is restricted and dangerous, and that unauthorized entry is illegal, are posted along the perimeter fence surrounding the ANAD at numerous locations and near all access gates. These signs are ~ 18 x 24 inches and are easily visible at a distance

of 25 feet. Large signs describing the "Conditions of Entry" are posted at each gate. These signs are ~ 4 x 6 feet in size, and warn of the possible consequences of unauthorized entry.

IV J F-1c Waiver

AAC 335-14-5-.02(5)(a)

A waiver is not being sought; therefore, this section is not applicable.

IV J F-1d Injury to Intruder and Violation Caused By Intruder

AAC 335-14-5-.02(5) a 1 and 2

Sections IV J F-1 and IV J 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. Section IV J F-1b (1) and (2) will not apply, and therefore will not be addressed.

IV J F-2 Inspection Schedule

AAC 335-14-5-.02(6), 335-14-5-.24(3), and 335-14-8-.02(5)(b)5

IV J F-2a General Inspection Requirements

AAC 335-14-5-.02(6)(a) and (b), 335-14-5-.03(4), and 335-14-8-.02(5)(b)5

The SDC area is inspected according to a prescribed inspection schedule designed to detect equipment deterioration and prevent possible equipment malfunctions that can potentially cause a release of hazardous wastes to the environment or pose a threat to human health. The inspection schedule document and inspection records will be located at the SDC. The inspection program will include inspections of the equipment, including frequency, such as those listed in Table IV J-3[5]. Inspection requirements will not be performed while the SDC is not in operation. This does not apply to any wastes that are in storage. Inspection of waste storage areas will be conducted at all times IAW regulatory requirements when waste is present.

IV J F-2a(1) Types of Problems

AAC 335-14-5-.02(6)(b)3

The types of problems looked for during inspections are identified in Table IV J-3.

IV J F-2a(2) Frequency of Inspection

AAC 335-14-5-.02(6)(b)4 and 335-14-5-.15(8)(c)

The frequency of inspection, as listed in Table IV J-3, is based on 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. The inspections are performed often enough to allow identification of problems in time to correct them before they harm human health or the environment.

Where appropriate, inspection frequencies have been developed from operational knowledge. Manufacturer recommendations, Army SOP, Occupational Safety and Health

[5] All tables are located at the end of this section.

Administration (OSHA) regulations, and specified regulated unit requirements are also adhered to.

IV J F-2b Specific Process Inspection Requirements

AAC 335-14-5-.02(6)(b)4 and 335-14-8-.02(5)(b)5

IV J F-2b(1) Miscellaneous Unit Inspection

AAC 335-14-5-.24(3) and 335-14-8-.02(5)(b)5

The inspection records will be kept at the SDC for a minimum of 3 years.

Inspections of operating and structural equipment, security devices, safety and emergency equipment, loading/unloading areas, monitoring equipment, secondary containment systems and the HVAC system at the facility are included in Table IV J-3.

IV J F-2b(2) Inspection for Process Vents

AAC 335-14-5-.27

The requirements of this section are not applicable because SDC does not operate any distillation/fractionation, thin-film evaporation, or solvent extraction units, nor does it conduct air or steam stripping operations.

IV J F-2b(3) Inspection Procedures for Equipment Leaks

AAC 335-14-5-.28

Inspections of operating equipment at the SDC are included in Table IV J-3

IV J F-2b(4) Inspection for Air Emission Standards for Tanks, Surface Impoundments, and Containers

AAC 335-14-5-.29

As described in Section IV J D-1, the munitions are exempt from the requirements of AAC 335-14-5-.29. Inspections of the HVAC system and monitoring devices are conducted as specified in Table IV J-3.

IV J F-2c Remedial Action

AAC 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. Remedial actions and required notifications for emergencies associated with the SDC area are detailed in the ANAD ICP.

If during routine inspection a drum is noted that has deteriorated or is beginning to leak (rusted, severely dented, lid fitting improperly, etc.), the drum will be transferred to a new container or over-packed in place. Any spilled material will be cleaned up immediately.

IV J F-2d Inspection Records

AAC 335-14-5-.05(4)(b)5

Inspection records that are used at the Building 695 Complex identify the name of inspector, observations made, date, and nature of repairs or remedial action taken. Inspection records will be on file at the SDC for a minimum of three years.

IV J F-3 Documentation of Preparedness and Prevention Requirements

AAC 335-14-8-.02(5)(b)6

The Army is not requesting any waivers for the preparedness and prevention requirements of AAC 335-14-5-.03(3) and 335-14-5-.03(6).

IV J F-3a Equipment Requirements

AAC 335-14-5-.03(3)

The following paragraphs describe the internal and external communication system, emergency equipment, and water for fire control that is available at SDC.

IV J F-3a(1) Internal Communications

AAC 335-14-5-.03(3)(a)

Telephones and public address loudspeakers are available at SDC in case of emergencies. The telephone system is available for internal as well as external communications.

IV J F-3a(2) External Communications

AAC 335-14-5-.03(3)(b)

The telephone system at the SDC is available for external communication with the ANAD and surrounding areas.

IV J F-3a(3) Emergency Equipment

AAC 335-14-5-.03(3)(c)

Internal /external communications and emergency equipment are included in the ANAD ICP. Safety equipment necessary for first responder activities as listed in the SDC Contingency Procedures are included in the weekly inspection logs for the applicable areas (see Table IV J-3).

IV J F-3a(4) Water for Fire Control

AAC 335-14-5-.03(3)(d)

Sufficient water exists for fire control as part of the water distribution system.

IV J F-3b Aisle Space Requirements

AAC 335-14-5-.03(6)

The SDC service magazines are permitted storage units under the MMR to store munitions. Sufficient aisle space (minimum 24 inches) is maintained in the service magazines to allow unobstructed movement of personnel, fire protection equipment, and spill control or decontamination equipment.

Storage of WMM and recovered WMM in the SDC-dedicated storage igloos is IAW DDESB standards. Like the service magazines, sufficient aisle space (24 inches) is maintained to

allow unobstructed movement of personnel, fire protection equipment, and spill control or decontamination equipment.

IV J F-4 Preventive Procedures, Structures, and Equipment

AAC 335-14-8-.02(5)(b)8

IV J F-4a Unloading Operations

AAC 335-14-8-.02(5)(b)8(i)

The three categories of wastes managed at the SDC include: (1) WMM to include recovered items, (2) explosives and propellants, including waste material contaminated with energetics and (3) treatment residues, ash, cleaning solutions, ventilation filters. (See Sections IV J C-1 and IV J C-2 for more detail.)

Unloading operations for hazardous WMM are described in Section IV F-4a.

Treatment residues, ash, and other treated solid dunnage will be discharged directly to collection containers. Containers will be properly classified, labeled, and placed into storage awaiting off-site treatment and disposal. Ventilation filters will be removed by personnel in adequate PPE and placed in appropriate containers. Ventilation filters will be disposed of IAW Table IV J-5.

Cleaning solutions generated during cleanup activities will be collected in appropriate containers stored in the proper location prior to disposal.

Spills that occur during loading or unloading operations are unlikely; however, in the event of an accident, they are immediately cleaned up. Standard industrial absorbents, absorbent booms, pads, sand and dirt are used for clean-up of spilled materials. Spill residues are placed in containers, properly classified, labeled, and placed into storage awaiting off-site treatment and disposal.

IV J F-4b Runoff

AAC 335-14-8-.02(5)(b)8(ii)

Runoff from hazardous waste handling areas is prevented by the SDC design features. Waste handling takes place in an enclosed structure. Since the waste propellants and explosives are effectively destroyed during SDC operations and remaining residue is collected from the treatment, the process itself eliminates the potential for run-off.

IV J F-4c Water Supplies

AAC 335-14-8-.02(5)(b)8(iii)

The processing of all hazardous waste at the SDC takes place in an enclosed structure with a concrete base that will prevent the downward percolation of liquids. The SDC is not in a flood plain. Any spills of hazardous materials are cleaned up IAW site procedures and, if necessary, the ANAD Integrated Contingency Plan. Therefore, prevention of contamination to water supplies is achieved.

IV J F-4d Equipment and Power Failure

AAC 335-14-8-.02(5)(b)8(iv)

In the event of an electrical failure, an automatic transfer switch will start a diesel generator and will automatically transfer the essential load to the generator. The generator connected load will consist of the exhaust filter unit for the SDC to maintain pressure, cameras and electronics, and interior and exterior lighting.

IV J F-4e Personal Protection Equipment

AAC 335-14-8-.02(5)(b)8(v)

Levels of PPE for workers will vary throughout the installation and are based upon the specific task to be performed. A job safety hazard analysis will be generated for hazardous tasks at the installation. These identify work practices, protective clothing, and procedures necessary to protect the worker from potential hazards.

IV J F-5 Prevention of Ignition or Reaction of Ignitable, Reactive, or Incompatible Wastes

AAC 335-14-8-.02(5)(b)9

IV J F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

AAC 335-14-5-.02(8)(a),(b),(c), and 335-14-8-.02(5)(b)9

No ignitable or reactive waste will stored at the SDC. These wastes are moved to the facility at the time of treatment. No matches, lighters, or other flame-producing instruments are allowed in the possession of personnel at the SDC. WMM are, therefore, adequately protected from ignition. The SDC will be equipped with a sprinkler system designed to meet the special needs of individual areas.

IV J F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

AAC 335-14-5-.02(8)(b),(c), and 335-14-8-.02(5)(b)9

General precautions for the SDC include:

- SDC operations will be under the direct supervision of an experienced and trained supervisor charged with responsibility for all activities within the area. During the supervisor's absence, a competent qualified person is designated to be in charge. This competent person is also charged with sole custody of ignition devices.
- The number of personnel involved in SDC operations will be kept to a minimum to limit exposure of personnel for a minimum time to a minimum amount of hazardous material consistent with safe and efficient operations.
- Anyone entering the SDC while operations are ongoing will report to the Control Room.

IV J F-5c Management of Ignitable or Reactive Wastes in Miscellaneous Units

AAC 335-14-5-.24

Management of reactive wastes is addressed in Sections IV F-5a, b, and c.

IV J F-5d Management of Incompatible Waste in Containers

AAC 335-14-5-.09(8)(a),(b) & (c) and 335-14-8-.02(6)(d)

Any incompatible wastes that may be generated will not be placed in the same container. All waste will be placed into new and/or cleaned containers for storage and off-site transportation/disposal or for disposal at a TSDF.

IV J G CONTINGENCY PLAN

AAC 335-14-5-.03(8), 335-14-5-.04(1) through 335-14-5-.04(7), and 335-148-.02(5)(b)7

Contingency requirements for the ANAD, including the Building 695 Complex, are found in the ANAD ICP.

IV J H PERSONNEL TRAINING

AAC 335-14-5-.02(7) and 335-14-8-.02(5)(b)12

The training program for the SDC provides personnel, depending on job descriptions, with the necessary knowledge and skills to perform hazardous waste duties safely, efficiently, and in an environmentally sound manner. The purpose of this training program is to prepare SDC personnel for treatment operations, with emphasis on reducing potential risks that may threaten human health or the environment. This is accomplished by ensuring that the SDC personnel handling hazardous waste can properly perform their assigned duties and responsibilities. In addition to providing training in the mechanics of the job functions, this training program provides SDC personnel with a thorough understanding of the treatment operations, including the safety and emergency response operations. Refresher training will be conducted, as necessary, to update workers on new methods or equipment.

This training program meets the requirements in AAC 335-14-5-.02(7) and 335-14-8-.02(5)(b)12 by:

- Providing specific training for various hazardous waste management positions;
- Ensuring that all personnel involved in ammunition operations and planning complete the training program prior to being assigned duties involving ammunitions or explosives;
- Providing training that ensures SDC personnel are able to respond effectively to emergencies;
- Ensuring that the training program is directed by qualified persons trained in hazardous waste management practices;
- Maintaining required documentation at the Building 695 Complex; and
- Maintaining training records on current SDC personnel for at least 3 years from the date last worked.

IV J H-1 Outline of Training Program

The SDC Training Program has been designed to ensure that personnel will be able to perform their specific job assignments. The training program consists of both onsite training and additional courses that apply to specific job functions.

Section IV J H-1a provides the job titles and descriptions for the SDC personnel involved in hazardous waste operations. Section IV J H-1b describes the training content, frequency, and techniques. Section IV J H-1c describes the responsibilities of the appropriate supervisor, who coordinates training of the SDC personnel. Section IV J H-1d describes the relevance of the training to the job positions, and Section IV J H-1e describes training for emergency response.

IV J H-1a Job Titles and Duties

AAC 335-14-5-.02(7)(d)1 and 2

Complete job descriptions, including title, office, person reporting to, duties, and minimum qualifications/training for each position related to hazardous waste management shall be maintained at the SDC and/or ANAD Directorate of Risk Management. Job titles and duties will be consistent with the current duties and responsibilities for safely treating explosive components from WMM IAW applicable OSHA, RCRA, and military requirements.

In general, all personnel working at the SDC will be required to:

- Demonstrate the ability to understand and apply both oral and written instructions at a level appropriate to the assigned job;
- Possess the aptitude and attitude necessary to ensure compliance with environmental, safety and job requirements; and
- Be physically capable of doing the work.

IV J H-1b Training Content, Frequency, and Techniques

AAC 335-14-5-.02(7)(a)3, 335-14-5-.02(7)(c) and 335-14-5-.02(7)(d)3

The training program provides both initial and continuing training of supervisors, operators, and personnel involved in the waste management unit operations. The principal objectives of the training program are to train personnel to safely operate, maintain, and monitor the SDC operation. The training program includes job orientation, safety procedures, and basic work principles.

At a minimum, SDC personnel involved in hazardous waste management operations have or will have received training in the following areas, as determined by the position and additional duties to which they are assigned:

- Hazard Communications (HAZCOM),
- Hazardous Waste Operations and Emergency Response (HAZWOPER)/ 24-hour Occupational Safety and Health Administration (OSHA) 1910.120,
- RCRA Compliance,
- Explosive Safety, and
- Material Handling Equipment Operator Certification.

SDC personnel are qualified to meet the minimum requirements outlined in 29 CFR 1910.120 covering HAZWOPER training for operations conducted under RCRA. Qualification records for the SDC personnel are maintained by the SDC Training Coordinator. This minimum training includes:

- 24 hours of initial training, consisting of classroom and hands-on experience, in the use of PPE, implementation of the emergency response plan, safe operating practices, identification of potential hazards or hazardous situations, etc., IAW OSHA standards and

- 8 hours of annual refresher training.

IAW with U.S. Army Materiel Command (AMC)-Regulation 350-4, any new personnel involved with the handling of WMM, as required for the download and reconfiguration, are required to meet certain training requirements prior to their being assigned duties associated with the SDC operation. All personnel must successfully complete the following training as determined by their assigned position and additional duties:

- Characteristics and Hazards of Explosives
- Explosives Safety
- Industrial Safety
- Protective Clothing and Equipment
- Standing Operating Procedures
- Material Handling Equipment
- Specialized Training (Acquaint the employee with conditions, procedures, and regulations as they apply to the specific job and local environment.)
- Examination and Critique

This information may be included as a component of the HAZWOPER training. Additional course work may be required based on actual duties as determined by the Training Coordinator.

Personnel operating or maintaining monitoring equipment, such as CEMS, are required to complete the same training as required by ANAD.

IV J H-1c Training Supervisor (SDC Training Coordinator)

AAC 335-14-5-.02(7)(a)2

The SDC Training Coordinator is responsible for the training of the SDC personnel. The responsibilities of the Training Coordinator are to:

- Coordinate training of the SDC personnel in the proper operation of the facility IAW Federal, State, Army, and installation regulations;
- Coordinate continuing training, as necessary, to inform personnel of new procedures, provide refresher training, and provide training for new personnel;
- Ensure that training records are maintained IAW 40 CFR 264.16(d) and (e); and
- Ensure that SDC personnel are trained in hazardous waste management and contingency plan implementation, including emergency procedures, and ensure that personnel receive training appropriate to their positions.

IV J H-1d Relevance of Training to Job Position

AAC 335-14-5-.02(7)(a)2

The SDC personnel receive training relevant to the duties and responsibilities entailed by their positions.

IV J H-1e Training for Emergency Response

AAC 14-5-.02(7)(a)3

Emergency response training is designed and structured to ensure that all SDC personnel are trained to respond properly to emergency situations, as outlined in the ANAD ICP, and to maintain compliance, during emergencies, with applicable permit requirements and environmental regulations.

This training addresses non-routine situations that could lead to emergency involving hazardous wastes, if proper responses are not implemented, such as:

- Procedures for using, inspecting, repairing, and replacing the SDC emergency and monitoring equipment,
- Communication and alarm systems,
- Implementation of the contingency plan and appropriate emergency notifications,
- Shutdown of operations and evacuation, and
- Response to fires, explosions, or other releases.

Additional topics covered during emergency response training include:

- Chemical characteristics of the wastes personnel will be assigned to manage, that is, reactivity and toxicity characteristics,
- Knowledge of what to do in the event of a spill or leak, and
- Types of protective equipment, which may include gloves, hard hat, eye protection, and splash resistant clothing.

Introductory training and annual review sessions will be completed by these personnel.

IV J H-2 Implementation of Training Program

AAC 335-14-5-.02(7)(b), 335-14-5-.02(7)(d)4, and 335-14-5-.02(7)(e)

All personnel are trained prior to beginning work at the SDC. All of the SDC personnel are required to complete the training program specific to his/her job assignment and will not work unsupervised until training has been successfully completed.

Training records for the SDC personnel are maintained electronically, onsite, and will include, at a minimum:

- Job title for each position related to hazardous waste management operation and activities, and the name of each employee filling the position;
- Job description specifying duties for each position, minimum qualifications required to fill the position, and required training for the position;

- Description of the type and amount of introductory and continuing training that will be given to each employee;
- Date each employee started working at the SDC; and
- Course enrollment, attendance, and successful completion information.

All training records and documentation on current SDC personnel will be kept until closure of the facility. Training records on former SDC personnel will be kept for at least 3 years from the date last worked.

IV J I CLOSURE PLAN, POST-CLOSURE PLAN, AND FINANCIAL ASSURANCES

AAC 335-14-5-.07(1) through 335-14-5-.07(11), 335-14-5-.08(1) through 335-14-5-.08(12), 335-14-5-.09(9), 335-14-5-.10(8), and 335-14-8-.02(5)(b)13 through 335-14-8-.02(5)(b)18

ANCDF performed decontamination of this facility at completion of the operational phase for chemical agent (mustard) operations. With the completion of chemical agent operations and based on the decontamination and monitoring records provided in the SDC Decontamination Report, the SDC unit, facilities, and service magazines are now classified as chemical agent free.

After decontamination, ANCDF provided ADEM with professional engineering (PE) certification and notification of completion of the decontamination of the SDC. The SDC Agent Decontamination Report was submitted in April of 2012 and approved by the ADEM on July 22, 2013.

This closure plan has been developed IAW AAC 335-14-5-.07(3) and specifies performance standards and procedures for the closure of the SDC. The closure performance standards of AAC 335-14-5-.07(2) are designed to minimize the need for further maintenance by removing all hazardous waste and hazardous waste constituents from the SDC. 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.

IV J I-1 Closure Plan

AAC 335-14-5-.07(3) and 335-14-8-.02(5)(b)13

During activities in the SDC, storage igloos, or the service magazines, any identified hazardous waste spill will be remediated and containerized immediately. Records of all spills and cleanup activities will be recorded in an operating record. If there is no evidence or record of an igloo being used to store waste or WMM, closure will be limited to making an administrative (record keeping) activity report.

Upon completion of operations, all hazardous waste and hazardous waste residues that may be in secondary containment will be removed. Equipment and structures will be decontaminated, if necessary, using an appropriate decontamination and water washing in accordance with the treatment technology requirements specified in 40 CFR 268.45.

IV J I-1a Closure Performance Standards

AAC 335-14-5-.07(2)

This closure plan specifies performance standards and describes procedures for the closure of the SDC. This closure plan is designed to provide for closure in a manner that will minimize the need for further maintenance and 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 will accomplish the goals of the closure performance standards, noted above by: (1) processing the entire inventory of WMM 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 management units.

Post-closure maintenance or monitoring is not anticipated since no hazardous wastes or hazardous constituents are expected to remain above clean closure target levels following final closure.

After final closure, certification, and acceptance of closure by the ADEM has been completed, the areas will no longer be classified as a hazardous waste management unit.

IV J I-1b Partial Closure and Final Closure Activities

AAC 335-14-5-.07(3)(b)

There is no date anticipated for implementation of closure for the SDC. Once an anticipated closure date is established, final closure should be completed within 180 days of completion of SDC activities.

IV J I-1c Maximum Waste Inventory

AAC 335-14-5-.07(3)(b)3

The maximum waste munition inventory to be held in the SDC at any given time will be determined by approval of the site safety submittal by the DDESB.

IV J I-1d Schedule for Closure

AAC 335-14-5-.07(3)(b)2 and 6

No specific date has been scheduled for implementation of closure for the SDC. The ADEM will be notified in writing at least 45 days prior to the date that any final closure operations are scheduled to begin. Final closure will occur when all operations are complete and final certification is received and approved by the Department. All hazardous waste including any spill cleanup material and decontamination residues will be removed from the facility within the 90-day time limit.

IV J I-1d Environmental Protection

Closure of the SDC will be performed in a manner that controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, 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, all necessary steps will be taken 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). The Permittees will comply with all applicable laws and regulations to ensure protection for human health and the environment.

IV J I-1e Closure Procedures

AAC 335-14-5-.07(3), 335-14-5-.07(5), and 335-14-8-.02(5)(b)13

Prior to closure, any hazardous waste in the SDC may be sent to a permitted storage igloo prior to shipment off-site. Waste generated during the closure activities will be characterized IAW applicable regulations and disposed of accordingly.

IV J I-2 Post-Closure Plan

AAC 335-14-5-.07(9), 335-14-8-.02(5)(b)13, and 335-14-5-.24(4)

Since the SDC is not a disposal site, and any residual hazardous contamination will be removed prior to closure, a post-closure plan is not required.

IV J I-3 Certification of Closure

AAC 335-14-5-.07(6)

Within 60 days of completion of final closure procedures, a certification will be signed by a PE and then submitted by the Permittee, that the SDC has been closed IAW the closure plan and all applicable regulations. Since there are no regulated disposal units, only certification of final closure of the facility will be submitted. In the event that clean closure cannot be achieved, a post-closure care permit application will be submitted to the ADEM.

IV J I-4 Closure Cost Estimate

AAC 335-14-5-.08(3) and 335-14-8-.02(5)(b)15

The Permittee will submit a closure cost estimate to the ANAD DRK for inclusion with the ANAD's closure estimate. The closure cost estimate will be prepared IAW AAC 335-14-8-.02(5)(b)(15). The Permittee will adjust the closure cost estimate annually for inflation. ANAD DRK will submit the closure cost estimate to the ADEM no later than June 1st of each calendar year.

IV J I-5 Financial Assurance Mechanism for Closure

AAC 335-14-5-.08(4), 335-14-8-.02(5)(b)15, and 335-14-5-.08(12)

No financial assurance mechanism for the closure of storage areas is required. AAC 335-14-5-.08(1) exempts States and Federal government from the financial requirements of AAC 335-14-5.

IV J I-6 Post-Closure Estimate

AAC 335-14-5-.08(5) and 335-14-8-.02(5)(b)16

No post-closure plan is required; therefore, no post-closure estimate is required.

IV J I-7 Financial Assurance Mechanism for Post-Closure Care

AAC 335-14-5-.08(6), 335-14-8-.02(5)(b)16, and 335-14-5-.08(12)

No post-closure plan is required; therefore, no financial assurance mechanism for post-closure care is required.

IV J I-8 Liability Requirements

AAC 335-14-8-.02(5)(b)17 and 335-14-5-.08(8)(a) and (b)

The Federal government owns the SDC; therefore, pursuant to AAC 14-5-.08(1)(d), it is exempt from the liability insurance requirements.

IV J I-9 State Financial Mechanism

AAC 335-14-8-.02(5)(b)18

Proof of coverage by a state financial mechanism is not required for the SDC because no financial assurance mechanism for the closure of the facility is required. AAC 335-14-5-.08(1)(d) exempts states and the Federal government from the financial requirements of AAC 335-14-5.

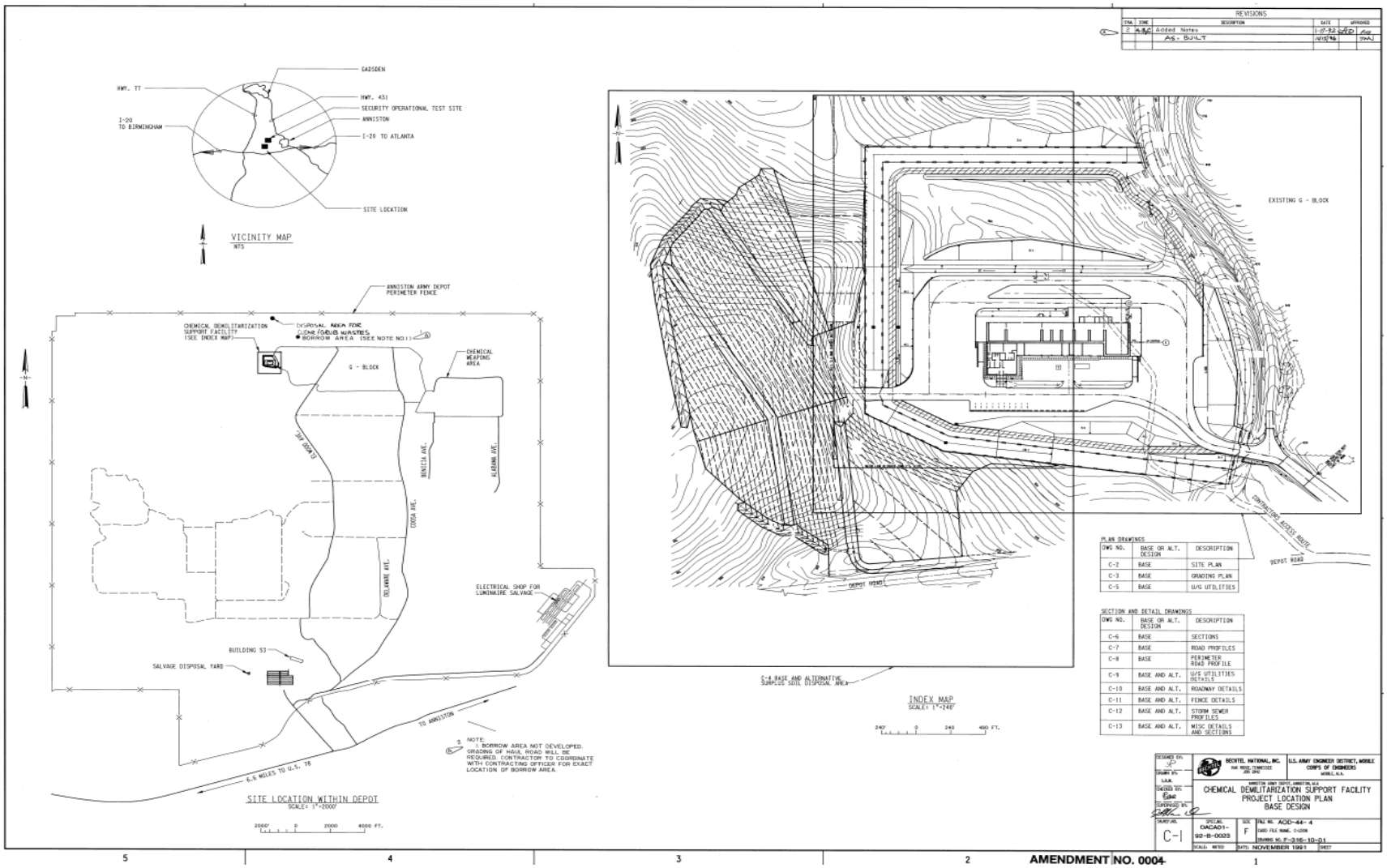
VICINITY MAP
SITE LOCATION WITHIN DEPOT
INDEX MAP
EXISTING G - BLOCK
CHEMICAL DEMILITARIZATION SUPPORT FACILITY
PROJECT LOCATION PLAN
BASE DESIGN
AMENDMENT NO. 0004

Figure IV J-1

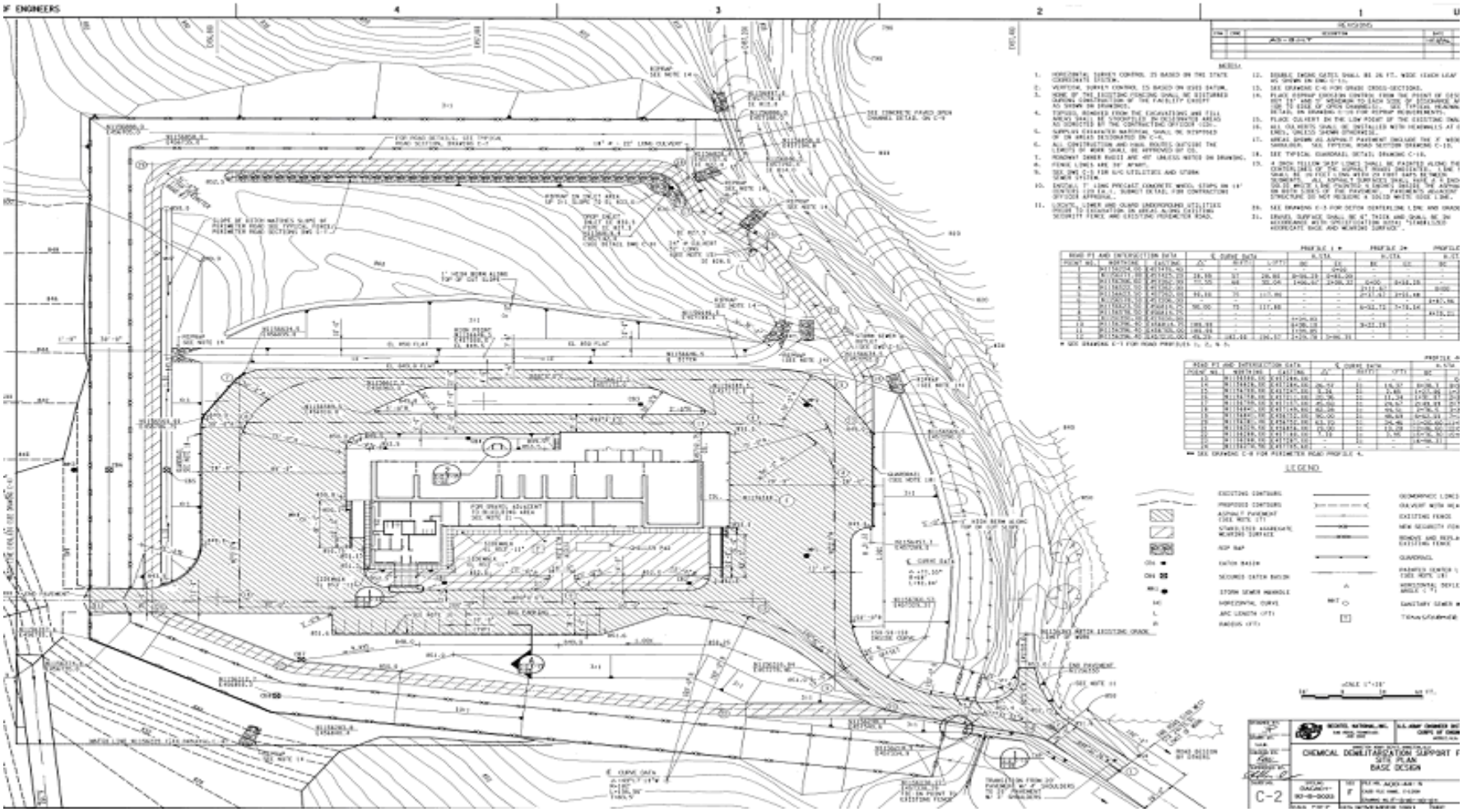
LEGEND
CHEMICAL DEMILITARIZATION SUPPORT F
SITE PLAN
BASE DESIGN
C-2

Figure IV J-2

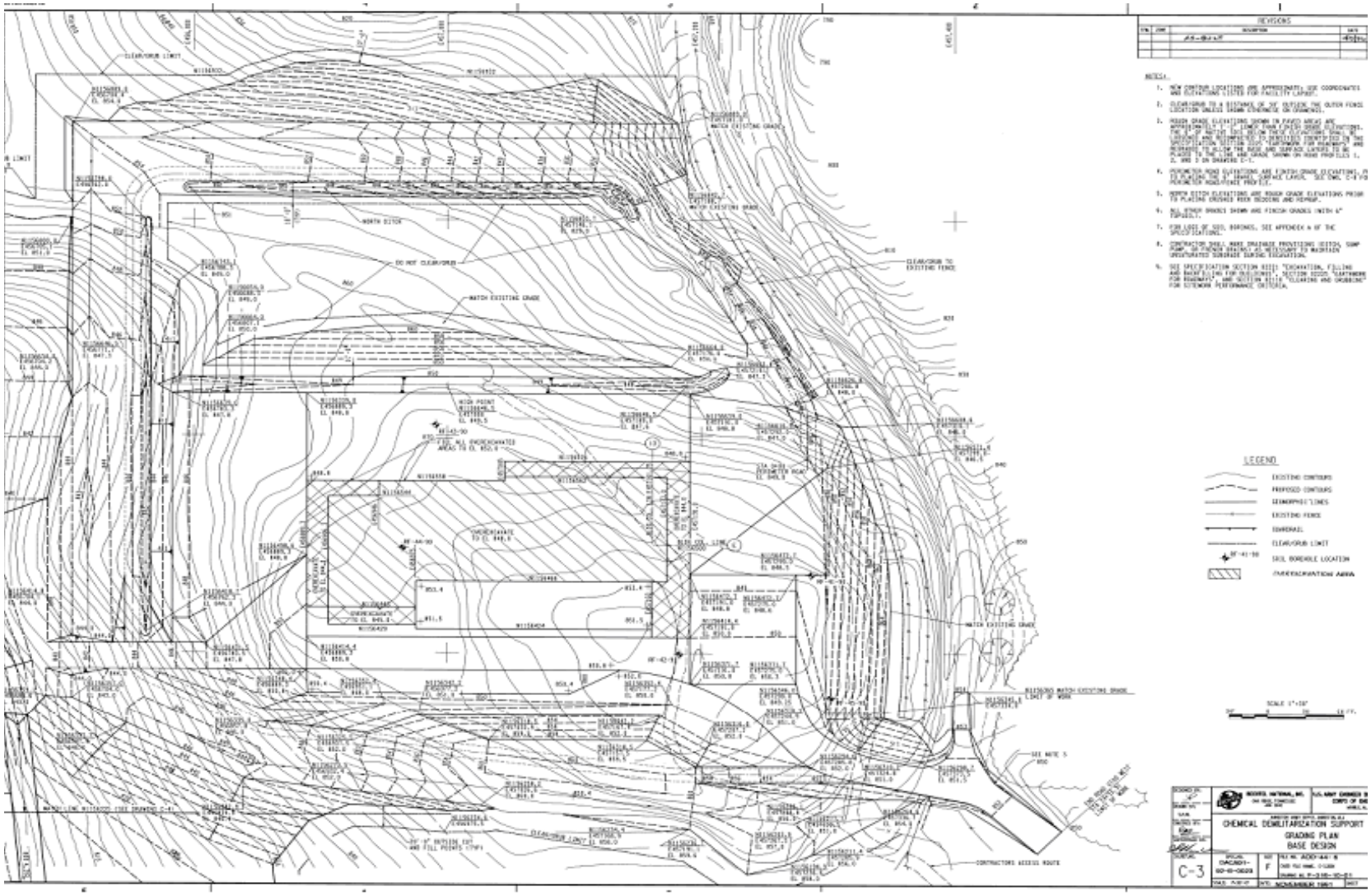
REVISIONS
NOTES:
LEGEND
EXISTING CONTOURS
PROPOSED CONTOURS
EXISTING FENCE
CLEARCRUB LIMIT
SOIL BOREHOLE LOCATION
CHEMICAL DEMILITARIZATION SUPPORT
GRADING PLAN
BASE DESIGN
C-3

Figure IV J-3

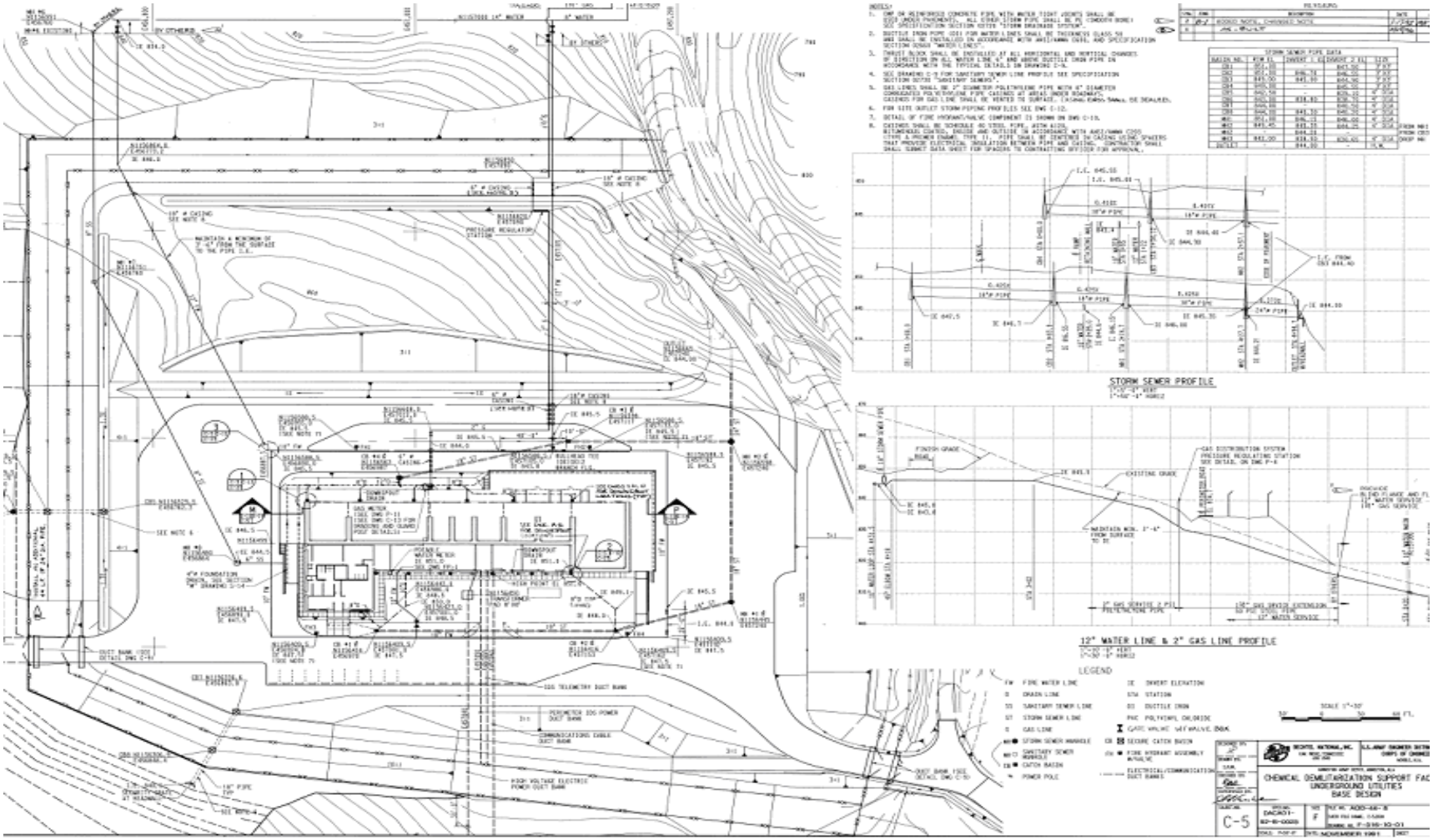
STORM SEWER PROFILE
12" WATER LINE & 2" GAS LINE PROFILE
LEGEND
CHEMICAL DEMILITARIZATION SUPPORT FAC
UNDERGROUND UTILITIES
BASE DESIGN
C-5

Figure IV J-4

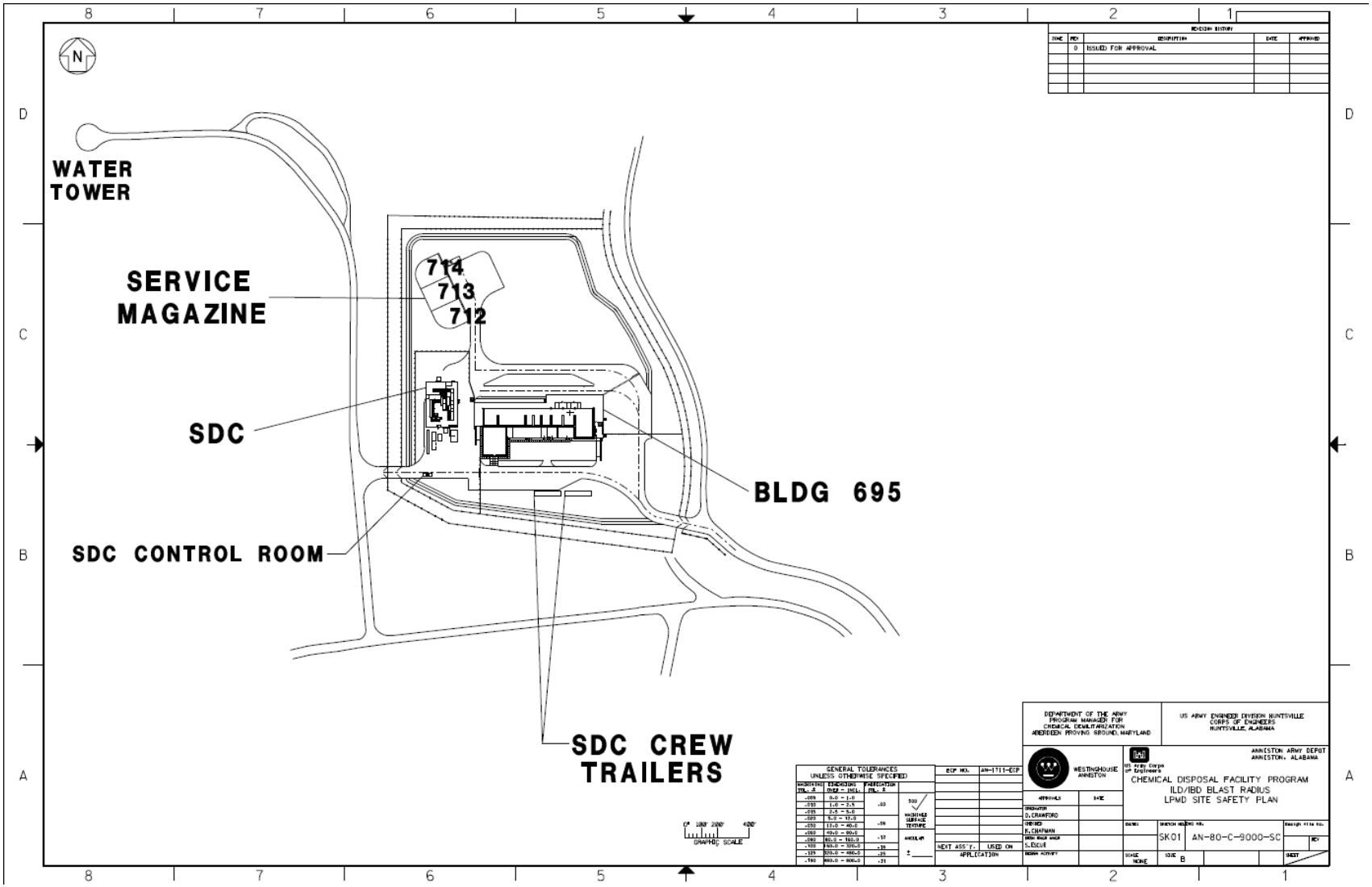
WATER TOWER
SERVICE MAGAZINE
714
713
712
SDC
BLDG 695
SDC CONTROL ROOM
SDC CREW TRAILERS
CHEMICAL DISPOSAL FACILITY PROGRAM
ILD/IBD BLAST RADIUS
LPMD SITE SAFETY PLAN
ANNISTON ARMY DEPOT
ANNISTON, ALABAMA
SK01
AN-80-C-9000-SC

Figure IV J-5

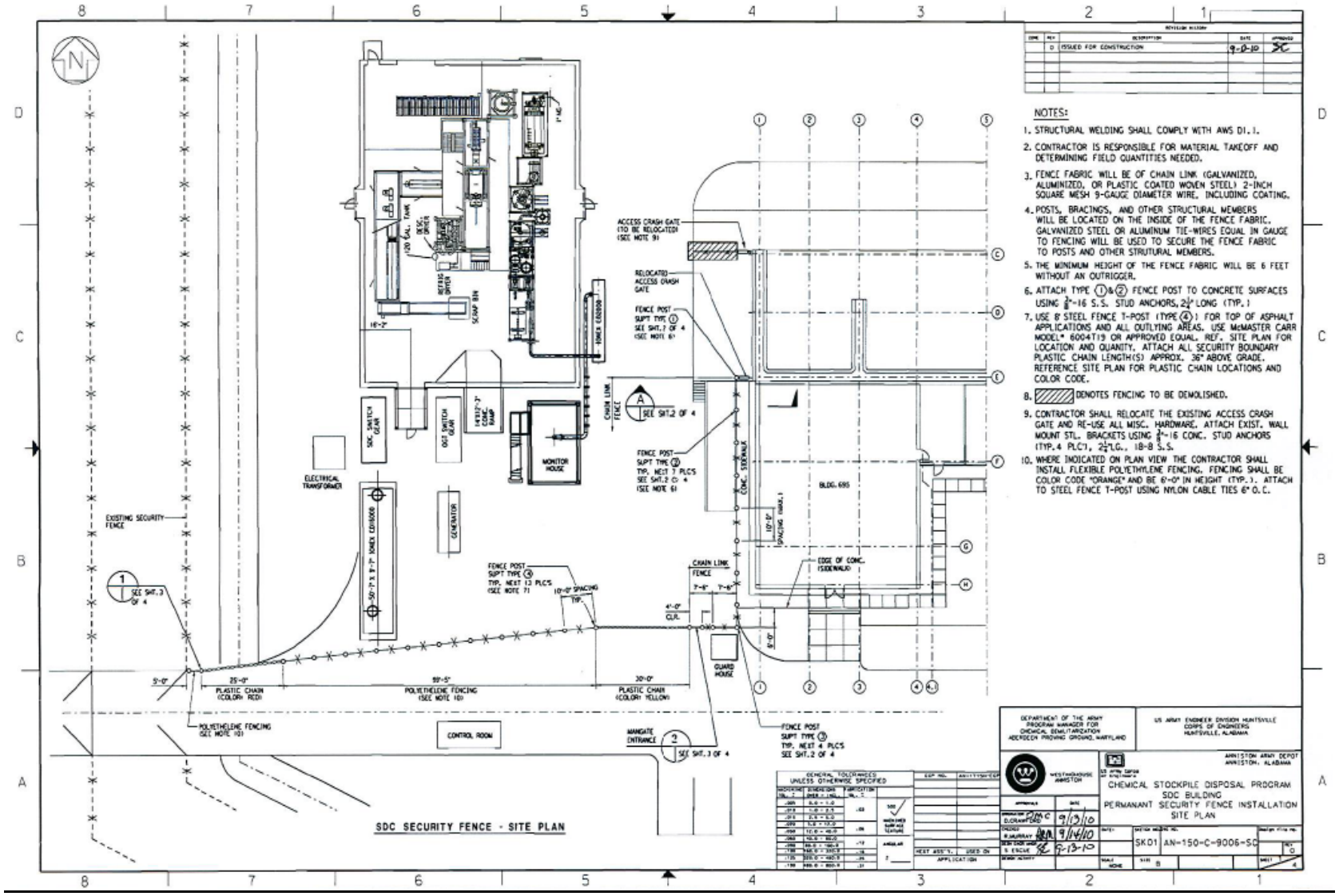
NOTES:
1. STRUCTURAL WELDING SHALL COMPLY WITH AWS D1.1.
2. CONTRACTOR IS RESPONSIBLE FOR MATERIAL TAKEOFF AND DETERMINING FIELD QUANTITIES NEEDED.
3. FENCE FABRIC WILL BE OF CHAIN LINK (GALVANIZED, ALUMINIZED, OR PLASTIC COATED WOVEN STEEL) 2-INCH SQUARE MESH 9-GAUGE DIAMETER WIRE, INCLUDING COATING.
4. POSTS, BRACINGS, AND OTHER STRUCTURAL MEMBERS WILL BE LOCATED ON THE INSIDE OF THE FENCE FABRIC. GALVANIZED STEEL OR ALUMINUM TIE-WIRES EQUAL IN GAUGE TO FENCING WILL BE USED TO SECURE THE FENCE FABRIC TO POSTS AND OTHER STRUTURAL MEMBERS.
5. THE MINIMUM HEIGHT OF THE FENCE FABRIC WILL BE 6 FEET WITHOUT AN OUTRIGGER.
6. ATTACH TYPE 1&2 FENCE POST TO CONCRETE SURFACES USING 3/8"-16 S.S. STUD ANCHORS, 2 1/4" LONG (TYP.)
7. USE 8' STEEL FENCE T-POST (TYPE 4) FOR TOP OF ASPHALT APPLICATIONS AND ALL OUTLYING AREAS. USE McMASTER CARR MODEL# 6004T19 OR APPROVED EQUAL. REF. SITE PLAN FOR LOCATION AND QUANITY. ATTACH ALL SECURITY BOUNDARY PLASTIC CHAIN LENGTH(S) APPROX. 36" ABOVE GRADE. REFERENCE SITE PLAN FOR PLASTIC CHAIN LOCATIONS AND COLOR CODE.
8. DENOTES FENCING TO BE DEMOLISHED.
9. CONTRACTOR SHALL RELOCATE THE EXISTING ACCESS CRASH GATE AND RE-USE ALL MISC. HARDWARE. ATTACH EXIST. WALL MOUNT STL. BRACKETS USING 3/8"-16 CONC. STUD ANCHORS (TYP.4 PLC), 2 1/4"LG., 18-8 S.S.
10. WHERE INDICATED ON PLAN VIEW THE CONTRACTOR SHALL INSTALL FLEXIBLE POLYETHYLENE FENCING. FENCING SHALL BE COLOR CODE "ORANGE" AND BE 6'-0" IN HEIGHT (TYP.). ATTACH TO STEEL FENCE T-POST USING NYLON CABLE TIES 6" O.C.
ISSUED FOR CONSTRUCTION
ACCESS CRASH GATE (TO BE RELOCATED) (SEE NOTE 9)
RELOCATED ACCESS CRASH GATE
FENCE POST SUPT TYPE 1 SEE SHT.2 OF 4 (SEE NOTE 6)
FENCE POST SUPT TYPE 2 TYP. NEXT 7 PLCS SEE SHT.2 OF 4 (SEE NOTE 6)
FENCE POST SUPT TYPE 4 TYP. NEXT 13 PLCS (SEE NOTE 7)
FENCE POST SUPT TYPE 3 TYP. NEXT 4 PLCS SEE SHT.2 OF 4
EXISTING SECURITY FENCE
ELECTRICAL TRANSFORMER
GENERATOR
MONITOR HOUSE
SDC SWITCH GEAR
OGC SWITCH GEAR
CONC. RAMP
SCRAP BIN
100 GAL. TANK
DESC. DRYER
REFRIG. DRYER
SONEX EXHAUST
CHAIN LINK FENCE
CONC. SIDEWALK
BLDG. 695
EDGE OF CONC. (SIDEWALK)
GUARD HOUSE
CONTROL ROOM
MANGATE ENTRANCE
PLASTIC CHAIN (COLOR: RED)
POLYETHELENE FENCING (SEE NOTE 10)
PLASTIC CHAIN (COLOR: YELLOW)
POLYETHELENE FENCING (SEE NOTE 10)
SEE SHT.2 OF 4
SEE SHT.3 OF 4
SDC SECURITY FENCE - SITE PLAN
DEPARTMENT OF THE ARMY PROGRAM MANAGER FOR CHEMICAL DEMILITARIZATION ABERDEEN PROVING GROUND, MARYLAND
US ARMY ENGINEER DIVISION HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA
ANNISTON ARMY DEPOT ANNISTON, ALABAMA
WESTINGHOUSE ANNISTON
CHEMICAL STOCKPILE DISPOSAL PROGRAM
SDC BUILDING
PERMANANT SECURITY FENCE INSTALLATION
SITE PLAN
SK01
AN-150-C-9006-SC

Figure IV J-6

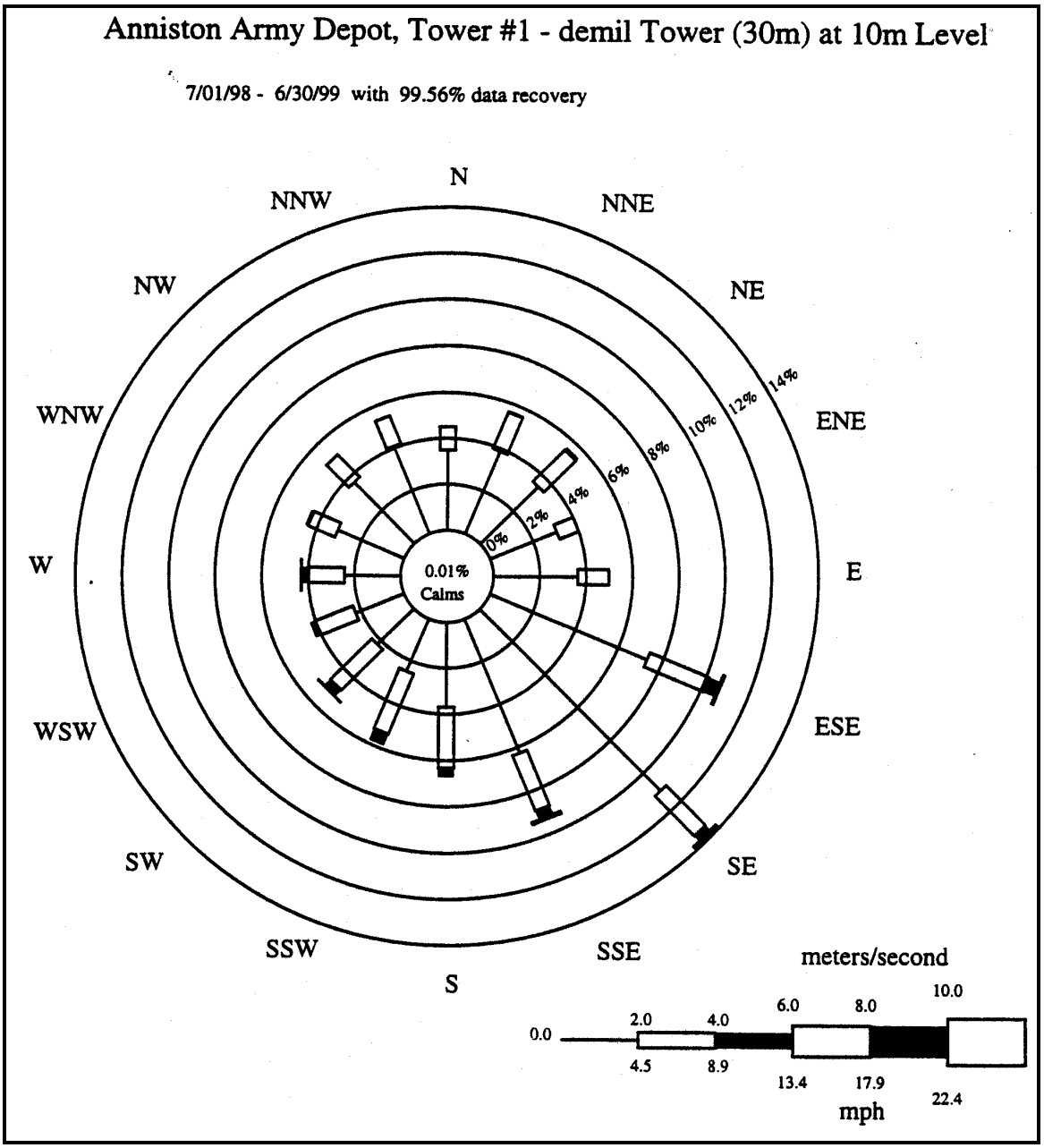

Figure IV J-7: 10m Level Wind Rose at ANAD

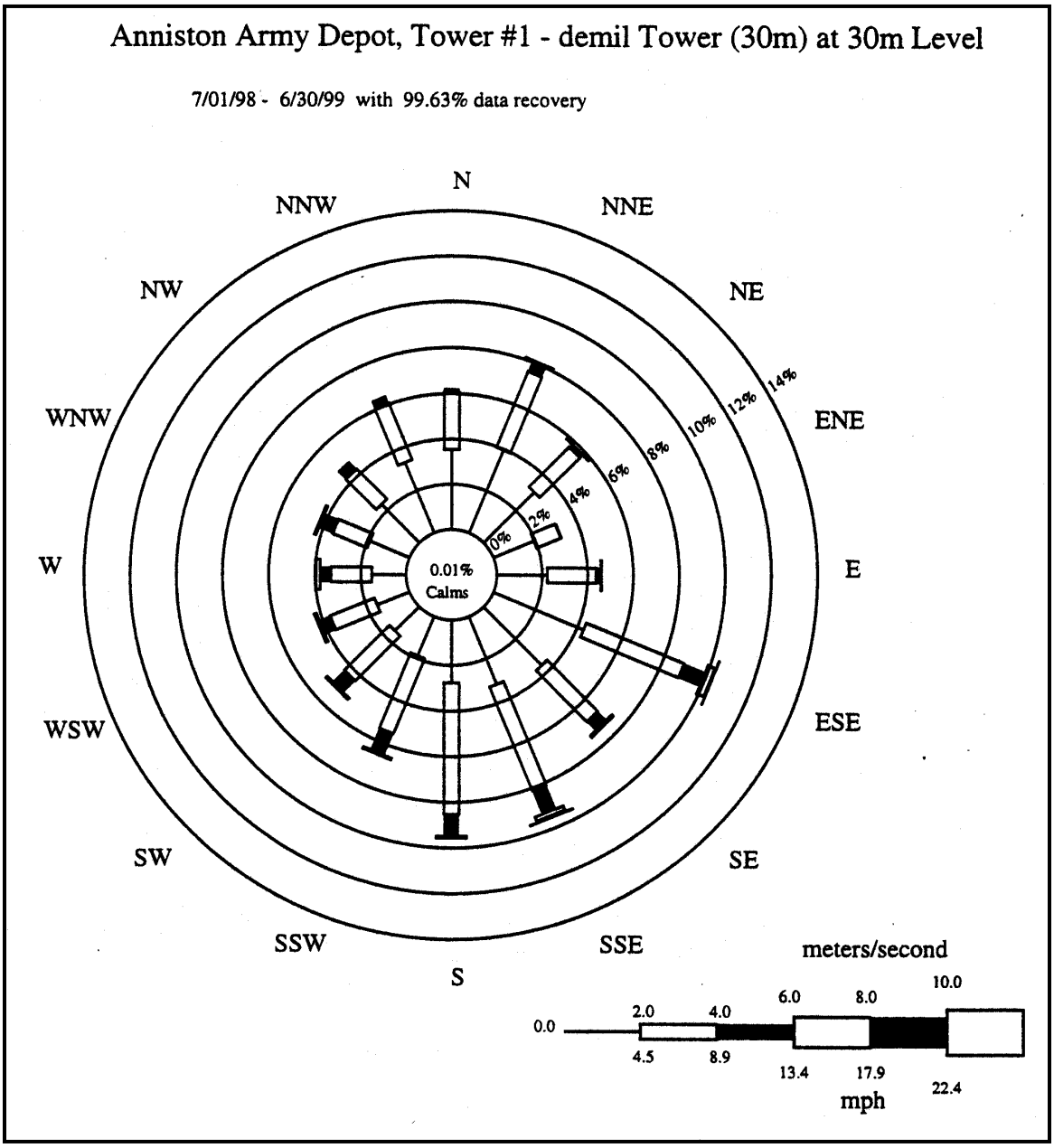

Figure IV J-8: 30m Level Wind Rose at ANAD

Table IV J- 1 : Parameters and Rationale

WAP Section Number	Waste Stream	Parameters for Analysis	Determination Methods	Frequency of Analysis/ Characterization(1)	Sampling Method(2)	Disposal Limits	Disposal Requirements
IV J C-2a(1)(a)	Scrap Metal	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
IV J C-2a(1)(a)	Ash from Treated Scrap Metal from the SDC	TCLP Organics and Metals	See Table IV J-2	Annually or as necessary to characterize for disposal	Grab or Composite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
IV J C-2a(1)(b)	Dust Material from the Buffer Tank, Cyclone and Dust Collection System						
IV J C-2a(1)(c)	Spent Solids from the Bag House Filter						
IV J C-2a(1)(d)	Salts from Water Recycle System						
IV J C-2a(1)(e)	Filter Units from the Exhaust Filter[1]			In the event of filter replacement	Representative sample		
IV J C-2a(1)(f)	Explosives and Propellants	See Section IV C	Generator knowledge/ Manufacturer's specifications	Not Applicable	Not Applicable	IAW Section IV C	Treatment in SDC
IV J C-2a(1)(g)	Miscellaneous Solid Waste	Total Organics and Metals	See Table IV J-2	As necessary to characterize for disposal	Grab or Composite sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		TCLP Organics and Metals					
		Ignitability					
		Reactivity	Generator knowledge		Not Applicable		
IV J C-2a(1)(h)	Refractory Material	TCLP Metals	See Table IV J-2	Each Batch			Disposal offsite

Table IV J-2: Parameters and Rationale (Continued)

WAP Section Number	Waste Stream	Parameters for Analysis	Determination Methods	Frequency of Analysis/ Characterization(1)	Sampling Method(2)	Disposal Limits	Disposal Requirements
IV J C-2a(2)(a)	OGT System Brines	TCLP Organics and Metals	See Table IV J-2	Annually or as necessary to characterize for disposal	Composite Sample	IAW applicable AAC or EPA regulations	Disposal requirements based on analytical results
		pH					
IV J C-2a(2)(b)	Miscellaneous Liquid Waste	TCLP Organics and Metals		As necessary to characterize for disposal	Grab or Composite Sample		Disposal requirements based on analytical results
		pH					
IV J C-2a(3)(a)	Brine Sludge	TCLP Organics and Metals					
		pH					

Footnotes:
(1) Similar waste streams may be profiled for disposal IAW this table for continued disposal.
(2) Sample containers and preservation techniques, if any, will be IAW individual method of analysis (see Section IV C).

Table IV J-2: 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
Beryllium		SW-846 Method 6010B/7000 or E200.7
Nickel		
Thallium		
Vanadium		
Zinc		
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
Cadmium		SW-846 Method 6010B/7000 or EPA 213.1
Chromium		SW-846 Method 6010B/7000 or EPA 218.1
Silver		SW-846 Method 6010B/7000 or EPA 272.1
Lead		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

Footnote:
(1) The most current approved analytical method will be used.

Table IV J-3: Inspection Schedule

Item	Frequency[1]	Types of Problems
General Area	W	Inspect the floor for areas that indicate excessive wear or deterioration of protective coating (where applicable).
General Area	M	Exits are clearly identified and marked.
General Area	D	Examine floor for apparent drips, spills, or leaks.
SDC EQUIPMENT		
Elevator	W	Observe equipment in operation to determine any loss of performance. Inspect lift area for apparent leaks from equipment.
Pushers	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Hatches	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Loading Chambers	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Tilting Unit	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Upper DC	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Lower DC	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Elevating System	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Turning System	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Locking Ring	W	Observe equipment in operation to determine any loss of performance. Inspect area for apparent leaks from equipment.
Conveyors	W	Observe equipment in operation to determine any loss of performance. Inspect areas for apparent drips, spills, or leaks.
FPI Mechanisms	W	Test control circuits and document waste-feed cutoff.

Table IV J-3: Inspection Schedule (Continued)

Item	Frequency[1]	Types of Problems
Detonation Chamber	A	Bring detonation chamber to ambient temperature and perform a detailed inspection/maintenance operation.
POLLUTION CONTROL EQUIPMENT		
Stack Monitors	D	Check Calibration.
ID Fans	D	Visually inspect for loss of lubrication, check for excessive vibration, and loss of performance by use of operator console data for operating parameters.
Quench Unit	M	Visually inspect shell for corrosion.
Scrubbers	M	Visually inspect shell for corrosion.
Spray Dryer	M	Visually inspect shell for corrosion.
Bag House	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
Cyclone	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
Exhaust Filter	W	Visually inspect for evidence of corrosion, malfunctions, leaks, or excessive wear.
SCRAP HANDLING SYSTEM		
Scrap Funnel	W	Observe equipment in operation to determine any loss of performance. Inspect areas for apparent drips, spills, or leaks.
Scrap Box	W	Observe equipment in operation to determine any loss of performance. Inspect areas for apparent drips, spills, or leaks.
Scrap Conveyors	W	Observe equipment in operation to determine any loss of performance. Inspect areas for apparent drips, spills, or leaks.
Ash Collection and Containers	D	Visually inspect for spills and level of waste in containers.
FIRE PROTECTION SYSTEM		
Extinguishers (Manual)	M	Check for condition and gauge pressure. Check expiration dates.
Sprinkler System	A	Inspect IAW Fire Codes and Regulations.
	Q	Using test valve, assure that the system functions and a signal is received by ANAD Fire Department.

Table IV J-3: Inspection Schedule (Continued)

Item	Frequency[1]	Types of Problems
UNINTERRUPTIBLE POWER SUPPLY		
Input Voltage, L-L and L-N	M	Check meter for proper voltage.
Input Amps	M	Check meter for proper current.
Input Hertz	M	Check meter for proper frequency.
Output VAC, L-L and L-N	M	Check meter for proper voltage.
Output Hertz	M	Check meter for proper frequency.
Output Amps	M	Check meter for proper current.
Battery VDC	M	Check meter for proper voltage.
EMERGENCY GENERATOR		
Engine / Generator	S	Visually inspect for loose drive belts, oil leaks, coolant leaks, lube oil level, mechanical integrity, crankcase containment and air motors; observe operation and inspect for loss of performance.
FIRST RESPONDER EMERGENCY EQUIPMENT		
Spill Control Material	W	Visually verify that safety equipment necessary for first responder activities is available and/or operational. These activities may be included on inspection logs for the applicable area(s).
Fire Extinguishers		
Eyewash Stations (Portable)		
Safety Shower		
PERMITTED STORAGE AREAS		
Service Magazines	A	Inspect for proper storage of materials, good housekeeping, and condition of magazine doors, vents and maintenance of fire breaks.
	S	Visual inspect the condition of Lightning Protection System.
	B	Check components of the Lightning Protection System for electrical continuity.
	W	Visually inspect for proper storage of materials, proper labeling, and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.

Table IV J-3: Inspection Schedule (Continued)

Item	Frequency[(1)]	Types of Problems
Storage Igloos	W	Visually inspect for proper storage of materials, proper labeling and aisle space. If present, visually inspect secondary containment for leaks and deterioration caused by corrosion or other factors.
	Q	Inspect WMM and Recovered WMM in storage IAW DDESB storage controls.
	A	Conduct inventory of WMM and recovered WMM in storage IAW DDESB and MMR requirements.

Footnotes:
(1) Inspection requirements will not be performed while the SDC is not in operation.
(2) Frequency definitions are as follows:

- D - daily (once every calendar day)
- W - weekly (once every calendar week)
- M - monthly (once every calendar month)
- S - semiannually (once every six (6) calendar months)
- A - annually (once every twelve (12) calendar months)
- Q - quarterly (once every three (3) calendar months)
- B - biennially (once every two (2) years)

1 Table IV J-4: RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)

Waste Material	RCRA Hazardous Waste Designation (Number)	RCRA Hazardous Waste Definition Regulatory Citation	Basis for Designation
Fill Material	---	---	Hazardous wastes to be processed in the SDC will be characterized using available Government sources of information such as the MARB, MIDAS, or other sources of information relative to the items being processed.
Explosives			
Composition B and Tetrytol	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains Class A explosives, tetryl, and TNT IAW 49 CFR 173.53.
Bursters (M5, M6, M14, M40A1, M71, M83 and M22 Booster)			
Tetryl			Is a Class A explosive IAW 49 CFR 173.53.
Fuzes (M8, M557, and M51A5, M603, M508, M57)			Contains a Class A explosive, tetryl, IAW 49 CFR 173.53.
Activator (M1)			Contains Class A explosives, igniter mix, lead azide and tetryl, IAW 49 CFR 173.53.
Propellants			
M28, M6, and M67	Reactive (D003)	AAC-14-2-.03(4)(a)8	Contains a Class A explosive, nitrocellulose, IAW 49 CFR Subpart C.
M6 and M67	Reactive (D003) TC organic (D030)	AAC-14-2-.03(4)(a)8 AAC-14-2-.03, Table 1	Contains a Class A explosive, 2,4-dinitrotoluene, IAW 49FR Subpart C.
Other Miscellaneous Wastes			
OGT HEPA filters and prefilters (from ventilation system)	Potentially Reactive (D003) Toxicity characteristic metals (D004 through D011)(If found to be present)	AAC-14-2-.03(4)(a)4 AAC-14-2-.03, Table 1	These filters may be contaminated with heavy metals and / or organics. The waste is not expected to be toxicity characteristic. Sampling and analysis will be used to identify other contaminants that may be subject to RCRA regulations.

2

TABLE IV J-4: RCRA HAZARDOUS WASTE DESIGNATION AND RATIONALE (1)(2)

Note:
(a) Memorandum from Matthew A. Straus, Acting Chief, Waste Identification Branch, U.S. Environmental Protection Agency (EPA), to Jon P. Yeagley, Chief, State Programs Section, U.S. EPA; June 4, 1984.

Footnotes:
(1) Explosives, propellants, and fuzes may contain the following:

D004	arsenic
D005	barium
D006	cadmium
D007	chromium
D008	lead
D009	mercury
D010	selenium
D011	silver

(2) The explosives and propellants listed are examples of the items that may be processed at the SDC. A more extensive list is contained in Section IV C. All energetic material processed at the SDC will be IAW approved feed rates and limitations contained in the RCRA Permit.

Table IV J-5: RATIONALE FOR SELECTION OF ANALYSIS TO PERFORM ON WASTE MATERIALS

Waste	Analysis	Rationale
Explosives in Munitions	None	Sampling and analysis is not conducted because the explosives were manufactured and loaded to government standards and sufficient information is available for proper characterization. These wastes are managed as RCRA hazardous wastes.
Propellants		
Energetic Contaminated Waste		Generator knowledge as described in Section IV J C-1 above will be applied for the energetic contaminated waste.
Other Miscellaneous Wastes (OGT HEPA Filter and Prefilters)	TC Organics and Metals	Spent filters may be generated occasionally at the SDC but are not stored, treated, or disposed of at this location. The filters will be disposed of as ordinary solid waste if no heavy metal or organics exposure has occurred with respect to the filters as is demonstrated by applicable analysis.

As co-operator of the Static Detonation Chamber, 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.

Co-Operator Signature Date Signed

Mr. Robert Taylor, Static Detonation Chamber Operations Manager for Washington Demilitarization Company LLC

Name and Official Title

As co-operator of the Static Detonation Chamber, 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.

Co-Operator Signature Date Signed

Mr. Robert Taylor, Static Detonation Chamber Operations Manager for Washington Demilitarization Company LLC

Name and Official Title

STATIC DETONATION CHAMBER
~~5-YEAR~~ EMISSIONS TEST PLAN
for CONDITION 1

Revision 1~~0~~, April 2016~~September 2015~~

PREPARED BY:

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LIST OF ACRONYMS AND ABBREVIATIONS

~ .....approximately
≤ .....less than or equal to
< .....less than
> .....greater than
% .....percent
º .....degrees

ACWA .....Assembled Chemical Weapons Alternative
ADEM.....Alabama Department of Environmental Management
AFO.....Anniston Field Office
ANAD .....Anniston Army Depot

CAA .....Clean Air Act
CEMS.....Continuous Emissions Monitoring System
CFR .....Code of Federal Regulations
CO .....carbon monoxide
CON .....Control Room
CPT .....comprehensive performance test
~~5CPT .....5-year CPT~~
CRO .....CON Operator

DC .....detonation chamber
DRE.....destruction and removal efficiency

EPA .....Environmental Protection Agency
EPT-C1 .....SDC Emissions Test Plan for Condition 1

ºF .....degree(s) Fahrenheit
FPI.....feed prohibited interlock

HAP.....hazardous air pollutant
HEPA .....high efficiency particulate air

IAW.....in accordance with
ICS .....Instrument Control System
ID .....induced draft
lb/event.....pound(s) per event
lb/hr .....pound(s) per hour

LC1 .....Loading Chamber 1
LC2 .....Loading Chamber 2
LDC.....lower DC

MACT .....Maximum Achievable Control Technology

NEW .....net explosive weight
NOC .....Notice of Compliance

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

O_2 .....diatomic oxygen
OGT .....off-gas treatment

PDARS.....Process Data Acquisition and Recording System
PLC .....programmable logic controller
POHC.....principal organic hazardous constituent
ppmv .....part(s) per million by volume

QAPP .....Quality Assurance Project Plan

RATA.....Relative Accuracy Test Audit
RCRA.....Resource Conservation and Recovery Act

SAP .....Sampling and Analysis Plan
SDC.....static detonation chamber

TRM.....Temporary Reference Method (CEMS)

UDC .....upper detonation chamber
ug/dscm .....microgram(s) per dry standard cubic meter
US .....United States

WDC .....Washington Demilitarization Company, LLC.
WMM.....waste military munition

1.0 FACILITY OVERVIEW

The United States (US) Army built a Static Detonation Chamber (SDC) System for the thermal treatment of conventional waste military munitions (WMM), disassembled explosive components removed from both WMM and chemical munitions that have been verified 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 waste. The SDC System is located at the Building 695 Complex at the Anniston Army Depot (ANAD) in Anniston, Alabama.

The Assembled Chemical Weapons Alternative (ACWA), represented by the Anniston Field Office (AFO), is the government owner of the facility. Washington Demilitarization Company (WDC), LLC., is the operator of the SDC. General facility information is listed below:

Mailing Address:	7 Frankfort Avenue c/o: SDC, ANAD Building 75 Anniston, AL 36201
Physical Address:	Same
EPA ID Number:	AL3 210 020 027
Facility Contact:	Timothy K. Garrett
Telephone Number:	(256) 238-1652

2.0 REGULATORY COMPLIANCE STATUS

The SDC operates under Resource Conservation and Recovery Act (RCRA) Permit, AL3 210 020 027, issued pursuant to the Code of Alabama 1975 §§ 22-30-1-et. seq. Further references to this permit will be termed the RCRA Permit. The SDC must also comply with its Clean Air Act (CAA) Permit, 301-0050-Z013. The Alabama Department of Environmental Management (ADEM) has determined that while the SDC is not directly regulated under the Maximum Achievable Control Technology (MACT) standards, operation of the unit is required to meet the standards found in MACT subpart EEE as applicable. As a result, a comprehensive performance test (CPT) for this unit will be conducted to demonstrate compliance with applicable EEE standards.

Compliance with the MACT for the SDC was demonstrated via an initial CPT-like emissions test conducted in August 2011. The execution for the subsequent CPT-like emissions test shall be conducted no longer than 61 months after the date of commencing the previous CPT. For the SDC, the subsequent CPT-like emissions test must be initiated no later than September 2016. ~~Further references to the subsequent CPT-like emissions test will be termed the 5-year CPT (5CPT) to distinguish between the two testing events~~.

WDC plans to execute the SDC Emissions Test Plan for Condition 1 (ETP-C1)~~5CPT~~ in September 2016. The submittal of this plan to the ADEM, Land and Air Divisions, serves as the official 1-year notice required for submittal of the ETP-C1~~5CPT plan~~ and SDC Continuous Monitoring System Plan as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii).

3.0 TESTING PROGRAM

The purpose of the ETP-C15~~CPT~~ is to demonstrate the performance of the SDC and Off-Gas Treatment (OGT) Systems at normal operating and feed conditions while meeting the testing objectives. No operating or feed parameters will be re-established as part of this ETP-C15~~CPT~~ only demonstration of the existing parameters established during the initial CPT. Agent-free WMM will be used during the ETP-C15~~CPT~~ as feed.

A minimum of 3~~three (3)~~ valid test runs is required for the ETP-C15~~CPT~~. If any test run is not executed under steady-state conditions, or if data is lost or compromised in any way, the results of that test run may or may not be included in the ETP-C15~~CPT~~ report. If a test run is not completed, the abandoned test run will not be included in the ETP-C15~~CPT~~ report. If a test run is completed and the data is lost or compromised, any available results will be included in the ETP-C15~~CPT~~ report. An additional test run may be executed at the discretion of the Test Director.

WDC has the responsibility for executing the ETP-C15~~CPT~~. The emissions sampling, packaging, transporting of samples to the off-site laboratory(s) for analysis, and reporting the results will be in accordance with (IAW) the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) (see Appendix A). The SAP/QAPP documents the precision, accuracy, representativeness, completeness, and comparability of the data set.

The Test Director will be the point of contact for any concerns associated with the ETP-C15~~CPT~~. During the initial pre-job brief for the ETP-C15~~CPT~~, a detailed organization chart and duty roster, including the names of personnel as identified by title, will be provided.

3.1 Objectives

The objectives for the ETP-C15~~CPT~~ are as follows:

- Demonstrate that dioxin/furan emissions do not exceed 0.20 nanograms (by Toxic Equivalency Quotient) per dry standard cubic meter corrected to 7 percent (%) oxygen (O_2);
- Demonstrate that mercury emissions do not exceed 130 micrograms per dry standard cubic meter (ug/dscm) corrected to 7% O_2;
- Demonstrate that lead and cadmium (combined) emissions do not exceed 230~~240~~ ug/dscm corrected to 7% O_2;
- Demonstrate that arsenic, beryllium, and chromium (combined) emissions do not exceed 92~~97~~ ug/dscm corrected to 7% O_2;
- Demonstrate that carbon monoxide (CO) emissions do not exceed 100 parts per million by volume (ppmv) dry basis and corrected to 7% O_2 (instantaneous reading) using facility Continuous Emissions Monitoring System (CEMS);
- Demonstrate that hydrochloric acid and chlorine gas emissions do not exceed 32~~77~~ ppmv, expressed as hydrochloric acid equivalents, dry basis and corrected to 7% O_2;
- Demonstrate that particulate matter emissions do not exceed 0.013 grains ~~34 milligrams~~ per dry standard cubic feet~~meter~~ corrected to 7% O_2;

- Demonstrate that emissions are less than the screening levels established in the Human Health Risk Assessment;
- Conduct a Relative Accuracy Test Audit (RATA) during a test run to validate the facility CEMS data.

The ETP-C15~~CPT~~ will verify that the operation of the SDC and OGT Systems at normal operating and processing conditions does not pose an unacceptable risk to public health or the environment.

3.2 PRINCIPAL ORGANIC HAZARDOUS CONSTITIUENT (POHC) SELECTION RATIONALE

Compliance with the Destruction and Removal Efficiency (DRE) requirement was demonstrated during the initial CPT conducted in 2011. Per 40 CFR 63.1206(b)(7), documented compliance with DRE is only required once providing no modifications have been made that could affect the ability of the SDC to achieve the DRE standard since the DRE test was performed. To date, no modifications have been made to the SDC which would hinder compliance with the DRE standard; therefore, selection of a POHC is not applicable.

3.3 ASSESSMENT OF HAZARDOUS AIR POLLUTANTS (HAPS)

HAPs as identified in 42 United States Code 7412 have been evaluated against the constituents comprising each WMM component, including propellant. For the HAPs identified, none exceed the limits listed in RCRA Permit Table 5-3. As allowed under 40 CFR 63.1207(f)(1)(ii), SDC will not quantify any feed for possible degradation products or other contaminants as no programmatic data currently exists which would support any reasonable estimation of degradation.

3.4~~3.2~~ Feed Description and Limitations

The SDC System is designed to accept all munitions, including over packed munitions. All materials fed to the system may include the original packaging. Removal of munitions from their packaging is not required. The handling for feeding is limited to moving the original packages to a feed tray placed on a feed conveyor. In the event that the munitions are not individually packaged, the process allows for loading the feed tray without the need for reconfiguring the SDC.

Conventional WMM can be processed in the system as long as the following boundary conditions are not exceeded:

- Chlorine less than (<) 11.1 pounds per event (lb/event),
- Sulfur < 6.3 lb/event,
- Detonating explosives < 6.7 lb/event (non-mass and mass),
- No shape charges unless shape charge is disengaged or altered prior to feeding in order to prevent equipment damage, and
- Overall weight < 330.7 lb/event (including feed tray).

The agent-free WMM components are generated from operations conducted at the Pueblo Chemical Agent Pilot Plant. If PCAPP generated WMM components are not available in sufficient quantities to support this testing, an alternative WMM component sourced from

existing Army demilitarization stockpiles may be used which has comparable constituent compared to normal processing rates of PCAPP WMM components.

With the exception of N335 fuzes, agent-free WMM components are generated at the PCAPP facility from either 105mm HD M60 cartridges/projectiles, 155mm HD M104/M110 projectiles, 4.2-inch HD/HT M2A1 cartridges~~, or D541 propellant~~. Based on the following estimated processing rates, the total energetic feed rates (express as net explosive weight [NEW]) per WMM component are as follows:

WMM Component	Explosive Content (lb-NEW/mun)	Peak Feed Rate (mun/event)	Total Explosive Rate (lb/event)
M6 Bursters	0.414	≤ 16	≤ 6.62
M5 Bursters	0.257	≤ 26	≤ 6.68
M51A5 Fuzes	0.04981	≤ 134	≤ 6.67
M57 Fuzes	0.0507	≤ 132	≤ 6.69
M28A1 Percussion Primers	0.04286	≤ 156	≤ 6.69
M67 Propellant Charge	2.825	≤ 2.3	≤ 6.50
M8 Burster/M14 Fuze	0.144	≤ 46	≤ 6.62
M2 Ignition Cartridge	0.017	≤ 394	≤ 6.70
M6 Propellant Charge	0.43	≤ 15	≤ 6.45
N335 Fuzes	0.0536	≤ 124	≤ 6.65
~~D541 – Charge #3~~	~~3.813~~	~~1~~	~~3.813~~
~~D541 – Charge #4~~	~~1.312~~	~~≤ 5~~	~~≤ 6.56~~
~~D541 – Charge #5~~	~~2.0~~	~~≤ 5~~	~~≤ 6.0~~
~~D541 – Charge #6~~	~~3.038~~	~~≤ 2~~	~~≤ 6.08~~
~~D541 – Charge #7~~	~~3.49~~	~~1~~	~~3.49~~

Based on planned treatability studies, SDC will~~may~~ petition to raise the non-mass detonating NEW limit. Accordingly~~If so~~, SDC has~~will~~ submitted a separate~~n~~ emissions test~~addendum to this~~ plan condition with the proposed feed and processing parameter changes.

3.5~~3~~ Emissions Sampling and Analytical Protocols

Data quality objectives will be developed in a manner that is consistent with US Environmental Protection Agency's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA/240/B-06/001). Sampling and analysis procedures will be conducted IAW US EPA-approved sampling methods, RCRA/CAA Permits, and 40 Code of Federal Regulations (CFR) 60. The off-gas sampling and analytical methods to be used to quantify specific ETP-C15~~CPT~~ parameters are as follows:

- US EPA Method 1, *Sample and Velocity Traverses for Stationary Sources*,
- US EPA Method 2, *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*,
- US EPA Method 3B, *Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air*,
- US EPA Method 4, *Determination of Moisture Concentration in Stack Gases*,

- US EPA Method 6C, *Determination of Sulfur Dioxide Emissions from Stationary Sources* (by Temporary Reference Method [TRM] CEMS),
- US EPA Method 7E, *Determination of Nitrogen Oxides Emissions from Stationary Sources* (by TRM CEMS),
- US EPA Method 10, *Determination of Carbon Monoxide Emissions from Stationary Sources* (by facility and TRM CEMS),
- SW-846 Method 0010, *Semivolatile Organic Compounds (SVOCs), Total Chromatographic Organics (TCO) Compounds, and Organics with Boiling Points 300 ℃ or Higher (GRAV) Using Modified Method 5 Sampling Train,*
- SW-846 Method 0023A, *Sampling Method for Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofuran Emissions from Stationary Sources,*
- SW-846 Method 0031, *Sampling Method for Volatile Organic Compounds,*
- SW-846 Method 0040, *Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags,*
- US EPA Method 26A, *Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method,*
- US EPA Method 5, *Determination of Particulate Matter Emissions from Stationary Sources,*
- US EPA Method 29, *Determination of Metals Emissions from Stationary Sources* and
- US EPA Modified Method 5, *Modified Sampling Train for Energetic Compounds*.

In addition to the emissions sampling, a RATA will also be conducted to validate the facility CEMS. Facility CEMS will be used to correct emission rates.

3.64 Sampling and Analysis Procedures

A detailed description of the sampling and analysis performed by the sampling contractor during the emission test is provided in Appendix A (SAP/QAPP).

3.75 Sampling Locations

The off-gas will be sampled at ports located between the safeguard filter and stack. The sampling locations were evaluated prior to testing by utilizing US EPA Methods 1 and 2 for representativeness. Schematic illustrations of the sampling locations can be found in Appendix D.

4.0 DETAILED ENGINEERING DESCRIPTION

The SDC System is designed for destruction of munitions and munition components by indirect/conductive heating. The munitions are fed via a conveyor system. The solid scrap material remaining from the munitions is emptied into a scrap-box via a scrap conveyor system. The off-gas generated is cleaned and filtered in the OGT System.

The loading area is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor transfer. After the loading conveyor is loaded, it moves 1~~one~~ tray at a time to the lift. The lift transfers the tray to the level of the first loading chamber (LC1). From the lift, the item is then transferred to the apron of LC1. The loading conveyors and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.

Staging of a tray consists of deflating a pneumatic seal in the gate leading to LC1 and then raising the gate. An electrically operated ram, equipped with sensors to detect miss-feeds and other problems, pushes the tray into the LC1 and then retracts. The gate is lowered and pneumatic seal inflated forming a gas-tight boundary. Staging of a tray into LC1 can occur while the previous tray is being processed in the DC.

When conditions are verified to be acceptable for initiating feed to the DC, the Control Room (CON) Operator (CRO) initiates the loading sequence for staging the next tray into the second loading chamber (LC2). The actions of transferring a tray to the DC are automatic but monitored in the CON and can be manually interrupted. The seals on both sides of the gate leading to LC2 are deflated and the gate is raised. The hydraulically operated ram pushes the tray into a cradle located in LC2 and then retracts. The gate leading to LC2 is lowered and the seals on both sides of the gate are inflated. This gate is rated to withstand blast pressures of the detonation chamber (DC).

The cradle and fragment valve within LC2 move as 1~~one~~ unit but are located perpendicular to each other. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upon entering the DC, the munitions are heated resulting in a detonation and/or deflagration. The increase of pressure within the munition casing caused by the ambient heat of the DC alone is adequate to open the munition case and destroy fill material without the presence of explosives. The DC consists of an upper portion (UDC) which is fixed to the loading system and a lower portion (LDC) which can separate from the UDC. During detonation, the UDC and LDC portions of the DC are sealed by means of a locking ring, rope gasket and 6~~six~~ pneumatic seals (3~~three~~ on the top side of the locking ring, sealing to the UDC, and 3~~three~~ underneath the locking ring, sealing the LDC).

To empty the DC, the pneumatic seals are deflated and locking ring is partially twisted to free the LDC. The LDC can then be lowered and tilted to empty the scrap. Following scrap emptying, the LDC is returned to the upright position and raised. The locking ring is twisted in the opposite direction to lock the UDC and LDC together and the pneumatic seals on both sides of the locking ring are inflated to seal the locking to each respective portion of the DC.

The LDC contains electric heaters to maintain the DC at high temperatures. Both the UDC and LDC are constructed of heat resistant steel which can withstand the mechanical stress loads caused by detonation pressures at high temperatures. Inside the LDC, a fragment shield acts as a sacrificial plate to absorb impacts from fragmentation.

The OGT System consist of a buffer tank which absorbs pressure perturbations caused by blast waves within the DC, followed by an orifice or control valve which also helps to equalize the flow going to downstream components of the system.

Off-gases from the detonation and/or deflagration are further treated by a spray dryer, baghouse filter, quench venturi, acid scrubber, and neutral scrubber. Off-gases received from the thermal oxidizer are cooled by a spray dryer followed by a baghouse to remove salts and particulates. The remaining contaminants are removed by the acid and neutralization scrubbers. The last step is a multistage exhaust filtration system, which acts as a safeguard to the OGT System prior to releasing the off-gas to the environment.

A description of key equipment is provided below.

Conveyor System

The conveyor system is electrically powered and consists of a series of conveyors which transport the trays to the lift.

Gate 1

Gate 1 is a hydraulically operated sliding gate located at the inlet to LC1. Gate 1 is sealed gastight with a pneumatic seal. An electric pusher propels the package into LC1.

Loading Chamber 1 (LC1)

LC1 is a staging location prior to LC2.

Gate 2

Gate 2 is a hydraulically operated sliding gate located at the inlet to LC2 from LC1. Gate 2 is sealed gastight with 4~~four~~ pneumatic seals which are designed to withstand design blast pressures within the DC.

Loading Chamber 2 (LC2) and Cradle

LC2 has a built-in hydraulically powered cradle and fragment valve which move as a single unit. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90º and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upper Detonation Chamber (UDC)

The UDC is mounted to the outlet flange of LC2. Connections for incoming process air, outlet off-gases, temperature sensors, and pressure gauges are placed on the UDC.

Lower Detonation Chamber (LDC)

The LDC has an inner fragment shield and outer chamber. Electrical resistance heating elements are located on the LDC.

Elevating and Turning System

When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks. The rotation of the LDC is made by a hydraulic motor connected to the LDC by a gearbox and roller chain.

Locking and Sealing System

The UDC and LDC are locked to each other with a locking ring during destruction. The locking ring is maneuvered by 2~~two~~ hydraulic cylinders. For the emptying procedure the locking ring is turned to the open position and the LDC is lowered and tilted. The connection between UDC and LDC is sealed by 6~~six~~ pressurized pneumatic gaskets during destruction.

Hydraulic Power Unit

The hydraulic power unit provides power to operate the lifting jacks, tilting motor, gates 1 and 2, locking ring, and pushers. It also has a built-in backup pump which is driven by the uninterrupted power supply of the SDC.

Scrap Chute and Scrap Conveyor

When removal of scrap material is required, the LDC is lowered and rotated so the scrap material can be transferred to the scrap conveyor via the scrap chute.

Scrap Conveyor System

Scrap conveyors 201, 202, and 203 are vibration conveyors which use gravity to transfer material. The scrap conveyors are separated by gates and can be operated independently of each other. Dust is removed and collected in a drum between scrap conveyers 202 and 203 when the scrap passes over a wire mesh. Scrap conveyor 203 allows visual inspections of WMM after treatment.

DC Air Heater

Air heaters are used to raise the temperature of the process air which is used to aid the destruction process.

Buffer Tank

The buffer tank is designed to smooth gas pressure and volume surges from the DC that occurs when a munition detonates or deflagrates. By smoothing surges to downstream equipment, the equipment is better able to operate near optimum design flow rates which allows for a more consistent removal of contaminants. The buffer tank is comprised of a cone-bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section. The bottom of the buffer tank has 2~~two~~ slide valves that operate pneumatically. These valves periodically open and solids are collected in a drum for disposal. The entire tank and associated piping are maintained at a predetermined temperature using electric heaters and insulation.

Orifice Plate / Control Valve

An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between 2~~two~~ pipe flanges. The control valve may be operated automatically to by-pass the orifice except when in a destruction cycle. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.

Process Ventilation Cyclone, Filter, and Fan

The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.

Thermal Oxidizer

The off-gases resulting from the detonation/deflagration process in the DC are transferred to a thermal oxidizer. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of a minimum of 2~~two~~ seconds or more at greater than (>) 1,741 degrees Fahrenheit (°F) for the peak load expected from the upstream SDC. An additional flow of combustion air is automatically added to ensure an oxygen rich environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.

Spray Dryer

The off-gas from the thermal oxidizer is quickly cooled to approximately (~) 350°F in the spray dryer by the injection of spent scrubber liquid into the gas stream. Evaporation of the spent scrubber liquid generates dry salts and particulates. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a screw feeder and slide gate valve for disposal.

Bag House Filter

The bag house is comprised of a filter system which uses bags layered with sodium bicarbonate, or similar, as the absorbent to remove dust and heavy metals from the off-gas. The ratio of the absorbent may be adjusted to fit the application. The absorbent is fed from a hopper by a pneumatic feed system to the outside of the bags providing a fresh surface to the incoming gases. Periodically when the pressure drop across the filter exceeds a predetermined set point, the bags are cleaned using a pulse jet and the spent solids are collected in a drum for disposal using a screw feeder and slide gate valve.

Quench Venturi

The quench venturi cools the off-gas from ~ 350 to 170°F by injecting solution water from the acid scrubber. Any remaining solution water is cooled and recycled to the acid scrubber sump.

Acid Scrubber

The acid scrubber cools the off-gas from ~ 170 to 150°F. The acid scrubber is designed where the scrubber liquid flows counter current to the gas flow. Dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off-gas by dissolving in the scrubber liquid making it acidic.

The conductivity of the scrubber liquid is also monitored. Rising conductivity is an indication of increasing dissolved salt content in the scrubber liquid. To counter act this, fresh water is added. Excess scrubber liquid is then transferred to the bleed water tank for mixing and pH correction.

Scrubber liquid is pumped from the bottom of the scrubber column to the top and distributed inside the column by a distribution pan. The off-gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure adequate mixing and contact between the liquid and gas, the columns are filled with a

column packing material. As a safeguard, the temperature of the off-gas inlet is monitored. In case of a high temperature off-gas, an emergency water injection is used.

Neutral Scrubber

The neutral scrubber removes any residual contaminants that passed through the spray dryer and acid scrubber. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.

The scrubber liquid is monitored by a pH controller. Sodium hydroxide is used to maintain the proper neutral pH. The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.

To obtain a constant quality in the scrubber, spent scrubber liquid is periodically removed based on level and conductivity and transferred to the Bleed Water Tank for mixing and pH correction. Scrubber liquid is refreshed by the addition of caustic solution as needed.

Induced Draft (ID) Fans

The 2two ID fans are located between the neutral scrubber and inlet to the safeguard filter. Should an ID fan fail, the other will automatically assume the load. The ID fans ensure that the pressure of the off-gas in the thermal oxidizer is maintained below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. The ID fans work continuously during the operations.

Safeguard Filter

The safeguard filter system is an exhaust filtration unit. The exhaust filtration unit is designed as a series of filters and built IAW the requirements by the US Army's Chemical Demilitarization program. The function of the filter units is described below:

- Prefilter: Removes particulates remaining in the gas stream that may cause blinding or clogging of the downstream HEPA filter;
- High-Efficiency Particulate air (HEPA) Filter: Removes particulates down to 0.3 microns;
- Charcoal: Removes contaminants such as volatile and semi-volatile heavy metals;
- Charcoal: Serves as a backup for the first charcoal filter described above; and
- HEPA Filter: Ensures that there are no emissions of potentially contaminated particulates released to the atmosphere.

The filter housings are made of stainless steel and equipped with differential pressure monitors on all filters to ensure adequate flow and monitor for when a filter needs to be replaced. The safeguard filter system includes an ID fan to maintain negative pressure within system to protect against leakage.

Stack

The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist Industrial Ventilation Manual.

5.0 DESCRIPTION OF FEED PROHIBITED INTERLOCK SYSTEM

The primary function of the Feed Prohibited Interlock (FPI) System is to prevent the feeding of munitions if SDC conditions are outside RCRA Permit limits. During upset conditions, the FPI System automatically prohibits the transfer of munitions from LC1 to 2 until all conditions are met or within range. Instrumentation is provided to monitor process conditions; provide data for ensuring compliance with regulatory requirements; and provide appropriate process response and control needs for operational flexibility, safety interlocking, and shutdown features (see Appendix B).

An automatic control system is used with a centralized control console (including closed-circuit television monitors for observing operations at various locations) and locally mounted programmable logic controllers (PLC). SDC processing and sequencing operations are controlled automatically through a dedicated PLC. Interlocks are monitored and continuous checking is undertaken to determine any lack of completion of a programmed step. All upset conditions, operator entries into the system, and starting and stopping of equipment are logged with the time of occurrence by the Process Data Acquisition and Recording System (PDARS). Interlocks are provided to respond to various conditions. Shutdowns are either immediate or in stages, depending upon the situation.

6.0 OFF-GAS MONITORING EQUIPMENT

The CEMS is a complete system designed to measure CO and O_2 emissions from the SDC and OGT System IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE (see Appendix C). All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

The facility CEMS continuously monitor the off-gas, downstream of the OGT equipment, to include the ID fans and safeguard filter system. The CEMS have the ability to cause a FPI condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include an~~two~~ analyzer~~s~~ (primary or unit of record (UOR) and ~~an~~ online backup. Both analyzers will be certified to allow for operational flexibility.

CEMS components are mounted in a National Electrical Manufacturers Association Instrument Control System (ICS) cabinet located in a monitoring shelter. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS.

7.0 LOCATION AND DESCRIPTION OF THE PROCESS CONTROL SYSTEM

The proper operation of the process control system is necessary to ensure consistent compliance with all RCRA/CAA Permit conditions and safe, efficient operation of the SDC and OGT Systems. The CON is the remote location where the SDC and OGT Systems are normally operated. The CON houses an operator control console, which includes closed-circuit television monitors for observing operations at various locations, as well as emergency shutdown controls.

All remote operations, with exception of emergency shutdown, are performed through an operator keyboard using the equipment controls and indications displayed on HMI screens. Processing and sequencing operations are controlled automatically through the PLC, which continuously communicates with the operator console in the CON.

The PLC is programmed to continually scan for alarm conditions and to initiate alarms in the CON, alerting the operator of abnormal conditions. The process control software was designed to provide pre-alarms in the CON. These pre-alarms are used to warn the CON operator in time to take corrective action should a process variable approach a FPI condition.

The PDARS logs and notes the time of all abnormal conditions, as well as, the starting and stopping of equipment and operator entries. This system is also used to record process data such as temperature, pressure, and waste feed intervals. PDARS records data at varying intervals. The PDARS takes instantaneous readings at a maximum interval of fifteen seconds. The collected data is then averaged on a ~~one (~~1~~)~~-minute basis. All PDARS data collected for RCRA/CAA instrumentation is included in the SDC operating record as required by the CAA/RCRA Permits and applicable regulations.

8.0 STARTUP/SHUTDOWN PROCEDURES

The SDC and OGT Systems will be brought up to normal operating conditions before introducing WMM to the DC. The phrase “normal operating condition” means that operating parameters are within parameters for initiating feed. Before the SDC and OGT Systems can be started, all utilities, including the FPI System, must be operational IAW SDC procedures.

FPIs are continuously monitored and interlocked and will be in operation during the emission test. In addition, the system’s operation will be monitored by CRO. If the operation of the system should deviate significantly from the desired range of operation or become unsafe, the CRO will manually secure feed. In the event of a major equipment or system failure, it may be necessary to shut down the SDC and/or OGT System completely. A shutdown of this type will be performed IAW the SDC procedures.

9.0 SCHEDULE

The ETP-C15~~CPT~~ test is expected to be executed in September 2016. The submittal of this plan will serve as the official 1-year MACT~~ADEM~~ notice required for CPT-like emissions tests~~test plans~~ as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii). Sixty days prior to the ETP-C15~~CPT~~, ADEM (Land and Air Divisions) will be notified of the intended execution date.

The ETP-C15~~CPT~~ will commence after SDC has received approval of this plan and successfully completed shakedown of the SDC System. The ETP-C15~~CPT~~ activities will span approximately 7~~six (6)~~ days including: 2~~one (1)~~ days for preparation, ~~four (~~4~~)~~ days for testing, and ~~one (~~1~~)~~ day for clean-up.

The ETP-C15~~CPT~~ will consist of a minimum of ~~three (~~3~~)~~ valid test runs. One (1) run per day is planned. The off-gas stream will be sampled until a minimum of ~~three (~~3~~)~~ cubic meters is collected or approximately 4~~four (~~4~~)~~ hours. This, combined with port changes, will cause total test time each day to be at least ~~six (~~6~~)~~ hours. Assuming minimal interruption during the emission test, the SDC and OGT Systems are expected to operate for ~~eight (~~8~~)~~ or more hours per test day. A fourth test run may be conducted at the discretion of the site management.

10.0 RAMP-UP PERIOD

The principal objective of the ramp-up period is to prepare the SDC and OGT System to safely process the munitions at proposed setpoints. Because SDC is not proposing to change any FPI setpoints, a ramp-up period of up to 720 hours is not required.

~~Based on planned treatability studies, SDC may petition to raise the non-mass detonating NEW limit. If so, the SDC will submit an addendum to this plan with the proposed feed and processing parameter changes and request a ramp-up period of up to 720 hours.~~

11.0 EMISSIONS TEST PERIOD

From the initiation of the first test run to the completion of the last test run, the SDC and OGT Systems will be within an emissions test period and hours of operation will not be considered shakedown hours.

12.0 POST-TEST PERIOD

For the duration of the post-trial period, the SDC and OGT Systems will be operated IAW the performance standards listed in the RCRA Permit until approval of the ETP-C15~~CPT~~ report and Notice of Compliance (NOC).

13.0 EMISSIONS TEST RESULTS

A final ETP-C15~~CPT~~ report/NOC must be submitted to ADEM (Land and Air Divisions) documenting that the ETP-C15~~CPT~~ has been carried out IAW the approved plan~~SDC 5CPT Plan~~ within 90 days after completion of the last test run. All data and analyzed sample results from the ETP-C15~~CPT~~ will be submitted in the final emission test report. A preliminary ETP-C15~~CPT~~ report addressing demonstration of the intended performance standards and objectives will be submitted approximately 20 working days following receipt of the samples at the contracted laboratory(s).

14.0 FINAL PERMIT LIMITS

SDC does not intend to re-establish any FPI set points. Retention of the existing FPI setpoints will be requested after demonstrating successful operation within the previously establish operating envelope.

Table 1: FPI Conditions

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	MIN	1,741ºF
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	MAX	-0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	MAX	400º F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	170ºF
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200ºF
SDC-FPI-11	AIT-900	CO Concentration	MAX	100 ppm, dry basis @ 7% O_2 (Instantaneous)
SDC-CPI-12	QICA 36008	Neutral Scrubber pH	MIN	7.0 pH

Footnote:
(1) Operational parameter(s) interlock will prohibit the transfer from LC1 into LC2 until all conditions are met or within range.

APPENDIX A: SAP/QAPP

STATIC DETONATION CHAMBER (SDC)
~~5-YEAR~~ EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX A
SAMPLING AND ANALYSIS (SAP)/QUALITY ASSURANCE PROJECT PLAN (QAPP)

REVISION 1~~0~~, APRIL 2016~~SEPTEMBER 2015~~

Approvals:

SDC Test Director	**Date**
SDC Test Coordinator	**Date**
Sampling and Analysis Contractor	**Date**
Sampling and Analysis Contractor QA Manager	**Date**
Contracted Laboratory Project Manager	**Date**
Contracted Laboratory QA Manager	**Date**
Contracted Laboratory Project Manager (if applicable)	**Date**
Contracted Laboratory QA Manager (if applicable)	**Date**

1.0 PROJECT DESCRIPTION

A minimum of 3 test runs will be conducted on the Static Detonation Chamber (SDC). The SDC emissions test will provide emissions results and system data that will allow the performance of the SDC to be compared to applicable emission and performance standards. The purpose and specific requirements that apply to the emissions test are listed in the SDC ~~5-Year~~ Emissions Test Plans for Condtions 1 and 2.

This Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) is an essential guidance document by which the test objectives will be demonstrated. The SAP/QAPP describes procedures that will be implemented during the emission test to demonstrate that all of the associated data are of sufficient quality to serve as the basis for regulatory decisions for the SDC. The primary purpose of the SAP/QAPP is to define all aspects of the quality assurance (QA)/quality control (QC) procedures that should be applied to the emissions tests while establishing detailed sampling and analytical quality indicators that will demonstrate the achievement of the emissions test objectives.

The general concept by which the goals and data quality objectives (DQO) were formulated is very simple. In order for any emission test data to be acceptable as representative of system performance, data must be collected from valid test runs. If a run is attempted and fails, then another run must be initiated and completed to replace it. Validity of the data is determined by the permittee(s) and Alabama Department of Environmental Management (ADEM).

The duration of the sampling events (time) and analytical test method sensitivity (mass) are used to calculate the emissions rates. Sampling duration, sample collection rates, and analytical methods have been selected to provide emission results of sufficient sensitivity to demonstrate the test objectives. In addition to issues of sensitivity, accuracy, and precision, objectives must be determined for the SDC emissions tests. These parameters are obtained from United (US) Environmental Protection Agency (EPA) guidance primarily, and are presented as target acceptance limits for percent recovery, relative percent difference, and related parameters that are defined elsewhere.

It must be understood that analytical test method DQO are target values. The US EPA has clearly defined validation processes for data review for the Contract Laboratory Program (CLP) that is published as the *National Functional Guidelines for Data Review*. Data that exceed target DQO are usually flagged as estimates. There are limited reasons for rejecting data as not usable. Ultimately, only the end data users can decide if data is acceptable for its intended purpose. For this document, US EPA guidance is the primary source of analytical DQO. Target acceptance criteria are defined for many of the measurements that will be made during the emissions tests in US EPA-625/6-89-023, *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration*. When this document does not provide accuracy and precision objectives directly, then the cited analytical test method was reviewed to obtain guidance. If these 2

3.0 SAMPLING OVERVIEW

3.1 SAMPLING AND ANALYSIS SCHEDULE

The schedule for the conducting the emissions test is divided into 3 phases:

- Preparation Phase –
  - Preparation and approval of the emission test plan
  - Procurement of sampling equipment and supplies
  - Equipment cleaning and calibration
  - Mobilization of equipment and supplies to SDC
  - Mobilization of personnel on-site
  - Preparation of the equipment for sampling
- On-site Sampling and Data Acquisition Phase –
  - Collect samples and data from a minimum of 3 valid test runs per condition
- Post-Test Phase –
  - Final preparation of the samples
  - Demobilization of the equipment
  - Transport and receipt of the samples by the SAC's analytical laboratory
  - Analytical program management of the samples through the SAC's analytical laboratories
  - Data reporting, review, reduction, and validation
  - Compilation of the emission test report

3.2 INTERRUPTIONS AND INCOMPLETE TEST RUNS

In the case of a system upset or other abnormal conditions, the Test Director will decide the appropriate course of action based on the actual conditions encountered. In all cases of sampling interruption, all sample collection logs will document when the interruption occurred and when sampling resumed. All exhaust gas sample volumes will be based on the actual time of sample collection and exclude all interruptions.

In the unlikely event of an incident that could constitute a safety problem, sampling activities will be suspended as determined by the Test Coordinator. An assessment will then be made by the Test Director of the conditions that led to the interruption to determine an anticipated restart time.

Table A-1: Planned Sample Collection Methods, Frequency, and Containers

Sample Name	Analysis	Type of Container(s)[1]	Frequency	Samples/Condition[1]
M0010 SAMPLING TRAINS (2) Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Semivolatile PIC/TIC Semivolatile and Non-volatile Unspeciated Mass	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses		XAD-2 resin tubes, 250-mL amber glass		
Impinger composite and glassware solvent rinses		1 gallon amber glass or multiple 1-L amber glass		
M0023A Sampling Train Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	PCDD/PCDF	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses		XAD-2 resin tubes, 250-mL amber glass		
M0031 Sampling Train 1 Tenax® and 1 Anasorb® resin tube per pair	Volatile PIC/TIC	Resin tubes	Collect 4 resin tube pairs, 40 minutes 0.5 L/min or 20 L per pair	16 pairs
Condensate		40-mL VOA vials	End of test run	4
M0040 Sampling Train	Volatile Unspeciated Mass	Tedlar® bags	2 Tedlar® bags per test run	8
		20-mL or 40-mL VOA vials	Condensate per Tedlar® bag	
M26A Sampling Train Particulate filter and acetone probe rinse	PM	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
0.1N H_2SO_4 impinger composite	HCl/HF	1-L HDPE		
0.1N NaOH impinger composite	Cl_2	500-mL HDPE		
M29 Sampling Train Filter and HNO_3 probe rinse	Metals	Petri dish, 120-mL HDPE	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
5% HNO_3/10% H_2O_2 impinger composite		1-L HDPE		
Empty Impinger	Mercury Only	120-mL HDPE		
4% $KMnO_4$/10% H_2SO_4 impinger composite and DI rinses		500-mL amber glass with vented lid		
8N HCl Rinsate		250-mL amber glass		

Table A-1: Planned Sample Collection Methods, Frequency, and Containers (Continued)

Sample Name	Analysis	Type of Container(s)(1)	Frequency	Samples/Condition(1)
MM5-E Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Energetics: nitroglycerin, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, RDX, HMX	500-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr.	4
Impinger composite and glassware solvent rinses				
XAD-2 resin tube		XAD-2 resin tubes		
M3B - Orsat	O_2 and CO_2	Tedlar® bag	1 Tedlar® bag per test run	4
TRM CEMS	CO	Not Applicable	Continuous	Not Applicable
	CO_2			
	O_2			
	SO_2			
	NOx			

Footnotes:

(1) Alternate container sizes may be used as required.

(2) Four test runs will be conducted but only 3 will be analyzed. A fourth run will be archived in case of sample loss or breakage.

Table A-11: Listing of Target Analytes

Volatile PIC		
Chloromethane (Methyl Chloride)	1,1,1-Trichloroethane	~~1,2-Dibromoethane (Ethylene Dibromide)~~
Vinyl Chloride	Carbon Tetrachloride	Ethyl Benzene
~~Bromomethane (Methyl Bromide)~~	Benzene	m,p-Xylene
Chloroethane (Ethyl Chloride)	1,2-Dichloroethane	o-Xylene
Trichlorofluoromethane (Freon 11)	Trichloroethene	~~Styrene~~
~~2-Chloropropane~~	~~1,2-Dichloropropane~~	~~Bromoform~~
~~1,1-Dichloroethene~~	~~Dibromomethane~~	1,1,2,2-Tetrachloroethane
~~1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)~~	~~Bromodichloromethane~~	~~cis-1,4-Dichloro-2-butene~~
Carbon Disulfide	~~cis-1,3-Dichloropropene~~	~~1,2,3-Trichloropropane~~
Acetone	~~trans-1,3-Dichloropropene~~	~~trans-1,4-Dichloro-2-butene~~
Methylene Chloride	~~4-Methyl-2-pentanone~~	1,1,1,2-Tetrachloroethane
trans-1,2-Dichloroethene	~~Toluene~~	~~Iodomethane~~
Hexane	1,1,2-Trichloroethane	Dichlorodifluoromethane
~~1,1-Dichloroethane~~	~~Tetrachloroethene~~	1,3-Butadiene
~~Vinyl Acetate~~	~~2-Hexanone~~	~~Vinyl Bromide~~
~~2-Butanone~~	~~Dibromochloromethane~~	
Chloroform	Chlorobenzene	
Semivolatile PIC		
~~Acenaphthene~~	~~1,3-Dichlorobenzene~~	~~4-Methylphenol~~
~~Acenaphthylene~~	~~1,4-Dichlorobenzene~~	~~Pentachloroethane~~
~~Acetophenone~~	~~3,3'-Dichlorobenzidine~~	Naphthalene
~~2-Acetylaminofluorene~~	~~2,4-Dichlorophenol~~	~~1,4-Naphthoquinone~~
~~4-Aminobiphenyl~~	~~2,6-Dichlorophenol~~	~~1-Napthylamine~~
~~3-Amino-9-ethycarbazole~~	~~Diethyl phthalate~~	~~2-Napthylamine~~
~~Aniline~~	~~Dihydrosafrole~~	~~5-Nitroacenaphthene~~
~~Anthracene~~	~~p-Dimethylaminoazobenzene~~	~~2-Nitroaniline~~
~~Aramite~~	~~7,12-Dimethylbenz(a)-anthracene~~	~~3-Nitroaniline~~
~~Benzidine~~	~~3,3'-Dimethylbenzidine~~	~~4-Nitroaniline~~
~~Benzoic acid~~	~~a,a-Dimethylphenethyl-amine~~	~~Nitrobenzene~~
~~Benzo (a) anthracene~~	~~2,4-Dimethylphenol~~	~~2-Nitrophenol~~
~~Benzo (b) fluoranthrene~~	~~Dimethyl phthalate~~	~~4-Nitrophenol~~
~~Benzo (j) fluoranthrene~~	~~1,3-Dinitrobenzene~~	~~4-Nitroquinoline-1-oxide~~
~~Benzo (k) fluoranthrene~~	~~4,6-Dinitro-2-methylphenol~~	~~N-Nitroso-di-n-butylamine~~
~~Benzo (g,h,i) perylene~~	~~2,4-Dinitrophenol~~	~~N-Nitrosodiethylamine~~
~~Benzo (a) pyrene~~	~~2,4-Dinitrotoluene~~	~~N-Nitrosodimethylamine~~
~~Benzo (e) pyrene~~	~~2,6-Dinitrotoluene~~	~~N-Nitrosomethylethylamine~~
Benzyl alcohol	~~Dioxathion~~	~~N-Nitrosodiphenylamine~~
Benzaldehyde	~~Diphenylamine~~	~~N-Nitroso-di-n-propylamine~~
~~Benzenethiol~~	~~1,2-Diphenylhydrazine~~	~~N-Nitrosomorpholine~~
~~Biphenyl~~	~~Di-n-octyl phthalate~~	~~N-Nitrosopiperidine~~

Table A-11: Listing of Target Analytes (Continued)

Semivolatile PIC (Continued)		
~~bis(2-Chloroethoxy)-methane~~	~~Ethyl methanesulfonate~~	~~N-Nitrosopyrrolidine~~
~~bis(2-Chloroethyl) ether~~	~~Ethyl parathion~~	~~Pentachlorobenzene~~
~~bis(2-Chloroisopropyl) ether~~	Fluoranthene	~~Pentachloronitrobenzene~~
bis(2-Ethylhexyl)-phthalate	~~Fluorene~~	~~Pentachlorophenol~~
~~4-Bromophenyl phenyl ether~~	~~Heptachlor~~	~~Phenacetin~~
~~Butyl benzyl phthalate~~	~~Hexachlorobenzene~~	~~Phenanthrene~~
~~2-sec-Butyl-4,6-dinitro-phenol~~	~~Hexachlorobutadiene~~	~~Phenol~~
~~4-Chloroaniline~~	~~Hexachlorocyclopentadiene~~	~~1,4-Phenylenediamine~~
~~Chlorobenzilate~~	~~Hexachloroethane~~	~~2-Picoline~~
~~4-Chloro-3-methylphenol~~	~~Hexachlorophene~~	~~Pronamide~~
~~1-Chloronaphthalene~~	~~Hexachloropropene~~	~~Pyrene~~
~~2-Chloronaphthalene~~	~~Indeno(1,2,3-cd)pyrene~~	~~Pyridine~~
~~2-Chlorophenol~~	~~Isophorone~~	~~Quinoline~~
~~4-Chlorophenyl phenyl ether~~	~~Isosafrole~~	~~Safrole~~
~~Chrysene~~	~~Methapyrilene~~	~~1,2,4,5-Tetrachloro-benzene~~
~~4,4'-DDE~~	~~Methoxychlor~~	~~2,3,4,6-Tetrachlorophenol~~
~~Diallate~~	~~Methylcyclohexane~~	~~o-Toluidine~~
~~Dibenz(a,j)acridine~~	~~3-Methylcholanthrene~~	~~p-Toluidine~~
~~Dibenz(a,h)anthracene~~	~~Methyl methanesulfonate~~	~~1,2,4-Trichlorobenzene~~
~~Dibenzofuran~~	~~2-Methylnapthalene~~	~~2,4,5-Trichlorophenol~~
~~1,2-Dibromo-3-chloropropane~~	~~2-Methyl-5-nitroaniline~~	~~2,4,6-Trichlorophenol~~
~~Di-n-butyl phthalate~~	~~2-Methylphenol~~	~~1,3,5-Trinitrobenzene~~
~~1,2-Dichlorobenzene~~	~~3-Methylphenol~~	~~Tributylamine~~
~~N,N'-Diisopropylcarbodiimide~~	~~Diisopropylmethylphosphonate~~	
PCDD/PCDF		
2,3,7,8-TetraCDD	1,2,3,7,8-PentaCDD	1,2,3,4,7,8-HexaCDD
1,2,3,6,7,8-HexaCDD	1,2,3,7,8,9-HexaCDD	1,2,3,4,6,7,8-HeptaCDD
1,2,3,4,6,7,8,9-OctaCDD	2,3,7,8-TetraCDF	1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF	1,2,3,4,7,8-HexaCDF	1,2,3,6,7,8-HexaCDF
2,3,4,6,7,8-HexaCDF	1,2,3,7,8,9-HexaCDF	1,2,3,4,6,7,8-HeptaCDF
1,2,3,4,7,8,9-HeptaCDF	1,2,3,4,6,7,8,9-OctaCDF	
Metals		
Uranium~~Aluminum~~	Antimony	Arsenic
Barium	Beryllium	Boron
Cadmium	Chromium	Cobalt
Copper	Lead	Manganese
Mercury	Nickel	Phosphorus
Selenium	Silver	Thallium
Tin	Vanadium	Zinc

APPENDIX B: CMS PLAN

STATIC DETONATION CHAMBER (SDC)
~~5-YEAR~~ EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX B
CONTINUOUS MONITORING SYSTEM (CMS)
PERFORMANCE EVALUATION PLAN (PEP)

REVISION 1~~0~~, APRIL 2016~~SEPTEMBER 2015~~

2.0 CMS PEP PROGRAM

2.1 OBJECTIVES

The objective of this CMS PEP is to demonstrate and maintain the effectiveness of the CMS related to the proper operation of the SDC IAW the requirements of 40 CFR 63.8, 40 CFR 63.1209 (d), and SDC Calibration Plan (SDC-MNT-002). Performance evaluation is defined as the conduct of calibration error testing and other measurements used in validating the CMS data.

2.2 APPROACH

The process and control instruments are tested in accordance with (IAW) the calibration and performance specification requirements. The CMS instruments and devices related to SDC operations are calibrated IAW SDC Calibration Plan (SDC-MNT-002). The frequency depends on CMS performance and audit results. These results are recorded on the instrument calibration record.

Prior to the emissions test, calibration and audit records are reviewed to ensure the precision and accuracy of the CMS relevant to the proper operation IAW the applicable CMS performance specifications. If, during the review of these records, the calibration and/or audit results indicate that any of the instruments and control devices do not meet the relevant standard; corrective action takes place to ensure the immediate repair or replacement of the CMS defective parts. Following the corrective action, the CMS is calibrated to ensure its operating within specification. Calibration or audit results are then evaluated to ensure the proper operation of the instrument. Results of the performance evaluation test results for the monitors will be documented in the emission test report.

2.3 PERFORMANCE EVALUATION CRITERIA

In order to provide uniformity in the assessment methods and reporting of data quality; the assessment methods for response drift and accuracy of the CEMS is IAW the SDC CEMS Certification Plan (SDC-ENV-003~~MNT-002~~) and Subpart EEE of Part 63. These assessment methods are based on procedures included in the applicable Performance Specifications for CEMS per Appendix B of 40 CFR Part 60 as described in Section 3.0. Assessment methods for all other CMS instruments and control devices are based on manufacturers' recommended procedures.

2.3.1 CEMS Performance Specification

A summary of the performance specification requirements for the CEMS can be found in the SDC CEMS Certification Plan (SDC-ENV~~OPS~~-003~~3.08~~).

3.0 DESCRIPTION OF THE CMS

Under MACT, a "Continuous Monitoring System" is a comprehensive term that includes the CEMS, FPI System, and/or other manual or automatic monitoring that is used for demonstrating compliance with an applicable regulation on a continuous basis as defined by the regulation. The definition of "continuous" as it relates to process parameters is that the CMS must sample the regulated parameter without interruption, and evaluate the detector. FPI instruments will be verified prior to initiating the destruction sequence for munitions processing.

SDC must use a CEMS to demonstrate and monitor compliance with the MACT CO standard. An O_2 CEMS is used to continuously correct the CO levels to 7 percent (%) O_2. SDC has installed, calibrated, maintained, and continuously operates the CEMS IAW the QA procedures provided in the appendix to 40 CFR Subpart EEE and Performance Specification 4B (CO and O_2) in 40 CFR 60, Appendix B or as specified in the SDC CEMS Certification Plan (SDC-ENV-003~~OPS-3.08~~).

The SDC must use CMS (e.g., thermocouples, pressure transducers, etc.) to document compliance with the applicable operating parameter limits IAW 40 CFR 63.1209(b). Thermocouples, pressure transducers, etc., must be installed and operated IAW 40 CFR 63.8(c)(3) that requires the owner, at a minimum, to comply with the manufacturer's written specifications or recommendations for installation, operation, and calibration of the system. The span of the CMS detector must not be exceeded. The span limits must be verified to be within range prior to initiation of the destruction sequence.

For the purpose of this plan, CMS is defined as the total equipment (sample interface, analyzer, and data recording) required for determining emissions and/or operating parameters. The CEMS, FPI System, and PDARS are the three basic categories of CMS at SDC.

3.1 CEMS

The CEMS are used for continuously monitoring the exhaust gas from the SDC and associated Off-Gas Treatment System while in operation. The facility CEMS suite consists of CO and O_2 monitors which are located in the exhaust stack. The CO CEMS is linked to the FPI System and corrected to 7% O_2 based upon O_2 CEMS readings. The facility CEMS are individual units and may be challenged during processing at the SDC. Operation of the facility CEMS units is described in the SDC CEMS Certification Plan (SDC-ENV-003~~OPS-3.08~~).

For the emissions test(s), TRM CEMS provided by the sampling contractor will be used to monitor for SO_2 and NO_X analyzers.

3.2 FPI SYSTEM

The FPI System is used to continuously monitor the source or pollution control device operating parameters. The FPI System is an integral part of the Control System. The Control System has a centralized control console, including closed-circuit television monitors for observing operations at various locations, and locally mounted programmable logic controllers (PLC). Most SDC

4.0 CMS PERFORMANCE EVALUATION TEST SUMMARY

The CMS performance evaluation tests are being conducted to measure and ensure precision and accuracy. These tests simulate malfunction and methods of calibration of all CMS instruments and devices. All results are documented as part of the RCRA Operating Record for the SDC.

4.1 ACCURACY AND PRECISION REQUIREMENTS

4.1.1 CMS Calibration

Calibration procedures are written for each applicable device. These procedures are available to personnel who operate the systems and regulatory personnel for review. References to "daily" checks or calibrations will normally be performed during operational hours.

Calibration audits of the CEMS conform to the quarterly absolute calibration audit IAW 40 CFR 63, Appendix to Subpart EEE of Part 63, *Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors*. Also, criteria for daily calibration checks conform to the SDC CEMS Certification Plan (SDC-ENV-003~~OPS-3.08~~).

Calibrations are fully documented and take place IAW the schedule presented in the calibration procedures for the facility. At a minimum, the CMS is calibrated prior to installation or just after installation; whichever is most appropriate for the CMS. Whenever the CMS requires major maintenance or repair, a full calibration is performed before data is declared valid. The frequency depends upon CMS performance and audit results.

With the exception of daily zero checks on CO CEMS and daily span checks on O_2 CEMS using supplied air, the reference standards for CEMS are either by certified compressed gases or a sealed gas cell containing a gas whose concentration is certified. Certified standards are traceable to National Institute of Standards and Technology (NIST) standards. Calibration accuracy is dependent on the quality of the reference standard used. Ideally, compressed gas standards are either NIST-Standard Reference Materials, gas vendor Certified Reference Materials, or a Primary Standard gas. NIST traceable standard may be used providing the necessary documentation is available.

Typical reference standards for the FPI System are liquid (water or mercury) manometers, NIST traceable thermometers, NIST traceable pitot tubes, and Fluke 4-20 milliamperes.

4.1.2 Zero and Span Checks

Zero (low level) and span checks (i.e., calibration drift [CD]) for CEMS are performed IAW the SDC CEMS Certification Plan (SDC-ENV-003~~OPS-3.08~~). The CMS response to zero or low level and span (high level) standards is recorded to evaluate the performance of the CEMS over a period of time. The CD checks are the first criteria for determining the degree of control of the CEMS.

APPENDIX E: MACT CROSS-WALK OF REQUIREMENTS

Item	63 CFR 1207	Requirement	Location
1	(f)	Provisions of §§63.7(c)(2)(i)-(iii) and (v) regarding the content of the test plan apply	See 62 – 81
2	(f)(1)(i)	An analysis of each feedstream, including hazardous waste, other fuels, and industrial furnace feedstocks, as fired, that includes	Section 3.4
3	(f)(1)(i)(A)	Heating value, levels of ash (for hazardous waste incinerators only), levels of semivolatile metals, low volatile metals, mercury, and total chlorine (organic and inorganic)	RCRA Permit Table 5-3 governs feed rates.
4	(f)(1)(i)(B)	Viscosity or description of the physical form of the feedstream	Section 3.4
5	(f)(1)(ii)	For organic hazardous air pollutants established by 42 U.S.C. 7412(b)(1), excluding caprolactam (CAS number 105602) as provided by §63.60	---
6	(f)(1)(ii)(A)	Except as provided by paragraph (f)(1)(ii)(D) of this section, an identification of such organic hazardous air pollutants that are present in each hazardous waste feedstream	Section 3.3
7	(f)(1)(ii)(B)	An approximate quantification of such identified organic hazardous air pollutants in the hazardous waste feedstreams, within the precision produced by analytical procedures of §63.1208(b)(8)	Section 3.3
8	(f)(1)(ii)(C)	A description of blending procedures, if applicable, prior to firing the hazardous waste feedstream, including a detailed analysis of the materials prior to blending, and blending ratios	Not applicable No blending will occur.
9	(f)(1)(ii)(D)	The Administrator may approve on a case-by-case basis a hazardous waste feedstream analysis for organic hazardous air pollutants in lieu of the analysis required under paragraph (f)(1)(ii)(A) of this section if the reduced analysis is sufficient to ensure that the POHCs used to demonstrate compliance with the applicable DRE standards of this subpart continue to be representative of the most difficult to destroy organic compounds in your hazardous waste feedstreams	Not Applicable No variance is requested.
10	(f)(1)(iii)	A detailed engineering description of the hazardous waste combustor, including ***Note: The SDC is not a hazardous waste combustor but is subject to these regulations by permit only.***	Section 4.0
11	(f)(1)(iii)(A)	Manufacturer's name and model number of the hazardous waste combustor	CAA Permit 301-0050-Z013
12	(f)(1)(iii)(B)	Type of hazardous waste combustor	Section 1.0
13	(f)(1)(iii)(C)	Maximum design capacity in appropriate units	Section 3.4
14	(f)(1)(iii)(D)	Description of the feed system for each feedstream	Section 4.0
15	(f)(1)(iii)(E)	Capacity of each feed system	Section 3.4
16	(f)(1)(iii)(F)	Description of automatic hazardous waste feed cutoff system(s)	Section 5.0
17	(f)(1)(iii)(G)	Description of the design, operation, and maintenance practices for any air pollution control system	Section 4.0
18	(f)(1)(iii)(H)	Description of the design, operation, and maintenance practices of any stack gas monitoring and pollution control monitoring systems	Sections 6.0 & 7.0
19	(f)(1)(iv)	A detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis	Section 3.3 & SAP/QAPP
20	(f)(1)(v)	A detailed test schedule for each hazardous waste for which the performance test is planned, including date(s), duration, quantity of hazardous waste to be burned, and other relevant factors	Section 9.0
21	(f)(1)(vi)	A detailed test protocol, including, for each hazardous waste identified, the ranges of hazardous waste feedrate for each feed system, and, as appropriate, the feedrates of other fuels and feedstocks, and any other relevant parameters that may affect the ability of the hazardous waste combustor to meet the emission standards	Section 3.4
22	(f)(1)(vii)	A description of, and planned operating conditions for, any emission control equipment that will be used	Section 4.0

Item	63 CFR 1207	Requirement	Location
23	(f)(1)(viii)	Procedures for rapidly stopping the hazardous waste feed and controlling emissions in the event of an equipment malfunction	Sections 4.0 & 5.0
24	(f)(1)(ix)	A determination of the hazardous waste residence time as required by §63.1206(b)(11)	Not applicable Variable by waste type.
25	(f)(1)(x)	If you are requesting to extrapolate metal feedrate limits from comprehensive performance test levels under §§63.1209(l)(1)(v) or 63.1209(n)(2)(vii)	Not Applicable No waste extrapolation is proposed for this test. Will maintain current approved feed limitations for metals.
26	(f)(1)(x)(A)	A description of the extrapolation methodology and rationale for how the approach ensures compliance with the emission standards	Not Applicable
27	(f)(1)(x)(B)	Documentation of the historical range of normal (i.e., other than during compliance testing) metals feedrates for each feedstream	Not Applicable
28	(f)(1)(x)(C)	Documentation that the level of spiking recommended during the performance test will mask sampling and analysis imprecision and inaccuracy to the extent that the extrapolated feedrate limits adequately assure compliance with the emission standards	Not Applicable
29	(f)(1)(xi)	If you do not continuously monitor regulated constituents in natural gas, process air feedstreams, and feedstreams from vapor recovery systems under §63.1209(c)(5), you must include documentation of the expected levels of regulated constituents in those feedstreams	CAA Permit 301-0050-Z013
30	(f)(1)(xii)	Documentation justifying the duration of system conditioning required to ensure the combustor has achieved steady-state operations under performance test operating conditions, as provided by paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
31	(f)(1)(xiii)	For cement kilns with in-line raw mills, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
32	(f)(1)(xiv)	For preheater or preheater/precalciner cement kilns with dual stacks, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
33	(f)(1)(xv)	If you request to use Method 23 for dioxin/furan you must provide the information required under §63.1208(b)(1)(i)(B)	SW-846 Method 0023A will be used.
34	(f)(1)(xvi)	If you are not required to conduct performance testing to document compliance with the mercury, semivolatile metals, low volatile metals, or hydrogen chloride/chlorine gas emission standards under paragraph (m) of this section, you must include with the comprehensive performance test plan documentation of compliance with the provisions of that section	Section 3.3
35	(f)(1)(xvii)	If you propose to use a surrogate for measuring or monitoring gas flowrate, you must document in the comprehensive performance test plan that the surrogate adequately correlates with gas flowrate, as required by paragraph (m)(7) of this section, and §63.1209(j)(2), (k)(3), (m)(2)(i), (n)(5)(i), and (o)(2)(i)	Not Applicable
36	(f)(1)(xviii)	You must submit an application to request alternative monitoring under §63.1209(g)(1) not later than with the comprehensive performance test plan, as required by §63.1209(g)(1)(iii)(A)	Not Applicable
37	(f)(1)(xix)	You must document the temperature location measurement in the comprehensive performance test plan, as required by §§63.1209(j)(1)(i) and 63.1209(k)(2)(i)	Table 1
38	(f)(1)(xx)	If your source is equipped with activated carbon injection, you must document in the comprehensive performance test plan	Not Applicable
39	(f)(1)(xx)(A)	The manufacturer specifications for minimum carrier fluid flowrate or pressure drop, as required by §63.1209(k)(6)(ii)	Not Applicable

Item	63 CFR 1207	Requirement	Location
40	(f)(1)(xx)(B)	Key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, if you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, as required by §63.1209(k)(6)(iii)	Not Applicable
41	(f)(1)(xxi)	If your source is equipped with a carbon bed system, and you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, you must include in the comprehensive performance test plan key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, as required by §63.1209(k)(7)(ii)	Not Applicable
42	(f)(1)(xxii)	If you feed a dioxin/furan inhibitor into the combustion system, you must document in the comprehensive performance test plan key parameters that affect the effectiveness of the inhibitor, and the operating limits you establish for those parameters based on the inhibitor fed during the performance test, if you elect not to specify and use the brand and type of inhibitor used during the comprehensive performance test, as required by §63.1209(k)(9)(ii)	Not Applicable
43	(f)(1)(xxiii)	If your source is equipped with a wet scrubber and you elect to monitor solids content of the scrubber liquid manually but believe that hourly monitoring of solids content is not warranted, you must support an alternative monitoring frequency in the comprehensive performance test plan, as required by §63.1209(m)(1)(i)(B)(1)(i)	Not Applicable See Section 4.0
44	(f)(1)(xxiv)	If your source is equipped with a particulate matter control device other than a wet scrubber, baghouse, or electrostatic precipitator, you must include in the comprehensive performance test plan	---
45	(f)(1)(xxiv)(A)	Documentation to support the operating parameter limits you establish for the control device, as required by §63.1209(m)(1)(iv)(A)(4)	Section 1.0 & Table 1
46	(f)(1)(xxiv)(B)	Support for the use of manufacturer specifications if you recommend such specifications in lieu of basing operating limits on performance test operating levels, as required by §63.1209(m)(1)(iv)(D)	Not Applicable
47	(f)(1)(xxv)	If your source is equipped with a dry scrubber to control hydrogen chloride and chlorine gas, you must document in the comprehensive performance test plan key parameters that affect adsorption, and the limits you establish for those parameters based on the sorbent used during the performance test, if you elect not to specify and use the brand and type of sorbent used during the comprehensive performance test, as required by §63.1209(o)(4)(iii)(A)	Not Applicable
48	(f)(1)(xxvi)	For purposes of calculating semivolatile metal, low volatile metal, mercury, and total chlorine (organic and inorganic), and ash feedrate limits, a description of how you will handle performance test feedstream analytical results that determines these constituents are not present at detectable levels	RCRA Permit Table 5-3 governs feed rates.
49	(f)(1)(xxvii)	Such other information as the Administrator reasonably finds necessary to determine whether to approve the performance test plan	Not Applicable No additional data has been requested.
50	(g)	Operating conditions during testing. You must comply with the provisions of §63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of §63.7(e)(1) to conduct performance testing under representative operating conditions	See 82 – 93
51	(g)(1)(i)	Comprehensive performance testing—(i) Operations during testing. For the following parameters, you must operate the combustor during the performance test under normal conditions (or conditions that will result in higher than normal emissions)	Section 3.0
52	(g)(1)(i)(A)	Chlorine feedrate. You must feed normal (or higher) levels of chlorine during the dioxin/furan performance test	Section 2.0
53	(g)(1)(i)(B)	Ash feedrate. For hazardous waste incinerators, you must conduct the following tests when feeding normal (or higher) levels of ash: The semivolatile metal and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 2.0

Item	63 CFR 1207	Requirement	Location
54	(g)(1)(i)(C)	Cleaning cycle of the particulate matter control device. You must conduct the following tests when the particulate matter control device undergoes its normal (or more frequent) cleaning cycle: The particulate matter, semivolatile metal, and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 4.0
55	(g)(1)(ii)	Modes of operation. Given that you must establish limits for the applicable operating parameters specified in §63.1209 based on operations during the comprehensive performance test, you may conduct testing under two or more operating modes to provide operating flexibility	Not Applicable Operating limits are already established.
56	(g)(1)(iii)(A)	Steady-state conditions. (A) Prior to obtaining performance test data, you must operate under performance test conditions until you reach steady-state operations with respect to emissions of pollutants you must measure during the performance test and operating parameters under §63.1209 for which you must establish limits. During system conditioning, you must ensure that each operating parameter for which you must establish a limit is held at the level planned for the performance test. You must include documentation in the performance test plan under paragraph (f) of this section justifying the duration of system conditioning	Section 3.0 & SAP/QAPP Section 6.3
57	(g)(1)(iii)(B)	If you own or operate a hazardous waste cement kiln that recycles collected particulate matter (i.e., cement kiln dust) into the kiln, you must sample and analyze the recycled particulate matter prior to obtaining performance test data for levels of selected metals that must be measured during performance testing to document that the system has reached steady-state conditions (i.e., that metals levels have stabilized).	Not Applicable
58	(h)(1)	Operating conditions during subsequent testing. (1) Current operating parameter limits established under §63.1209 are waived during subsequent comprehensive performance testing	Not Applicable No waiver of current approved operating limits is requested.
59	(h)(2)	Current operating parameter limits are also waived during pretesting prior to comprehensive performance testing for an aggregate time not to exceed 720 hours of operation (renewable at the discretion of the Administrator) under an approved test plan or if the source records the results of the pretesting. Pretesting means	Not Applicable No waiver of current approved operating limits is requested.
60	(h)(2)(i)	Operations when stack emissions testing for dioxin/furan, mercury, semivolatile metals, low volatile metals, particulate matter, or hydrogen chloride/chlorine gas is being performed	Not Applicable No waiver of current approved operating limits is requested.
61	(h)(2)(ii)	Operations to reach steady-state operating conditions prior to stack emissions testing under paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
62	63.7(c)(2)(i)	Submission of site-specific test plan. Before conducting a required performance test, the owner or operator of an affected source shall develop and, if requested by the Administrator, shall submit a site-specific test plan to the Administrator for approval. The test plan shall include a test program summary, the test schedule, data quality objectives, and both an internal and external quality assurance (QA) program. Data quality objectives are the pretest expectations of precision, accuracy, and completeness of data	Conditions 1/2 & SAP/QAPP
63	63.7(c)(2)(ii)	The internal QA program shall include, at a minimum, the activities planned by routine operators and analysts to provide an assessment of test data precision; an example of internal QA is the sampling and analysis of replicate samples	SAP/QAPP Section 6.0
64	63.7(c)(2)(iii)	The performance testing shall include a test method performance audit (PA) during the performance test	SAP/QAPP Section 5.0
65	63.7(c)(2)(iii)(A)	The source owner, operator, or representative of the tested facility shall obtain an audit sample, if commercially available, from an AASP for each test method used for regulatory compliance purposes. No audit samples are required for the following test methods: Methods 3A and 3C of appendix A-3 of part 60; Methods 6C, 7E, 9, and 10 of appendix A-4 of part 60; Methods 18 and 19 of appendix A-6 of part 60; Methods 20, 22, and 25A of appendix A-7 of part 60; and Methods 303, 318, 320, and 321 of appendix A of part 63	SAP/QAPP Sections 5.0 & 14.5

Item	63 CFR 1207	Requirement	Location
66	63.7(c)(2)(iii)(B)	An AASP shall have and shall prepare, analyze, and report the true value of audit samples in accordance with a written technical criteria document that describes how audit samples will be prepared and distributed in a manner that will ensure the integrity of the audit sample program. An acceptable technical criteria document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
67	63.7(c)(2)(iii)(B)(1)	Preparing the sample	SAP/QAPP Sections 5.0 & 14.5
68	63.7(c)(2)(iii)(B)(2)	Confirming the true concentration of the sample	SAP/QAPP Sections 5.0 & 14.5
69	63.7(c)(2)(iii)(B)(3)	Defining the acceptance limits for the results from a well qualified tester. This procedure must use well established statistical methods to analyze historical results from well qualified testers. The acceptance limits shall be set so that there is 95 percent confidence that 90 percent of well qualified labs will produce future results that are within the acceptance limit range	SAP/QAPP Sections 5.0 & 14.5
70	63.7(c)(2)(iii)(B)(4)	Providing the opportunity for the compliance authority to comment on the selected concentration level for an audit sample	SAP/QAPP Sections 5.0 & 14.5
71	63.7(c)(2)(iii)(B)(5)	Distributing the sample to the user in a manner that guarantees that the true value of the sample is unknown to the user	SAP/QAPP Sections 5.0 & 14.5
72	63.7(c)(2)(iii)(B)(6)	Recording the measured concentration reported by the user and determining if the measured value is within acceptable limits	SAP/QAPP Sections 5.0 & 14.5
73	63.7(c)(2)(iii)(B)(7)	Reporting the results from each audit sample in a timely manner to the compliance authority and to the source owner, operator, or representative by the AASP	SAP/QAPP Sections 5.0 & 14.5
74	63.7(c)(2)(iii)(B)(8)	Evaluating the acceptance limits of samples at least once every two years to determine in consultation with the voluntary consensus standard body if they should be changed	SAP/QAPP Sections 5.0 & 14.5
75	63.7(c)(2)(iii)(B)(9)	Maintaining a database, accessible to the compliance authorities, of results from the audit that shall include the name of the facility tested, the date on which the compliance test was conducted, the name of the company performing the sample collection, the name of the company that analyzed the compliance samples including the audit sample, the measured result for the audit sample, the true value of the audit sample, the acceptance range for the measured value, and whether the testing company passed or failed the audit	SAP/QAPP Sections 5.0 & 14.5
76	63.7(c)(2)(iii)(C)	The accrediting body shall have a written technical criteria document that describes how it will ensure that the AASP is operating in accordance with the AASP technical criteria document that describes how audit samples are to be prepared and distributed. This document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
77	63.7(c)(2)(iii)(C)(1)	Checking audit samples to confirm their true value as reported by the AASP	SAP/QAPP Sections 5.0 & 14.5
78	63.7(c)(2)(iii)(C)(2)	Performing technical systems audits of the AASP's facilities and operating procedures at least once every two years	Not Applicable
79	63.7(c)(2)(iii)(C)(3)	Providing standards for use by the voluntary consensus standard body to approve the accrediting body that will accredit the audit sample providers	Not Applicable
80	63.7(c)(2)(iii)(D)	The technical criteria documents for the accredited sample providers and the accrediting body shall be developed through a public process guided by a voluntary consensus standards body (VCSB)	Not Applicable
81	63.7(c)(2)(v)	The Administrator may request additional relevant information after the submittal of a site-specific test plan	Not Applicable

Item	63 CFR 1207	Requirement	Location
82	63.7(e)(1)	Conduct of performance tests. (1) Performance tests shall be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance (i.e., performance based on normal operating conditions) of the affected source. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test, nor shall emissions in excess of the level of the relevant standard during periods of startup, shutdown, and malfunction be considered a violation of the relevant standard unless otherwise specified in the relevant standard or a determination of noncompliance is made under §63.6(e). Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests	Section 3.0 & SAP/QAPP Section 6.3
83	63.7(e)(2)	Performance tests shall be conducted and data shall be reduced in accordance with the test methods and procedures set forth in this section, in each relevant standard, and, if required, in applicable appendices of parts 51, 60, 61, and 63 of this chapter unless the Administrator	Sections 3.0 & 4.0, CMS Plan Section 4.0
84	63.7(e)(2)(i)	Specifies or approves, in specific cases, the use of a test method with minor changes in methodology (see definition in §63.90(a)). Such changes may be approved in conjunction with approval of the site-specific test plan (see paragraph (c) of this section); or	Section 3.3
85	63.7(e)(2)(ii)	Approves the use of an intermediate or major change or alternative to a test method (see definitions in §63.90(a)), the results of which the Administrator has determined to be adequate for indicating whether a specific affected source is in compliance; or	Not Applicable
86	63.7(e)(2)(iii)	Approves shorter sampling times or smaller sample volumes when necessitated by process variables or other factors; or	Not Applicable
87	63.7(e)(2)(iv)	Waives the requirement for performance tests because the owner or operator of an affected source has demonstrated by other means to the Administrator's satisfaction that the affected source is in compliance with the relevant standard	Not Applicable
88	63.7(e)(3)	Unless otherwise specified in a relevant standard or test method, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the relevant standard. For the purpose of determining compliance with a relevant standard, the arithmetic mean of the results of the three runs shall apply. Upon receiving approval from the Administrator, results of a test run may be replaced with results of an additional test run in the event that	Section 9.0
89	63.7(e)(3)(i)	A sample is accidentally lost after the testing team leaves the site; or	SAP/QAPP Section 5.3
90	63.7(e)(3)(ii)	Conditions occur in which one of the three runs must be discontinued because of forced shutdown; or	Section 9.0
91	63.7(e)(3)(iii)	Extreme meteorological conditions occur; or	SAP/QAPP Section 5.0
92	63.7(e)(3)(iv)	Other circumstances occur that are beyond the owner or operator's control	SAP/QAPP Section 5.0
93	63.7(e)(4)	Nothing in paragraphs (e)(1) through (e)(3) of this section shall be construed to abrogate the Administrator's authority to require testing under section 114 of the Act	Not Applicable No additional requests have been made at this time.

STATIC DETONATION CHAMBER EMISSIONS TEST PLAN for CONDITION 1

Revision 1, April 2016

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RCRA Permit Controlled Document

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LIST OF ACRONYMS AND ABBREVIATIONS

~ .....approximately
≤ .....less than or equal to
< .....less than
> .....greater than
% .....percent
º .....degrees

ACWA .....Assembled Chemical Weapons Alternative
ADEM.....Alabama Department of Environmental Management
AFO.....Anniston Field Office
ANAD .....Anniston Army Depot

CAA .....Clean Air Act
CEMS.....Continuous Emissions Monitoring System
CFR .....Code of Federal Regulations
CO .....carbon monoxide
CON .....Control Room
CPT .....comprehensive performance test
CRO .....CON Operator

DC .....detonation chamber
DRE.....destruction and removal efficiency

EPA .....Environmental Protection Agency
EPT-C1 .....SDC Emissions Test Plan for Condition 1

ºF .....degree(s) Fahrenheit
FPI.....feed prohibited interlock

HAP.....hazardous air pollutant
HEPA .....high efficiency particulate air

IAW.....in accordance with
ICS .....Instrument Control System
ID .....induced draft
lb/event.....pound(s) per event
lb/hr .....pound(s) per hour

LC1 .....Loading Chamber 1
LC2 .....Loading Chamber 2
LDC.....lower DC

MACT .....Maximum Achievable Control Technology

NEW .....net explosive weight

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

NOC .....Notice of Compliance

O_2 .....diatomic oxygen
OGT .....off-gas treatment

PDARS.....Process Data Acquisition and Recording System
PLC .....programmable logic controller
POHC.....principal organic hazardous constituent
ppmv .....part(s) per million by volume

QAPP .....Quality Assurance Project Plan

RATA.....Relative Accuracy Test Audit
RCRA.....Resource Conservation and Recovery Act

SAP .....Sampling and Analysis Plan
SDC.....static detonation chamber

TRM.....Temporary Reference Method (CEMS)

UDC .....upper detonation chamber
ug/dscm .....microgram(s) per dry standard cubic meter
US .....United States

WDC .....Washington Demilitarization Company, LLC.
WMM.....waste military munition

1.0 FACILITY OVERVIEW

The United States (US) Army built a Static Detonation Chamber (SDC) System for the thermal treatment of conventional waste military munitions (WMM), disassembled explosive components removed from both WMM and chemical munitions that have been verified 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 waste. The SDC System is located at the Building 695 Complex at the Anniston Army Depot (ANAD) in Anniston, Alabama.

The Assembled Chemical Weapons Alternative (ACWA), represented by the Anniston Field Office (AFO), is the government owner of the facility. Washington Demilitarization Company (WDC), LLC., is the operator of the SDC. General facility information is listed below:

Mailing Address:	7 Frankfort Avenue c/o: SDC, ANAD Building 75 Anniston, AL 36201
Physical Address:	Same
EPA ID Number:	AL3 210 020 027
Facility Contact:	Timothy K. Garrett
Telephone Number:	(256) 238-1652

2.0 REGULATORY COMPLIANCE STATUS

The SDC operates under Resource Conservation and Recovery Act (RCRA) Permit, AL3 210 020 027, issued pursuant to the Code of Alabama 1975 §§ 22-30-1-et. seq. Further references to this permit will be termed the RCRA Permit. The SDC must also comply with its Clean Air Act (CAA) Permit, 301-0050-Z013. The Alabama Department of Environmental Management (ADEM) has determined that while the SDC is not directly regulated under the Maximum Achievable Control Technology (MACT) standards, operation of the unit is required to meet the standards found in MACT subpart EEE as applicable. As a result, a comprehensive performance test (CPT) for this unit will be conducted to demonstrate compliance with applicable EEE standards.

Compliance with the MACT for the SDC was demonstrated via an initial CPT-like emissions test conducted in August 2011. The execution for the subsequent CPT-like emissions test shall be conducted no longer than 61 months after the date of commencing the previous CPT. For the SDC, the subsequent CPT-like emissions test must be initiated no later than September 2016. .

WDC plans to execute the SDC Emissions Test Plan for Condition 1 (ETP-C1) in September 2016. The submittal of this plan to the ADEM, Land and Air Divisions, serves as the official 1-year notice required for submittal of the ETP-C1 and SDC Continuous Monitoring System Plan as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii).

3.0 TESTING PROGRAM

The purpose of the ETP-C1 is to demonstrate the performance of the SDC and Off-Gas Treatment (OGT) Systems at normal operating and feed conditions while meeting the testing objectives. No operating or feed parameters will be re-established as part of this ETP-C1 only demonstration of the existing parameters established during the initial CPT. Agent-free WMM will be used during the ETP-C1 as feed.

A minimum of 3 valid test runs is required for the ETP-C1. If any test run is not executed under steady-state conditions, or if data is lost or compromised in any way, the results of that test run may or may not be included in the ETP-C1 report. If a test run is not completed, the abandoned test run will not be included in the ETP-C1 report. If a test run is completed and the data is lost or compromised, any available results will be included in the ETP-C1 report. An additional test run may be executed at the discretion of the Test Director.

WDC has the responsibility for executing the ETP-C1. The emissions sampling, packaging, transporting of samples to the off-site laboratory(s) for analysis, and reporting the results will be in accordance with (IAW) the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) (see Appendix A). The SAP/QAPP documents the precision, accuracy, representativeness, completeness, and comparability of the data set.

The Test Director will be the point of contact for any concerns associated with the ETP-C1. During the initial pre-job brief for the ETP-C1, a detailed organization chart and duty roster, including the names of personnel as identified by title, will be provided.

3.1 Objectives

The objectives for the ETP-C1 are as follows:

- Demonstrate that dioxin/furan emissions do not exceed 0.20 nanograms (by Toxic Equivalency Quotient) per dry standard cubic meter corrected to 7 percent (%) oxygen (O_2);
- Demonstrate that mercury emissions do not exceed 130 micrograms per dry standard cubic meter (ug/dscm) corrected to 7% O_2;
- Demonstrate that lead and cadmium (combined) emissions do not exceed 230 ug/dscm corrected to 7% O_2;
- Demonstrate that arsenic, beryllium, and chromium (combined) emissions do not exceed 92 ug/dscm corrected to 7% O_2;
- Demonstrate that carbon monoxide (CO) emissions do not exceed 100 parts per million by volume (ppmv) dry basis and corrected to 7% O_2 (instantaneous reading) using facility Continuous Emissions Monitoring System (CEMS);
- Demonstrate that hydrochloric acid and chlorine gas emissions do not exceed 32 ppmv, expressed as hydrochloric acid equivalents, dry basis and corrected to 7% O_2;
- Demonstrate that particulate matter emissions do not exceed 0.013 grains per dry standard cubic feet corrected to 7% O_2;
- Demonstrate that emissions are less than the screening levels established in the Human Health Risk Assessment;

- Conduct a Relative Accuracy Test Audit (RATA) during a test run to validate the facility CEMS data.

The ETP-C1 will verify that the operation of the SDC and OGT Systems at normal operating and processing conditions does not pose an unacceptable risk to public health or the environment.

3.2 Principal Organic Hazardous Constituent (POHC) Selection Rationale

Compliance with the Destruction and Removal Efficiency (DRE) requirement was demonstrated during the initial CPT conducted in 2011. Per 40 CFR 63.1206(b)(7), documented compliance with DRE is only required once providing no modifications have been made that could affect the ability of the SDC to achieve the DRE standard since the DRE test was performed. To date, no modifications have been made to the SDC which would hinder compliance with the DRE standard; therefore, selection of a POHC is not applicable.

3.3 Assessment of Hazardous Air Pollutants (HAPs)

HAPs as identified in 42 United States Code 7412 have been evaluated against the constituents comprising each WMM component, including propellant. For the HAPs identified, none exceed the limits listed in RCRA Permit Table 5-3. As allowed under 40 CFR 63.1207(f)(1)(ii), SDC will not quantify any feed for possible degradation products or other contaminants as no programmatic data currently exists which would support any reasonable estimation of degradation.

3.4 Feed Description and Limitations

The SDC System is designed to accept all munitions, including over packed munitions. All materials fed to the system may include the original packaging. Removal of munitions from their packaging is not required. The handling for feeding is limited to moving the original packages to a feed tray placed on a feed conveyor. In the event that the munitions are not individually packaged, the process allows for loading the feed tray without the need for reconfiguring the SDC.

Conventional WMM can be processed in the system as long as the following boundary conditions are not exceeded:

- Chlorine less than (<) 11.1 pounds per event (lb/event),
- Sulfur < 6.3 lb/event,
- Detonating explosives < 6.7 lb/event (non-mass and mass),
- No shape charges unless shape charge is disengaged or altered prior to feeding in order to prevent equipment damage, and
- Overall weight < 330.7 lb/event (including feed tray).

The agent-free WMM components are generated from operations conducted at the Pueblo Chemical Agent Pilot Plant. If PCAPP generated WMM components are not available in sufficient quantities to support this testing, an alternative WMM component sourced from existing Army demilitarization stockpiles may be used which has comparable constituent compared to normal processing rates of PCAPP WMM components.

With the exception of N335 fuzes, agent-free WMM components are generated at the PCAPP facility from either 105mm HD M60 cartridges/projectiles, 155mm HD M104/M110 projectiles,

and 4.2-inch HD/HT M2A1 cartridges. Based on the following estimated processing rates, the total energetic feed rates (express as net explosive weight [NEW]) per WMM component are as follows:

WMM Component	Explosive Content (lb-NEW/mun)	Peak Feed Rate (mun/event)	Total Explosive Rate (lb/event)
M6 Bursters	0.414	≤ 16	≤ 6.62
M5 Bursters	0.257	≤ 26	≤ 6.68
M51A5 Fuzes	0.04981	≤ 134	≤ 6.67
M57 Fuzes	0.0507	≤ 132	≤ 6.69
M28A1 Percussion Primers	0.04286	≤ 156	≤ 6.69
M67 Propellant Charge	2.825	≤ 2.3	≤ 6.50
M8 Burster/M14 Fuze	0.144	≤ 46	≤ 6.62
M2 Ignition Cartridge	0.017	≤ 394	≤ 6.70
M6 Propellant Charge	0.43	≤ 15	≤ 6.45
N335 Fuzes	0.0536	≤ 124	≤ 6.65

Based on planned treatability studies, SDC will petition to raise the non-mass detonating NEW limit. Accordingly, SDC has submitted a separate emissions test plan condition with the proposed feed and processing parameter changes.

3.5 Emissions Sampling and Analytical Protocols

Data quality objectives will be developed in a manner that is consistent with US Environmental Protection Agency's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA/240/B-06/001). Sampling and analysis procedures will be conducted IAW US EPA-approved sampling methods, RCRA/CAA Permits, and 40 Code of Federal Regulations (CFR) 60. The off-gas sampling and analytical methods to be used to quantify specific ETP-C1 parameters are as follows:

- US EPA Method 1, *Sample and Velocity Traverses for Stationary Sources*,
- US EPA Method 2, *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*,
- US EPA Method 3B, *Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air*,
- US EPA Method 4, *Determination of Moisture Concentration in Stack Gases*,
- US EPA Method 6C, *Determination of Sulfur Dioxide Emissions from Stationary Sources* (by Temporary Reference Method [TRM] CEMS),
- US EPA Method 7E, *Determination of Nitrogen Oxides Emissions from Stationary Sources* (by TRM CEMS),
- US EPA Method 10, *Determination of Carbon Monoxide Emissions from Stationary Sources* (by facility and TRM CEMS),
- SW-846 Method 0010, *Semivolatile Organic Compounds (SVOCs), Total Chromatographic Organics (TCO) Compounds, and Organics with Boiling Points*

300 °C or Higher (GRAV) Using Modified Method 5 Sampling Train,

- SW-846 Method 0023A, *Sampling Method for Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofuran Emissions from Stationary Sources*,
- SW-846 Method 0031, *Sampling Method for Volatile Organic Compounds*,
- SW-846 Method 0040, *Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags*,
- US EPA Method 26A, *Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method*,
- US EPA Method 5, *Determination of Particulate Matter Emissions from Stationary Sources*,
- US EPA Method 29, *Determination of Metals Emissions from Stationary Sources* and
- US EPA Modified Method 5, *Modified Sampling Train for Energetic Compounds*.

In addition to the emissions sampling, a RATA will also be conducted to validate the facility CEMS. Facility CEMS will be used to correct emission rates.

3.6 Sampling and Analysis Procedures

A detailed description of the sampling and analysis performed by the sampling contractor during the emission test is provided in Appendix A (SAP/QAPP).

3.7 Sampling Locations

The off-gas will be sampled at ports located between the safeguard filter and stack. The sampling locations were evaluated prior to testing by utilizing US EPA Methods 1 and 2 for representativeness. Schematic illustrations of the sampling locations can be found in Appendix D.

4.0 DETAILED ENGINEERING DESCRIPTION

The SDC System is designed for destruction of munitions and munition components by indirect/conductive heating. The munitions are fed via a conveyor system. The solid scrap material remaining from the munitions is emptied into a scrap-box via a scrap conveyor system. The off-gas generated is cleaned and filtered in the OGT System.

The loading area is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor transfer. After the loading conveyor is loaded, it moves 1 tray at a time to the lift. The lift transfers the tray to the level of the first loading chamber (LC1). From the lift, the item is then transferred to the apron of LC1. The loading conveyors and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.

Staging of a tray consists of deflating a pneumatic seal in the gate leading to LC1 and then raising the gate. An electrically operated ram, equipped with sensors to detect miss-feeds and other problems, pushes the tray into the LC1 and then retracts. The gate is lowered and

pneumatic seal inflated forming a gas-tight boundary. Staging of a tray into LC1 can occur while the previous tray is being processed in the DC.

When conditions are verified to be acceptable for initiating feed to the DC, the Control Room (CON) Operator (CRO) initiates the loading sequence for staging the next tray into the second loading chamber (LC2). The actions of transferring a tray to the DC are automatic but monitored in the CON and can be manually interrupted. The seals on both sides of the gate leading to LC2 are deflated and the gate is raised. The hydraulically operated ram pushes the tray into a cradle located in LC2 and then retracts. The gate leading to LC2 is lowered and the seals on both sides of the gate are inflated. This gate is rated to withstand blast pressures of the detonation chamber (DC).

The cradle and fragment valve within LC2 move as 1 unit but are located perpendicular to each other. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upon entering the DC, the munitions are heated resulting in a detonation and/or deflagration. The increase of pressure within the munition casing caused by the ambient heat of the DC alone is adequate to open the munition case and destroy fill material without the presence of explosives. The DC consists of an upper portion (UDC) which is fixed to the loading system and a lower portion (LDC) which can separate from the UDC. During detonation, the UDC and LDC portions of the DC are sealed by means of a locking ring, rope gasket and 6 pneumatic seals (3 on the top side of the locking ring, sealing to the UDC, and 3 underneath the locking ring, sealing the LDC).

To empty the DC, the pneumatic seals are deflated and locking ring is partially twisted to free the LDC. The LDC can then be lowered and tilted to empty the scrap. Following scrap emptying, the LDC is returned to the upright position and raised. The locking ring is twisted in the opposite direction to lock the UDC and LDC together and the pneumatic seals on both sides of the locking ring are inflated to seal the locking to each respective portion of the DC.

The LDC contains electric heaters to maintain the DC at high temperatures. Both the UDC and LDC are constructed of heat resistant steel which can withstand the mechanical stress loads caused by detonation pressures at high temperatures. Inside the LDC, a fragment shield acts as a sacrificial plate to absorb impacts from fragmentation.

The OGT System consist of a buffer tank which absorbs pressure perturbations caused by blast waves within the DC, followed by an orifice or control valve which also helps to equalize the flow going to downstream components of the system.

Off-gases from the detonation and/or deflagration are further treated by a spray dryer, baghouse filter, quench venturi, acid scrubber, and neutral scrubber. Off-gases received from the thermal oxidizer are cooled by a spray dryer followed by a baghouse to remove salts and particulates. The remaining contaminants are removed by the acid and neutralization scrubbers. The last step is a multistage exhaust filtration system, which acts as a safeguard to the OGT System prior to releasing the off-gas to the environment.

A description of key equipment is provided below.

Conveyor System

The conveyor system is electrically powered and consists of a series of conveyors which transport the trays to the lift.

Gate 1

Gate 1 is a hydraulically operated sliding gate located at the inlet to LC1. Gate 1 is sealed gastight with a pneumatic seal. An electric pusher propels the package into LC1.

Loading Chamber 1 (LC1)

LC1 is a staging location prior to LC2.

Gate 2

Gate 2 is a hydraulically operated sliding gate located at the inlet to LC2 from LC1. Gate 2 is sealed gastight with 4 pneumatic seals which are designed to withstand design blast pressures within the DC.

Loading Chamber 2 (LC2) and Cradle

LC2 has a built-in hydraulically powered cradle and fragment valve which move as a single unit. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90º and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upper Detonation Chamber (UDC)

The UDC is mounted to the outlet flange of LC2. Connections for incoming process air, outlet off-gases, temperature sensors, and pressure gauges are placed on the UDC.

Lower Detonation Chamber (LDC)

The LDC has an inner fragment shield and outer chamber. Electrical resistance heating elements are located on the LDC.

Elevating and Turning System

When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks. The rotation of the LDC is made by a hydraulic motor connected to the LDC by a gearbox and roller chain.

Locking and Sealing System

The UDC and LDC are locked to each other with a locking ring during destruction. The locking ring is maneuvered by 2 hydraulic cylinders. For the emptying procedure the locking ring is turned to the open position and the LDC is lowered and tilted. The connection between UDC and LDC is sealed by 6 pressurized pneumatic gaskets during destruction.

Hydraulic Power Unit

The hydraulic power unit provides power to operate the lifting jacks, tilting motor, gates 1 and 2, locking ring, and pushers. It also has a built-in backup pump which is driven by the uninterrupted power supply of the SDC.

Scrap Chute and Scrap Conveyor

When removal of scrap material is required, the LDC is lowered and rotated so the scrap material can be transferred to the scrap conveyor via the scrap chute.

Scrap Conveyor System

Scrap conveyors 201, 202, and 203 are vibration conveyors which use gravity to transfer material. The scrap conveyors are separated by gates and can be operated independently of each other. Dust is removed and collected in a drum between scrap conveyers 202 and 203 when the scrap passes over a wire mesh. Scrap conveyor 203 allows visual inspections of WMM after treatment.

DC Air Heater

Air heaters are used to raise the temperature of the process air which is used to aid the destruction process.

Buffer Tank

The buffer tank is designed to smooth gas pressure and volume surges from the DC that occurs when a munition detonates or deflagrates. By smoothing surges to downstream equipment, the equipment is better able to operate near optimum design flow rates which allows for a more consistent removal of contaminants. The buffer tank is comprised of a cone-bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section. The bottom of the buffer tank has 2 slide valves that operate pneumatically. These valves periodically open and solids are collected in a drum for disposal. The entire tank and associated piping are maintained at a predetermined temperature using electric heaters and insulation.

Orifice Plate / Control Valve

An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between 2 pipe flanges. The control valve may be operated automatically to by-pass the orifice except when in a destruction cycle. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.

Process Ventilation Cyclone, Filter, and Fan

The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.

Thermal Oxidizer

The off-gases resulting from the detonation/deflagration process in the DC are transferred to a thermal oxidizer. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of a minimum of 2 seconds or more at greater than (>) 1,741 degrees Fahrenheit (°F) for the peak load expected from the upstream SDC. An additional flow of combustion air is automatically

added to ensure an oxygen rich environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.

Spray Dryer

The off-gas from the thermal oxidizer is quickly cooled to approximately (~) 350°F in the spray dryer by the injection of spent scrubber liquid into the gas stream. Evaporation of the spent scrubber liquid generates dry salts and particulates. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a screw feeder and slide gate valve for disposal.

Bag House Filter

The bag house is comprised of a filter system which uses bags layered with sodium bicarbonate, or similar, as the absorbent to remove dust and heavy metals from the off-gas. The ratio of the absorbent may be adjusted to fit the application. The absorbent is fed from a hopper by a pneumatic feed system to the outside of the bags providing a fresh surface to the incoming gases. Periodically when the pressure drop across the filter exceeds a predetermined set point, the bags are cleaned using a pulse jet and the spent solids are collected in a drum for disposal using a screw feeder and slide gate valve.

Quench Venturi

The quench venturi cools the off-gas from ~ 350 to 170°F by injecting solution water from the acid scrubber. Any remaining solution water is cooled and recycled to the acid scrubber sump.

Acid Scrubber

The acid scrubber cools the off-gas from ~ 170 to 150°F. The acid scrubber is designed where the scrubber liquid flows counter current to the gas flow. Dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off-gas by dissolving in the scrubber liquid making it acidic.

The conductivity of the scrubber liquid is also monitored. Rising conductivity is an indication of increasing dissolved salt content in the scrubber liquid. To counter act this, fresh water is added. Excess scrubber liquid is then transferred to the bleed water tank for mixing and pH correction.

Scrubber liquid is pumped from the bottom of the scrubber column to the top and distributed inside the column by a distribution pan. The off-gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure adequate mixing and contact between the liquid and gas, the columns are filled with a column packing material. As a safeguard, the temperature of the off-gas inlet is monitored. In case of a high temperature off-gas, an emergency water injection is used.

Neutral Scrubber

The neutral scrubber removes any residual contaminants that passed through the spray dryer and acid scrubber. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.

The scrubber liquid is monitored by a pH controller. Sodium hydroxide is used to maintain the proper neutral pH. The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.

To obtain a constant quality in the scrubber, spent scrubber liquid is periodically removed based on level and conductivity and transferred to the Bleed Water Tank for mixing and pH correction. Scrubber liquid is refreshed by the addition of caustic solution as needed.

Induced Draft (ID) Fans

The 2 ID fans are located between the neutral scrubber and inlet to the safeguard filter. Should an ID fan fail, the other will automatically assume the load. The ID fans ensure that the pressure of the off-gas in the thermal oxidizer is maintained below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. The ID fans work continuously during the operations.

Safeguard Filter

The safeguard filter system is an exhaust filtration unit. The exhaust filtration unit is designed as a series of filters and built IAW the requirements by the US Army's Chemical Demilitarization program. The function of the filter units is described below:

- Prefilter: Removes particulates remaining in the gas stream that may cause blinding or clogging of the downstream HEPA filter;
- High-Efficiency Particulate air (HEPA) Filter: Removes particulates down to 0.3 microns;
- Charcoal: Removes contaminants such as volatile and semi-volatile heavy metals;
- Charcoal: Serves as a backup for the first charcoal filter described above; and
- HEPA Filter: Ensures that there are no emissions of potentially contaminated particulates released to the atmosphere.

The filter housings are made of stainless steel and equipped with differential pressure monitors on all filters to ensure adequate flow and monitor for when a filter needs to be replaced. The safeguard filter system includes an ID fan to maintain negative pressure within system to protect against leakage.

Stack

The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist Industrial Ventilation Manual.

5.0 DESCRIPTION OF FEED PROHIBITED INTERLOCK SYSTEM

The primary function of the Feed Prohibited Interlock (FPI) System is to prevent the feeding of munitions if SDC conditions are outside RCRA Permit limits. During upset conditions, the FPI System automatically prohibits the transfer of munitions from LC1 to 2 until all conditions are met or within range. Instrumentation is provided to monitor process conditions; provide data for ensuring compliance with regulatory requirements; and provide appropriate process response and control needs for operational flexibility, safety interlocking, and shutdown features (see Appendix B).

An automatic control system is used with a centralized control console (including closed-circuit television monitors for observing operations at various locations) and locally mounted programmable logic controllers (PLC). SDC processing and sequencing operations are controlled automatically through a dedicated PLC. Interlocks are monitored and continuous checking is undertaken to determine any lack of completion of a programmed step. All upset conditions, operator entries into the system, and starting and stopping of equipment are logged with the time of occurrence by the Process Data Acquisition and Recording System (PDARS). Interlocks are provided to respond to various conditions. Shutdowns are either immediate or in stages, depending upon the situation.

6.0 OFF-GAS MONITORING EQUIPMENT

The CEMS is a complete system designed to measure CO and O_2 emissions from the SDC and OGT System IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE (see Appendix C). All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

The facility CEMS continuously monitor the off-gas, downstream of the OGT equipment, to include the ID fans and safeguard filter system. The CEMS have the ability to cause a FPI condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include 2 analyzers (primary or unit of record (UOR) and an online backup. Both analyzers will be certified to allow for operational flexibility.

CEMS components are mounted in a National Electrical Manufacturers Association Instrument Control System (ICS) cabinet located in a monitoring shelter. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS.

7.0 LOCATION AND DESCRIPTION OF THE PROCESS CONTROL SYSTEM

The proper operation of the process control system is necessary to ensure consistent compliance with all RCRA/CAA Permit conditions and safe, efficient operation of the SDC and OGT Systems. The CON is the remote location where the SDC and OGT Systems are normally operated. The CON houses an operator control console, which includes closed-circuit television monitors for observing operations at various locations, as well as emergency shutdown controls. All remote operations, with exception of emergency shutdown, are performed through an operator keyboard using the equipment controls and indications displayed on HMI screens. Processing and sequencing operations are controlled automatically through the PLC, which continuously communicates with the operator console in the CON.

The PLC is programmed to continually scan for alarm conditions and to initiate alarms in the CON, alerting the operator of abnormal conditions. The process control software was designed to provide pre-alarms in the CON. These pre-alarms are used to warn the CON operator in time to take corrective action should a process variable approach a FPI condition.

The PDARS logs and notes the time of all abnormal conditions, as well as, the starting and stopping of equipment and operator entries. This system is also used to record process data such as temperature, pressure, and waste feed intervals. PDARS records data at varying intervals. The PDARS takes instantaneous readings at a maximum interval of fifteen seconds. The collected data is then averaged on a 1-minute basis. All PDARS data collected for RCRA/CAA instrumentation is included in the SDC operating record as required by the CAA/RCRA Permits and applicable regulations.

8.0 STARTUP/SHUTDOWN PROCEDURES

The SDC and OGT Systems will be brought up to normal operating conditions before introducing WMM to the DC. The phrase "normal operating condition" means that operating parameters are within parameters for initiating feed. Before the SDC and OGT Systems can be started, all utilities, including the FPI System, must be operational IAW SDC procedures.

FPIs are continuously monitored and interlocked and will be in operation during the emission test. In addition, the system's operation will be monitored by CRO. If the operation of the system should deviate significantly from the desired range of operation or become unsafe, the CRO will manually secure feed. In the event of a major equipment or system failure, it may be necessary to shut down the SDC and/or OGT System completely. A shutdown of this type will be performed IAW the SDC procedures.

9.0 SCHEDULE

The ETP-C1 test is expected to be executed in September 2016. The submittal of this plan will serve as the official 1-year MACT notice required for CPT-like emissions tests as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii). Sixty days prior to the ETP-C1, ADEM (Land and Air Divisions) will be notified of the intended execution date.

The ETP-C1 will commence after SDC has received approval of this plan and successfully completed shakedown of the SDC System. The ETP-C1 activities will span approximately 7 days including: 2 days for preparation, 4 days for testing, and 1 day for clean-up.

The ETP-C1 will consist of a minimum of 3 valid test runs. One (1) run per day is planned. The off-gas stream will be sampled until a minimum of 3 cubic meters is collected or approximately 44 hours. This, combined with port changes, will cause total test time each day to be at least 6 hours. Assuming minimal interruption during the emission test, the SDC and OGT Systems are expected to operate for 8 or more hours per test day. A fourth test run may be conducted at the discretion of the site management.

10.0 RAMP-UP PERIOD

The principal objective of the ramp-up period is to prepare the SDC and OGT System to safely process the munitions at proposed setpoints. Because SDC is not proposing to change any FPI setpoints, a ramp-up period of up to 720 hours is not required.

11.0 EMISSIONS TEST PERIOD

From the initiation of the first test run to the completion of the last test run, the SDC and OGT Systems will be within an emissions test period and hours of operation will not be considered shakedown hours.

12.0 POST-TEST PERIOD

For the duration of the post-trial period, the SDC and OGT Systems will be operated IAW the performance standards listed in the RCRA Permit until approval of the ETP-C1 report and Notice of Compliance (NOC).

13.0 EMISSIONS TEST RESULTS

A final ETP-C1 report/NOC must be submitted to ADEM (Land and Air Divisions) documenting that the ETP-C1 has been carried out IAW the approved plan within 90 days after completion of the last test run. All data and analyzed sample results from the ETP-C1 will be submitted in the final emission test report. A preliminary ETP-C1 report addressing demonstration of the intended performance standards and objectives will be submitted approximately 20 working days following receipt of the samples at the contracted laboratory(s).

14.0 FINAL PERMIT LIMITS

SDC does not intend to re-establish any FPI set points. Retention of the existing FPI setpoints will be requested after demonstrating successful operation within the previously establish operating envelope.

Table 1: FPI Conditions

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	MIN	1,741ºF
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	MAX	-0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	MAX	400º F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	170ºF
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200ºF
SDC-FPI-11	AIT-900	CO Concentration	MAX	100 ppm, dry basis @ 7% O_2 (instantaneous)
SDC-CPI-12	QICA 36008	Neutral Scrubber pH	MIN	7.0 pH

Footnote:
(1) Operational parameter(s) interlock will prohibit the transfer from LC1 into LC2 until all conditions are met or within range.

APPENDIX A: SAP/QAPP

STATIC DETONATION CHAMBER (SDC)
EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX A
SAMPLING AND ANALYSIS (SAP)/QUALITY ASSURANCE PROJECT PLAN (QAPP)

REVISION 1, APRIL 2016

Approvals:

SDC Test Director	**Date**
SDC Test Coordinator	**Date**
Sampling and Analysis Contractor	**Date**
Sampling and Analysis Contractor QA Manager	**Date**
Contracted Laboratory Project Manager	**Date**
Contracted Laboratory QA Manager	**Date**
Contracted Laboratory Project Manager (if applicable)	**Date**
Contracted Laboratory QA Manager (if applicable)	**Date**

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LIST OF ACRONYMS AND ABBREVIATIONS

% .....percent
≤ .....less than or equal to
± .....plus or minus
°C .....degrees Celsius
~ .....approximate
< .....less than
> .....greater than

ADEM.....Alabama Department of Environmental Management
ASTM .....American Society for Testing and Materials

CEMS.....Continuous Emissions Monitoring System
CFR.....Code of Federal Regulations
Cl_2 .....diatomic chlorine
CLP .....Contract Laboratory Program
CO_2.....carbon dioxide
COA .....certificate of analysis
COC .....chain of custody

DI .....deionized
DL .....detection limit
DNT .....dinitrotoluene
DQO.....data quality objective

EPA.....Environmental Protection Agency

FHR.....front-half rinse
FID .....flame ionization detector

GC.....gas chromatography
GRAV .....gravimetric

H_2O_2 .....hydrogen peroxide
H_2SO_4.....sulfuric acid
HCl.....hydrogen chloride
HDPE .....high density polyethylene
HF .....hydrogen fluoride
HNO_3.....nitric acid
HPLC .....high-performance liquid chromatography

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

HRA .....health risk assessment
HRGC .....high resolution gas chromatography
HRMS .....high resolution mass spectrometry

IAW.....in accordance with
ID .....inner diameter

$KMnO_4$.....potassium permanganate

L .....liter
L/min.....liters per minute
LCS .....laboratory control sample
LCSD .....laboratory control sample duplicate
LIMS .....laboratory information management system

M0010 .....SW-846 Method 0010
M0023A .....SW-846 Method 0023A
M0031 .....SW-846 Method 0031
M0040 .....SW-846 Method 0040
M10 .....US EPA Method 10
M26A .....US EPA Method 26A
M29 .....US EPA Method 29
m^3 .....cubic meter
m^3/hr.....cubic meters per hour
M3A .....US EPA Method 3A
M3B .....US EPA Method 3B
MDL.....method detection limit
mg .....milligram
mL .....milliliter
mm .....millimeter
MM5E .....US EPA Modified Method 5 for Energetics
MS.....mass spectrometry
MS.....matrix spike
MSD.....matrix spike duplicate

N.....normality
NaOH .....sodium hydroxide
NO_x .....nitrogen oxides

O_2 .....oxygen

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

PCDD.....polychlorinated dibenzo-p-dioxin
PCDF.....polychlorinated dibenzofuran
PDARS.....Process Data Acquisition and Recording System
PIC .....product of incomplete combustion
PM.....particulate matter
POHC.....principal organic hazardous constituent

QA.....quality assurance
QAPP .....Quality Assurance Project Plan
QC.....quality control

RCRA.....Resource Conservation and Recovery Act
RL .....reporting limit
RPD.....relative percent difference
RSD.....relative standard deviation

SAC.....sampling and analysis contractor
SAP .....Sampling and Analysis Plan
SDC.....Static Detonation Chamber
SO_2 .....sulfur dioxide
SRM .....standard reference material
SVOC.....semivolatile organic compounds

TCO.....total chromatographic organic
TIC .....tentatively identified compound
TRM.....temporary reference method
TX .....Tenax®

US .....United States

VOA.....volatile organic analysis

WDC .....Washington Demilitarization Company, LLC

1.0 PROJECT DESCRIPTION

A minimum of 3 test runs will be conducted on the Static Detonation Chamber (SDC). The SDC emissions test will provide emissions results and system data that will allow the performance of the SDC to be compared to applicable emission and performance standards. The purpose and specific requirements that apply to the emissions test are listed in the SDC Emissions Test Plans for Condtions 1 and 2.

This Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) is an essential guidance document by which the test objectives will be demonstrated. The SAP/QAPP describes procedures that will be implemented during the emission test to demonstrate that all of the associated data are of sufficient quality to serve as the basis for regulatory decisions for the SDC. The primary purpose of the SAP/QAPP is to define all aspects of the quality assurance (QA)/quality control (QC) procedures that should be applied to the emissions tests while establishing detailed sampling and analytical quality indicators that will demonstrate the achievement of the emissions test objectives.

The general concept by which the goals and data quality objectives (DQO) were formulated is very simple. In order for any emission test data to be acceptable as representative of system performance, data must be collected from valid test runs. If a run is attempted and fails, then another run must be initiated and completed to replace it. Validity of the data is determined by the permittee(s) and Alabama Department of Environmental Management (ADEM).

The duration of the sampling events (time) and analytical test method sensitivity (mass) are used to calculate the emissions rates. Sampling duration, sample collection rates, and analytical methods have been selected to provide emission results of sufficient sensitivity to demonstrate the test objectives. In addition to issues of sensitivity, accuracy, and precision, objectives must be determined for the SDC emissions tests. These parameters are obtained from United (US) Environmental Protection Agency (EPA) guidance primarily, and are presented as target acceptance limits for percent recovery, relative percent difference, and related parameters that are defined elsewhere.

It must be understood that analytical test method DQO are target values. The US EPA has clearly defined validation processes for data review for the Contract Laboratory Program (CLP) that is published as the *National Functional Guidelines for Data Review*. Data that exceed target DQO are usually flagged as estimates. There are limited reasons for rejecting data as not usable. Ultimately, only the end data users can decide if data is acceptable for its intended purpose. For this document, US EPA guidance is the primary source of analytical DQO. Target acceptance criteria are defined for many of the measurements that will be made during the emissions tests in US EPA-625/6-89-023, *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration*. When this document does not provide accuracy and precision objectives directly, then the cited analytical test method was reviewed to obtain guidance. If these 2

sources of analytical DQO do not address the accuracy and precision requirements adequately, then laboratory data history will be used to define test objectives. This process ensures that the target DQO for analytical data meet standard recommendations.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The emissions tests will be conducted by Washington Demilitarization Company, LLC (WDC) along with a Sampling and Analysis Contractor (SAC).

2.1 WDC MANAGEMENT

WDC is responsible for operating the SDC. WDC has contracted a SAC to provide independent sampling and analysis support to include: performance of emissions sampling, packing, transporting of exhaust gas samples to the analytical laboratory(s), sample analysis, and QA/QC associated with these tasks. The SAC may also assist in the validation of laboratory reports and preparation of the final report as required.

2.2 SAC PROJECT MANAGER

The SAC will have a team of experienced personnel to perform the required sampling. In addition, the SAC will ship exhaust gas samples to the SAC's analytical laboratory. The SAC Project Manager is responsible for all SAC personnel. The SAC Project Manager will report to the SDC Test Coordinator. The SAC Project Manager will have signature authority for the SAC and will certify all reports from the SAC to WDC to be correct. The SAC Project Manager may delegate certain responsibilities to his/her team members.

2.3 QUALIFICATIONS/CERTIFICATIONS

WDC personnel have written qualification, certification, and recertification records certifying that each individual has the necessary proficiency to perform the duties assigned according to job title. SAC personnel will have appropriate training and qualifications as well. Objective evidence of personnel training/qualifications will be documented and maintained. All training and certification documentation will be available for review upon request.

3.0 SAMPLING OVERVIEW

3.1 SAMPLING AND ANALYSIS SCHEDULE

The schedule for the conducting the emissions test is divided into 3 phases:

- Preparation Phase –
  - Preparation and approval of the emission test plan
  - Procurement of sampling equipment and supplies
  - Equipment cleaning and calibration
  - Mobilization of equipment and supplies to SDC
  - Mobilization of personnel on-site
  - Preparation of the equipment for sampling
- On-site Sampling and Data Acquisition Phase –
  - Collect samples and data from a minimum of 3 valid test runs per condition
- Post-Test Phase –
  - Final preparation of the samples
  - Demobilization of the equipment
  - Transport and receipt of the samples by the SAC's analytical laboratory
  - Analytical program management of the samples through the SAC's analytical laboratories
  - Data reporting, review, reduction, and validation
  - Compilation of the emission test report

3.2 INTERRUPTIONS AND INCOMPLETE TEST RUNS

In the case of a system upset or other abnormal conditions, the Test Director will decide the appropriate course of action based on the actual conditions encountered. In all cases of sampling interruption, all sample collection logs will document when the interruption occurred and when sampling resumed. All exhaust gas sample volumes will be based on the actual time of sample collection and exclude all interruptions.

In the unlikely event of an incident that could constitute a safety problem, sampling activities will be suspended as determined by the Test Coordinator. An assessment will then be made by the Test Director of the conditions that led to the interruption to determine an anticipated restart time.

3.3 SAMPLING DESCRIPTION AND STRATEGY

The sampling implemented during the emissions testing will consist of all test samples including exhaust gas and QA/QC samples. The sampling will be founded on current US EPA sample collection methods. The sampling will be documented through the use of sample collection sheets, sample checklists, sample master logs, and chain-of-custody (COC) forms. Copies of all completed sample collection documentation will be compiled and presented in the emissions test report.

The primary objective of the emissions test sampling is to collect, over the duration of the test period, samples that are representative of the actual matrix encountered, and to deliver these samples to the SAC's analytical laboratory for analysis. To accomplish this objective, the samples will be handled in such a way as to:

- Avoid cross-contamination from the time of collection,
- Identify and document each sample during its collection,
- Chemically or physically preserve the sample in the field, and
- Inventory, package, and deliver the sample to the SAC's analytical laboratory under the US EPA guidelines of traceability.

The overall results of a successful implementation of this emissions test sampling will be to yield samples of uncompromised quality that are documented for analysis. Table A-1 summarizes the planned analysis, container, sampling method, frequency, and total number of samples to be collected for each sample type.

3.4 SAMPLING LOCATIONS

Exhaust duct sampling locations are accessed through flanged ports in the duct. The sampling locations will be evaluated prior to testing by utilizing US EPA Methods 1 and 2 for representativeness.

3.5 PRE-SAMPLING ACTIVITIES AND EQUIPMENT CALIBRATION

Presampling activities include equipment calibration, sample media preparation, precleaning of the sample train glassware, and other miscellaneous tasks. Each of these activities are described or referenced in the following subsections. Other presampling activities include such details as team meetings, equipment packing and shipping, equipment setup, and finalization of all details leading up to the start of the sampling program.

3.5.1 <u>Glassware Preparation</u>

Before use in the field, sample train glassware and sample containers will require specialized precleaning to avoid contamination of the sample from the collection container or devices. All bottle caps will be fitted with Teflon® liners which will be cleaned in the same manner as the

bottles themselves. Cleaning and storage procedures for sample train glassware, as applicable, are summarized below.

- SW-846 Method 0010 (M0010) – Semivolatile Organic Compounds (SVOC), Total Chromatographic Organics (TCO) Compounds, and Organics with Boiling Points 300°C or Higher (GRAV) Using Modified Method 5 Sampling Train: Soap and water wash, deionized (DI) water rinse 3 times, acetone rinse 3 times, methanol/methylene chloride rinse 3 times. Seal open ends with Teflon® tape and hexane rinsed aluminum foil.
- SW-846 Method 0023A (M0023A) – Sampling Method for Polychlorinated Dibenzo-p-Dioxins (PCDD)/Polychlorinated Dibenzofurans (PCDF) Emissions from Stationary Sources: Soap and water wash, DI water rinse 3 times, acetone rinse 3 times, methylene chloride rinse 3 times, toluene rinse 3 times. Seal open ends with Teflon® tape and aluminum foil.
- SW-846 Method 0031 (M0031) – Sampling Method for Volatile Organic Compounds: Sonicate 1 hour in solution of laboratory soap, rinse with hot tap water, high-performance liquid chromatography (HPLC)-grade water rinse 3 times, oven dry at 110 degrees Celsius (^{o}C). Seal open ends with Teflon® tape, aluminum foil, or other non-contaminating material.
- SW-846 Method 0040 (M0040) – Sampling of Principal Organic Hazardous Constituents (POHC) from Combustion Sources using Tedlar® Bags:
  - Glassware, Sample Lines, and Rigid Containers - Soap and water wash, 10 percent (%) nitric acid (HNO_3) rinse 3 times, DI water rinse 3 times, oven dry at 130°C for 2 hours. Seal open ends with Teflon® tape and aluminum foil.
  - Tedlar® Bags – Flush each bag 3 times with high purity nitrogen. Fill the bag with nitrogen and analyze for total organics.
- US EPA Method 26A (M26A) – Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method: Soap and water wash, DI water rinse 3 times, rinse front-half with acetone, air dry. Seal open ends with Parafilm®.
- US EPA Method 29 (M29) – Determination of Metals Emissions from Stationary Sources: Rinse with hot tap water, soap and water wash, hot tap water rinse 3 times, DI water rinse 3 times, 10% HNO_3 soak for 4 hours minimum, DI water rinse 3 times, acetone rinse, air dry. Seal open ends with Parafilm® or other non-contaminating material.
- US EPA Modified Method 5 - Modified Sampling Train for Energetic Compounds (MM5E): Soap and water wash, DI water rinse 3 times, methanol

rinse 3 times, methylene chloride rinse 3 times, air dry. Seal open ends with Teflon® tape and hexane-rinsed aluminum foil.

These cleaning techniques have proven to reliably produce clean glassware as demonstrated by samples from blank trains. Copies of the methods identified above will be maintained on-site and will be available for review upon request. All trains and their components will be sampled and analyzed for background contribution in the form of reagent blank samples and as blank trains at least once during the emissions test.

3.5.2 Sampling Equipment Calibration

An important aspect of presampling preparation is the inspection and calibration of the equipment. Equipment is inspected for proper operation and durability before calibration. Calibration of sampling equipment will be conducted in accordance with (IAW) the procedures outlined in the EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III -- Stationary Source Specific Methods*, (EPA-600/4-77-027b and 600/R-94-038c), 40 Code of Federal Regulations (CFR) 60, and the specific equipment calibration requirements detailed in the applicable EPA sampling method source document. Table A-2 lists the calibration procedures for each piece of sampling equipment, their calibration criteria, and corrective actions.

The Orsat analyzer will be subject to an audit to demonstrate it is capable of producing acceptable results. Temporary Reference Method (TRM) Continuous Emissions Monitoring System (CEMS) will be used during the emissions test to monitor the exhaust gas for sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and oxygen (O_2). The TRM CEMS will be certified prior to use. Certification documentation will be available for review upon request.

3.5.3 Sampling Media Preparation

Resin used in the M0010, M0023A, and MM5E sampling trains will be packed in specially designed sorbent traps provided by the SAC. The resin will be purchased precleaned or prepared by the laboratory to meet or exceed all QC requirements specified in the method, as applicable. The date a batch of resin was cleaned will not be used to determine the usability of the resin. In all instances, resin will be used that has been cleaned and batch certified to be sufficiently clean for the applicable target analytes by the laboratory supplying the resin. The batch certification will be documented using copies of the actual analytical results used to batch certify the resin. A media request form will also accompany the resin traps that shows the batch identification of the resin used to prepare the traps and any spiking of the resin that was conducted.

Each M0010 and/or M0023A XAD-2 resin tube prepared will be spiked with a deuterated or isotopically labeled semivolatile compound and/or a labeled PCDD/PCDF isomer. Prior to use in the field, each XAD trap for the MM5E will be field-spiked with the surrogate

3,4-dinitrotoluene by the laboratory. In addition, the first impinger of the MM5E train will be spiked in the field with the surrogate 3,4-dinitrotoluene prior to sampling.

The M0031 sample tubes will be conditioned by the laboratory IAW procedures specified in the reference method. Laboratory preparation steps will meet or exceed all QC requirements specified in the method.

Before field use, filters designated for use in the M26A train will be given a unique sample number and tare weighed to a constant weight using a calibrated analytical balance in a laboratory. All tared train filters will be encased in cleaned petri dishes and sealed with Parafilm® and/or Teflon® tape until needed.

Sample containers that have been pre-cleaned to US EPA specifications and certified analyte-free will be purchased directly from the manufacturer/supplier and dedicated for use on this project. All containers will remain in their sealed shipping cartons until needed.

All chemical preservatives and reagents used in the trains will be purchased directly from the manufacturer/supplier and as specified in the applicable US EPA methods. These reagents will be ordered in small unit quantities so that they may remain sealed in their original shipping containers until needed.

4.0 ANALYTICAL METHODS AND PROCEDURES

4.1 ANALYTICAL PROGRAM DESCRIPTION AND STRATEGY

The analytical program that will be performed in support of the emissions test will consist of the analysis of all collected exhaust gas samples, their associated field QA/QC samples, as well as the analysis of all method-required and project-specific QA/QC analyses. This program will be founded on the latest US EPA and US Army analytical methods. The results of the sample analyses will be summarized on Certificates of Analysis (COA). A complete copy of all SAC analytical laboratory deliverables will be placed in the emissions test report. Table A-3 is a complete listing of all anticipated analyses, the sample types on which these will be performed, and their reference method.

The primary objective of the analytical program is to generate a database that most accurately reflects the composition of the samples being analyzed. This database will then be coupled with the sample collection information to complete the performance evaluation of the SDC. To accomplish this objective, the exhaust gas samples are prepared, extracted, and quantified in the SAC's analytical laboratory using procedures specified in the referenced analytical methodology and the resulting compiled data are reviewed to verify accuracy and completeness. The data is reviewed both internally at the SAC's analytical laboratory before publication and again during the reduction, interpretation, and evaluation phase of the project by the SAC.

This section also describes the procedures that will be followed during the analytical program and are available on-site. These procedures are founded on the referenced analytical methods but also address all project-specific QA/QC concerns. A separate procedure has been prepared for each analysis type listed in Table A-3. These procedures discuss the equipment to be used, holding times, and the details of the procedure. The procedures follow the US EPA and/or SW-846 methods.

4.2 ANALYTICAL METHODS, PROCEDURES, AND REFERENCES

Standard analytical reference methods, procedures, and techniques described in this plan will be followed during analysis of all samples collected and associated with the emissions test. The methods and procedures are discussed in detail in the following documents:

- *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*. SW-846 Third Edition, December 1996. EPA, Office of Solid Waste and Emergency Response (OSWER). Washington, D.C. 20460.
- 40 CFR 60, Appendix A, Methods 1 through 4, 26A, and 29.
- 40 CFR 60, Appendix B, Performance Specification 4B.
- Guidance for Total Organics, Final Report. EPA/600/R-96/033, EPA, March 1996.

The type of analysis, sample matrices, procedure descriptions, and associated reference methods (preparation and analysis) are summarized in Table A-3.

5.0 QA/QC OBJECTIVES

The QA/QC objective of the emissions test is to identify a complete data set that meets the criteria set forth in this plan. This data set will include all data quality indicators produced during the emissions test. In addition, the data acceptance criteria will be defined. The data acceptance criteria identify the target precision and accuracy limits that are used to assess the data quality. The overall DQO is to produce a database that will be suitable for completing an assessment of the operational performance of the SDC.

Personnel designated by the Test Director will review the field and analytical data obtained during the emissions test. The data quality will be discussed with regard to the planned data acceptance criteria and the overall emissions test objectives. Data that are determined to be outside of the target data QC limits will be evaluated to determine their impact on defining the SDC's performance. The data collection phase will be documented formally to provide complete traceability of the information pertinent to the system performance.

Table A-4 displays the target precision, accuracy, and frequency objectives, which have been defined for each type of analysis to be performed during the emissions test. The following definitions will be used.

Accuracy: Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that result from sampling and analytical operations.

Accuracy is determined by analyzing a reference method of known pollutant concentration or by reanalyzing a sample to which a material of known concentration or amount of pollutant has been added. Accuracy is usually expressed either as a percent recovery or as a percent bias. Determination of accuracy always includes the effects of variability (precision); therefore, accuracy is used as a combination of bias and precision.

Precision: Precision is a measure of agreement among replicate measurements of the same property, under prescribed conditions. This agreement is calculated as either the range or as the standard deviation(s). It may also be expressed as a percentage of the mean of the measurements, such as relative range or relative percent difference (RPD) for duplicates or relative standard deviation (RSD).

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that should have been collected (i.e., measurements that were planned to be collected). Samples that are judged to be invalid on

the basis of field performance indicators or aborted runs will not be submitted to the laboratory for analysis. The completeness objective will be to obtain acceptable results for all parameters for all valid test runs. The completeness DQO will be met if these valid tests are obtained. The impact of any sample losses will be assessed with regard to the objective of obtaining valid runs. Analytical results will be reported in the emission test report for all samples that receive analytical testing per regulatory reporting requirements.

Representativeness: Representativeness is a measure of the degree to which data accurately and precisely represent a characteristic of a population parameter at a sampling point or for a process or environmental condition. Representativeness is a qualitative term that should be evaluated to determine whether in situ and other measurements are made and physical samples collected in such a manner that the resulting data appropriately reflect the media and phenomenon measured or studied. Representativeness in sampling is achieved through the use of US EPA standard sampling methodologies, which are found EPA-625/6-89/023, *Quality Assurance/Quality Control Procedures (QA/QC) for Hazardous Waste Incineration*. Isokinetic sampling will be performed when required, ensuring representative samples for the applicable parameters.

Comparability: Comparability is the qualitative term that expresses the confidence that 2 data sets can contribute to a common analysis and interpolation. Comparability must be carefully evaluated to establish whether 2 data sets can be considered equivalent in regard to the measurement of a specific variable or groups of variables. In a laboratory analysis, the term comparability focuses on method type comparison, holding times, stability issues, and aspects of overall analytical quantitation.

Bias: Bias is the systemic or persistent distortion of a measurement process that causes errors in 1 direction. Bias assessment for environmental measurements is made using personnel, equipment, and spiking materials or reference materials as independent as possible from those used in the calibration of the measurement system. When possible, bias assessments should be based on analysis of spiked samples rather than reference materials so that the effect of the matrix on recovery is incorporated into the assessment.

Several procedures will be used for monitoring the precision and accuracy objectives of the analytical program. Sampling and analytical activities will follow standard referenced procedures whenever possible. Standard reference materials (SRM), calibration standards,

internal standards, and spiking compounds will be high-purity materials that are commercially available. Typically, these materials are greater than 99% pure and have a concentration that has been certified by the manufacturer. Analytical instruments used will be calibrated per the reference method requirements prior to sample analysis in order to demonstrate that accurate performance levels are being met. Data precision and accuracy will be assessed by evaluating the results from the analysis of internal standards, spiking compounds, laboratory blanks, calibration check standards, reagent and method blanks, field and trip blanks, duplicate samples, and matrix or surrogate spiked samples.

Neither ADEM nor US EPA have established quantitative standards for the precision, accuracy, representativeness, comparability, and completeness parameters that must be met by the data produced from the emissions test. However, US EPA has defined QA objectives for each of its reference sampling methodologies. These objectives are extensively detailed in the *Quality Assurance Handbook for Air Pollution Measurement System, Volume III, Stationary Source Specific Methods* (EPA/600/4-77-027b). These criteria generally establish calibration procedures and equipment acceptance criteria. Additionally, there are specific QA objectives for accuracy and precision of the sample preparation and analysis procedures that will be used in the SAC's laboratory.

When analytical QC procedures reveal that a measurement's error has exceeded the target criterion, the source of the deviation will be identified, and corrective action will be taken. If the data fall outside the acceptable range of precision and accuracy after corrective action has been taken, the out-of-range data points will be flagged and discussed specifically in the emissions test report. Whenever possible, alternative procedures (either sampling or analytical) will be considered and recommended to the Test Director/Coordinator.

5.1 PRECISION

Analytical precision for a single analyte is expressed as the RPD based on a percentage, which is calculated as follows:

$$RPD = \left| \frac{Value\ 1 - Value\ 2}{Arithmetic\ Mean\ of\ Values\ 1\ and\ 2} \right| x\ 100$$

Precision will be determined through the use of duplicates, laboratory control samples (LCS), laboratory control sample duplicates (LCSD), matrix spikes (MS), and matrix spike duplicates (MSD), as applicable, for the analytical work performed, see Table A-4.

Tables A-5 through A-8 show the surrogate and matrix spiking compounds and matrix-specific recovery limits that will be employed for volatile and semivolatile organics, energetics, and PCDD/PCDF analyses. The target precision estimates presented in Table A-4 display acceptable target variability levels for replicate measurements of the same parameters and are expressed in terms of RPD for duplicate samples. Precision data will be calculated and presented in the emission test report.

5.2 ACCURACY

Accuracy values presented in Table A-4 represent components of both random error and bias, which are expressed as percent recovery of a "known" concentration of analyte spike, internal standard spike, standard reference material analysis, or audit sample analysis. Where direct analyses of a known standard material can be evaluated, accuracy may be assessed by analysis of a sample of the reference standard. In cases in which the matrix or sample preparation is to be evaluated for effects on accuracy, MSs will be evaluated in the samples. In some cases, a combination of these accuracy evaluation procedures will be used. The accuracy of organic determinations by gas chromatography/mass spectrometry (GC/MS) and some GC/flame ionization detector (FID) analysis will include spiking each sample with surrogate standards and selected samples with MS compounds.

An evaluation of accuracy on the M0031 will include an evaluation of the analysis of the front- and back-half traps analyzed separately to determine possible target analyte breakthrough to the Anasorb® portion of the sampling train. The analysis of an Anasorb® trap should indicate less than 30% of the concentration that is collected by the front-half Tenax® traps. Breakthrough of the Anasorb® trap above this level may cause loss of the desorption efficiency and result in a negative bias in the analytical result. This criterion does not apply when less than 75 nanograms are detected on the back trap. The accuracy of the analysis of each individual trap will be evaluated based on the recovery of surrogate standards spiked on to each trap prior to trap desorbtion and analysis.

5.3 COMPLETENESS

Data completeness represents the percentage of valid data collected from a measurement system as compared to the total amount expected to be obtained under optimal, normal conditions. The sampling completeness objective will be to obtain representative samples for all analytical parameters while operating the unit at the desired test specifications for each test run. The completeness objective will be to obtain acceptable results for all parameters (i.e., 100%). The completeness DQO will be met if the necessary valid test runs are obtained. If a test run is not completed, the abandoned test run data will not be included in the emissions test report. If a test run is completed and the data is lost or compromised, the available results will be included in the emissions test report. If the completeness DQO is not achieved, the lack of completeness will be investigated and any lessons learned will be incorporated into future plans.

5.4 REPRESENTATIVENESS

Representativeness is achieved through sampling program design. By ensuring that sampling locations are selected properly and that standard protocols are used, the resulting data will represent the exhaust conditions existing at the site at the time of sample collection.

5.5 COMPARABILITY

Comparability of the data set will be achieved by using the standard techniques to collect and analyze representative samples, and by reporting analytical results in appropriate units.

6.0 SAMPLING AND MONITORING PROCEDURES

The primary objective of the emissions test sampling and monitoring program is the collection of representative exhaust gas samples that will provide the analytical and/or screening data necessary to evaluate the performance and demonstrate compliance with the SDC regulatory requirements. This objective will be met by reducing the risk of all known potential sources of fugitive contamination or bias that may be introduced to the samples by the sampling equipment, ambient conditions, handling, and sample preservation techniques. Table A-1 summarizes the planned sampling techniques, methodology, and containers that are to be used for each sample type collected during the test.

Exhaust gas samples will be collected using standard US EPA methods from either SW-846 or CFR specifications or US Army procedures in instances where US EPA methods are not available. During the emissions test, all sampling and monitoring activities will be documented. US EPA and ADEM approval will be requested if deviations from these procedures are expected during the sampling and monitoring procedures. The samples that will be collected are listed in Table A-3.

Prior to the start of each sampling run, the SAC will be responsible for verifying that the sampling trains have been assembled properly and that calibrations have been performed properly. The SAC will also check to see that proper absorbing solutions have been used, required leak-check procedures are performed, and sample recovery is performed properly after completion of the test run.

6.1 EXHAUST GAS SAMPLING

The collection of exhaust gas samples will be completed by following the standard US EPA and/or SW-846 methods. The SAC is responsible for operation of the sampling equipment and collection of exhaust gas samples during each test run. The SAC is also responsible for proper recovery and preparation of the exhaust gas samples for shipment to the analytical laboratory. During the emissions test, the SAC will be responsible for monitoring the sampling team's adherence to the standard sampling procedures and for completing and performing final review of calibration documentation. QA procedures that will be specifically applied to the sampling activities are discussed in the following sections.

6.1.1 US EPA Methods 1 and 2

US EPA Methods 1 and 2 will be used to determine the correct traverse point locations and to measure exhaust gas velocities at each of the traverses, respectively. The absence of cyclonic flow will also be documented during a preliminary traverse. The SAC will review all calibration and calculation documentation prior to the emissions test. The SAC will inspect the data for correct traverse point selection, absence of cyclonic flow, correct number of sampling points, and orientation of sampling ports. Documentation of the application and review of US EPA Methods 1 and 2 will be included in the emissions test report. The sample ports will conform to

US EPA Method 1 in that they are 2 duct diameters downstream of a disturbance and one-half duct diameter upstream. Velocity variation across the port is not anticipated since the duct diameter is constant.

6.1.2 US EPA Method 3B

During each test run, US EPA Method 3B will be used for the collection and analysis of integrated exhaust gas samples collected in Tedlar® bags and analyzed for oxygen (O_2) and carbon dioxide (CO_2) using the Orsat method. Multi-point integrated Tedlar® bag samples will be taken in conjunction with an isokinetic sampling train during each run. The SAC will monitor the analytical procedure for adherence to procedures prescribed in the method. These determinations will be documented and reviewed by the SAC for completeness. Once during the emissions test audit samples will be analyzed. The audit samples will consist of 2 cylinders containing O_2 and CO_2 (each cylinder will have different concentrations of each gas).

6.1.3 US EPA Method 4

Although a separate EPA Method 4 train will not be run, moisture will be determined IAW US EPA Method 4. The principle of this method is to remove the moisture from the sample stream and determine moisture either volumetrically or gravimetrically for each sample train.

6.1.4 SW-846 Method 0010 (SVOC)

The M0010 (SVOC) sampling train will be used to collect exhaust gas for an assessment of semivolatile PIC/TIC. During each test run, the M0010 (SVOC) sampling train will be assembled and leak-checked before sampling begins. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 cubic meters (m^3) of exhaust gas during each test run. At the end of each test run, the sampling train will be disassembled, and all train samples will be collected.

To quantitate PIC, all M0010 (SVOC) train samples will be analyzed against, at a minimum, the site-specific list of semivolatile compounds listed in Table A-11, which is derived from the SDC Health Risk Assessment (HRA) Protocol. In addition, the 20 largest non-target peaks that are greater than 10% of the nearest internal standard will be identified and quantitated as TIC.

Liquid and solid sample train fractions will be prepared for extraction as appropriate using SW-846 Method 3542. The sample train fractions will be spiked with surrogate compounds prior to extraction. Analysis for the semivolatile PICs will be performed using GC/MS IAW SW-846 Method 8270. All analytical fractions will receive analysis for this list of compounds with each compound's individually determined response factors used in the quantitation of the target analytes.

A spiking program will be applied to the M0010 (SVOC) trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds will be placed on the components of the train at the different stages of the sampling

and analytical program so that the efficiency of the method's performance can be measured quantitatively. By assuming that these compounds have chemical characteristics that are identical to the semivolatile target compounds, the overall method efficiency can be assessed. Tables A-5 and A-6 summarize the spiking materials that will be applied to the M0010 train samples.

6.1.5 SW-846 Method 0010 (TCO/GRAV)

A separate M0010 (TCO/GRAV) train will be used to collect exhaust gas samples for total semivolatile and nonvolatile organics. The sampling and analysis methodology is similar to the methodology for semivolatiles, with these exceptions:

- Analysis of the extracts for semivolatile unspeciated mass will be performed by GC/FID;
- Nonvolatile organics will be analyzed by a gravimetric method; and
- Extreme care must be employed to avoid contamination of the sample collection apparatus and media by toluene, which is detected by this method.

6.1.6 SW-846 Method 0023A

The M0023A sampling train will be used to collect exhaust gas for an assessment of the PCDD/PCDF concentrations. During each test run, the M0023A sampling train will be assembled and leak-checked before sampling begins. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. At the end of each run, the sampling train will be disassembled and all train samples will be collected.

The front-half and back-half sample fractions will be extracted separately and the resulting extracts will be split into 2 equal portions with 1 split being analyzed for PCDD/PCDF and the remaining split will be archived. The following describes the extraction steps. The filter and front-half solvent rinse will be placed together into a Soxlet extractor and extracted with toluene. Prior to adding the filter to the extractor, the filter will be spiked with the same surrogate compounds the XAD-2 resin trap was spiked prior to being shipped to the site. Following the loading of the Soxhlet extractor, internal standards are added and are extracted and concentrated. The XAD-2 resin and back-half solvent rinse are placed into a Soxhlet extractor, spiked with internal standards and extracted in toluene. The specific PCDD/PCDF internal standard and surrogate compounds are defined in M0023A.

Analysis for PCDD/PCDF will be completed using high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) following SW-846 Method 8290 for all 2,3,7,8-chlorinated isomers and totals of all PCDD/PCDF by class (i.e., tetra – octa).

A spiking program will be applied to the M0023A trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds

will be placed on the components of the train at the different stages of the sampling and analytical program so that the efficiency of the method's performance can be measured quantitatively. The overall method efficiency can be assessed by assuming that these compounds have chemical characteristics that are identical to the PCDD/PCDF target compounds. Four types of spiking materials will be applied to the M0023A train samples. Tables A-5, A-7, and A-8 summarize the spiking materials that will be applied to the M0023A train samples.

6.1.7 SW-846 Method 0031

The M0031 sampling train will be used to sample exhaust gas onto Tenax® and Anasorb® resin tubes for analysis of volatile PIC/TIC. The sampling apparatus will be inspected and calibrated prior to the emissions test. During each run, the SAC will verify adherence to the prescribed sampling procedure as described in M0031. M0031 requires that 2 Tenax® tubes and 1 Anasorb® tube are to be used in a 2-tube configuration of the sampling train. Four sets of tubes will be used during the test run to sample a nominal 20 liters of exhaust gas per tube set. Four sets will be analyzed by combined SW-846 Methods 5041 and 8260; although only 3 sets are required. In order to ensure holding time requirements are met if 1 of the required data sets is lost or compromised during analysis, the fourth set will also be analyzed. Since the holding time for M0031 is 14 days, the analysis of the fourth pair with the others ensures its availability should it be needed. This ensures that the data completeness and final DQO are achieved. During the analysis, the 2 Tenax® tubes will be paired for analysis and the Anasorb® tubes will be analyzed separately so that breakthrough can be evaluated.

To quantitate PIC, all samples receiving M0031 analysis will be analyzed, at a minimum, against the site-specific list of volatile compounds in Table A-11, which is derived from the SDC HRA Protocol. In addition, the 10 largest non-target peaks that are greater than 10% of the nearest internal standard will be identified and quantitated as TIC.

A spiking program will be applied to the M0031 trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds will be placed on the components of the train at the different stages of the sampling and analytical program so that the efficiency of the method's performance can be measured quantitatively. By assuming that these compounds have chemical characteristics that are identical to the volatile target compounds, the overall method efficiency can be assessed. Table A-9 summarizes the spiking materials that will be applied to the M0031 train samples.

6.1.8 SW-846 Method 0040

This method is used for the characterization of light organics with boiling points less than 100ºC. These light organics are collected in a Tedlar® bag and are measured by a GC/FID. The condensate from the collection of the sample is analyzed using a purge and trap GC/FID. The light organics compose 1 portion of the total organics number for the exhaust gas and are considered to be organic compounds C_1 to C_7. Each test run will produce the following samples:

- Tedlar® bag sample 1,
- Condensate sample 1,
- Tedlar bag sample 2,
- Condensate sample 2,
- Daily Tedlar bag field blank (i.e., only 1 field blank is collected each day), and
- Daily condensate field blank (i.e., only 1 field blank is collected each day)

During 1 of the test runs, a field control spike will be conducted. According to the method, a field control spike is performed by injecting known concentrations of target compounds directly into the Tedlar bag during the collection of a field sample. The field control spike replaces 1 of the field samples collected during a test run under this scenario. For the emissions tests, to ensure 2 valid samples are collected and reported for each run, the field control spike may be prepared by spiking known concentrations of target compounds into a field sample Tedlar bag after it has been analyzed.

6.1.9 US EPA Method 26A

A standard M26A will be used to collect exhaust gas samples for hydrogen chloride (HCl), hydrogen fluoride (HF), chlorine (Cl_2), and particulates matter (PM) analysis during each test run. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. An integrated gas sample is extracted from the sampling point and passed through a 0.1N sulfuric acid (H_2SO_4) solution. In this acidic solution, the HCl gas is solubilized and forms chloride ions. The acidified solution prevents the chlorine gas from solubilizing and allows this gas to pass on through to the next set of impingers that contains a 0.1N sodium hydroxide (NaOH) solution.

Sodium thiosulfate is added to the contents of the recovered hydroxide impingers to further the hydrolysis reaction. The chloride concentrations of the H_2SO_4 impinger samples and the NaOH impinger samples will be reported separately. Analyses of these samples will be conducted IAW M26A.

The exhaust gas PM emissions will be determined by weighing the solid residue collected from an acetone probe and filter housing rinse and by weighing the train particulate filter before and after sampling to determine total particulate by difference. The reported PM determination will be the sum of the probe rinse residue and particulate filter residue.

6.1.10 US EPA Method 29

A standard M29 sampling train will be used to collect exhaust gas samples for an assessment of metals. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. The M29 samples will be analyzed for the following metals: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, total

chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorous, selenium, silver, thallium, tin, vanadium, and zinc.

The probe rinse and the particulate filter digestate will be combined in the laboratory as the front-half composite sample and analyzed for the target metals. The back-half of the train consists of the following 4 samples collected in separate containers: the 5% HNO_3/10% hydrogen peroxide (H_2O_2) impinger catches from impingers 1 through 3, the empty impinger moisture gain (at position 4), the 4% potassium permanganate ($KMnO_4$)/10% H_2SO_4 impinger catches from impingers 5 and 6, and a final rinse of impingers 5 and 6 with 8N HCl. The 5% HNO_3/10% H_2O_2 impinger catches will be analyzed for the full target metals list, while the impinger 4 sample, the 4% $KMnO_4$/10% H_2SO_4 impinger catches, and the 8N HCl rinse will be analyzed separately for mercury only.

The use of hydrofluoric acid is required in the preparation of the particulate filter and probe rinse composite. The 5% HNO_3/10% H_2O_2 impinger composite will be analyzed separately for the target metal analyte list. A separate portion of the impinger composite will be prepared by SW-846 Method 7470 for mercury. The fourth impinger (empty at the start of a test), the 4% $KMnO_4$/10% H_2SO_4 impinger composite, and the 8N HCl impinger rinse will be prepared and analyzed separately for mercury using SW-846 Method 7470.

6.1.11 US EPA Modified Method 5 for Energetics

During the emissions test, a MM5E sampling train will be used to collect exhaust gas samples for an assessment of energetic compounds. The MM5E samples will be analyzed for the following analytes: nitroglycerin, 2,4-dinitrotoluene, 2,6- dinitrotoluene, 2,4,6-trinitrotoluene, cyclotrimethylenenitramine, and high melting explosives.

The first section of the XAD-2 resin trap is spiked by the laboratory with surrogate solution. Prior to assembling the sampling train, the first impinger is charged with 50 milliliters of DI water and spiked with surrogate solution. At the completion of sampling, the sample train will be recovered and shipped to the laboratory for extraction and analysis.

6.2 QC SAMPLES

QC samples will be collected during field and laboratory sampling activities to provide a measured indication of QA for the test samples. Table A-4 summarizes the field QC sample requirements that will be applied during sampling activities.

6.2.1 Laboratory Resin Blanks

After sample resin tube preparation, the resin will be certified to be free of target analyte contamination above the laboratory reporting limit (RL). Certification will be performed by analyzing the XAD-2 resin for the target semivolatile organics, PCDD/PCDF, and energetics. The Tenax® and Anasorb®tubes will be certified by analyzing a tube of each type from each preparation lot for the target volatile organics. Each analysis will be performed using the same

surrogate spiking compounds used for the field samples. Sample media will not be used in the field for analyses showing target analytes with detected concentrations above the laboratory RL.

6.2.2 Reagent Blanks

Reagent blanks are defined as samples of the reagent source water (ASTM Type II water, organic-free DI water), solvents, solutions, and other media used for sample collection. Each reagent blank will be analyzed for the same analytical parameters as the actual samples. The results from the analyses of these blanks will be used to demonstrate that these solvents, solutions, and filters are not potential sources of background contamination for samples requiring these sampling media during collection.

6.2.3 Field Blanks

For the isokinetic sampling trains, blank trains will be assembled and charged with all the required chemical reagents and sample collection media in the same manner as the actual test sample trains. They will be placed near the sampling point, heated to the appropriate temperature, and leak-checked the proper number of times. The blank trains will then be disassembled and the contents will be collected using the same recovery procedures as used for the actual test sample trains.

For the non-isokinetic sampling train used to collect volatile organics (M0031), the field blank will consist of blank Tenax®-GC and Anasorb®-747 tubes that are attached to the sampling train while the train is leak-checked and then removed and stored with the sample tubes. For the non-isokinetic sampling train used to collect volatile unspeciated organics (M0040), the field blank will be collected by assembling the sampling train and attaching a Tedlar® bag containing either zero air or nitrogen to the sample probe and collecting the organic-free gas in the same manner as a sample.

The results of the blank train samples are indicative of contamination from contaminated reagents, glassware preparation, sampling environment, train handling, and sample recovery technique.

During the emissions test, 1 blank train will be collected for each of the following trains: M0010, M0023A, M0040, M26A, M29, and MM5E. For M0031, 1 field blank will be collected per run. For M0040, 1 field blank will be collected per day. The field blank samples will be collected and analyzed to demonstrate that sample handling procedures at each sampling location do not expose the samples to contaminants. Field blanks will be considered to demonstrate good quality of background if the compound concentrations detected are less than the lowest standard as specified in the US EPA's *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration Handbook* (EPA/625/6-89/023), with the exception of low levels of common laboratory contaminants and products of resin degradation. For volatile organics, these include chloromethane, benzene, toluene, methylene chloride, acetone, and bromomethane. For semivolatile organics, these include benzoic acid, benzaldehyde, benzyl alcohol, bis(2-

ethylhexyl)phthalate, di-n-octyl phthalate, di-n-butyl phthalate, diethylphthalate, and naphthalene. Good laboratory practices and appropriate handling precautions will be taken to minimize these common laboratory contaminants and resin degradation products.

6.2.4 Trip Blanks

Trip blanks will consist of a set of clean, sealed M0031 Tenax® and Anasorb® tubes, an XAD-2 tube from both M0010 methods, the M0023A, and the MM5E sampling trains, a M0040 Tedlar bag filled with a "zero" gas, and volatile organic analysis vials filled with ASTM Type II DI water for the M0031 and M0040 sampling trains. With the exception of the M0040 Tedlar® bag which are analyzed on-site, these tubes and vials are transported from the field site to the laboratory for storage and analysis along with the field test samples. The trip blank data will demonstrate that the samples are not exposed to fugitive contamination during storage and transport to their final laboratory destination. Trip blanks are analyzed for the same analytical parameters as the actual test samples. Trip blanks will generally be considered to demonstrate good quality of background if the compound concentrations detected are less than the lowest calibration standard, as specified in the US EPA/625/6-89/023, *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration Handbook*, with the exception of low levels of the following common laboratory contaminants and products of resin degradation:

- Volatiles: chloromethane, benzene, toluene, methylene chloride, acetone, and bromomethane.
- Semivolatiles: naphthalene, bis(2-ethylhexyl)phthalate, diethylphthalate, di-n-butyl phthalate, benzoic acid, benzaldehyde, benzyl alcohol, and di-n-octyl phthalate.

6.3 PROCESS MONITORING EQUIPMENT

Process data output is monitored by the SDC operators in order to maintain steady-state operating conditions. Process monitoring equipment is inspected and calibrated periodically.

Process Data Acquisition and Recording System (PDARS) information associated with Feed Prohibitive Interlock instrumentation is computed and the average of 15-second (at a minimum) readings recorded at least every 60 seconds. All applicable PDARS information will be provided to ADEM and included in the emissions test report.

A Relative Accuracy Test Audit will be conducted to verify the accuracy of the facility CEMS during the emissions test.

6.4 TRM CEMS

TRM CEMS for NO_x, SO_2, CO_2, CO, and O_2 will be used during the emissions test. The quality of data generated by this TRM CEMS will be evaluated by conducting system performance

checks before testing begins by conducting calibration checks and reviewing all data records obtained during the initial instrument performance evaluation.

The zero and span checks of monitors will be considered a verification of the quality of data received. If the zero and span show unacceptable accuracy and precision, then the monitor will be calibrated IAW the manufacturer's specifications. Data will be reported on 1-minute intervals and archived in the SAC's TRM CEMS data acquisition system. The quality of data generated by this TRM CEMS will be evaluated by conducting system performance checks before testing begins. The calibration gas will conform to the US EPA's *Traceability Protocols for Assay and Certification of Gaseous Calibration Standards* (RTI/6960/208-01F).

7.0 SAMPLE HANDLING, TRACEABILITY, AND HOLDING TIMES

Sample custody will be the responsibility of the SAC from the time of sample collection until delivery of the samples at the SAC's analytical laboratory. Thereafter, the SAC's analytical laboratory performing the analysis will maintain custody. Samples requiring preservation will be kept on ice, or equivalent, and shipped to the SAC's analytical laboratory in a secured cooler (see Table A-10).

Custody of samples will begin with the sampling team and be transferred to the SAC's analytical laboratory at the time of sample shipment. The custody procedures will include the following activities:

- Labeling of all samples with a unique sample number;
- Each sample train will be documented from setup through recovery;
- A list of all samples will be maintained in a sample logbook which will contain a master sample checklist;
- All containers used for shipping samples to the SAC's laboratory(s) will be sealed, signed, and dated by the SAC; and
- The original COC will be shipped with the samples to the SAC's analytical laboratory; a copy of the COC will be faxed to the SAC laboratory prior to shipping.

The intent of these procedures is to document the sample′s traceability, while providing a COC record for all samples collected. Possession and custody of the samples will be maintained in a competent fashion, and samples will be handled responsibly and stored at all times. Samples held overnight on-site will be stored on ice (or equivalent) in coolers or an on-site refrigerator that are secured within a trailer or other portable workspace, as required.

7.1 SAMPLE LABELING AND NUMBERING SCHEME

Samples will be collected in containers and appropriately labeled to distinctly identify each sample. The sample labels will be completed with the SDC identification, test description or identification, sample type, date, preservatives, analytical procedures, and test run number before sample collection. After all containers have been labeled, each will be staged in a sample cooler or an on-site refrigerator at its appropriate sampling location or temporary storage locations prior to shipment, as applicable.

7.2 SAMPLING DOCUMENTATION

The SAC will be responsible for ensuring that all field documentation of the sampling activities is complete and correct. Examples of the field documentation forms are available upon request. Additional documentation and QC records will be provided IAW applicable US EPA methods.

7.3 MASTER SAMPLE CHECKLIST

Upon finalization of the program analytical scope, i.e., plan approved, and in advance of the mobilization, a sample logbook will be prepared to include a complete listing of samples to be collected and analyzed in the program. This compilation of samples becomes the master sample checklist that will contain information such as the test and test run number, the sample number assigned, the sample description, the destination SAC's analytical laboratory, and an indication if the sample is a field sample or a QA/QC sample. This master sample checklist is carefully reviewed at the conclusion of each valid test run and prior to sample shipment for completeness and accuracy. The purpose of the master sample checklist is to serve as a complete sample inventory.

7.4 SAMPLE COC FORM

The COC form is the formal custody record. The original COC form will be sent to the SAC's analytical laboratory with the sample shipment and the SAC will retain 1 photocopy. As part of the SAC's analytical laboratory coding process, the samples are entered into the contracted laboratory(s)'s analytical Laboratory Information Management System (LIMS) and assigned a laboratory tracking number. The LIMS will then provide the main tracking mechanism for tracing sample status through analysis and reporting. Copies of all signed COC forms will be placed in the emissions test report.

The SAC will take an inventory of each shipment of samples and will sign and date the original COC form. Signed COC forms will be shipped along with the samples. The SAC's analytical laboratory personnel will then evaluate the sample shipment and note on the Sample Receipt Log portion of the COC form the date of receipt, temperature of samples, condition of the samples, and any sample loss or breakage when the coolers were received. The SAC will be notified immediately of any problems identified with shipped samples. The SAC's analytical laboratory will maintain custody of the samples until notification for release or disposal is received from the Test Coordinator or his/her designee.

7.5 SAMPLE PRESERVATION AND HOLDING TIMES

Samples will be placed on ice, or equivalent, in coolers or an on-site refrigerator during and after sampling, as required, and will be preserved as specified by Table A-10. The M0031 and M0040 (condensate) samples will be preserved before, during, and after testing by placing them on ice, or equivalent, in a dedicated sample cooler or an on-site refrigerator that is located away from other samples and recovery areas to avoid contamination (see Table A-10).

7.6 SAMPLE PACKING AND SHIPPING

At the time of collection, gathered samples will be segregated to avoid the possibility of cross contamination. At the end of each test run, the gathered samples will be inventoried against the master sample checklist. A final review of the sample label and checklist will be performed and then the sample will be packaged. For all train samples, Teflon® tape will be used to seal the

container lids of all recovered solutions. The level of solution on the bottle will be marked with a permanent marker. The utmost care will be taken to wrap all containers in a shock absorbing material and place into re-sealable bags. The samples will be packed and preserved on ice, or equivalent, in sample coolers or an on-site refrigerator, see Table A-10. Coolers will be kept in a designated sample storage area that can be locked for additional security. The samples will be managed to meet holding time requirements.

7.6.1 Transport by Hand Delivery

The SAC will be responsible for loading all collected exhaust gas samples and transporting them to the SAC's analytical laboratory(s). In this way, the samples will be handled with the utmost care and the risk for damage is greatly reduced. Additionally, sample custody, preservation, and coding are facilitated.

7.6.2 Transport by Overnight Courier

If shipping via overnight courier, every effort will be taken to secure a safe delivery of the samples to the SAC's analytical laboratory. Trip blank samples will be prepared and placed with each sample shipment, as required, to assess possible cross contamination. Samples will then be segregated by compatibility into approved containers, and proper shipping papers and labels will be completed IAW US Department of Transportation/International Air Transport Association regulations. A final review of all of the shipping papers and containers will be performed in the office of the overnight courier to confirm completeness and accuracy. The SAC's analytical laboratory will receive a complete COC form that will include all samples in that shipment. This COC form will be signed before shipping to release custody of the samples to the SAC's analytical laboratory. All forms, or equivalent, will be faxed to the SAC's analytical laboratory before shipping.

8.0 SPECIFIC CALIBRATION PROCEDURES AND FREQUENCY

Calibration procedures for SAC's instruments used for the SDC emissions tests are provided in the method procedure documents discussed in this section. The sampling components requiring calibration include dry gas meters, probe nozzles, pitot tubes, and temperature-indicating devices. The SAC's laboratory analytical instruments will be calibrated IAW the reference method requirements. The analytical methods are referenced in Table A-3.

8.1 PROCESS MONITORING EQUIPMENT

The SAC's process monitoring equipment includes: flow meters, weigh scales, thermocouples, and pressure-sensing devices. All calibration data for each instrument will be documented and should include the calibration procedures implemented, if different from the manufacturers' recommended procedures, as well as the following:

- Device being calibrated,
- Identification number (serial number or tag number),
- Reference device,
- Date of reference device's last calibration,
- Identification of reference device (such as serial number or lot number),
- Date of the performance of calibration, and
- Name of primary technician performing calibration.

8.2 SAMPLING EQUIPMENT

The M0010, M0023A, M0031, M0040, M26A, M29, and MM5E sampling train components will be calibrated as defined in the applicable method. The activity matrices for calibrating the equipment and apparatus are shown in Table A-2. Calibration of sampling equipment will be performed prior to the initiation of SDC emissions test sampling.

8.3 ORSAT

Prior to the analysis of samples, the Orsat gas analyzer will be leak-checked and inspected carefully. During the emissions test, multi-point integrated bag samples will be collected and analyzed for CO_2 and O_2 using an Orsat analyzer (US EPA Method 3B). Once per emissions test, the SAC will perform an audit of the Orsat analyzer. Two audit cylinders will be provided by the SAC to conduct this audit with each cylinder containing known concentrations of a mixture of CO_2 and O_2. The audit will be conducted by taking a sample from each cylinder containing known concentrations CO_2 and O_2, and analyzing IAW the procedure used for the samples. The found concentrations must agree with the known values plus or minus 0.5%.

9.0 ANALYTICAL OBJECTIVES AND PROCEDURES

The analytical project objective for the emissions test is to provide a database that appropriately and accurately reflects the composition of the samples being analyzed. This objective will be met by successful implementation of the analytical methodologies and procedures selected for the analysis of the demonstration test samples. The process of selecting the analytical methods and procedures took into consideration the sample matrix, composition, volume, and the analytes of interest.

9.1 ANALYTICAL LABORATORY

The following section and Table A-3 summarize the sample types and the methods of analysis to be used for the SDC emissions tests. The SAC's analytical laboratory qualifications will be submitted upon request.

9.2 ANALYTICAL PROCEDURES

Standard methods will be followed during the analyses of all samples collected during the emissions test. The samples to be collected, sample matrices, procedure descriptions and the associated reference methods are summarized in Table A-1.

10.0 SPECIFIC INTERNAL QC CHECKS

This section describes QC procedures that will be followed by the SAC's analytical laboratory during the analysis of the samples from the emissions test. The SAC's analytical laboratory will be required to monitor the precision and accuracy of their sample analyses. The SAC's analytical laboratory will use the following high-purity, commercially available materials for their QC procedures: SRM, calibration standards, internal standards, and spiking compounds. Using these materials, data precision and accuracy will be assessed by evaluating the results from an analysis of method blanks, laboratory blanks, and reagent blanks; duplicate samples; calibration check and internal (where appropriate) standards; matrix or internal standard spiked samples; and internal standard compound spike samples. Table A-4 summarizes the laboratory QC sample requirements. The analytical QC checks, frequencies, acceptance criteria, and corrective actions for each analytical method or other parameters are described in greater detail in the appropriate analytical reference method.

10.1 METHOD BLANKS

Method blanks contain all the reagents used in the preparation and analysis of samples and are processed through the entire analytical scheme to assess spurious contamination arising from reagents, glassware, and other materials used in the analysis.

10.2 ANALYTICAL INSTRUMENT CALIBRATION

Prior to sample analysis, initial and continuing calibrations will be performed IAW the prescribed reference method to compare linearity of response to concentration of known amounts of the analytes of interest. If acceptance criteria, as specified in the appropriate analytical methods for initial or continuing calibrations, are not met, sample analysis will not proceed until the analytical problem has been rectified and the criteria have been met. Linearity checks will be used to verify that response has not shifted significantly from the most recent calibration. The instrument initial calibration procedures and acceptance criteria will be those established in the analytical method.

10.3 LABORATORY CONTROL SAMPLES

These samples are generated from spikes prepared independently from the calibration concentrates. LCS are used to establish that an instrument or procedure is in control. A LCS is normally carried through the entire sample preparation and analysis procedure. A LCSD is prepared at the same time as the LCS. Precision and accuracy data can be determined from the analysis of LCS/LCSD pairs.

10.4 MATRIX SPIKE SAMPLES

These samples are generated by spiking an aliquot of an actual field sample with a known concentration of 1 or more analytes. The spiking solution(s) is prepared independently from the calibration concentrates. MS samples are used to establish that an analytical system or procedure

is in control. A MS sample is normally carried through the entire sample preparation and analysis procedure but may be performed as post-spiked analyses. A MSD is prepared at the same time as the MS sample. Precision and accuracy data can be determined from the analysis of MS/MSD pairs. For air matrices, these samples are generally not performed as the entire sample is consumed during analysis. For the exhaust gas samples, the MS/MSD will consist of LCS/LCSD as the entire sample is generally consumed during the analysis leaving no sample on which to perform MS. Exceptions include the MS/MSD for the back-half mercury fraction, the M26A samples, and in some instances, the M0031 and M0040 condensates. For metals other than mercury post-digestion spikes will be performed.

10.5 SURROGATE STANDARD SPIKES

The GC/MS analytical procedures require that each sample be spiked with surrogate standard compounds used to calculate recovery as an indicator of the general accuracy of sample preparation and analysis. Tables A-6 and A-8 provide the target QC percent recoveries for volatiles and semivolatile surrogate standard compounds, respectively. These surrogate standard compounds are the recommended spiking materials used for SW-846 Methods 8260 and 8270 for spiking samples being analyzed for volatiles and semivolatiles, respectively.

The M0010 and M0023A XAD-2 resin tubes will be spiked with 1 or more a field surrogates during sample tube preparation. The spiking standards used will be prepared from certified stock standards separate from the unlabeled standards used for calibration.

11.0 DATA REDUCTION, VALIDATION, AND REPORTING

This section describes the approach used to report, review, and reduce the field and laboratory data into an appropriate presentation format in the final report. The results will be presented in a manner that demonstrates compliance with the test objectives. The raw data will be generated as field sampling documentation, sample traceability documentation, laboratory processing documentation, and raw data from analytical instruments. The most significant aspect of data reporting will be the compilation of the analytical results from each laboratory. Analytical results will be compiled into analytical data packages. Following delivery of the analytical results to the designated personnel, a data verification effort will be undertaken to review the content of these deliverables for compliance with the emissions test plan requirements. The reported data also will be evaluated for compliance with the DQO. If the data are determined to have met the analytical requirements, they will then be used to demonstrate the test objectives.

11.1 DATA REPORTING

Data reporting is considered to be the compilation of the results from the laboratories. The laboratory deliverables that constitute this compilation are the hard copy analytical data packages. The style and format of the deliverables and the process for completing their compilation is discussed in this section.

11.1.1 Analytical Data Packages

Analytical data packages are formatted and organized in a manner similar to the EPA CLP format (CLP-like). These data packages are stand-alone deliverables that include the instrument raw data, parameter-specific QC documentation, calibration and calibration check performance, and instrumentation performance information. These data are included so an independent verification of the final analytical results can be conducted. In addition to the raw data, all analytical data packages will contain a narrative that identifies project-specific information and any pertinent information from the performing laboratory concerning data quality. The narrative also summarizes the QC data and any difficulties or analytical anomalies encountered during laboratory processing that are considered pertinent to achieving DQO or project-specific objectives. Each laboratory report will also include all COC records as well as a cross-reference for the field sample and laboratory sample identities.

The remaining analytical data package sections are specific to each type of analysis performed (the associated reference methods are summarized in Table A-3). Each validatable CLP-like data package will summarize the raw data on standard EPA forms (or on forms similar to the standard EPA forms). The summary forms are included to tabulate information that is relevant to the analysis in a more accessible fashion.

11.1.2 Certificates of Analysis

Certificates of analysis, or results pages, will be presented in a format that includes both sample collection information (i.e., date of collection) and analytical data. The results pages will summarize the analytical results and may provide a summary of the internal standard and surrogate recoveries, as applicable.

11.1.3 Analytical Data Results

Reporting of analytical results is dependent upon the analytical procedure employed. For this analytical program, detection limits (DL), RL, and method detection limits (MDL) will be reported.

The laboratory reports a DL when the analytical method (e.g., SW-846 Method 8290) specifies a minimum level at which results should be reported. The DL is calculated IAW the method requirements and values below the DL are not reported. It is isotope dilution methods typically report to a DL given the quantitation technique. For these methods, each sample is spiked with an isotopically labeled surrogate or internal standard for each target compound. On a sample-by-sample basis, the recovery of each surrogate or internal standard is determined; then, the analytical result is normalized to the recovery of the corresponding surrogate compound. In this manner, the DL for each sample and each compound can vary as the surrogate recovery varies.

The MDL is defined as the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero. It is a statistical limit that is matrix independent. The MDL, however, is an absolute measurement and, as such, does not factor in the accuracy of the quantitation. The laboratory-generated MDLs are evaluated to ensure their suitability. One evaluation criteria that is often employed is the comparison of the mean concentration of the replicate analyses from the study versus the statistically-derived MDL. Based on such evaluations, the limit of reliable detection may be established at a value that is greater than the statistically-derived value (e.g., the MDL may be based on the analysis of a low-level detection limit verification sample). The MDL is used with analyses that employ external or internal standard quantitation.

The RL is a laboratory-specific minimum concentration at which results are typically reported (i.e., values less than the reporting limit are generally not reported). For this program, results that are less than the RL but greater than the MDL will be reported. There is no specific requirement that establishes how a RL must be established. SW-846 guidance suggests that values below the lowest calibration standard should not be reported. In the absence of a specific requirement, RL are established based on the lowest concentration in the calibration curve, one-half of the lowest concentration in the calibration curve or a multiplier of the MDL. The RL may not be established at a value that is less than the MDL. Changes to extraction protocol, amount of sample used in preparation, or dilution applied to the sample can raise or lower the RL.

The results of sample analyses will be reported in concentration units. Sample results will be reported for all samples and parameters required for the emissions test. Exhaust gas sample results will be reported as a total mass at the DL. In all instances, results will be calculated following method requirements or standard reporting conventions. Based on guidelines found in the analytical method, data validation guidelines, or in this SAP/QAPP, each laboratory will assign qualifiers to the results, when appropriate. Qualifiers appearing on a results page will be defined on that results page or in the case narrative.

11.1.4 Report Preparation

Each laboratory will follow a standard operating procedure for the steps taken in the reporting process for the analytical data packages. Laboratory personnel will review the calculations to confirm the analytical results are correct. An analysis-specific data review checklist should be used to ensure all preparation and analysis documentation for the test run and the QC samples is included in the data package. Laboratory personnel will also check the accuracy and completeness of the CLP-like summarization forms. The data package should also be subject to peer review by the group leader, section head, or designated laboratory personnel. The laboratory manager, or designee, will perform the final review of the deliverables to check for completeness and to determine that the client's requirements for data quality were met.

11.2 DATA REVIEW

The data review process will be initiated when the designated personnel receives the analytical data packages from the laboratory and verifies each sample was analyzed correctly for the parameter requested on the COC forms. This review of the deliverables will confirm all required laboratory QC was performed and the results were reported. After this initial review, data reported on the results pages and raw data are compared to verify no transcription errors occurred during reporting. Next, the data for each analytical parameter will be reviewed thoroughly for each individual sample to ensure all the pertinent information is included in the analytical data package. This review will confirm the data are usable for an assessment of system performance.

If, during the review process, any errors or deficiencies are found in the analytical data packages, they will be noted by the reviewer and the laboratory will be notified so corrected pages can be issued for inclusion into the final report. The corrected pages are then reviewed upon submittal for accuracy before incorporation into the data package.

11.3 DATA REDUCTION

When the data review process is complete, the results will be summarized in tables for presentation in the final report and reduced into a form that is usable demonstrating the test objectives.

11.3.1 Analytical Data Summary

Analytical data summary tables will be included in the final report and will be categorized primarily by analytical parameter. Typically, these tables will summarize the analytical results and the results of the individual sampling trains, as applicable.

In the summary tables, the data for exhaust gas samples will be summarized for all test runs and/or on a run-by-run basis and presented. The data for exhaust gas samples will be presented on a per-fraction basis. Results for each fraction are reported from the laboratory in terms of total mass. Combining the results from each fraction produces a total to be used in calculating mass emission. In instances where the analyte concentration in a sample is reported as a nondetect, the RL and a "<" symbol will be the reported value in the table for the result. Any estimated quantitation reported from the laboratory or as indicated by the data validation effort will be discussed in the final report.

The results will be evaluated by designated personnel to determine if the project objectives have been met. If anomalous results are obtained, every effort will be made to identify the reason for the anomaly in the sample collection, sample preparation, or analysis. If any anomalies have occurred, the final report will include the results of the affected sample data, a thorough discussion of occurrence, and any perceived impact on overall data usability.

11.3.2 QC Data Summary

The QC data summary tables will be provided in the QA/QC report appendix of each final report and are organized by parameter. General types of QC data summary tables that may be provided include internal standard and surrogate recovery results and LCS/LCSD recovery results. The results will be checked against the target acceptance limits. Any data that fall outside of the target acceptance limits will be flagged or footnoted on the QC data summary tables. The data from the field-generated blanks will be sorted into categories such as field blanks, trip blanks, reagent blanks, and blank trains. The data from the field blanks and trip blanks will be interpreted in the QA/QC report to show that the samples could be handled in the field and transported to the laboratory without contamination problems. The reagent blank and blank train results will be interpreted to represent the amount of contamination from reagents or handling that will be present in a train before sampling has begun. Emissions results will not be adjusted based on blank results.

11.4 DATA VALIDATION

It is anticipated that ADEM and/or US EPA will perform a validation of the data packages submitted with the emissions test report. IAW the requirements of this QAPP, the SAC's laboratory is required to supply CLP-like analytical data packages which are intended to support data validation efforts. The SAC's laboratories will be required to submit data packages that are supported by QC test results and raw data.

The laboratory report prepared by the contracted laboratory(s) will be validated and included in the emissions test report. The validation protocols used to validate the data will be based on published US EPA data validation guidelines.

Three validation levels for the emissions testing program have been established. The 3 levels and a description each activity are identified below:

Level A - This level of validation includes:

- verification of required deliverables,
- requested versus reported analyses,
- evaluation of qualification of results based on holding times, and
- qualification of results based on method blank results.

Level B – This level of data validation includes all items identified in Level A plus evaluation and qualification of results based on the following:

- MS/MSD analysis,
- surrogate recoveries, and
- internal standards performance (HRGC/HRMS only).

Level C – This level of data validation includes all items identified in Levels A and B plus evaluation and qualification of results based on the following:

- initial and continuing instrument calibrations (standards and blanks),
- laboratory control samples,
- instrument tuning
- analytical sequence, and
- internal standards performance (GC/MS and ICP/MS).

All laboratory reports of emissions data generated during the emissions test will be prepared to allow validation to any level.

11.5 DATA MANAGEMENT

Data management consists of 5 areas where data is collected, analyzed, and reported: field sampling data, laboratory data, preliminary report, data validation, and final report. As much as possible, data will be transferred electronically through the data management areas to avoid transcription errors.

The SAC's laboratory will prepare and submit US EPA CLP-like analytical data packages.

12.0 ROUTINE MAINTENANCE PROCEDURES AND SCHEDULES

Routine maintenance of sampling and analytical equipment used by the SAC during the emissions test will be performed IAW the procedures and schedules set forth in manufacturers' maintenance manuals and as described in appropriate sections of standard methods. The methods in which the calibration requirements are defined are included in Table A-2. Sampling equipment is routinely tested and calibrated prior to deployment IAW the methods cited. Defective equipment will not be deployed. During the emissions test, equipment that does not meet calibration specifications, or fails the prescribed performance specification test, will be tagged out of service. The equipment will not be used until it is repaired and meets specifications. A maintenance log will be maintained for the emissions test and will become part of the permanent records.

Routine maintenance of all SAC's analytical instruments will follow the procedures and schedules as prescribed in the SAC's analytical laboratory QA manual and the standard operating procedures written for each instrument. These documents are available upon request. All routine maintenance performed will be recorded in a maintenance log for each instrument. If the maintenance procedure could have affected performance of the instrument then calibration check samples will be analyzed and the results recorded in the record notebook before any samples are analyzed. The serial number of the new parts will be logged into the maintenance log. When parts are replaced, check standards shall be analyzed to demonstrate correct operation of the system. Certain types of equipment, such as analytical balances, are re-certified by the service representative after repair. Routine preventative maintenance may be documented in the analytical run log.

Each SAC's analytical laboratory instrument or piece of equipment shall be uniquely identified. Bound maintenance logs shall be assigned to each instrument, and will be controlled by the SAC's analytical laboratory QA personnel.

13.0 ACCURACY, PRECISION, AND COMPLETENESS PROCEDURES

The SAC's QA activities implemented in the emissions test will provide a basis for assessing the accuracy and precision of the analytical measurements. The generalized form of the equations that will be used to calculate accuracy and precision are given below:

13.1 ACCURACY

$$Percent\ Recovery = \left(\frac{(X - S)}{T}\right) \quad x \quad 100$$

where: X = Experimentally determined concentration of the spiked sample
T = True concentration of the spike
S = Sample concentration before spiking

13.2 PRECISION

$$Relative\ Percent\ Difference\ (RPD) = \left(\frac{|D_1 - D_2|}{\left(\frac{D_1 + D_2}{2}\right)}\right) \quad x \quad 100$$

where: D_1 and D_2 = The results of duplicate measurements or as the standard deviation relative to the average value expressed as:

$$Relative\ Standard\ Deviation\ (\%\ RSD) = \left(\frac{\sigma_{(n-1)}}{\overline{X}\ (x_1 .. x_n)}\right) \times 100$$ where: $\sigma_{(n-1)}$ =

Standard deviation of the sample data
n = Number of duplicates
$X_{(x1....xn)}$ = Arithmetic mean of the sample data

13.3 COMPLETENESS

Data completeness is a measure of the extent to which the database resulting from a measurement effort fulfills objectives for the amount of data required. For the emissions test, completeness will be defined as the percentage of valid data for the total valid tests. The completeness objective will help to evaluate the accuracy and precision of the analytical measurements. Furthermore, if the data set is not complete it will not meet the requirements of the emissions test. Completeness is assessed by the following equation:

$$Completeness = \left(\frac{D_r}{D_c}\right) \quad x \quad 100$$

where: D_r = Number of samples for which valid results are reported

D_c = Number of valid samples that are collected and reach the laboratory for analysis

14.0 AUDIT PROCEDURES, CORRECTIVE ACTION, AND REPORTING

14.1 AUDIT PROCEDURES

The SAC, WDC, US EPA, and ADEM representatives will accomplish sampling performance audits through observation of the sampling operations. Adherence to methods/procedures will be maintained for each sampling train configuration. The field data sheets will constitute a complete record of the sampling activity. The SAC will assume full responsibility for review of the sampling data, which will include a summary of the sampling activity. If deemed necessary by the SAC, SRM will be submitted for analysis as blind QC samples.

14.2 CORRECTIVE ACTION-MINOR SYSTEM EVENTS

Corrective action is required whenever a circumstance arises that adversely affects the quality of the data output. In order for corrective action to be initiated, awareness of a discrepancy must exist. In most instances, the personnel conducting the field work and the laboratory analysis are in the best position to recognize events that will affect data quality. Awareness on their part can frequently detect minor instrument changes, drifts, or malfunctions, which can then be corrected, thus preventing a major breakdown of the system.

In the event that the SAC observes a condition that may adversely affect the quality of the data, he must first decide if he can fix the discrepancy before a serious effect occurs. An example would be any circumstance where instrumental conditions have to be changed to maintain isokinetic conditions within the allowed flow rate window. If this kind of circumstance occurs, the SAC should correct the discrepancy immediately, then note the discrepancy and the corrective action on the run sheet. A nonconformance report is not required to document minor system events.

14.3 CORRECTIVE ACTION—MAJOR SYSTEM EVENTS

If major sampling events arise, the SAC's technicians are in the best position to observe a need for corrective action and initiate a response immediately, thus minimizing data loss. Therefore, the field sampling personnel will have a prime responsibility for recognizing nonconforming conditions. The SAC must notify the Test Coordinator immediately when serious situations arise. The Test Director may authorize a temporary suspension of sampling while corrective action is defined and/or performed. If the event is deemed to be minor, the Test Director will then enter the event in his records and instruct the appropriate personnel that the test run will continue.

If testing is suspended, the corrective action must follow a more formal path. The Test Director/Coordinator and the SAC should obtain input from the appropriate personnel and initiate a closed-loop response. If the event cannot easily be contained, then alternative actions must be considered and communicated to oversight personnel.

Decisions on whether to take corrective action and what action(s) to take will be made by the Test Coordinator or the SAC. When a corrective action is taken by any of the sampling technicians, they will be responsible for notifying the SAC so that, if deemed necessary, QA surveillance of the affected sampling or analysis system can be intensified. The personnel identifying the event shall initiate nonconformance reports. Each nonconformance and corrective action report will become part of the emissions test report or the supporting data files.

14.4 CORRECTIVE ACTION—LABORATORY NONCONFORMANCE

The SAC's analytical laboratory analysis personnel will have a prime responsibility for recognizing the need for a nonconformance. The person originating it shall document each nonconformance. More significant events require the initiation of a non-conformance report. Minor events will be recorded in the analysis run log.

14.5 CORRECTIVE ACTION ARISING FROM REVIEW OF TEST, QC, OR AUDIT SAMPLE DATA

The SAC will be responsible for initiating corrective action during sample analysis. The appropriate management will then be responsible for instituting corrective action and verifying that the corrective actions produce the desired results. For example, if MS results are outside QC limits and sufficient sample remains to prepare and reanalyze the sample, the decision may be made to repeat the analysis if holding times have not expired.

Optionally, upon approval from the Test Coordinator, modified preparation techniques may be used if the analyst's observations indicate that the standard preparation is inadequate. If results cannot be obtained that meet the target criteria, then qualification may result. The entire situation will be reported on a nonconformance memo and discussed in the case narrative and emissions test report. Ultimately, the personnel performing and checking the sampling and analysis procedures and results must participate in decisions to take corrective actions. To reach the proper decision, each individual must understand the program objectives and data quality required to meet these objectives. Personnel involved in the emissions test will receive or have available to them an approved copy of this document and will be informed of these objectives. Each individual will have a responsibility to notify the respective field sampling or laboratory operations supervisor whenever a measurement system is not yielding data within these objectives.

14.6 QA REPORTING

The SAC will review the QAPP prior to initiation of the emissions test. The SAC will immediately notify the Test Coordinator of any event or occurrence that could have a significant effect on the validity of the results. Notification will be verbal, followed by a written memorandum, which include the proposed corrective action. Major events will be reported using the SAC's Nonconformance Report. QA reports will be submitted with the emissions test report.

Table A-1: Planned Sample Collection Methods, Frequency, and Containers

Sample Name	Analysis	Type of Container(s)[1]	Frequency	Samples/Condition[1]
M0010 SAMPLING TRAINS (2) Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Semivolatile PIC/TIC	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses	Semivolatile and Non-volatile Unspeciated Mass	XAD-2 resin tubes, 250-mL amber glass		
Impinger composite and glassware solvent rinses		1 gallon amber glass or multiple 1-L amber glass		
M0023A Sampling Train Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	PCDD/PCDF	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses		XAD-2 resin tubes, 250-mL amber glass		
M0031 Sampling Train 1 Tenax® and 1 Anasorb®resin tube per pair	Volatile PIC/TIC	Resin tubes	Collect 4 resin tube pairs, 40 minutes 0.5 L/min or 20 L per pair	16 pairs
Condensate		40-mL VOA vials	End of test run	4
M0040 Sampling Train	Volatile Unspeciated Mass	Tedlar® bags	2 Tedlar® bags per test run	8
		20-mL or 40-mL VOA vials	Condensate per Tedlar® bag	
M26A Sampling Train Particulate filter and acetone probe rinse	PM	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
0.1N H_2SO_4 impinger composite	HCl/HF	1-L HDPE		
0.1N NaOH impinger composite	Cl_2	500-mL HDPE		
M29 Sampling Train Filter and HNO_3 probe rinse	Metals	Petri dish, 120-mL HDPE	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
5% HNO_3/10% H_2O_2 impinger composite		1-L HDPE		
Empty Impinger	Mercury Only	120-mL HDPE		
4% $KMnO_4$/10% H_2SO_4 impinger composite and DI rinses		500-mL amber glass with vented lid		
8N HCl Rinsate		250-mL amber glass		

Table A-1: Planned Sample Collection Methods, Frequency, and Containers (Continued)

Sample Name	Analysis	Type of Container(s)(1)	Frequency	Samples/Condition(1)
MM5-E Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Energetics: nitroglycerin, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, RDX, HMX	500-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr.	4
Impinger composite and glassware solvent rinses				
XAD-2 resin tube		XAD-2 resin tubes		
M3B - Orsat	O_2 and CO_2	Tedlar® bag	1 Tedlar® bag per test run	4
TRM CEMS	CO	Not Applicable	Continuous	Not Applicable
	CO_2			
	O_2			
	SO_2			
	NOx			

Footnotes:

(1) Alternate container sizes may be used as required.

(2) Four test runs will be conducted but only 3 will be analyzed. A fourth run will be archived in case of sample loss or breakage.

Table A-2: Activity Matrix for Calibration of Equipment

Equipment	Acceptance Limits	Frequency and Method of Measurements	Method Reference	Action if Requirements Are Not Met
Dry gas meter	$Y_i = Y \pm 0.02\ Y$	Calibration versus wet test meter, reference dry gas meter that as been calibrated against a wet test meter, or calibrated orifice set: initially and when post-check exceeds Y ± 0.05	US EPA Method 5 and US EPA's *Quality Assurance Handbook of Air Pollution Measurement Systems* (EPA-600/4-77-027b)	Repair/replace and calibrate
Thermocouples	Impinger thermocouples ± 1°C; Dry gas thermocouple ± 3°C over range; Stack temperature sensor ± 1.5% of absolute temperature	Calibration prior to test against an ASTM mercury-in-glass thermometer		Adjust, determine a constant correction factor, or reject
Probe heating system	Capable of maintaining 120 ± 14°C	Periodic checks during sampling		Immediately increase the sampling train system to the proper temperature, otherwise Repair or replace, and then re-verify the calibration
	Capable of maintaining 130 ± 5°C			
Probe nozzle	Average of 3 ID measurements of nozzle; Difference between high and low < 0.1 mm	Measurement by micrometer to nearest 0.025 mm prior to test, visual inspection after test		Remove from service when nozzle becomes nicked, dented, or corroded
Barometer, aneroid (if used in lieu of obtaining barometric pressure from local National Weather Service station)	± 2.5 mm mercury of mercury-in-glass barometer	Calibrate against a mercury barometer or NIST-traceable barometer prior to the field test.		Adjust to agree with a certified barometer
Trip Balance	Standard weights measured ± 0.5 gram of stated value	Calibration verified upon receipt and daily		Adjust/repair
Standard pitot tube	All specifications met IAW US EPA Method 2 [Optional: Calibrated to NIST-traceable standard pitot in wind tunnel]	Calibration prior to test and visual inspection after each field test	US EPA Method 2C	Use pitot tubes that meet specifications, repair or replace, as required

Table A-3: Summary of Analytical Methods and Procedures

Sample Name	Sample Matrix	Analysis	Analysis Method
M0010	Moisture	Exhaust Gas	US EPA Method 4
	Semivolatile PIC/TIC	Front-Half Composite	SW-846 Method 8270
		Back-Half Composite	
		Impinger Composite and Glassware Solvent Rinses	
	Total Semivolatile and Non-volatile Organics	Front-Half Composite	SW-846 Method 3542 and EPA/600/R-96/033[s]
		Back-Half Composite	
		Impinger Composite and Glassware Solvent Rinses	
M0023A	Moisture	Exhaust Gas	US EPA Method 4
	PCDD/PCDF	Front-Half Composite	SW-846 Method 8290
		Back-Half Composite	
M0031	Volatile PIC/TIC	TX and Anasorb® resins	SW-846 Method 8260
		Condensate	SW-846 Methods 0030/8260/5041
M0040	Volatile Unspeciated Mass	Whole air exhaust gas	EPA/600/R-96/033
		Condensate	
M26A/M5	Moisture	Exhaust Gas	US EPA Method 4
	$HCl/Cl_2/HF$	Impinger solutions	US EPA Method 26A
	PM	Filter	US EPA Method 5
M29	Moisture	Exhaust Gas	US EPA Method 4
	Metals	Impinger solutions, particulate filters, and residues	US EPA Method 29 and SW-846 Methods 6010C/6020/7470/7471A
MM5E	Moisture	Exhaust Gas	US EPA Method 4
	Energetics	XAD-2 resin, filter, solvent probe rinses, impinger condensate	US EPA Modified Method 5 (site-specific procedure) and SW-846 Methods 8330/8332
M3A	CO_2 and O_2	Exhaust gas	US EPA Method 3A
M6C	SO_2	Exhaust gas	US EPA Method 6C
M7E	NO_x	Exhaust gas	US EPA Method 7E
M10	CO	Exhaust gas	US EPA Method 10

Table A-4: Summary of Target DQO for Precision, Accuracy, and Frequency

Parameter	QC Type	Precision [1,2]	Accuracy [3]	Frequency
M0010 (SVOC) Sampling Train	LCS/LCSD	≤ 35% RPD	See Table A-7	One (1) per analytical batch
	Surrogate spike	Not Applicable	See Table A-6	Every sample
	Sampling surrogate spike		See Table A-5	Every XAD-2 trap
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0010 (TCO) Sampling Train	LCS/LCSD	≤ 50% RPD	40 to 120%	One (1) per analytical batch
	Surrogate spike (n-Heptadecane)	Not Applicable	50 to 150%	Every sample
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0010 (GRAV) Sampling Train	Replicate weighing	± 0.5 mg	Not Applicable	Every sample
	LCS/LCSD	≤ 35% RPD	50 to 150%	One (1) per analytical batch
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M0023A Sampling Train	LCS/LCSD	≤ 20% RPD	See Table A-7	One (1) per analytical batch
	Internal standard	Not Applicable	See Table A-8	Every sample
	Sampling surrogate spike		See Table A-5	
	Recovery spike			
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0031 Sampling Train	Surrogate spike	Not Applicable	See Table A-9	Every sample
	Break through evaluation		< 30% PIC detected on Tenax tube pair	Every resin tube set
	LCS/LCSD	≤ 25% RPD	70 to 130% recovery	One (1) per analytical batch
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M0040 Sampling Train (C_1 to C_7)	Field spike	Not Applicable	80 to 120%	One (1) per emissions test
	Duplicate	≤ 20% RPD	Not Applicable	Every Tedlar® bag
	LCS	Not Applicable	75 to 125%	One (1) per analytical batch

Table A-4: Summary of Target DQO for Precision, Accuracy, and Frequency (Continued)

Parameter	QC Type	Precision [1,2]	Accuracy [3]	Frequency
M0040 Sampling Train (C_4 to C_7)	LCS/LCSD	≤ 35% RPD	50 to 150%	One (1) per analytical batch
	Surrogate spike (n-Heptadecane)	Not Applicable		Every sample
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M26A Sampling Train	MS/MSD	≤ 25% RPD	85 to 125%	One (1) per emissions test
	LCS	Not Applicable	90 to 110%	One (1) per analytical batch
	Replicate weighing (PM only)	± 0.5 mg	± 0.5 mg	Every sample
	Duplicate	≤ 5% RPD[4]	Not Applicable	One (1) per emissions test
	Audit sample (if provided)	Not Applicable	Established by provider	
M29 Sampling Train	LCS	Not Applicable	75 to 125%	One (1) per analytical batch
	MS/MSD, post-digestion spike			One (1) per emissions test
	Audit sample (if provided)		Established by provider	
MM5-E Sampling Train	LCS	Not Applicable	75 – 125%	One (1) per analytical batch
	Surrogate Spike		70 to 130%	Every resin and condensate sample
M3B (CO_2 / O_2)	US EPA audit gas	Not Applicable	± 0.5%	One (1) per emissions test
M7E (NO_x)	US EPA traceability gas	± 3% of span	± 5% of calibration gas value	Every run
M6C (SO_2)				
M3A (CO_2 and O_2)				
M10 (CO)				

Footnotes:

(1) Precision DQO are defined by RSD or RPD.

(2) The precision criteria do not apply when determinations are near the detection limit of the specific method being performed due to the inherent uncertainty of data determinations derived from trace level samples at or below the RL. However, in all instances where the criteria have not been met, the data will be flagged, and the acceptance of the data for its intended objectives will be discussed in the emissions test report.

(3) Accuracy is, in general, defined as percent recovery of spiked analytes or the bias associated with the measurements of SRM and standards. When SRM are analyzed as accuracy assessment samples, an acceptance range around the "true" value is used to evaluate accuracy.

(4) The RPD is < 5% between analyses of each sample and < 20% for actual duplicate analyses.

Table A-5: Sampling Surrogate Spike Compounds with Target Recovery Criteria for SW-846 Methods 0010/0023A and US EPA Modified Method 5 for Energetics

Compound	Target Recovery (%)
Semivolatiles	
$^{13}C_6$-Naphthalene	50 to 150
Energetics	
3,4-Dinitrotoluene	50 to 150
PCDD/PCDF	
$^{37}Cl_4$-2,3,7,8-TetraCDD	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8-HexaCDD	70 to 130
$^{13}C_{12}$-2,3,4,7,8-PentaCDF	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8-HexaCDF	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8,9-HeptaCDF	70 to 130

Table A-6: Surrogate Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 8270C

Compound	Target Recovery (%)		
Surrogate Standards	***Front-half***	***Back-half***	***Condensate***
2-Fluorobiphenyl	48 to 110	48 to 111	56 to 109
2-Fluorophenol	37 to 105	42 to 104	29 to 90
2,4,6-Tribromophenol	34 to 121	51 to 125	40 to 127
Nitrobenzene-d_5	43 to 107	45 to 110	52 to 109
Phenol-d_5	48 to 114	50 to 118	19 to 134
Terphenyl-d_{14}	67 to 112	73 to 108	55 to 115
Spiking Compounds	***Front-half***	***Back-half***	***Condensate***
Benzoic acid	10 to 122	20 to 170	10 to 99
Benzyl alcohol	54 to 122	59 to 121	70 to 118
bis(2-Ethylhexyl) phthalate	77 to 128	84 to 125	80 to 123
Di-n-butyl phthalate	70 to 122	75 to 120	74 to 128
Di-n-octyl phthalate	73 to 123	78 to 122	78 to 118
Naphthalene	59 to 120	61 to 120	62 to 120

Table A-7: Internal Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 0023A

Compound	Target Recovery (%)
Internal Standards	
$^{13}C_{12}$-2,3,7,8-TetraCDD	40 to 135
$^{13}C_{12}$-2,3,7,8-TetraCDF	40 to 135
$^{13}C_{12}$-1,2,3,7,8-PentaCDD	40 to 135
$^{13}C_{12}$-1,2,3,7,8-PentaCDF	40 to 135
$^{13}C_{12}$-1,2,3,6,7,8-HexaCDD	40 to 135
$^{13}C_{12}$-1,2,3,6,7,8-HexaCDF	40 to 135
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDD	25 to 150
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDF	25 to 150
$^{13}C_{12}$-OctaCDD	25 to 150
Spiking Compounds	
2,3,7,8-TetraCDD	50 to 150
1,2,3,7,8-PentaCDD	50 to 150
1,2,3,4,7,8-HexaCDD	50 to 150
1,2,3,6,7,8-HexaCDD	50 to 150
1,2,3,7,8,9-HexaCDD	50 to 154
1,2,3,4,6,7,8-HeptaCDD	50 to 150
OctaCDD	50 to 150
2,3,7,8-TetraCDF	50 to 150
1,2,3,7,8-PentaCDF	50 to 150
2,3,4,7,8-PentaCDF	50 to 150
1,2,3,4,7,8-HexaCDF	50 to 150
1,2,3,6,7,8-HexaCDF	50 to 150
2,3,4,6,7,8-HexaCDF	50 to 160
1,2,3,7,8,9-HexaCDF	50 to 159
1,2,3,4,6,7,8-HeptaCDF	50 to 150
1,2,3,4,7,8,9-HeptaCDF	50 to 150
OctaCDF	50 to 150

Table A-8: Surrogate Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 8260B

Compound	Target Recovery (%)
Surrogate Standards	
Toluene-d_8	50 to 150
4-Bromofluorobenzene	50 to 150
Dibromofluoromethane	50 to 150
1,2-Dichloroethane-d_4	50 to 150
Spiking Compounds	
1,1-Dichloroethene	50 to 150
Trichloroethene	50 to 150
Benzene	50 to 150
Toluene	50 to 150
Chlorobenzene	50 to 150

Table A-9: Summary of Field QC Sample Requirements

Sample	QC Sample Type	Frequency
M0010	Trip blank (resin tube)	One (1) per sample shipment
	Reagent blank	One (1) per emissions test: Methanol/methylene chloride solvent rinses Particulate filter Deionized water
	Field blank	One (1) per emissions test: Front-half composite Back-half composite Impinger condensate and glassware solvent rinses
	Audit Sample	One (1) per emissions test (if presented)
M0023A	Trip blank (resin tube)	One (1) per sample shipment
	Reagent blank	One (1) per emissions test: Acetone, toluene, and methylene chloride solvent rinses Particulate filter
	Field blank	One (1) per emissions test: Front-half composite Back-half composite
	Audit Sample	One (1) per emissions test (if presented)
M0031	Trip blank (sorbent tubes)	One (1) pair per sample shipment
	Trip blank (DI water)	One (1) per sample shipment
	Field blank	One (1) complete pair per valid test run
	Audit Sample	One (1) set of 4 pairs (if presented)
M0040	Trip blank (aqueous)	One (1) per sample shipment
	Field blank	One (1) per valid test run or at a minimum 1 per day: Fill Tedlar bag with hydrocarbon-free zero nitrogen Recover as with a normal stack sample
	Field spike	One (1) per emissions test
M26A	Reagent blank	One (1) per emissions test: 0.1N H_2SO_4 impinger composite 0.1N NaOH impinger composite Particulate filter Acetone probe rinse
	Field blank	
	Audit Sample	One (1) per emissions test (if presented)

Table A-9: Summary of Field QC Sample Requirements (Continued)

Sample	QC Sample Type	Frequency
M29	Reagent blank	One (1) per emissions test: 0.1N HNO_3 probe rinse solution and particulate filter 5% HNO_3 and 10% H_2O_2 impinger solution 4% $KMnO_4$ and 10% H_2SO_4 impinger solution 8N HCl rinse solution
	Field blank	One (1) per emissions test: 0.1N HNO_3 probe rinse solution and particulate filter 5% HNO_3 and 10% H_2O_2 impinger solution 4th impinger ONLY: 0.1N HNO_3 rinse 4% $KMnO_4$ and 10% H_2SO_4 impinger solution 8N HCl rinse solution
	Audit Sample	One (1) per emissions test (if presented)
MM5E	Reagent Blank	One (1) per emissions test: Acetonitrile Reagent water
	Trip blank (resin tube)	One (1) per sample shipment
	Field Blank	One (1) per emissions test: Front-half rinse/filter Impinger contents/rinse Resin trap

Table A-10: Sample Holding Time and Preservation Techniques

Measurement	Matrix	Preservation	Holding Time
Semivolatiles	All	Cool, 0 to 6°C	14 days to extraction, 40 days to analysis
PCDD/PCDF			30 days to extraction, 45 days to analysis
Volatiles	Tenax® and Anasorb®, condensate	Cool, < 10°C	14 days to analysis
Volatile Unspeciated Mass	Tedlar Bags	None	6 hours
	Aqueous condensates	Cool, 0 to 6°C	14 days to analysis
HCL, Cl_2, HF	All	None	28 days to analysis
Metals			6 months to analysis, 28 days to analysis (mercury only)
Energetics		Cool, 0 to 6°C	14 days to extraction (FHR/fitler requires no extraction), 40 days to analysis

Table A-11: Listing of Target Analytes

Volatile PIC		
Acetone	Benzene	1,3-Butadiene
Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene
Chloroethane (Ethyl Chloride)	Chloroform	Chloromethane (Methyl Chloride)
1,2-Dichloroethane	Dichlorodifluoromethane	trans-1,2-Dichloroethene
Ethyl Benzene	Hexane	Methylene Chloride
1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	1,1,1-Trichloroethane
1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane (Freon 11)
Vinyl Chloride	m,p-Xylene	o-Xylene
Semivolatile PIC		
Naphthalene	Benzyl alcohol	Fluoranthene
bis(2-Ethylhexyl)-phthalate	Benzaldehyde	
PCDD/PCDF		
2,3,7,8-TetraCDD	1,2,3,7,8-PentaCDD	1,2,3,4,7,8-HexaCDD
1,2,3,6,7,8-HexaCDD	1,2,3,7,8,9-HexaCDD	1,2,3,4,6,7,8-HeptaCDD
1,2,3,4,6,7,8,9-OctaCDD	2,3,7,8-TetraCDF	1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF	1,2,3,4,7,8-HexaCDF	1,2,3,6,7,8-HexaCDF
2,3,4,6,7,8-HexaCDF	1,2,3,7,8,9-HexaCDF	1,2,3,4,6,7,8-HeptaCDF
1,2,3,4,7,8,9-HeptaCDF	1,2,3,4,6,7,8,9-OctaCDF	
Metals		
Antimony	Arsenic	Barium
Beryllium	Boron	Cadmium
Chromium	Cobalt	Copper
Lead	Manganese	Mercury
Nickel	Phosphorus	Selenium
Silver	Thallium	Tin
Uranium	Vanadium	Zinc
Miscellaneous Pollutants		
Chlorine/ Hydrogen Chloride	Hydrogen Fluoride	Particulate
Energetics		
RDX	2,4-Dinitrotoluene	2,4,6-Trinitrotoluene
HMX	2,6-Dinitrotoluene	Nitroglycerine

APPENDIX B: CMS PLAN

STATIC DETONATION CHAMBER (SDC)
EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX B
CONTINUOUS MONITORING SYSTEM (CMS)
PERFORMANCE EVALUATION PLAN (PEP)

REVISION 1, APRIL 2016

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ACRONYMS AND ABBREVIATIONS

°F.....degree(s) Fahrenheit
@.....at
%.....percent

ADEM.....Alabama Department of Environmental Management

CD.....calibration drift
CEMS.....Continuous Emissions Monitoring System
cfm .....cubic feet per minute
CFR.....Code of Federal Regulations
CMS.....Continuous Monitoring System
CO.....carbon monoxide

DQO.....data quality objective

FPI.....Feed Prohibitive Interlock

IAW.....in accordance with

MACT.....Maximum Achievable Control Technology

NIST.....National Institute of Standards and Technology
NOx.....nitrogen oxides

O_2 .....oxygen

PDARS.....Process Data Acquisition and Recording System
PEP.....Performance Evaluation Plan
PLC .....programmable logic controller
ppm .....part(s) per million
psi.....pound(s) per square inch

QA.....quality assurance
QC.....quality control

RCRA.....Resource Conservation and Recovery Act

SDC.....Static Detonation Chamber
SO_2 .....sulfur dioxide

TRM.....temporary reference method

WDC .....Washington Demilitarization Company

1.0 OVERVIEW

The Washington Demilitarization Company, LLC, (WDC) has submitted this emission test plan to verify proper operation of the Static Detonation Chamber (SDC). The Alabama Department of Environmental Management (ADEM) has determined that while the SDC is not directly regulated under the Maximum Achievable Control Technology (MACT) standards, operation of the unit will be required to meet the standards found in MACT subpart EEE as applicable. As a result, the emissions tests for this unit will be conducted to demonstrate compliance with applicable EEE standards.

The Continuous Monitoring System (CMS) consists of the Continuous Emissions Monitoring System (CEMS), Process Data Acquisition and Recording System (PDARS), and Feed Prohibitive Interlock (FPI) System. The facility CEMS include the carbon monoxide (CO) and oxygen (O_2) analyzers. Temporary reference method (TRM) CEMS, provided by the sampling contractor for the duration of the emissions test, include sulfur dioxide (SO_2) and nitrogen oxides (NO_X) analyzers. MACT is only applicable to CO facility CEMS. The FPI System includes monitoring pollution control device operations and monitoring system operations (i.e., thermocouples, pressure gauges, etc.).

The MACT monitoring requirements are found in 40 Code of Federal Regulations (CFR) 63.1209 and in the MACT General Provisions (40 CFR 63.8). This document establishes the proposed CMS Performance Evaluation Plan (PEP) and has been designed to address the MACT CMS evaluation plan requirements found in 40 CFR 63.1207 for the emissions test requirements and 40 CFR 63.8 and 63.1209 for monitoring requirements.

All CMS required for the proper operation of the emission test will be installed, calibrated, and operational as per 40 CFR 63.7 and 63.1207 and the exceptions allowed under 40 CFR 63.1206(b) prior to operation of the unit. This CMS PEP describes the methodology that is used to verify the operational status of the CMS relevant to the test.

This CMS PEP includes a description of the CMS, CMS emission test requirements, performance evaluation program objectives, and summary for the CMS-related to proper operation. The quality assurance (QA)/quality control (QC) objectives for all CMS are contained in the SDC standard operating procedures. Equipment calibration procedures for the FPI are in the SDC Equipment Calibration Procedures (SDC-EQP-3.01, 3.02, and/or 3.03).

WDC has the responsibility for operating the SDC and conducting the emissions test as required, in addition to, calibration and performance auditing of the CMS that are associated with the operation of the facility, QA/QC associated with these tasks, and reporting of the results.

2.0 CMS PEP PROGRAM

2.1 OBJECTIVES

The objective of this CMS PEP is to demonstrate and maintain the effectiveness of the CMS related to the proper operation of the SDC IAW the requirements of 40 CFR 63.8, 40 CFR 63.1209 (d), and SDC Calibration Plan (SDC-MNT-002). Performance evaluation is defined as the conduct of calibration error testing and other measurements used in validating the CMS data.

2.2 APPROACH

The process and control instruments are tested in accordance with (IAW) the calibration and performance specification requirements. The CMS instruments and devices related to SDC operations are calibrated IAW SDC Calibration Plan (SDC-MNT-002). The frequency depends on CMS performance and audit results. These results are recorded on the instrument calibration record.

Prior to the emissions test, calibration and audit records are reviewed to ensure the precision and accuracy of the CMS relevant to the proper operation IAW the applicable CMS performance specifications. If, during the review of these records, the calibration and/or audit results indicate that any of the instruments and control devices do not meet the relevant standard; corrective action takes place to ensure the immediate repair or replacement of the CMS defective parts. Following the corrective action, the CMS is calibrated to ensure its operating within specification. Calibration or audit results are then evaluated to ensure the proper operation of the instrument. Results of the performance evaluation test results for the monitors will be documented in the emission test report.

2.3 PERFORMANCE EVALUATION CRITERIA

In order to provide uniformity in the assessment methods and reporting of data quality; the assessment methods for response drift and accuracy of the CEMS is IAW the SDC CEMS Certification Plan (SDC-ENV-003) and Subpart EEE of Part 63. These assessment methods are based on procedures included in the applicable Performance Specifications for CEMS per Appendix B of 40 CFR Part 60 as described in Section 3.0. Assessment methods for all other CMS instruments and control devices are based on manufacturers' recommended procedures.

2.3.1 <u>CEMS Performance Specification</u>

A summary of the performance specification requirements for the CEMS can be found in the SDC CEMS Certification Plan (SDC-ENV-003).

2.3.2 FPI System Performance Specification

All other FPI instruments related to the emissions test are verified "acceptable" based on the manufacturers' specifications for these systems. The SDC Calibration Plan (SDC-MNT-002) incorporates this data.

2.4 CORRECTIVE ACTION

There are three degrees of "control" for setting action and data quality criteria: acceptable, marginal, and out-of-control. Acceptable data is self-explanatory; the data is valid and the CMS is operating within specifications. Marginal data is still valid but some action is needed to prevent further deterioration to the point where the data is invalid and the CMS is out of specification. When the third level of control, i.e. "out-of-control", is reached a serious problem exists in the system and data is invalidated until the problem is identified and fixed.

If a CEMS is declared out-of-control, all data collected during the "out-of-control" period is considered invalid data. If any of the FPI that affect the specified Resource Conservation and Recovery Act (RCRA) set points is declared out-of-control, feed to the SDC is stopped. In the event a malfunction of the FPI System occurs during the emissions test, additional waste feed is automatically locked out.

3.0 DESCRIPTION OF THE CMS

Under MACT, a "Continuous Monitoring System" is a comprehensive term that includes the CEMS, FPI System, and/or other manual or automatic monitoring that is used for demonstrating compliance with an applicable regulation on a continuous basis as defined by the regulation. The definition of "continuous" as it relates to process parameters is that the CMS must sample the regulated parameter without interruption, and evaluate the detector. FPI instruments will be verified prior to initiating the destruction sequence for munitions processing.

SDC must use a CEMS to demonstrate and monitor compliance with the MACT CO standard. An O_2 CEMS is used to continuously correct the CO levels to 7 percent (%) O_2. SDC has installed, calibrated, maintained, and continuously operates the CEMS IAW the QA procedures provided in the appendix to 40 CFR Subpart EEE and Performance Specification 4B (CO and O_2) in 40 CFR 60, Appendix B or as specified in the SDC CEMS Certification Plan (SDC-ENV-003).

The SDC must use CMS (e.g., thermocouples, pressure transducers, etc.) to document compliance with the applicable operating parameter limits IAW 40 CFR 63.1209(b). Thermocouples, pressure transducers, etc., must be installed and operated IAW 40 CFR 63.8(c)(3) that requires the owner, at a minimum, to comply with the manufacturer's written specifications or recommendations for installation, operation, and calibration of the system. The span of the CMS detector must not be exceeded. The span limits must be verified to be within range prior to initiation of the destruction sequence.

For the purpose of this plan, CMS is defined as the total equipment (sample interface, analyzer, and data recording) required for determining emissions and/or operating parameters. The CEMS, FPI System, and PDARS are the three basic categories of CMS at SDC.

3.1 CEMS

The CEMS are used for continuously monitoring the exhaust gas from the SDC and associated Off-Gas Treatment System while in operation. The facility CEMS suite consists of CO and O_2 monitors which are located in the exhaust stack. The CO CEMS is linked to the FPI System and corrected to 7% O_2 based upon O_2 CEMS readings. The facility CEMS are individual units and may be challenged during processing at the SDC. Operation of the facility CEMS units is described in the SDC CEMS Certification Plan (SDC-ENV-003).

For the emissions test(s), TRM CEMS provided by the sampling contractor will be used to monitor for SO_2 and NO_X analyzers.

3.2 FPI SYSTEM

The FPI System is used to continuously monitor the source or pollution control device operating parameters. The FPI System is an integral part of the Control System. The Control System has a centralized control console, including closed-circuit television monitors for observing operations at various locations, and locally mounted programmable logic controllers (PLC). Most SDC

processing and sequencing operations are controlled automatically through the PLC. Interlocks are provided to prevent improper facility operation. Abnormal conditions, operator entries into the system, and starting and stopping of equipment are logged with the time of occurrence. The Control System provides continuous automatic control of the treatment process.

The instruments that are used to measure the FPI are listed in Table 2. All instruments are installed per manufacturers; specifications and calibrated IAW the SDC Calibration Plan (SDC-MNT-002) and Procedures (SDC-EQP-3.01, 3.02, and/or 3.03).

3.3 PDARS

The PDARS is a computer-based data collection, reporting, and archiving system for monitoring operations. The PDARS monitors many areas or parameters such as temperatures, flows, and instrument status. The CEMS instruments have status and output signals continuously monitored by the PDARS.

4.0 CMS PERFORMANCE EVALUATION TEST SUMMARY

The CMS performance evaluation tests are being conducted to measure and ensure precision and accuracy. These tests simulate malfunction and methods of calibration of all CMS instruments and devices. All results are documented as part of the RCRA Operating Record for the SDC.

4.1 ACCURACY AND PRECISION REQUIREMENTS

4.1.1 CMS Calibration

Calibration procedures are written for each applicable device. These procedures are available to personnel who operate the systems and regulatory personnel for review. References to "daily" checks or calibrations will normally be performed during operational hours.

Calibration audits of the CEMS conform to the quarterly absolute calibration audit IAW 40 CFR 63, Appendix to Subpart EEE of Part 63, *Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors*. Also, criteria for daily calibration checks conform to the SDC CEMS Certification Plan (SDC-ENV-003).

Calibrations are fully documented and take place IAW the schedule presented in the calibration procedures for the facility. At a minimum, the CMS is calibrated prior to installation or just after installation; whichever is most appropriate for the CMS. Whenever the CMS requires major maintenance or repair, a full calibration is performed before data is declared valid. The frequency depends upon CMS performance and audit results.

With the exception of daily zero checks on CO CEMS and daily span checks on O_2 CEMS using supplied air, the reference standards for CEMS are either by certified compressed gases or a sealed gas cell containing a gas whose concentration is certified. Certified standards are traceable to National Institute of Standards and Technology (NIST) standards. Calibration accuracy is dependent on the quality of the reference standard used. Ideally, compressed gas standards are either NIST-Standard Reference Materials, gas vendor Certified Reference Materials, or a Primary Standard gas. NIST traceable standard may be used providing the necessary documentation is available.

Typical reference standards for the FPI System are liquid (water or mercury) manometers, NIST traceable thermometers, NIST traceable pitot tubes, and Fluke 4-20 milliamperes.

4.1.2 Zero and Span Checks

Zero (low level) and span checks (i.e., calibration drift [CD]) for CEMS are performed IAW the SDC CEMS Certification Plan (SDC-ENV-003). The CMS response to zero or low level and span (high level) standards is recorded to evaluate the performance of the CEMS over a period of time. The CD checks are the first criteria for determining the degree of control of the CEMS.

The CD is checked at two levels, zero and high. If the instrument technology is such that it is not possible to check the zero level, a low level point is checked instead. The CD levels of instrument span are defined as follows:

- Zero ±0.25%,
- Low level = 0 to 20%, and
- High level = 50 to 100%.

4.1.3 Performance Audits for Data Accuracy

A CEMS audit will be conducted on operational days to verify that all equipment is in good working order to include the sample collection and transport system. The system audit includes, at a minimum, a review of electronic data; an inspection of the analyzer warning lights, gas flows, and PDARS. CEMS-specific system audit forms are included in the SDC-SOP-001, *Continuous Emissions Monitoring System (CEMS).*

4.1.4 System Audits

A system audit is performed by a person other than the person who does routine daily checks, repair and maintenance, or data reporting; preferably a supervisor who is familiar with the CMS but does not have daily contact with it. Generally, system audits are “paper audits”, concerned with verifying the existence of documentation, adherence to procedures as written, verifying complete documentation and the physical condition of the CEMS operation. Data resulting from routine daily checks are reviewed for completeness.

4.2 RECORD KEEPING

SDC maintains records of all CMS activities in a file and/or logbook. Records are maintained IAW the records management program and procedures controlled by SDC. The CMS operator responsible for ensuring that the CMS is operating correctly uses this record. The record can also be made available to ADEM upon request. The record includes, at a minimum, the following information:

- Records of routine observation checks,
- Records of routine maintenance and adjustments,
- Records of parts that are replaced,
- Records of CMS calibration,
- Records of CMS daily CD,
- Records of CMS audits,
- Records of corrective action taken to bring an out-of-control CMS into control, and
- Records of date and time when CMS is inoperative or out-of-control.

4.3 REPORTING

SDC is required to submit reports to ADEM. These reports must include, at a minimum, the following information:

- Reporting period (as determined by permit condition);
- CMS type, manufacturer, serial number, and location;
- Data recorded during periods of CMS breakdowns, repairs, audits, calibration checks, and zero and span adjustments will not be included in the data averages;
- The magnitude of excess emissions computed IAW any conversion factor(s), and the date and time of commencement and completion of each period of excess emissions;
- Specific identification of each period of excess emissions that occur during startups, shutdowns, and malfunction of the SDC, nature and cause of any malfunction (if known), corrective action taken or preventive measures adopted;
- The date and time identifying each period during which the CMS was inoperative (out-of-control) except for zero and span checks and nature of the CMS repairs or adjustments; and
- Results of all CMS audits conducted during the reporting period.

5.0 QA/QC PROCEDURE

The QA/QC requirements include the data quality objectives (DQO) and both an internal and external QA/QC program. DQO are the pre-evaluation expectations of precision, accuracy, and completeness of data. The internal QA/QC program includes, at a minimum, the activities planned by routine operators and analysts to provide an assessment of CMS performance. The external QA/QC program includes, at a minimum, systems audits that include the opportunity for on-site evaluation by the regulatory authorities of instrument calibration, data validation, sample logging, and documentation of QC data and field maintenance activities.

Table 1: Facility CEMS

Manufacturer	Model	Parameter	Identification	Quantity	Range
Teledyne-API	300EM	CO	03-SDC-AIT-900A/B	2	0-200, 0-5,000 ppmv
		O_2	03-SDC-AIT-901A/B		0-25%

Table 2: FPI Conditions

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter[(1)]
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure	Maximum	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature	Minimum	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	Minimum	1,741ºF
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	Maximum	-0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	Maximum	400ºF
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	Maximum	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Flow Rate	Minimum	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow Rate	Minimum	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	Maximum	170ºF
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	Maximum	200ºF
SDC-FPI-11	AAHH-900	CO Concentration	Maximum	100 ppm, dry basis @ 7% O_2 (instantaneous)
SDC-FPI-12	QICA 36008	Neutral Scrubber pH	Minimum	7.0 pH

Footnote:
(1) Operational parameter(s) interlock will prohibit the transfer from LC1 into LC2 until all conditions are met or within range.

APPENDIX C: SDC CEMS CERTIFICATION PLAN

STATIC DETONTATION CHAMBER (SDC)

CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS) CERTIFICATION PLAN

SDC-ENV-003
Revision 0

Approved by:

Will Leslie, SDC Plant Manager	01SEP15 *Date*
Timothy K. Garrett, ACWA AFO	1 Sept 2015 *Date*

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ACRONYMS AND ABBREVIATIONS

± .....plus or minus
% .....percent
≤ .....less or equal to
≥ .....greater than or equal to
°F……degrees Fahrenheit

ACA.....absolute calibration audit
ACWA……Assembled Chemical Weapons Association
ADEM .....Alabama Department of Environmental Management
AFO……Anniston Field Office
AIT.....analyzer indicating transmitter
ANAD…….Anniston Army Depot

CAA……Clean Air Act
CD.....calibration drift
CE .....calibration error
CEMS .....continuous emissions monitoring system
CFR.....Code of Federal Regulations
CGA .....cylinder gas audit
CO.....carbon monoxide
CON.....Control Room

DQO.....data quality objective

EPA.....Environmental Protection Agency

FPI……..feed prohibitive interlock

GFC……gas filter correlation

IAW .....in accordance with
ICS .....Instrument Control System
ID .....induced draft (fan)
IR .....infrared

mA .....milliamp
M&TE.....measurement and test equipment
MACT.....Maximum Achievable Control Technologies

N_2……....nitrogen
NDIR .....non-dispersive infrared
NIST .....National Institute for Standards and Technology

O_2 .....oxygen
OGT……off gas treatment

ACRONYMS AND ABBREVIATIONS (Continued)

PDARS .....Process Data Acquisition and Recording System
PLC .....Programmable Logic Controller
PM.....preventive maintenance
ppm .....parts per million

QA.....quality assurance
QAPP .....Quality Assurance Project Plan
QC.....quality control

RA.....relative accuracy
RCRA .....Resource Conservation and Recovery Act
RT .....response time

SDC.....Static Detonation Chamber

µm .....micrometer
UOR.....unit of record
US .....United States

WMM……..waste military munitions
WDC .....Washington Demilitarization Company

1.0 INTRODUCTION

Continuous Emissions Monitoring Systems (CEMS) are used at the Static Detonation Chamber (SDC) to monitor stack emissions for both process efficiency and to provide evidence of compliance with the Clean Air Act (CAA) and Resource Conservation and Recovery Act (RCRA) permit. The Alabama Department of Environmental Management (ADEM) has the authority to administer RCRA programs.

The SDC facility is designed for treatment or destruction of waste military munitions (WMM), recovered WMM from within the State of Alabama, and munitions components which are either explosively or non-explosively configured. The SDC facility is located within the Ammunition Limited Area on the west side of G block within Anniston Army Depot (ANAD).

This plan includes information relating to the CEMS used to comply with the SDC permits. This plan combines the format of the SDC CEMS Certification Plan with the information specific of the SDC CEMS Equipment and Monitoring Strategy Plan into one cohesive document which satisfies the requirements found in the Code of Federal Regulations (CFR) and standards that are subject to Maximum Achievable Control Technologies (MACT) requirements.

1.1 Purpose

This document allows for continuous operational control of the CEMS to ensure the requirements listed in the SDC permits are met during certification activities and normal operations by providing the following:

- Location of CEMS,
- Initial certification activities/specifications,
- Continuing certification requirements,
- Calibration drift (CD) determination and adjustment,
- Preventive maintenance (PM) (including spare parts), and
- Data recording, calculations, and reporting.

This plan describes the regulations, certification methods, performance specifications, and quality assurance (QA)/quality control (QC) methods used to assure reliable and accurate data. Also included is a description of the CEMS sample location along with expected operating parameters. The CEMS analyzer theory of operation, manufacturer, model number, and ranges of operation are also provided. Detailed activities used for operations of the CEMS can be found in SDC-SOP-001, Continuous Emissions Monitoring System (CEMS).

These requirements are necessary for the control, improvement, and assessment of the quality of CEMS data used to demonstrate compliance with the standards provided in the SDC permits. This plan either meets or exceeds the intent of the requirements of 40 CFR 63, Subpart EEE and 40 CFR 60 for carbon monoxide (CO) and oxygen (O_2) CEMS. This plan may be revised on an “as needed” basis, but will be reviewed annually, at a minimum to ensure validity.

This plan is written in a 12 point format based on a guidance document published by the United States (US) Environmental Protection Agency (EPA) for writing QA project plans in order to provide consistency with the contents of most plans reviewed by regulatory officials. The outline of this document has been cross-referenced to the US EPA Quality Assurance Project Plan (QAPP) elements provided in the following US EPA documents (See Table 1):

- EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000;
- EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G 5, Office of Environmental Information, December 2002; and
- EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001.

1.2 Scope

The requirements of this plan are applicable to all SDC personnel performing any CEMS activities for the SDC. These standards reflect guidance found in 40 CFR 63 Subpart EEE, as specified by Section 112 of the CAA. Additionally, this plan incorporates the requirements for reference methods found in 40 CFR 60 Appendix A, as well as, the Performance Specifications found in Appendix B.

1.3 Responsibilities

The CEMS requirements are to provide continuous monitoring for CO, one (1) of six (6) "criteria" air pollutants for which emission standards have been established by the EPA. Since the reporting standard established for CO is corrected to 7 percent (%) O_2 to allow for data comparability, the CEMS will continuously monitor for both CO and O_2. Washington Demilitarization Company (WDC) has the responsibility for certification and operation of the CEMS. WDC is also responsible for reporting all data to support initial and continuing certification of the CEMS. This data will be compiled into a certification report and submitted to ADEM by the Anniston Field Office (AFO) for approval.

SDC personnel responsible for CEMS monitoring are listed below in hierarchical order to include duties and reporting responsibilities by position down to the technician level.

1.3.1 SDC Operations Manager

(a) Reports to the SDC Plant Manager.

(b) Provides adequate staffing to support CEMS activities.

(c) Oversees scheduling of CEMS related activities.

(d) Ensures that the CEMS provide reliable and accurate readings.

(e) Researches applicable environmental permit and regulatory requirements and supervise monitoring staff in accordance with (IAW) those requirements.

(f) Verifies that the CEMS are certified and operating IAW this plan during all operations.

(g) Reviews the data archiving process to ensure that complete and accurate CEMS data is maintained.

(h) Ensures that corrective actions are developed and implemented for CEMS malfunctions.

1.3.2 Duty Area Supervisor

(a) Assigns certified operators to ensure the CEMS are functioning properly.

(b) Determines CEMS status and work that must be performed.

(c) Ensures that the CEMS are operating correctly and the data collection system is working properly.

(d) Facilitates ordering replacements of consumables and spare parts.

(e) Ensures CEMS calibrations are performed.

(f) Responds to CEMS alarms/malfunctions as directed by Control Room (CON) Operators.

1.3.3 CEMS Technician/Operator

(a) Provides the on-site technical expertise for CEMS monitoring.

(b) Performs maintenance, repair, and calibration of CEMS equipment.

(c) Conducts initial, quarterly and annual certification activities relative to CEMS.

(d) Responds to alarms and malfunctions to determine cause and resolve.

(e) Performs data logging and ensures that the Process Data Acquisition and Recording System (PDARS) are operating correctly.

(f) Compiles the data used for the quarterly CEMS report.

(g) Mentors, trains, and assists with technician/operator certifications.

1.3.4 Maintenance Superintendent

(a) Reports to the SDC Operations Manager.

(b) Provides an independent overview of the CEMS.

(c) Inspects and monitors the CEMS certification, calibration, and quarterly audits.

(d) Observes audits and validates the performance of the CEMS personnel.

(e) Reviews CEMS documentation for accuracy.

(f) Performs routine inspections of the CEMS.

(g) Observes the actions of the CEMS personnel.

(h) Observes CEMS calibrations to verify the recorded calibration data.

(i) Observes CEMS audits to verify they are performed correctly.

(j) Verifies CEMS documentation.

1.4 Personnel Training and Certification Requirements

SDC personnel have written qualification and certification records to ensure each individual has the necessary proficiency to perform the duties assigned. Objective evidence of personnel training/qualifications will be documented and maintained. All training and certification documentation will be available for review upon request.

2.0 GENERAL OVERVIEW

The SDC is designed for the destruction of munitions and components by indirect heating in a stainless steel chamber. The chamber uses electricity to maintain an operating temperature of greater than or equal to (≥) 1,000 degrees Fahrenheit (°F). Heated sweep air may be added to the chamber during operations. The gases from the destruction process are transferred into and cleaned by an Off-Gas Treatment (OGT) System comprised of a thermal oxidizer, spray dryer, bag house filter, quench unit, acid scrubber, and neutral scrubber. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required to effectively treat the off gases from the SDC. An additional flow of secondary air is automatically added to ensure an oxidizing environment. Effluent temperatures are reduced by the spray drier, quench, and scrubbers. Downstream of the scrubbers are a series of induced draft (ID) fans and safeguard filter system. Prior to reaching the ID fans, the effluent pressure remains slightly below atmospheric pressure to ensure no potentially untreated off gas is released into the environment.

During operations, the CEMS will continuously monitor the exhaust, downstream of the OGT equipment, to include the ID fans and filter system. The CEMS have the ability to cause a feed prohibitive interlock (FPI) condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include two (2) analyzers (primary or unit of record (UOR) and an online backup). Both analyzers will be certified to allow for operational flexibility; however, only one is required to be operational in order to feed. More detailed sample location information can be found in Section 4. The CEMS sample locations and interferences are identified in Table 2 and detailed drawings for both can be found in Figures 1 and 2.

CEMS components are mounted in a National Electrical Manufacturers Association 1 Instrument Control System (ICS) cabinet located in a monitoring house. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS. Detailed information for the major CEMS subcomponents can be found in Section 3. Detailed data transmission information can be found in Section 6.

2.1 Type/Make of Instrument Shelter

The CEMS monitoring house is constructed of composition panels that provide weather protection and insulation. The monitoring house is heated and cooled to provide continuous temperature control. The CEMS equipment is powered by an uninterruptible power supply to ensure continuous monitoring. Required calibration and certification gases are plumbed from ground level cylinder storage racks to the monitoring house, which is approximately 10 feet above ground level.

2.2 System Type

The SDC will utilize extractive CEMS with redundant analyzers and all components necessary to provide the capability for reporting CO emissions in parts per million (ppm) corrected to dry O_2 units. The manufacturer, model, and ranges of the analyzers are detailed in Section 3.

Close-coupled conditioning of the extracted sample will be made using a dual-pass thermoelectric chiller with Kynar/Glass impingers and with final filtration and moisture carryover alarms. Dual peristaltic pumps continuously drain condensed moisture away from the condenser system. The system utilizes a flange-mounted sampling probe with heated 24 inches probe stinger assembly and heated ceramic primary filter. The probe is connected directly to the inlet of the close-coupled chiller assembly mounted below the probe at the stack sampling point. Sample is then transported via an unheated Teflon tubing bundle to the ICS cabinet.

The close-coupled probe and chiller assembly assures delivery of a suitable dry sample to the ICS cabinet housing the redundant analyzers, flow controls, pumps and programmable logic controller (PLC). Both analyzers have their own internal sample pump to provide the necessary motive force to move the sampled gas from the stack, through the conditioning equipment and through the gas analyzers.

2.3 CEMS Certification

Prior to operations, the CEMS equipment will complete initial certification testing, to include response time (RT), calibration error (CE), 7-day CD and alternative relative accuracy (RA) tests IAW the applicable performance specifications of 40 CFR 60, Appendix B. These specifications and supporting tests are detailed in Section 5. After initial certification, daily CD checks are performed on operational days, CE tests (or equivalent) are performed quarterly, and alternative RA tests are performed annually.

During quarterly and annual certification testing, the data will be compiled into a CEMS certification report, which will include summary results of the performance specification tests. This certification report will include the applicable field data sheets and calibration gas certifications and will be submitted to ADEM within 60 days of the completion of the testing.

3.0 DETAILED INFORMATION

The CEMS is a complete system designed to measure CO and O_2 emissions from the exhaust stack of the SDC which is equipped with air pollution controls IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE. Gas monitoring will be conducted at the stack with gas conditions saturated and at approximately 170 to 180°F. All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

3.1 <u>CEMS Analyzers</u>

Manufacturer:	Teledyne Instruments-API Advanced Pollution Instrumentation 9480 Carroll Park Drive San Diego, CA 92121-5201
Model Number:	300EM
CO Ranges:	Range 1 (Low) = 0 to 200 ppm Range 2 (High) = 0 to 5000 ppm
Measurement Principle:	Non-dispersive Infrared (NDIR) with Gas Filter Correlation (GFC)

The analyzer measures CO by comparing infrared (IR) energy absorbed by a sample to that absorbed by a reference gas IAW the Beer-Lambert law or Beer's Law. This scientific principle defines how light of a specific wavelength is absorbed by a particular gas molecule over a certain distance. This is accomplished by using a heated element to generate a beam of broad-band IR light with a known intensity (measured during instrument calibration). This beam is directed through multi-pass cells filled with sample gas. The sample cell uses mirrors at each end to reflect the IR beam back and forth through the sample gas a number of times. Upon exiting the sample cell, the beam shines through a band-pass filter that allows only light at a wavelength of 4.7 micrometers (um) to pass. Finally, the beam strikes a solid-state photo-detector that converts the light signal into a modulated voltage signal representing the attenuated intensity of the beam.

Water vapor can also absorb light at a wavelength of 4.7 um. To overcome potential interfering effects from water vapor, the light is also passed through a GFC wheel. This wheel has two chambers, one filled with pure nitrogen (N_2) (measurement cell) and the other with a combination of N_2 mixed with a high concentration of CO (reference cell). As the wheel spins, the IR light alternatively passes through both cells. This causes a fluctuation in the intensity of the IR light striking the photo-detector resulting in two separate and distinct peaks. The analyzer determines the ratio between the peaks of the measure pulse and the reference pulse and then uses a look-up table, with interpolation, to linearize the response. This response value is combined with calibration slope and offset values to produce a CO concentration which is then normalized for changes in sample pressure. If an interfering gas, such as water vapor is introduced into the sample, the peak heights will change identically, but their ratios will not be affected. In this case, the GFC rejects the effects of interfering gases so that the analyzer only responds to the presence of CO.

The analyzer has dual range capabilities in the ranges specified above and has auto ranging capability to move directly from low (0 to 200 ppm) to high (0 to 5000 ppm) range in the event measured values exceed the 200 ppm span of the low range.

O_2 Range: 0 to 25%

Measurement Principle: Paramagnetic

The paramagnetic analyzer is based on the scientific principle that O_2 is a paramagnetic material, which means that it can be easily attracted into a magnetic field, or is "magnetically susceptible." Magnetic susceptibility is a measure of the intensity of the magnetism of a substance when it is placed in a magnetic field. O_2 has an exceptionally high magnetic susceptibility compared to other gases – actually several hundred times greater than that of most gases. This allows for fast and accurate measurements.

This type of paramagnetic detector is known as the magnetodynamic or "dumbbell" type. The sensor's core is made up of two N_2 filled glass spheres which are mounted on a rotating suspension within a magnetic field (shaped like a dumbbell). A mirror is mounted centrally on the suspension and light is shone onto the mirror that reflects the light onto a pair of photocells. The signal generated by the photocells is passed to a feedback loop, which outputs a current to a wire winding mounted on the suspended mirror. This results in a small direct current electric motor. O_2 from the sample stream is attracted to the magnetic field displacing the N_2 filled spheres, causing the suspended mirror to rotate. This displacement changes the amount of light reflected onto the photocells thereby changing their output levels. This feedback loop increases the amount of current fed into the winding in order to move the mirror back into its original position. The more O_2 present, the more the mirror moves and the more current is fed into the winding by the feedback control loop.

Although the O_2 range can be as great as 0 to 100% with 0.1% precision and accuracy, the CEMS units will only be operated in the 0 to 25% range IAW 40 CFR 60, Performance Specification 4B.

3.2 Operational Data

The FPI set point is derived from the RCRA Permit. The CO FPI set point of 100 ppm is instantaneous and corrected to 7% O_2, dry basis. Expected operating ranges for CO and O_2 are provided in Table 4.

3.3 Cylinder Gas Calibration Standards

Table 5 lists the gas standards used for daily calibrations and audits of the CEMS. The CEMS rack has its own calibration system. The calibration system, with appropriate calibration gases, regulators, valves, and interconnecting tubing has the capability of verifying the zero and upscale response of each CEMS analyzer. The gas is introduced into the CEMS sampling system as close to the distal end of the heated sample probe as possible to ensure it passes through all CEMS components used during normal sampling. The duration of each gas injection during calibrations is adjustable and has been established to ensure that the CEMS surfaces are adequately conditioned.

3.4 Alternative Sampling

There are no alternate sampling methods or equipment. All compliance analyzers are calibrated on operational days and audited quarterly/annually. The CEMS cabinet contains two analyzers; one to serve as the UOR while the other remains an online backup, when available. In the event both units fail and cannot be repaired in a timely manner, SDC will utilize a like kind replacement strategy for the compromised units. When a malfunctioning analyzer is replaced, the replacement analyzer will have a successful calibration and CE test performed to validate the precision and accuracy of the new instrument before it can become the UOR. The new unit will assume the future quarterly and annual recertification dates of the replaced unit.

3.5 PM Program

The PM Program consists of taking diagnostic readings that identify the operating condition of the CEMS analyzers. These checks include the calibration check, inspection of the recording system, control panel warning lights, and sample transport and interface system IAW 40 CFR 60 and 40 CFR 63, Subpart EEE. The PM checks are included as a part of SDC-SOP-001, Continuous Emissions Monitoring System (CEMS). In addition, there may also be weekly, quarterly, semi annual, and annual PM performed on various parts of the CEMS to include the support systems.

4.0 SAMPLE LOCATION

Table 2 summarizes the probe location for the CEMS. A probe located at the centroidal area of the duct at the stack location is the introduction point for the sample. The sample probe site was selected IAW the methods outlined in the applicable performance specifications listed in Section 5.0.

The stack sampling location has a designed duct inner diameter of 14 inches. As the drawing in Figure 1 indicates, the nearest upstream flow disturbance is a 45° “Y” in the duct, where the OGT duct transitions to the stack. It is located approximately 5.5 duct diameters away. The nearest downstream flow disturbance is a taper where the stack diameter drops from 14 to 12 inches. This taper is located approximately 10 duct diameters away.

The monitoring house type is described in Section 2.1 and a detailed drawing can be found in Figure 2. As the drawing indicates, the house is positioned so that the stack penetrates through the monitoring house. Floor of the monitoring house is approximately 10 feet above ground-level and the CEMS sample port is approximately another 2 feet 6 inches above the floor inside the house. The CEMS ICS cabinet will also be located inside this monitoring house. This configuration allows for the entire system to remain protected from the elements and under consistently stable temperature conditions. Additionally, this design ensures minimum sample line distance (10 to 15 feet), and extremely fast response to changes in monitored process parameters.

5.0 PERFORMANCE REQUIREMENTS

The CEMS performance testing requirements adhere to the requirements of 40 CFR 60, Appendix B, as well as, 40 CFR 63, Subpart EEE guidelines. The performance specifications and guidelines that apply include:

- US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources,
- US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources (incorporating Performance Specification 4A by reference), and
- 40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors.

5.1 CEMS Audit

A CEMS audit will be conducted on operational days to verify that all equipment is in good working order to include the sample collection and transport system. The system audit includes, at a minimum, a review of electronic data; an inspection of the analyzer warning lights, gas flows, and PDARS. CEMS specific system audit forms are included in the SDC SOP 001, Continuous Emissions Monitoring System (CEMS).

5.2 Calibration Drift

SDC will conduct the seven day CD test upon initial startup of the CEMS analyzers, IAW 40 CFR 60, Section 1 of the applicable performance specification. The CD demonstrates the stability of the calibration over time and is defined as the deviation of the output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment takes place. If any adjustments are made to the zero and/or span settings, they are recorded prior to performing the adjustments.

Following an initial calibration, the monitors are challenged every 24 hours for an additional seven consecutive days with a low-level (zero) and high-level (span) calibration gas. The gas is introduced into the sampling system as close to the sample probe outlet as practical and passes through all components used during normal monitoring. The response for each "challenge" is recorded at the end of the period and subtracted from the reference value (calibration gas) to determine the CD. The CD is calculated using the following equations:

For CO: $$CD = \left(\frac{|A - R|}{S} \right) x 100$$

For O_2: $$CD = |A - R|$$

Where:

CD	=	% CD
A	=	Actual monitor response to gas
R	=	Reference value of zero or span gas
S	=	Span of the instrument

The seven day CD test was completed at the time of or soon after installation of CEMS analyzers. The CD test will not be performed during annual testing that occurs after the initial CD test is completed. Ongoing CD assessments will be conducted on operational days following the completion of the initial seven day CD test.

5.3 Calibration Error

The CE test documents the accuracy and linearity of the analyzer over the entire measurement range. The CE is defined as the difference between the concentration indicated by the CEMS and the known concentration of the US EPA Protocol calibration gas.

Each CO and O_2 monitor will be challenged three nonconsecutive times at three measurement points within the ranges specified in Table 6. This is IAW the requirements for an absolute calibration audit (ACA) under MACT. The terms ACA and CE test are used interchangeably throughout this document as they are in the Federal Regulations, but the tests are identical.

The calibration gas will be injected into the sampling system as close to the sample probe outlet as practical and will pass through all CEMS components used during normal monitoring. The difference between the instrument response and the reference value (certified gas value) will be calculated and the resulting differences will be averaged to determine the CE at each measurement point.

All calculations for CE determination have been programmed into an automated worksheet to eliminate mathematical errors, provide consistent rounding, and report all values to the correct decimal place IAW guidelines in the CFR. These worksheets automatically determine the PASS/FAIL status of the test results based on the criteria in the applicable CFR. The equations used for CE determination are listed below.

For CO:

$$CE = \left(\frac{Avg.Difference \left| \; d \; \right|}{InstFullScale(FS)} \right) x\, 100$$

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non-consecutive times
FS	=	Span of the instrument

For O_2:

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non consecutive times

5.4 Response Time

The RT test is performed upon initial startup of the CEMS to document the response rate of the monitoring equipment to a step change in the system-input value. The RT is defined as the time interval between the start of an abrupt change in the system input and the time when the data recorder displays 95% of the final value.

To conduct the RT test, each monitor is challenged with a zero gas. After the system output has stabilized at this condition (no change greater than 1% of full scale for 30 seconds), the monitor is challenged with a high-level calibration gas. The time required to reach 95% of the final stable value at this new condition is determined (upscale response time). Next, the zero gas is reintroduced and allowed to stabilize. The time required to reach 95% of the final stable value at this new condition is determined (downscale response time). The entire procedure is repeated three (3) times to determine the mean upscale and downscale response times. The longer of the two (2) mean values is considered the system response time.

In accordance with the applicable 40 CFR 60 performance specifications, RT tests are completed at the time of or soon after installation of CEMS analyzers.

5.5 Relative Accuracy

40 CFR Part 60, Appendix B, Performance Specification 4B, Section 7.3, states the following:

> *"Alternate RA Procedure. Under some operating conditions, it may not be possible to obtain meaningful results using the RA test procedure. This includes conditions where consistent, very low CO emission or low CO emissions interrupted periodically by short duration, high level spikes are observed. It may be appropriate in these circumstances to waive the RA test and substitute the following procedure.*
>
> *Conduct a complete CEMS status check following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions, sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. All parts of the CEMS must be functioning properly before the RA requirement can be waived. The instrument must also successfully pass the CE and CD specifications. Substitution of the alternate procedure requires approval of the Regional Administrator."*

Based on the regulatory guidance cited above, SDC proposes the use of the alternate RA procedure be allowed at SDC. This is based on Mass Balance calculations which show that the SDC generates an average of 0.0188 lb/hr (1.88E-08 ppm/hr) of CO. The SDC will also occasionally experience periods of time after a detonation when the CO will spike for a short time and then will decline. And, as noted in the US EPA Performance Specification 4B, meaningful data may be hard to obtain from a CEMS unit that undergoes a Relative Accuracy Test Audit when the system is unable to produce consistent higher levels of CO. These factors make the SDC a prime candidate for the alternate RA procedure. To conduct the alternate RA test for the CEMS, the units will successfully pass a daily CD assessment and CE test to ensure all parts of the CEMS are functioning properly. These results will be included in the certification report to be submitted to the state as outlined in Section 2.3.

5.6 Certification Data – Handling and Custody Procedures

All measurements made to support CEMS certification will be made on-site. The CEMS data will be recorded by PDARS. All final data results will be presented in the final report.

6.0 DATA MANAGEMENT

Data generated in the field is not considered final until reviewed by the CEMS personnel. Data from PDARS is automatically transmitted and accuracy is verified on a routine basis.

6.1 Data Quality Objectives (DQO)

DQO include accuracy, precision, completeness, comparability, and representativeness. Because data is generally pulled from PDARS, two other DQO must be achieved. The first is data availability (see Section 6.2) and the second is to ensure the data recorded by PDARS represents the data generated at the analyzer. CEMS data is generated at the analyzers and transmitted through the PLC. Due to the variability associated with data transmission through these signal loops, CEMS data from the field is checked to ensure it matches the data stored in PDARS. To do this, daily calibration values are recorded in the field and verified against the calibration data recorded in PDARS. If the field-recorded span values vary from the PDARS values by more than 2% of the instrument range, the signal loops are checked, and recalibrated if necessary.

Accuracy: Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. With CEMS, this is measured by CD on a daily basis.

Precision: Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions expressed in terms of the standard deviation.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that is expected to be obtained under correct, normal conditions. If a CEMS analyzer loses the ability to communicate with the PLC, a malfunction alert is generated and the backup unit is automatically selected.

Comparability: Comparability is the measure of the confidence with which one data set or method can be compared with another. Since all CEMS that measure a particular analyte use the same type of analyzer, measurements from any type CEMS will be 100% comparable with any other measurement taken from that type of CEMS. The only variability between two instruments at the same location would normally be the individual accuracy differences between instruments.

Representativeness: The use of standard sampling techniques and methods of analysis will provide data that is representative of actual conditions. Since CEMS are sampling the actual stack gases, they are representative of the conditions.

6.2 Data Availability

The CEMS provide system availability by utilizing a primary and backup unit. Only the UOR is required to store data and generate alarms. Monitoring will automatically switch to the backup unit when the primary CEMS is unavailable due to malfunction conditions or periods of service. During these events, the PLC will generate an FPI only if both units (primary and backup) simultaneously experience a malfunction. The backup monitor will provide continuity of monitoring to allow for sustained operations.

Daily CEMS calibrations may be conducted during the operational day, resulting in downtime for which emissions data will not be available. During these times, the SDC may continue to process waste for a maximum of 20 minutes while completing the calibrations. A PLC timer will generate an FPI condition if the calibration event exceeds this limit IAW 40 CFR 63, Appendix EEE, Section 6.2.

There are three primary conditions that have the ability to reduce CEMS availability. These are calibrations, malfunctions and maintenance.

Calibrations: The calibration is a manually initiated, automatic function that requires approximately 10 to 15 minutes to complete. The PDARS records the unadjusted concentration measurement prior to resetting the monitor to the corrected value for calibrations. Data recorded during calibrations is not system conditions, so it is not factored into the emission averages reported for compliance purposes.

Malfunctions: Malfunctions are conditions that may indicate an actual or pending problem with the CEMS unit. Examples of conditions that may generate malfunction alarms include, but are not limited to, failed calibrations, heater/cooler temperatures out of tolerance, broken electrical connections, sample pressure too high/low and moisture too high/low. A malfunction alarm does not necessarily mean a CEMS should be taken out of service. Rather, it is a signal for the technician to investigate the cause and determine the source of the malfunction. In the event this occurs on the UOR and the backup unit is unavailable, or it occurs with both units simultaneously, waste feed may not continue until the condition is resolved.

Maintenance: Maintenance requires the instrument or unit to be intentionally taken off line to perform testing or some type of corrective or PM activity. During times when this must take place on both units simultaneously, additional waste feed will be prevented by the FPI.

6.3 Data Recording/Reporting

All outputs from each analyzer will be directed to an Allen Bradley Compact Logix Series PLC. The PLC is configured with eight (8) analog inputs, 16 digital inputs, 16 digital relay inputs as well as communication capability with PDARS. The PLC is located in the system cabinet for data integration and output to PDARS. A cabinet-mounted touch screen PC is also located in the cabinet for local display and control functions. The PDARS will be the only official repository for archiving and retrieving official compliance data. PDARS data will be retained in the facility operating record for a minimum of five years IAW MACT requirements found in 40 CFR 63, Appendix EEE.

6.3.1 Calibration Data

Calibration data is recorded at three locations:

(a) PDARS records all CEMS readings including calibrations;

(b) CEMS readings are recorded in the cabinet-mounted programmable computer for up to seven days and the calibration data is annotated in the instrument logbook; and

(c) A calibration worksheet is completed.

6.3.2 PDARS Data Discrepancies

If the calibration values recorded on the CEMS daily worksheet do not agree with information recorded by PDARS within the tolerances outlined in Section 6.1, a SDC-SOP-001-0003.FRM, CEMS PDAR Data Discrepancy Form, is completed documenting the problem. This form is included with the daily calibration package. Any discrepancies are addressed and revised as appropriate.

6.3.3 Instrument Log

A permanently bound logbook with consecutively numbered pages will be located in the proximity of the CEMS cabinet. This log will contain a running history of the instruments assigned to that rack. Each entry will include as a minimum the date, time, activity description, applicable data and technician identification of the person making the entry.

Current calibration certifications are maintained in the Monitoring House. This will help serve as a record of the gas cylinders used and to ensure all gases installed have current certifications prior to their installation.

6.3.4 Data Archiving

Electronic CEMS data will be archived. Hard copy data (e.g., logbooks, forms, etc.) is maintained IAW document control procedures.

6.4 Data Collection, Reduction, and Validation

Regulations require that CEMS data be collected at least once each 15 seconds, but average data values need to be recorded as one-minute averages. CEMS data is collected and used to update the CO corrected to 7% O_2 every 15-seconds, regardless of the presence or absence of hazardous waste in the chamber.

6.5 Data Calculations

Through the ICS rack, the analyzers output CEMS data to the PLC. The PLC continuously receives CEMS data and records the values for PDARS storage at least every 15 seconds. The PLC corrects CO 15-second to 7% O_2 as follows:

$$CO_A = CO_I \times \left(\frac{21\% - 7\%}{21\% - O_{2A}} \right)$$

Where:

CO_A	=	Advisor screen displayed CO concentration as calculated by PLC
CO_I	=	CO concentration read by PLC from the CO monitor
O_{2A}	=	Advisor screen displayed O_2 concentration

6.6 Missing Data

Because of redundant data collection methods for CEMS data, it is highly unlikely that there will be any missing data. Should there be missing data; the cause for the missing data will be determined and the following accomplished:

- Replication of the missing data, if possible;
- Documentation that data was lost; and
- Corrective action taken to prevent a future reoccurrence of missing data.

All of the above will be included in the CEMS quarterly report.

7.0 QUALITY CONTROL

7.1 Type/Frequency

All CEMS undergo system audits and CD checks. Table 5 lists the CEMS gas standards to be used for calibrations. The QC Inspector reviews the calibration forms and certificates ensuring that all data and related standards are recorded and calculated IAW SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), . QC Personnel may observe calibration of CEMS to validate the accuracy of the calibrations, determine if the reported CD is correct, and review the quarterly CEMS audits.

In addition to the activities above, the CEMS may also undergo weekly, quarterly, semi-annual, and annual PM procedures. The PM activities are based on manufacturer's recommendations to ensure long-term stability or trending data indicating potential problems. Quarterly data assessment and annual certification audits are also performed.

7.2 Control Limits and Actions during Calibrations

The control limits and actions stated here relate to operations of the CEMS. During calibrations, the CD is evaluated to determine excessiveness as follows:

O_2 Excessive:	CD is determined to be excessive if the 1 to 2% (zero) or the 20.9% (span) reading differs from the reference value by more than 0.5% O_2. If the CD is excessive, the calibration must be adjusted.
CO Excessive:	CD is determined to be excessive if the zero or span reading differs from the reference value by more than six (6) ppm for the low range (200 ppm) or more than 150 ppm for the high range (5,000 ppm). If the CD is excessive, the calibration must be adjusted.
CO/ O_2 Out of Control:	The CEMS is determined to be out of control if the CD for zero or span exceeds two times the limits stated above, or if the cumulative adjustment (zero and span) exceeds three (3) times the limit stated above. If this occurs, corrective maintenance will be performed and a new CD will be performed within the limits stated above. The CEMS cannot be the UOR until a CE test has been successfully completed.

If the CD evaluation indicates that the CEMS are out of control, the following steps will be taken:

- Identify and correct the cause for the excessive drift;
- Complete an "out of control" report; and
- Ensure corrective action is developed to prevent future occurrences of the same type of problem where possible.

8.0 QUALITY ASSURANCE

8.1 Audit Procedures

The CEMS also undergo quarterly and annual audits to further ensure data reliability. Audits and surveillances of the CEMS fall into two categories internal and external.

8.1.1 Internal Audits and Surveillances

RCRA CEMS will have an ACA or CE test performed IAW 40 CFR 63, Subpart EEE. Normally, this test may only be conducted for three of the four calendar quarters of a given year, unless an alternative test procedure is utilized. Under the alternative RA test procedure, the SDC facility will conduct these tests in all four calendar quarters in lieu of an RA test during one of the quarters.

ACA or CE tests may also be conducted more than three quarters in succession if the affected system(s) are shutdown for an extended period of time and, as a result, the RA test (if required) cannot be completed due to the absence of thermal loading at the affected facility. In these instances, ADEM will be notified and an extension (or reschedule) will be requested for the impending test date.

A QA representative may provide oversight during operations or audits and verify the accuracy of the data generated. The SDC Plant Manager may schedule surveillances aimed at observing all types of monitoring operations. These surveillances may include the CEMS during any given period. All results of surveillances will be documented and forwarded to the SDC Plant Manager upon request.

8.1.2 External Audits and Surveillances

The US EPA or ADEM may conduct audits and surveillances of the CEMS as deemed necessary. These may be scheduled or unscheduled at the discretion of the agency conducting the audit or surveillance.

8.2 National Institute for Standards and Technology (NIST) Traceability

The measurement accuracy for the standards used to calibrate the CEMS and the measurement and test equipment (M&TE) are traceable to the NIST. The accuracy certificate for the CEMS calibration gases is maintained on file and made a part of certification and calibration records. US EPA protocol certified gases will be used for all cylinder gas accuracy audits including ACA or CE tests. CEMS CD determination may use US EPA certified cylinder gas, protocol gas, certified N2, or plant-supplied instrument air.

8.3 Operational Procedures

SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), details operations performed on CEMS instruments to include startup, shut down, calibrations, CE testing, RT testing, alarm/malfunction response, and performance of maintenance activities. All SOP require approval by SDC management and are validated in the field prior to use. However, SOP may be revised, at any time, if a change is necessary to comply with changes to applicable requirements or if conditions exist that will not allow CEMS operations to be performed IAW the prescribed method.

8.4 Operator Training

All personnel with CEMS responsibilities will be trained and certified prior to working unsupervised on any CEMS instruments.

8.5 Measurement & Test Equipment Calibration

The M&TE used in support of certification, technical audits, daily CEMS calibrations, and PM are calibrated using standards that are traceable to the NIST. M&TE used to support CEMS operations are calibrated as follows:

8.5.1 M&TE that is a "built-in" component of the ICS rack will be certified with the system during the initial CEMS certification. The calibrations and quarterly audits of the CEMS prove the accuracy of this type of support equipment on an ongoing basis. If a CEMS fails a calibration due to a faulty piece of integral M&TE, that piece is replaced and the system has a new calibration performed to prove its accuracy. Since this calibration is maintained as a system, the individual components do not need separate calibrations or "calibration due" stickers placed on them.

8.5.2 M&TE that is used to troubleshoot the CEMS equipment has its calibration maintained through the SDC Maintenance Department. The M&TE will be verified against a known accurate instrument to ensure the calibration was performed correctly. A label on each piece of M&TE indicates when the next calibration is due. A computerized recall system is used to help ensure that no out-of-date M&TE is left in the work place where it may be used.

9.0 QUARTERLY DATA ASSESSMENT REPORT

A quarterly data assessment report is submitted to the ADEM no later than 60 days after the end of each calendar quarter IAW SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan. This report details CEMS malfunctions resulting in FPI and provides information about maintenance activities conducted on the CEMS.

Table 1: Comparison to US EPA QAPP Elements

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
Title Page	A1 Title and Approval Sheet	Not Applicable
Table of Contents	A2 Table of Contents	Not Applicable
1.0 Introduction	A4 Project/Task Organization A5 Problem Definition/Background A6 Project/Task Description	Step 1: State the problem Step 2: Identify the decision Step 3: Identify the inputs to the decision Step 6: Specify limits on decision errors
2.0 General Overview	A6 Project/Task Description C2 Reports to Management D1 Data Review, Verification, and Validation	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
3.0 Detailed Information	B1 Sampling Process Design B7 Instrument/Equipment Calibration and Frequency B8 Supplies and Consumables	Step 1: State the problem Step 2: Identify the decision Step 4: Define boundaries Step 5: Develop a decision rule Step 6: Specify limits on decision errors
4.0 Sample Location	A6 Project/Task Description B1 Sampling Process Design	Step 4: Define boundaries Step 5: Develop a decision rule Step 7: Optimize the design for obtaining data
5.0 Performance Requirements	A7 Quality Objectives and Criteria A9 Documentation and Records B2 Sampling Methods B3 Sample Handling and Custody B4 Analytical Methods D2 Verification and Validation Methods	Step 3: Identify the inputs to the decision Step 4: Define boundaries Step 6: Specify limits on decision errors

Table 1: Comparison to US EPA QAPP Elements (Continued)

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
6.0 Data Management	A7 Quality Objectives and Criteria A9 Documentation and Records B10 Data Management D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
7.0 Quality Control	A7 Quality Objectives and Criteria D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
8.0 Quality Assurance	A7 Quality Objectives and Criteria A8 Special Training/Certification B6 Instrument/Equipment Testing, Inspection, and Maintenance B7 Instrument/Equipment Calibration and Frequency C1 Assessments and Response Actions	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
9.0 Quarterly Data Assessment Report	A9 Documentation and Records C2 Reports to Management	Step 5: Develop a decision rule Step 6: Specify limits on decision errors

Table 2: CEMS Sample Locations

Tag Number	Analyte	FPI	Upstream Interference	Downstream Interference	Duct ID (inches)
03-SDC-AIT-900A	CO/O_2	Yes	45° connecting duct to stack	Stack Taper	14
03-SDC-AIT-900B					

Table 3: Analyzer Types

Quantity	Parameters	Manufacturer	Model	Range
2	CO	Teledyne-API	300EM	0 to 200ppmv 0 to 5,000 ppmv
2	O_2			0 to 25%

Table 4: Operational Data

System	Analyte	Instrument Range	Instrument Accuracy	FPI Set Point	Expected Concentration
SDC	CO	0 to 200ppmv 0 to 5,000 ppmv	$\pm$ 2% of range	100 ppm	0 to 10 ppm
	O_2	0 to 25%		Not Applicable	8 to 12%

Table 5: Calibration Gas Standards

Gas Standard ID(1)	Gas Value/Type	Purpose
CG1	99.99% N_2 [pure]	Zero gas for O_2, CO-L and CO-H daily; Low gas for CE testing - ALL
CG2(2)	8 to 10% O_2 / 60 to 80ppm CO [blended]	Mid gas for CE testing O_2 and CO-L
CG3(2)	14 to 16% O_2 / 140 to 160ppm CO [blended]	Span gas for O_2 and CO-L daily; High gas for CE testing O_2 and CO-H
CG4	1,500 to 2,000 ppm	Mid gas for CE testing CO-H
CG5	3,500 to 4,000 ppm	Span gas for CO-H daily; High gas for CE testing CO-H
CG6	Not Applicable	Spare/Test Gas

Footnotes:

(1) The accuracy for the gas standards may be certified for 24 to 36 months, depending on the vendor supplying the gas.

(2) Blended gases will be used to allow for consolidation of cylinders based on space limitations and reducing the amount of calibration gas control equipment necessary to facilitate testing.

Table 6: Test Gas Range Measurement Points

Calibration Gas Range	CO-Low (0 to 200 ppm)	CO-High (0 to 5,000 ppm)	O_2 (0 to 25%)
Zero/Low	0 to 40	0 to 600	0 to 2
Mid	60 to 80	1,500 to 2,000	8 to 10
High	140 to 160	3,500 to 4,000	14 to 16

Table 7: QC Requirements

Specification	Requirement
CO Performance Specification 4A/B	
CD (24 hours)	≤ 3% of span value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 5% of full scale
RT	≤ 2 minutes
RA	As specified in performance specification, presently 10% of RM or 5 ppm, whichever is greater, unless alternative is used. When alternative is used the default is the ACA specification.
O_2 Performance Specification 3/4B	
CD (24 hours)	≤ 0.5% of reference value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 0.5% of reference value
RT	≤ 2 minutes
RA	As specified in performance specification, presently ≤ 1% O_2, unless alternative is used. When alternative is used the default is the ACA specification.

Figure 1: Stack Configuration

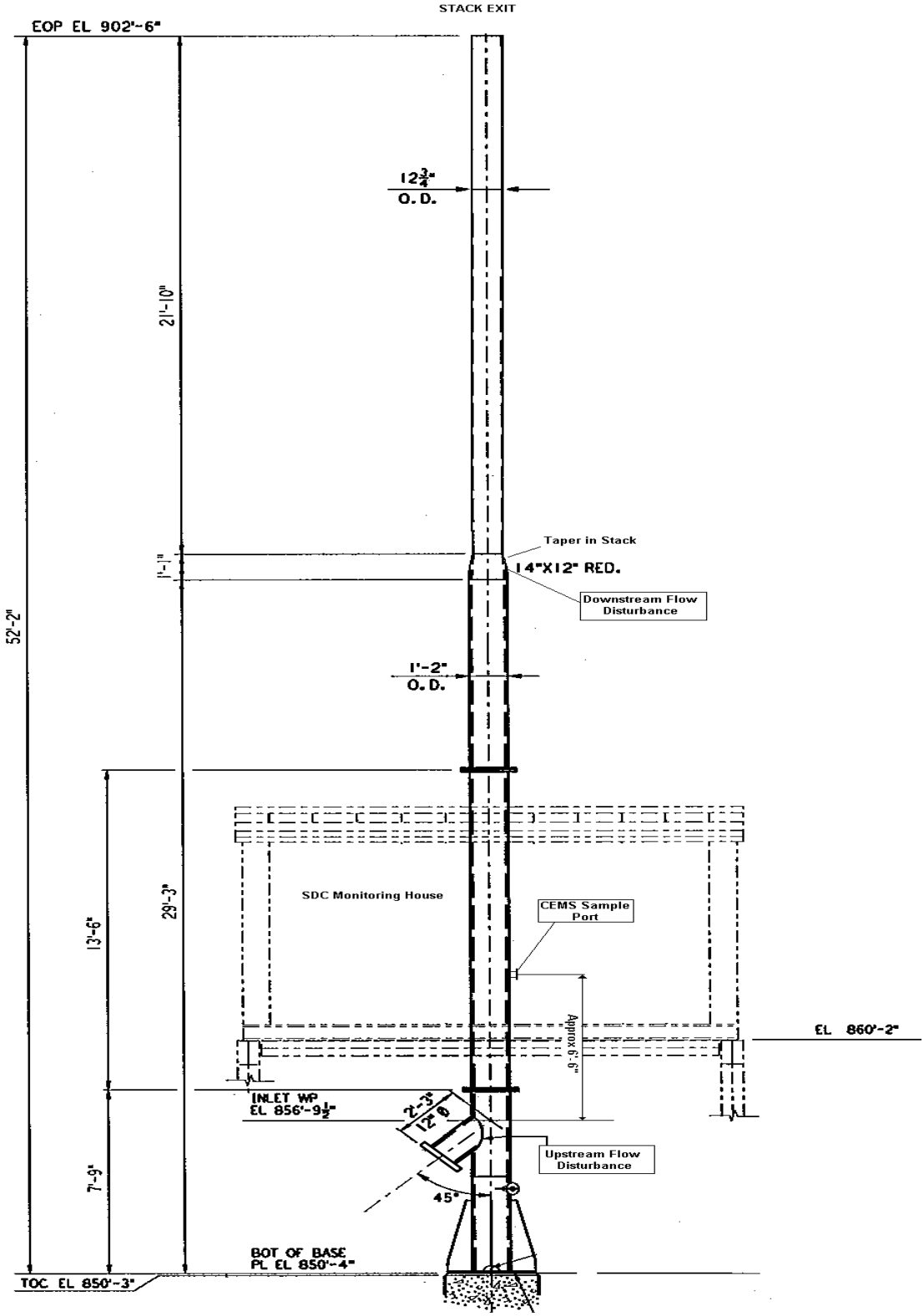
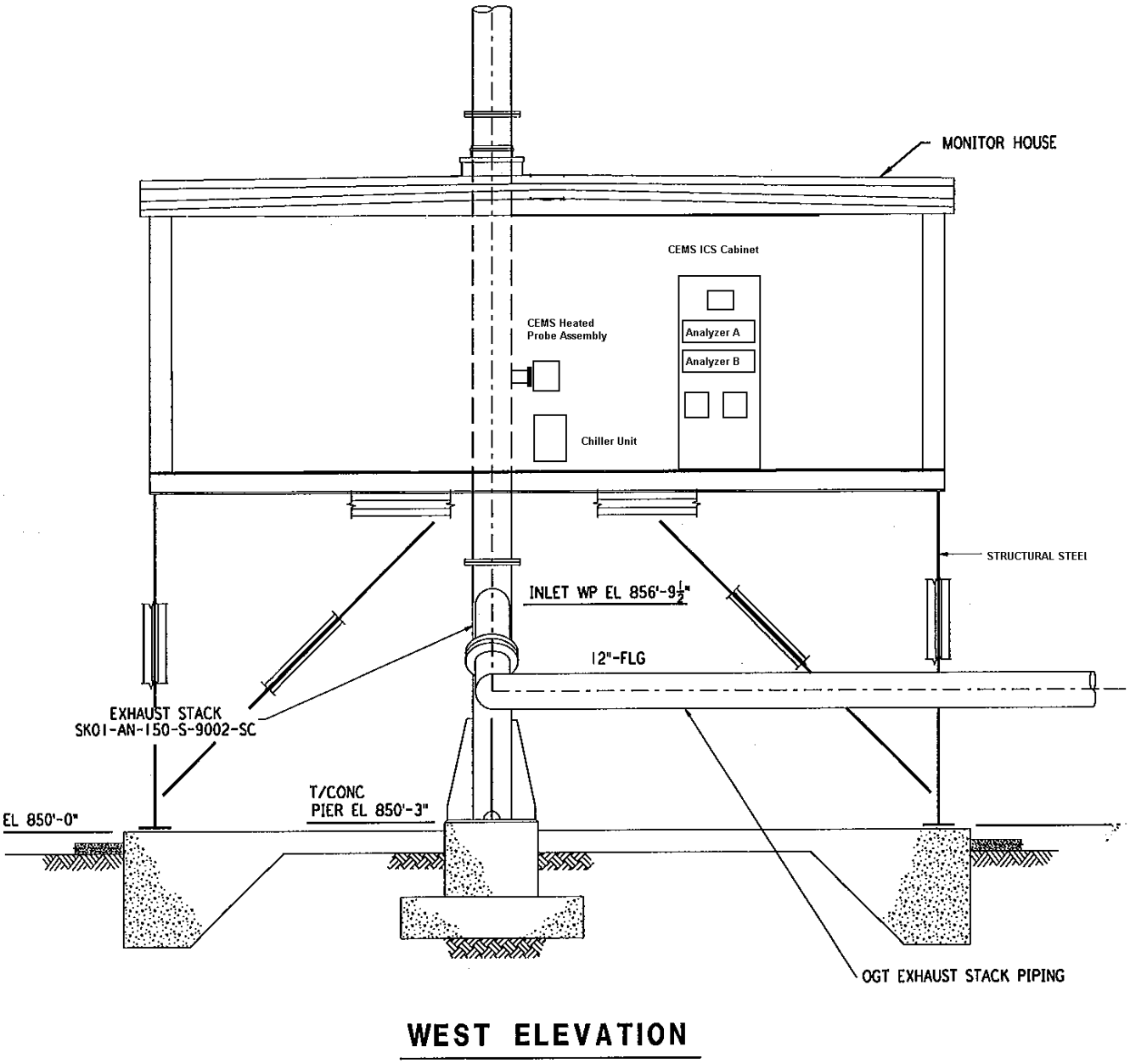


Figure 2: CEMS Monitoring Location



Appendix A: References

SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan

SDC-SOP-001, Continuous Emissions Monitoring System

EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000

EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G-5, Office of Environmental Information, December 2002

EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001

US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources

US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources

40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors

APPENDIX D: SCHEMATIC OF SAMPLING LOCATION

Evaluation of the SDC Exhaust Duct Sampling Ports for Compliance with EPA Method 1 and EPA Method 2

EPA Method 1 Evaluation

EPA Method 1, Sample and Velocity Traverses for Stationary Sources, provides guidance for the selection of sampling ports and traverse points at which sampling for air pollutants will be performed pursuant to applicable regulations. The method is applicable to gas streams flowing in exhaust ducts and cannot be used when: (1) the flow is cyclonic or swirling; or (2) a duct is smaller than 0.30 meter (12 inches) in diameter. The simplified procedure described in the method cannot be used when the measurement site is less than two duct diameters downstream or less than a half diameter upstream from a flow disturbance.

Drawings AN-150-P-9007-SC (Revision 0) provides the off-gas treatment exhaust stack piping plan. These drawings show eight (8) ports sets to be used for sampling of the exhaust gas and include distances from upstream and downstream disturbances. The drawings show the duct diameter to be twelve (12) inches at the planned sampling location which is the minimum diameter allowed for the simplified procedure described inn EPA Method 1. Each port set was evaluated and all were found to be at least two (2) duct diameters downstream and a half (0.5) diameter upstream from the nearest flow disturbance. Table 1 provides a summary of this evaluation.

Having reviewed the EPA Method 1 requirements and the applicable drawings that show the exhaust ducting and sampling ports it has been determined that the planned sampling locations meet the requirements of EPA Method 1. It is noted that it is not possible to establish if the flow is cyclonic or swirling without directly measuring the as-built system for this condition.

EPA Method 2 Evaluation

EPA Method 2, Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube), is applicable for the determination of the average velocity and the volumetric flow rate of a gas stream. The method is not applicable at measurement sites that fail to meet the criteria of EPA Method 1. The average gas velocity in an exhaust duct is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. The method does not specify a minimum flow requirement but based on the limitations of the standard Type S pitot and standard inclined manometers, flow rates should generally be greater than ten (10) feet per second.

The sampling locations were found to meet the EPA Method 1 requirements as described previously. The mass and energy balance for the 4.2-Inch condition (see 4.2 inch-10-PC3.xls) show a flow rate of eight (8) meters per second which is equivalent to 26.24 feet per second and is greater than the ten (10) feet per second minimum. As both the EPA Method 1 and minimum flow requirements have been satisfied, EPA Method 2 may be employed at the proposed sampling locations on the exhaust duct.

Table 1. EPA Method 1 Evaluation of SDC Sampling Locations

Sample Port	Duct Diameter, inches	Nearest Upstream Flow Disturbance, inches	Duct Diameters Downstream from Upstream Flow Disturbance	Nearest Downstream Flow Disturbance, inches	Duct Diameters Upstream from Downstream Flow Disturbance	Satisfies EPA Method 1
N1/N2	12.00	261.75	21.81	216.00	18.00	YES
N3/N4	12.00	285.75	23.81	192.00	16.00	YES
N5/N6	12.00	309.75	25.81	168.00	14.00	YES
N7/N8	12.00	333.75	27.81	144.00	12.00	YES
N9/N10	12.00	357.75	29.81	120.00	10.00	YES
N11'N12	12.00	381.75	31.81	96.00	8.00	YES
N13/N14	12.00	405.75	33.81	72.00	6.00	YES
N15/N16	12.00	429.75	35.81	48.00	4.00	YES

Notes:

1. EPA Method 1 may not be used when the duct diameter is smaller than twelve (12) inches.
2. EPA Method 1 may not be used when the measurement site is less than two (2) duct diameters downstream or less than a half (0.5) diameter upstream from a flow disturbance.

APPENDIX E: MACT CROSS-WALK OF REQUIREMENTS

Item	63 CFR 1207	Requirement	Location
1	(f)	Provisions of §§63.7(c)(2)(i)-(iii) and (v) regarding the content of the test plan apply	See 62 – 81
2	(f)(1)(i)	An analysis of each feedstream, including hazardous waste, other fuels, and industrial furnace feedstocks, as fired, that includes	Section 3.4
3	(f)(1)(i)(A)	Heating value, levels of ash (for hazardous waste incinerators only), levels of semivolatile metals, low volatile metals, mercury, and total chlorine (organic and inorganic)	RCRA Permit Table 5-3 governs feed rates.
4	(f)(1)(i)(B)	Viscosity or description of the physical form of the feedstream	Section 3.4
5	(f)(1)(ii)	For organic hazardous air pollutants established by 42 U.S.C. 7412(b)(1), excluding caprolactam (CAS number 105602) as provided by §63.60	---
6	(f)(1)(ii)(A)	Except as provided by paragraph (f)(1)(ii)(D) of this section, an identification of such organic hazardous air pollutants that are present in each hazardous waste feedstream	Section 3.3
7	(f)(1)(ii)(B)	An approximate quantification of such identified organic hazardous air pollutants in the hazardous waste feedstreams, within the precision produced by analytical procedures of §63.1208(b)(8)	Section 3.3
8	(f)(1)(ii)(C)	A description of blending procedures, if applicable, prior to firing the hazardous waste feedstream, including a detailed analysis of the materials prior to blending, and blending ratios	Not applicable No blending will occur.
9	(f)(1)(ii)(D)	The Administrator may approve on a case-by-case basis a hazardous waste feedstream analysis for organic hazardous air pollutants in lieu of the analysis required under paragraph (f)(1)(ii)(A) of this section if the reduced analysis is sufficient to ensure that the POHCs used to demonstrate compliance with the applicable DRE standards of this subpart continue to be representative of the most difficult to destroy organic compounds in your hazardous waste feedstreams	Not Applicable No variance is requested.
10	(f)(1)(iii)	A detailed engineering description of the hazardous waste combustor, including ***Note: The SDC is not a hazardous waste combustor but is subject to these regulations by permit only.***	Section 4.0
11	(f)(1)(iii)(A)	Manufacturer's name and model number of the hazardous waste combustor	CAA Permit 301-0050-Z013
12	(f)(1)(iii)(B)	Type of hazardous waste combustor	Section 1.0
13	(f)(1)(iii)(C)	Maximum design capacity in appropriate units	Section 3.4
14	(f)(1)(iii)(D)	Description of the feed system for each feedstream	Section 4.0
15	(f)(1)(iii)(E)	Capacity of each feed system	Section 3.4
16	(f)(1)(iii)(F)	Description of automatic hazardous waste feed cutoff system(s)	Section 5.0
17	(f)(1)(iii)(G)	Description of the design, operation, and maintenance practices for any air pollution control system	Section 4.0
18	(f)(1)(iii)(H)	Description of the design, operation, and maintenance practices of any stack gas monitoring and pollution control monitoring systems	Sections 6.0 & 7.0
19	(f)(1)(iv)	A detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis	Section 3.3 & SAP/QAPP
20	(f)(1)(v)	A detailed test schedule for each hazardous waste for which the performance test is planned, including date(s), duration, quantity of hazardous waste to be burned, and other relevant factors	Section 9.0
21	(f)(1)(vi)	A detailed test protocol, including, for each hazardous waste identified, the ranges of hazardous waste feedrate for each feed system, and, as appropriate, the feedrates of other fuels and feedstocks, and any other relevant parameters that may affect the ability of the hazardous waste combustor to meet the emission standards	Section 3.4
22	(f)(1)(vii)	A description of, and planned operating conditions for, any emission control equipment that will be used	Section 4.0

Item	63 CFR 1207	Requirement	Location
23	(f)(1)(viii)	Procedures for rapidly stopping the hazardous waste feed and controlling emissions in the event of an equipment malfunction	Sections 4.0 & 5.0
24	(f)(1)(ix)	A determination of the hazardous waste residence time as required by §63.1206(b)(11)	Not applicable Variable by waste type.
25	(f)(1)(x)	If you are requesting to extrapolate metal feedrate limits from comprehensive performance test levels under §§63.1209(l)(1)(v) or 63.1209(n)(2)(vii)	Not Applicable No waste extrapolation is proposed for this test. Will maintain current approved feed limitations for metals.
26	(f)(1)(x)(A)	A description of the extrapolation methodology and rationale for how the approach ensures compliance with the emission standards	Not Applicable
27	(f)(1)(x)(B)	Documentation of the historical range of normal (i.e., other than during compliance testing) metals feedrates for each feedstream	Not Applicable
28	(f)(1)(x)(C)	Documentation that the level of spiking recommended during the performance test will mask sampling and analysis imprecision and inaccuracy to the extent that the extrapolated feedrate limits adequately assure compliance with the emission standards	Not Applicable
29	(f)(1)(xi)	If you do not continuously monitor regulated constituents in natural gas, process air feedstreams, and feedstreams from vapor recovery systems under §63.1209(c)(5), you must include documentation of the expected levels of regulated constituents in those feedstreams	CAA Permit 301-0050-Z013
30	(f)(1)(xii)	Documentation justifying the duration of system conditioning required to ensure the combustor has achieved steady-state operations under performance test operating conditions, as provided by paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
31	(f)(1)(xiii)	For cement kilns with in-line raw mills, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
32	(f)(1)(xiv)	For preheater or preheater/precalciner cement kilns with dual stacks, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
33	(f)(1)(xv)	If you request to use Method 23 for dioxin/furan you must provide the information required under §63.1208(b)(1)(i)(B)	SW-846 Method 0023A will be used.
34	(f)(1)(xvi)	If you are not required to conduct performance testing to document compliance with the mercury, semivolatile metals, low volatile metals, or hydrogen chloride/chlorine gas emission standards under paragraph (m) of this section, you must include with the comprehensive performance test plan documentation of compliance with the provisions of that section	Section 3.3
35	(f)(1)(xvii)	If you propose to use a surrogate for measuring or monitoring gas flowrate, you must document in the comprehensive performance test plan that the surrogate adequately correlates with gas flowrate, as required by paragraph (m)(7) of this section, and §63.1209(j)(2), (k)(3), (m)(2)(i), (n)(5)(i), and (o)(2)(i)	Not Applicable
36	(f)(1)(xviii)	You must submit an application to request alternative monitoring under §63.1209(g)(1) not later than with the comprehensive performance test plan, as required by §63.1209(g)(1)(iii)(A)	Not Applicable
37	(f)(1)(xix)	You must document the temperature location measurement in the comprehensive performance test plan, as required by §§63.1209(j)(1)(i) and 63.1209(k)(2)(i)	Table 1
38	(f)(1)(xx)	If your source is equipped with activated carbon injection, you must document in the comprehensive performance test plan	Not Applicable
39	(f)(1)(xx)(A)	The manufacturer specifications for minimum carrier fluid flowrate or pressure drop, as required by §63.1209(k)(6)(ii)	Not Applicable

Item	63 CFR 1207	Requirement	Location
40	(f)(1)(xx)(B)	Key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, if you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, as required by §63.1209(k)(6)(iii)	Not Applicable
41	(f)(1)(xxi)	If your source is equipped with a carbon bed system, and you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, you must include in the comprehensive performance test plan key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, as required by §63.1209(k)(7)(ii)	Not Applicable
42	(f)(1)(xxii)	If you feed a dioxin/furan inhibitor into the combustion system, you must document in the comprehensive performance test plan key parameters that affect the effectiveness of the inhibitor, and the operating limits you establish for those parameters based on the inhibitor fed during the performance test, if you elect not to specify and use the brand and type of inhibitor used during the comprehensive performance test, as required by §63.1209(k)(9)(ii)	Not Applicable
43	(f)(1)(xxiii)	If your source is equipped with a wet scrubber and you elect to monitor solids content of the scrubber liquid manually but believe that hourly monitoring of solids content is not warranted, you must support an alternative monitoring frequency in the comprehensive performance test plan, as required by §63.1209(m)(1)(i)(B)(1)(i)	Not Applicable See Section 4.0
44	(f)(1)(xxiv)	If your source is equipped with a particulate matter control device other than a wet scrubber, baghouse, or electrostatic precipitator, you must include in the comprehensive performance test plan	---
45	(f)(1)(xxiv)(A)	Documentation to support the operating parameter limits you establish for the control device, as required by §63.1209(m)(1)(iv)(A)(4)	Section 1.0 & Table 1
46	(f)(1)(xxiv)(B)	Support for the use of manufacturer specifications if you recommend such specifications in lieu of basing operating limits on performance test operating levels, as required by §63.1209(m)(1)(iv)(D)	Not Applicable
47	(f)(1)(xxv)	If your source is equipped with a dry scrubber to control hydrogen chloride and chlorine gas, you must document in the comprehensive performance test plan key parameters that affect adsorption, and the limits you establish for those parameters based on the sorbent used during the performance test, if you elect not to specify and use the brand and type of sorbent used during the comprehensive performance test, as required by §63.1209(o)(4)(iii)(A)	Not Applicable
48	(f)(1)(xxvi)	For purposes of calculating semivolatile metal, low volatile metal, mercury, and total chlorine (organic and inorganic), and ash feedrate limits, a description of how you will handle performance test feedstream analytical results that determines these constituents are not present at detectable levels	RCRA Permit Table 5-3 governs feed rates.
49	(f)(1)(xxvii)	Such other information as the Administrator reasonably finds necessary to determine whether to approve the performance test plan	Not Applicable No additional data has been requested.
50	(g)	Operating conditions during testing. You must comply with the provisions of §63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of §63.7(e)(1) to conduct performance testing under representative operating conditions	See 82 – 93
51	(g)(1)(i)	Comprehensive performance testing—(i) Operations during testing. For the following parameters, you must operate the combustor during the performance test under normal conditions (or conditions that will result in higher than normal emissions)	Section 3.0
52	(g)(1)(i)(A)	Chlorine feedrate. You must feed normal (or higher) levels of chlorine during the dioxin/furan performance test	Section 2.0
53	(g)(1)(i)(B)	Ash feedrate. For hazardous waste incinerators, you must conduct the following tests when feeding normal (or higher) levels of ash: The semivolatile metal and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 2.0

Item	63 CFR 1207	Requirement	Location
54	(g)(1)(i)(C)	Cleaning cycle of the particulate matter control device. You must conduct the following tests when the particulate matter control device undergoes its normal (or more frequent) cleaning cycle: The particulate matter, semivolatile metal, and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 4.0
55	(g)(1)(ii)	Modes of operation. Given that you must establish limits for the applicable operating parameters specified in §63.1209 based on operations during the comprehensive performance test, you may conduct testing under two or more operating modes to provide operating flexibility	Not Applicable Operating limits are already established.
56	(g)(1)(iii)(A)	Steady-state conditions. (A) Prior to obtaining performance test data, you must operate under performance test conditions until you reach steady-state operations with respect to emissions of pollutants you must measure during the performance test and operating parameters under §63.1209 for which you must establish limits. During system conditioning, you must ensure that each operating parameter for which you must establish a limit is held at the level planned for the performance test. You must include documentation in the performance test plan under paragraph (f) of this section justifying the duration of system conditioning	Section 3.0 & SAP/QAPP Section 6.3
57	(g)(1)(iii)(B)	If you own or operate a hazardous waste cement kiln that recycles collected particulate matter (i.e., cement kiln dust) into the kiln, you must sample and analyze the recycled particulate matter prior to obtaining performance test data for levels of selected metals that must be measured during performance testing to document that the system has reached steady-state conditions (i.e., that metals levels have stabilized).	Not Applicable
58	(h)(1)	Operating conditions during subsequent testing. (1) Current operating parameter limits established under §63.1209 are waived during subsequent comprehensive performance testing	Not Applicable No waiver of current approved operating limits is requested.
59	(h)(2)	Current operating parameter limits are also waived during pretesting prior to comprehensive performance testing for an aggregate time not to exceed 720 hours of operation (renewable at the discretion of the Administrator) under an approved test plan or if the source records the results of the pretesting. Pretesting means	Not Applicable No waiver of current approved operating limits is requested.
60	(h)(2)(i)	Operations when stack emissions testing for dioxin/furan, mercury, semivolatile metals, low volatile metals, particulate matter, or hydrogen chloride/chlorine gas is being performed	Not Applicable No waiver of current approved operating limits is requested.
61	(h)(2)(ii)	Operations to reach steady-state operating conditions prior to stack emissions testing under paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
62	63.7(c)(2)(i)	Submission of site-specific test plan. Before conducting a required performance test, the owner or operator of an affected source shall develop and, if requested by the Administrator, shall submit a site-specific test plan to the Administrator for approval. The test plan shall include a test program summary, the test schedule, data quality objectives, and both an internal and external quality assurance (QA) program. Data quality objectives are the pretest expectations of precision, accuracy, and completeness of data	Conditions 1/2 & SAP/QAPP
63	63.7(c)(2)(ii)	The internal QA program shall include, at a minimum, the activities planned by routine operators and analysts to provide an assessment of test data precision; an example of internal QA is the sampling and analysis of replicate samples	SAP/QAPP Section 6.0
64	63.7(c)(2)(iii)	The performance testing shall include a test method performance audit (PA) during the performance test	SAP/QAPP Section 5.0
65	63.7(c)(2)(iii)(A)	The source owner, operator, or representative of the tested facility shall obtain an audit sample, if commercially available, from an AASP for each test method used for regulatory compliance purposes. No audit samples are required for the following test methods: Methods 3A and 3C of appendix A-3 of part 60; Methods 6C, 7E, 9, and 10 of appendix A-4 of part 60; Methods 18 and 19 of appendix A-6 of part 60; Methods 20, 22, and 25A of appendix A-7 of part 60; and Methods 303, 318, 320, and 321 of appendix A of part 63	SAP/QAPP Sections 5.0 & 14.5

Item	63 CFR 1207	Requirement	Location
66	63.7(c)(2)(iii)(B)	An AASP shall have and shall prepare, analyze, and report the true value of audit samples in accordance with a written technical criteria document that describes how audit samples will be prepared and distributed in a manner that will ensure the integrity of the audit sample program. An acceptable technical criteria document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
67	63.7(c)(2)(iii)(B)(1)	Preparing the sample	SAP/QAPP Sections 5.0 & 14.5
68	63.7(c)(2)(iii)(B)(2)	Confirming the true concentration of the sample	SAP/QAPP Sections 5.0 & 14.5
69	63.7(c)(2)(iii)(B)(3)	Defining the acceptance limits for the results from a well qualified tester. This procedure must use well established statistical methods to analyze historical results from well qualified testers. The acceptance limits shall be set so that there is 95 percent confidence that 90 percent of well qualified labs will produce future results that are within the acceptance limit range	SAP/QAPP Sections 5.0 & 14.5
70	63.7(c)(2)(iii)(B)(4)	Providing the opportunity for the compliance authority to comment on the selected concentration level for an audit sample	SAP/QAPP Sections 5.0 & 14.5
71	63.7(c)(2)(iii)(B)(5)	Distributing the sample to the user in a manner that guarantees that the true value of the sample is unknown to the user	SAP/QAPP Sections 5.0 & 14.5
72	63.7(c)(2)(iii)(B)(6)	Recording the measured concentration reported by the user and determining if the measured value is within acceptable limits	SAP/QAPP Sections 5.0 & 14.5
73	63.7(c)(2)(iii)(B)(7)	Reporting the results from each audit sample in a timely manner to the compliance authority and to the source owner, operator, or representative by the AASP	SAP/QAPP Sections 5.0 & 14.5
74	63.7(c)(2)(iii)(B)(8)	Evaluating the acceptance limits of samples at least once every two years to determine in consultation with the voluntary consensus standard body if they should be changed	SAP/QAPP Sections 5.0 & 14.5
75	63.7(c)(2)(iii)(B)(9)	Maintaining a database, accessible to the compliance authorities, of results from the audit that shall include the name of the facility tested, the date on which the compliance test was conducted, the name of the company performing the sample collection, the name of the company that analyzed the compliance samples including the audit sample, the measured result for the audit sample, the true value of the audit sample, the acceptance range for the measured value, and whether the testing company passed or failed the audit	SAP/QAPP Sections 5.0 & 14.5
76	63.7(c)(2)(iii)(C)	The accrediting body shall have a written technical criteria document that describes how it will ensure that the AASP is operating in accordance with the AASP technical criteria document that describes how audit samples are to be prepared and distributed. This document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
77	63.7(c)(2)(iii)(C)(1)	Checking audit samples to confirm their true value as reported by the AASP	SAP/QAPP Sections 5.0 & 14.5
78	63.7(c)(2)(iii)(C)(2)	Performing technical systems audits of the AASP's facilities and operating procedures at least once every two years	Not Applicable
79	63.7(c)(2)(iii)(C)(3)	Providing standards for use by the voluntary consensus standard body to approve the accrediting body that will accredit the audit sample providers	Not Applicable
80	63.7(c)(2)(iii)(D)	The technical criteria documents for the accredited sample providers and the accrediting body shall be developed through a public process guided by a voluntary consensus standards body (VCSB)	Not Applicable
81	63.7(c)(2)(v)	The Administrator may request additional relevant information after the submittal of a site-specific test plan	Not Applicable

Item	63 CFR 1207	Requirement	Location
82	63.7(e)(1)	Conduct of performance tests. (1) Performance tests shall be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance (i.e., performance based on normal operating conditions) of the affected source. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test, nor shall emissions in excess of the level of the relevant standard during periods of startup, shutdown, and malfunction be considered a violation of the relevant standard unless otherwise specified in the relevant standard or a determination of noncompliance is made under §63.6(e). Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests	Section 3.0 & SAP/QAPP Section 6.3
83	63.7(e)(2)	Performance tests shall be conducted and data shall be reduced in accordance with the test methods and procedures set forth in this section, in each relevant standard, and, if required, in applicable appendices of parts 51, 60, 61, and 63 of this chapter unless the Administrator	Sections 3.0 & 4.0, CMS Plan Section 4.0
84	63.7(e)(2)(i)	Specifies or approves, in specific cases, the use of a test method with minor changes in methodology (see definition in §63.90(a)). Such changes may be approved in conjunction with approval of the site-specific test plan (see paragraph (c) of this section); or	Section 3.3
85	63.7(e)(2)(ii)	Approves the use of an intermediate or major change or alternative to a test method (see definitions in §63.90(a)), the results of which the Administrator has determined to be adequate for indicating whether a specific affected source is in compliance; or	Not Applicable
86	63.7(e)(2)(iii)	Approves shorter sampling times or smaller sample volumes when necessitated by process variables or other factors; or	Not Applicable
87	63.7(e)(2)(iv)	Waives the requirement for performance tests because the owner or operator of an affected source has demonstrated by other means to the Administrator's satisfaction that the affected source is in compliance with the relevant standard	Not Applicable
88	63.7(e)(3)	Unless otherwise specified in a relevant standard or test method, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the relevant standard. For the purpose of determining compliance with a relevant standard, the arithmetic mean of the results of the three runs shall apply. Upon receiving approval from the Administrator, results of a test run may be replaced with results of an additional test run in the event that	Section 9.0
89	63.7(e)(3)(i)	A sample is accidentally lost after the testing team leaves the site; or	SAP/QAPP Section 5.3
90	63.7(e)(3)(ii)	Conditions occur in which one of the three runs must be discontinued because of forced shutdown; or	Section 9.0
91	63.7(e)(3)(iii)	Extreme meteorological conditions occur; or	SAP/QAPP Section 5.0
92	63.7(e)(3)(iv)	Other circumstances occur that are beyond the owner or operator's control	SAP/QAPP Section 5.0
93	63.7(e)(4)	Nothing in paragraphs (e)(1) through (e)(3) of this section shall be construed to abrogate the Administrator’s authority to require testing under section 114 of the Act	Not Applicable No additional requests have been made at this time.

STATIC DETONATION CHAMBER EMISSIONS TEST PLAN for CONDITION 2

Revision 0, April 2016

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RCRA Permit Controlled Document

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LIST OF ACRONYMS AND ABBREVIATIONS

~ .....approximately
≤ .....less than or equal to
< .....less than
> .....greater than
% .....percent
º .....degrees

ACWA .....Assembled Chemical Weapons Alternative
ADEM.....Alabama Department of Environmental Management
AFO.....Anniston Field Office
ANAD .....Anniston Army Depot

CAA .....Clean Air Act
CEMS.....Continuous Emissions Monitoring System
CFR .....Code of Federal Regulations
CO .....carbon monoxide
CON .....Control Room
CPT .....comprehensive performance test
CRO .....CON Operator

DC .....detonation chamber
DRE.....destruction and removal efficiency

EPA .....Environmental Protection Agency
EPT-C2 .....SDC Emissions Test Plan for Condition 2

ºF .....degree(s) Fahrenheit
FPI.....feed prohibited interlock

HAP.....hazardous air pollutant
HEPA .....high efficiency particulate air

IAW.....in accordance with
ICS .....Instrument Control System
ID .....induced draft
lb/event.....pound(s) per event
lb/hr .....pound(s) per hour

LC1 .....Loading Chamber 1
LC2 .....Loading Chamber 2
LDC.....lower DC

MACT .....Maximum Achievable Control Technology

NEW .....net explosive weight

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

NOC .....Notice of Compliance

O_2 .....diatomic oxygen
OGT .....off-gas treatment

PDARS.....Process Data Acquisition and Recording System
PLC .....programmable logic controller
POHC.....principal organic hazardous constituent
ppmv .....part(s) per million by volume

QAPP .....Quality Assurance Project Plan

RATA.....Relative Accuracy Test Audit
RCRA.....Resource Conservation and Recovery Act

SAP .....Sampling and Analysis Plan
SDC.....static detonation chamber

TRM.....Temporary Reference Method (CEMS)

UDC .....upper detonation chamber
ug/dscm .....microgram(s) per dry standard cubic meter
US .....United States

WDC .....Washington Demilitarization Company, LLC.
WMM.....waste military munition

1.0 FACILITY OVERVIEW

The United States (US) Army built a Static Detonation Chamber (SDC) System for the thermal treatment of conventional waste military munitions (WMM), disassembled explosive components removed from both WMM and chemical munitions that have been verified 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 waste. The SDC System is located at the Building 695 Complex at the Anniston Army Depot (ANAD) in Anniston, Alabama.

The Assembled Chemical Weapons Alternative (ACWA), represented by the Anniston Field Office (AFO), is the government owner of the facility. Washington Demilitarization Company (WDC), LLC., is the operator of the SDC. General facility information is listed below:

Mailing Address:	7 Frankfort Avenue c/o: SDC, ANAD Building 75 Anniston, AL 36201
Physical Address:	Same
EPA ID Number:	AL3 210 020 027
Facility Contact:	Timothy K. Garrett
Telephone Number:	(256) 238-1652

2.0 REGULATORY COMPLIANCE STATUS

The SDC operates under Resource Conservation and Recovery Act (RCRA) Permit, AL3 210 020 027, issued pursuant to the Code of Alabama 1975 §§ 22-30-1-et. seq. Further references to this permit will be termed the RCRA Permit. The SDC must also comply with its Clean Air Act (CAA) Permit, 301-0050-Z013. The Alabama Department of Environmental Management (ADEM) has determined that while the SDC is not directly regulated under the Maximum Achievable Control Technology (MACT) standards, operation of the unit is required to meet the standards found in MACT subpart EEE as applicable. As a result, a comprehensive performance test (CPT)-like for this unit will be conducted to demonstrate compliance with applicable EEE standards while processing non-mass detonating energetics at an increased feed rate.

Compliance with the MACT for the SDC was demonstrated via an initial CPT-like emissions test conducted in August 2011. The execution for the subsequent CPT-like emissions test will be conducted in September 2016 with waste military munitions (WMM) processed at normal feed rates (SDC Emission Test Plan for Condition 1 [ETP-C1]). A follow-on CPT-like emissions test, Condition 2) will also be conducted while processing non-mass detonating energetics to demonstrate a higher feed rate.

WDC may execute the SDC Emissions Test Plan for Condition 2 (EPT-C2) as early as September 2016 during the same sampling event as Condition 1 or as late as December 2016 as a separate sampling event. This plan is being submitted as an addendum to MODR45 which was submitted to ADEM in September 2015. The submittal of this plan to the ADEM, Land and Air Divisions, serves as the official 1-year notice required for submittal of the EPT-C2 plan and SDC Continuous Monitoring System Plan as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii).

3.0 TESTING PROGRAM

The purpose of the ETP-C2 is to demonstrate the performance of the SDC and Off-Gas Treatment (OGT) Systems at normal operating conditions while meeting the testing objectives. No operating parameters will be re-established as part of this ETP-C2 only demonstrationof an increased non-mass detonating energetics feed rate. Agent-free D541 propellant will be used during the ETP-C2 as feed.

A minimum of 3 valid test runs is required for the ETP-C2. If any test run is not executed under steady-state conditions, or if data is lost or compromised in any way, the results of that test run may or may not be included in the ETP-C2report. If a test run is not completed, the abandoned test run will not be included in the ETP-C2report. If a test run is completed and the data is lost or compromised, any available results will be included in the ETP-C2 report. An additional test run may be executed at the discretion of the Test Director.

WDC has the responsibility for executing the ETP-C2. The emissions sampling, packaging, transporting of samples to the off-site laboratory(s) for analysis, and reporting the results will be in accordance with (IAW) the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) (see Appendix A). The SAP/QAPP documents the precision, accuracy, representativeness, completeness, and comparability of the data set.

The Test Director will be the point of contact for any concerns associated with the ETP-C2. During the initial pre-job brief for the ETP-C2, a detailed organization chart and duty roster, including the names of personnel as identified by title, will be provided.

3.1 Objectives

The objectives for the ETP-C2 are as follows:

- Demonstrate a non-mass detonating feed rate of less than (<) 23 pounds per event (lb/event);
- Demonstrate that dioxin/furan emissions do not exceed 0.20 nanograms (by Toxic Equivalency Quotient) per dry standard cubic meter corrected to 7 percent (%) oxygen (O_2);
- Demonstrate that mercury emissions do not exceed 130 micrograms per dry standard cubic meter (ug/dscm) corrected to 7% O_2;
- Demonstrate that lead and cadmium (combined) emissions do not exceed 230 ug/dscm corrected to 7% O_2;
- Demonstrate that arsenic, beryllium, and chromium (combined) emissions do not exceed 92 ug/dscm corrected to 7% O_2;
- Demonstrate that carbon monoxide (CO) emissions do not exceed 100 parts per million by volume (ppmv) dry basis and corrected to 7% O_2 (instantaneous reading) using facility Continuous Emissions Monitoring System (CEMS);
- Demonstrate that hydrochloric acid and chlorine gas emissions do not exceed 32 ppmv, expressed as hydrochloric acid equivalents, dry basis and corrected to 7% O_2;
- Demonstrate that particulate matter emissions do not exceed 0.013 grains per dry standard cubic feet corrected to 7% O_2;

- Demonstrate that emissions are less than the screening levels established in the Human Health Risk Assessment;
- Conduct a Relative Accuracy Test Audit (RATA) during a test run to validate the facility CEMS data.

The ETP-C2 will verify that the operation of the SDC and OGT Systems at normal operating and processing conditions does not pose an unacceptable risk to public health or the environment.

3.2 PRINCIPAL ORGANIC HAZARDOUS CONSTITIUENT (POHC) SELECTION RATIONALE

Compliance with the Destruction and Removal Efficiency (DRE) requirement was demonstrated during the initial CPT conducted in 2011. Per 40 CFR 63.1206(b)(7), documented compliance with DRE is only required once providing no modifications have been made that could affect the ability of the SDC to achieve the DRE standard since the DRE test was performed. To date, no modifications have been made to the SDC which would hinder compliance with the DRE standard; therefore, selection of a POHC is not applicable.

3.3 ASSESSMENT OF HAZARDOUS AIR POLLUTANTS (HAPS)

HAPs as identified in 42 United States Code 7412 have been evaluated against the constituents comprising each WMM component, including propellant. For the HAPs identified, none exceed the limits listed in RCRA Permit Table 5-3. As allowed under 40 CFR 63.1207(f)(1)(ii), SDC will not quantify any feed for possible degradation products or other contaminants as no programmatic data currently exists which would support any reasonable estimation of degradation.

3.4 <u>Feed Description and Limitations</u>

The SDC System is designed to accept all munitions, including over packed munitions and propellant. All materials fed to the system may include the original packaging. Removal of the packaging is not required. The handling for feeding is limited to moving the original packages to a feed tray placed on a feed conveyor.

Conventional WMM can be processed in the system as long as the following boundary conditions are not exceeded:

- Chlorine < 11.1 lb/event,
- Sulfur < 6.3 lb/event,
- Mass-detonating explosives < 6.7 lb/event
- No shape charges unless shape charge is disengaged or altered prior to feeding in order to prevent equipment damage, and
- Overall weight < 330.7 lb/event (including feed tray).

The D541 propellant will be used to demonstrate a non-mass detonating energetics feed rate of ≤ 23 lb-Net Explosive Weight (NEW)/event. Based on the following estimated processing rates, the total non-mass detonating energetics feed rates (express as NEW) per D541 charge are as follows:

Propellant	Explosive Content (lb-NEW/charge)	Propellant	Explosive Content (lb-NEW/charge)
D541 – Charge #3	3.813	D541 – Charge #6	3.038
D541 – Charge #4	1.312	D541 – Charge #7	3.49
D541 – Charge #5	2.0		

However, to reach a feed rate of < 23 lb-NEW/event, the D541 charges will be combined to establish an increased non-mass detonating energetics feed rate. Examples of combining D541 charges (but not limited to) are as follows:

	D541 Propellant (lb/charge)					
Tray	Charge #3	Charge #4	Charge #5	Charge #6	Charge #7	Total NEW (lb/event)
1	1	1	---	2	2	18.49
2	1	1	2	1	2	19.47
3, etc.	2	2	1	2	1	22.26

3.5 Emissions Sampling and Analytical Protocols

Data quality objectives will be developed in a manner that is consistent with US Environmental Protection Agency's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA/240/B-06/001). Sampling and analysis procedures will be conducted IAW US EPA-approved sampling methods, RCRA/CAA Permits, and 40 Code of Federal Regulations (CFR) 60. The off-gas sampling and analytical methods to be used to quantify specific ETP-C2 parameters are as follows:

- US EPA Method 1, *Sample and Velocity Traverses for Stationary Sources*,
- US EPA Method 2, *Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*,
- US EPA Method 3B, *Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air*,
- US EPA Method 4, *Determination of Moisture Concentration in Stack Gases*,
- US EPA Method 6C, *Determination of Sulfur Dioxide Emissions from Stationary Sources* (by Temporary Reference Method [TRM] CEMS),
- US EPA Method 7E, *Determination of Nitrogen Oxides Emissions from Stationary Sources* (by TRM CEMS),
- US EPA Method 10, *Determination of Carbon Monoxide Emissions from Stationary Sources* (by facility and TRM CEMS),
- SW-846 Method 0010, *Semivolatile Organic Compounds (SVOCs), Total Chromatographic Organics (TCO) Compounds, and Organics with Boiling Points 300℃ or Higher (GRAV) Using Modified Method 5 Sampling Train*,
- SW-846 Method 0023A, *Sampling Method for Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofuran Emissions from Stationary Sources*,

- SW-846 Method 0031, *Sampling Method for Volatile Organic Compounds*,
- SW-846 Method 0040, *Sampling of Principal Organic Hazardous Constituents from Combustion Sources Using Tedlar® Bags*,
- US EPA Method 26A, *Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method*,
- US EPA Method 5, *Determination of Particulate Matter Emissions from Stationary Sources*,
- US EPA Method 29, *Determination of Metals Emissions from Stationary Sources* and
- US EPA Modified Method 5, *Modified Sampling Train for Energetic Compounds*.

In addition to the emissions sampling, a RATA will also be conducted to validate the facility CEMS. Facility CEMS will be used to correct emission rates.

3.6 Sampling and Analysis Procedures

A detailed description of the sampling and analysis performed by the sampling contractor during the emission test is provided in Appendix A (SAP/QAPP).

3.7 Sampling Locations

The off-gas will be sampled at ports located between the safeguard filter and stack. The sampling locations were evaluated prior to testing by utilizing US EPA Methods 1 and 2 for representativeness. Schematic illustrations of the sampling locations can be found in Appendix D.

4.0 DETAILED ENGINEERING DESCRIPTION

The SDC System is designed for destruction of munitions and munition components by indirect/conductive heating. The munitions are fed via a conveyor system. The solid scrap material remaining from the munitions is emptied into a scrap-box via a scrap conveyor system. The off-gas generated is cleaned and filtered in the OGT System.

The loading area is where munitions are placed in ammunition trays and loaded onto the loading conveyor. The loading conveyor is designed to accept multiple trays prior to any conveyor transfer. After the loading conveyor is loaded, it moves 1 tray at a time to the lift. The lift transfers the tray to the level of the first loading chamber (LC1). From the lift, the item is then transferred to the apron of LC1. The loading conveyors and lift are also equipped with guides, interlocks, and sensors that prevent misalignment of trays or other problems and will halt movements automatically if problems arise.

Staging of a tray consists of deflating a pneumatic seal in the gate leading to LC1 and then raising the gate. An electrically operated ram, equipped with sensors to detect miss-feeds and other problems, pushes the tray into the LC1 and then retracts. The gate is lowered and pneumatic seal inflated forming a gas-tight boundary. Staging of a tray into LC1 can occur while the previous tray is being processed in the DC.

When conditions are verified to be acceptable for initiating feed to the DC, the Control Room (CON) Operator (CRO) initiates the loading sequence for staging the next tray into the second

loading chamber (LC2). The actions of transferring a tray to the DC are automatic but monitored in the CON and can be manually interrupted. The seals on both sides of the gate leading to LC2 are deflated and the gate is raised. The hydraulically operated ram pushes the tray into a cradle located in LC2 and then retracts. The gate leading to LC2 is lowered and the seals on both sides of the gate are inflated. This gate is rated to withstand blast pressures of the detonation chamber (DC).

The cradle and fragment valve within LC2 move as 1 unit but are located perpendicular to each other. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upon entering the DC, the munitions are heated resulting in a detonation and/or deflagration. The increase of pressure within the munition casing caused by the ambient heat of the DC alone is adequate to open the munition case and destroy fill material without the presence of explosives. The DC consists of an upper portion (UDC) which is fixed to the loading system and a lower portion (LDC) which can separate from the UDC. During detonation, the UDC and LDC portions of the DC are sealed by means of a locking ring, rope gasket and 6 pneumatic seals (3 on the top side of the locking ring, sealing to the UDC, and 3 underneath the locking ring, sealing the LDC).

To empty the DC, the pneumatic seals are deflated and locking ring is partially twisted to free the LDC. The LDC can then be lowered and tilted to empty the scrap. Following scrap emptying, the LDC is returned to the upright position and raised. The locking ring is twisted in the opposite direction to lock the UDC and LDC together and the pneumatic seals on both sides of the locking ring are inflated to seal the locking to each respective portion of the DC.

The LDC contains electric heaters to maintain the DC at high temperatures. Both the UDC and LDC are constructed of heat resistant steel which can withstand the mechanical stress loads caused by detonation pressures at high temperatures. Inside the LDC, a fragment shield acts as a sacrificial plate to absorb impacts from fragmentation.

The OGT System consist of a buffer tank which absorbs pressure perturbations caused by blast waves within the DC, followed by an orifice or control valve which also helps to equalize the flow going to downstream components of the system.

Off-gases from the detonation and/or deflagration are further treated by a spray dryer, baghouse filter, quench venturi, acid scrubber, and neutral scrubber. Off-gases received from the thermal oxidizer are cooled by a spray dryer followed by a baghouse to remove salts and particulates. The remaining contaminants are removed by the acid and neutralization scrubbers. The last step is a multistage exhaust filtration system, which acts as a safeguard to the OGT System prior to releasing the off-gas to the environment.

A description of key equipment is provided below.

Conveyor System

The conveyor system is electrically powered and consists of a series of conveyors which transport the trays to the lift.

Gate 1

Gate 1 is a hydraulically operated sliding gate located at the inlet to LC1. Gate 1 is sealed gastight with a pneumatic seal. An electric pusher propels the package into LC1.

Loading Chamber 1 (LC1)

LC1 is a staging location prior to LC2.

Gate 2

Gate 2 is a hydraulically operated sliding gate located at the inlet to LC2 from LC1. Gate 2 is sealed gastight with 4 pneumatic seals which are designed to withstand design blast pressures within the DC.

Loading Chamber 2 (LC2) and Cradle

LC2 has a built-in hydraulically powered cradle and fragment valve which move as a single unit. With the cradle in position to receive a tray, the fragment valve is located over the opening to the DC. When a tray is placed in the cradle, hydraulic pressure is released off the fragment valve and the cradle/fragment valve assembly rotates 90º and dumps the tray into the DC. The cradle/fragment valve assembly is then rotated back into position. A hydraulic piston exerts pressure on the fragment valve to hold it in place during detonations/deflagration in the DC.

Upper Detonation Chamber (UDC)

The UDC is mounted to the outlet flange of LC2. Connections for incoming process air, outlet off-gases, temperature sensors, and pressure gauges are placed on the UDC.

Lower Detonation Chamber (LDC)

The LDC has an inner fragment shield and outer chamber. Electrical resistance heating elements are located on the LDC.

Elevating and Turning System

When emptying the LDC, it is first lowered by the hydraulically powered mechanical lifting jacks. The rotation of the LDC is made by a hydraulic motor connected to the LDC by a gearbox and roller chain.

Locking and Sealing System

The UDC and LDC are locked to each other with a locking ring during destruction. The locking ring is maneuvered by 2 hydraulic cylinders. For the emptying procedure the locking ring is turned to the open position and the LDC is lowered and tilted. The connection between UDC and LDC is sealed by 6 pressurized pneumatic gaskets during destruction.

Hydraulic Power Unit

The hydraulic power unit provides power to operate the lifting jacks, tilting motor, gates 1 and 2, locking ring, and pushers. It also has a built-in backup pump which is driven by the uninterrupted power supply of the SDC.

Scrap Chute and Scrap Conveyor

When removal of scrap material is required, the LDC is lowered and rotated so the scrap material can be transferred to the scrap conveyor via the scrap chute.

Scrap Conveyor System

Scrap conveyors 201, 202, and 203 are vibration conveyors which use gravity to transfer material. The scrap conveyors are separated by gates and can be operated independently of each other. Dust is removed and collected in a drum between scrap conveyers 202 and 203 when the scrap passes over a wire mesh. Scrap conveyor 203 allows visual inspections of WMM after treatment.

DC Air Heater

Air heaters are used to raise the temperature of the process air which is used to aid the destruction process.

Buffer Tank

The buffer tank is designed to smooth gas pressure and volume surges from the DC that occurs when a munition detonates or deflagrates. By smoothing surges to downstream equipment, the equipment is better able to operate near optimum design flow rates which allows for a more consistent removal of contaminants. The buffer tank is comprised of a cone-bottom cylindrical tank made of stainless steel. The inlet and outlet of the tank is configured in such a way that the tank also acts as a cyclone, allowing the removal of large particles of ash and small metal fragments from detonations. These materials are collected in the bottom of the conical tank section. The bottom of the buffer tank has 2 slide valves that operate pneumatically. These valves periodically open and solids are collected in a drum for disposal. The entire tank and associated piping are maintained at a predetermined temperature using electric heaters and insulation.

Orifice Plate / Control Valve

An orifice plate or control valve also helps to smooth the flow of gases presented to downstream equipment. The orifice plate is comprised of a sharp edged orifice located in a stainless steel metal plate which is in turn sandwiched between 2 pipe flanges. The control valve may be operated automatically to by-pass the orifice except when in a destruction cycle. These components are replaceable if needed, and are also maintained at temperature using electric heaters and insulation.

Process Ventilation Cyclone, Filter, and Fan

The fan drives the process ventilation for the SDC. The cyclone and filter remove dust from the process ventilation. The dust is transferred to the air mainly from the scrap emptying sequence and the scrap conveyor system.

Thermal Oxidizer

The off-gases resulting from the detonation/deflagration process in the DC are transferred to a thermal oxidizer. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required. The thermal oxidizer design is based on a retention time of a minimum of 2 seconds or more at greater than (>) 1,741 degrees Fahrenheit (°F) for the peak load expected from the upstream SDC. An additional flow of combustion air is automatically added to ensure an oxygen rich environment. The gases to be treated are fed tangentially via a ring system to ensure proper treatment of the contaminated gases.

Spray Dryer

The off-gas from the thermal oxidizer is quickly cooled to approximately (~) 350°F in the spray dryer by the injection of spent scrubber liquid into the gas stream. Evaporation of the spent scrubber liquid generates dry salts and particulates. The dry salts and particulates are automatically removed from the bottom of the spray dryer and collected in a container using a screw feeder and slide gate valve for disposal.

Bag House Filter

The bag house is comprised of a filter system which uses bags layered with sodium bicarbonate, or similar, as the absorbent to remove dust and heavy metals from the off-gas. The ratio of the absorbent may be adjusted to fit the application. The absorbent is fed from a hopper by a pneumatic feed system to the outside of the bags providing a fresh surface to the incoming gases. Periodically when the pressure drop across the filter exceeds a predetermined set point, the bags are cleaned using a pulse jet and the spent solids are collected in a drum for disposal using a screw feeder and slide gate valve.

Quench Venturi

The quench venturi cools the off-gas from ~ 350 to 170°F by injecting solution water from the acid scrubber. Any remaining solution water is cooled and recycled to the acid scrubber sump.

Acid Scrubber

The acid scrubber cools the off-gas from ~ 170 to 150°F. The acid scrubber is designed where the scrubber liquid flows counter current to the gas flow. Dust is removed by washing out solid particles in the washing tower. Acid gases, volatile and semi-volatile heavy metals will also be removed from the off-gas by dissolving in the scrubber liquid making it acidic.

The conductivity of the scrubber liquid is also monitored. Rising conductivity is an indication of increasing dissolved salt content in the scrubber liquid. To counter act this, fresh water is added. Excess scrubber liquid is then transferred to the bleed water tank for mixing and pH correction.

Scrubber liquid is pumped from the bottom of the scrubber column to the top and distributed inside the column by a distribution pan. The off-gas enters the column from a position located just above the column sump and streams from the bottom to top of the column. In order to ensure adequate mixing and contact between the liquid and gas, the columns are filled with a column packing material. As a safeguard, the temperature of the off-gas inlet is monitored. In case of a high temperature off-gas, an emergency water injection is used.

Neutral Scrubber

The neutral scrubber removes any residual contaminants that passed through the spray dryer and acid scrubber. The neutral scrubber has the same dimensions and is built using the same construction principles as the acid scrubber. The neutral scrubber operates with a parallel current gas liquid flow. To obtain a good material exchange between the gas and the liquid, a column packing is used.

The scrubber liquid is monitored by a pH controller. Sodium hydroxide is used to maintain the proper neutral pH. The amount of scrubber liquid in the neutral scrubber is controlled by a level transmitter in the sump of the scrubber column.

To obtain a constant quality in the scrubber, spent scrubber liquid is periodically removed based on level and conductivity and transferred to the Bleed Water Tank for mixing and pH correction. Scrubber liquid is refreshed by the addition of caustic solution as needed.

Induced Draft (ID) Fans

The 2 ID fans are located between the neutral scrubber and inlet to the safeguard filter. Should an ID fan fail, the other will automatically assume the load. The ID fans ensure that the pressure of the off-gas in the thermal oxidizer is maintained below atmospheric pressure. The pressure is controlled by pressure transmitters. The speed of the ID fans is adjustable by a frequency controller. The ID fans work continuously during the operations.

Safeguard Filter

The safeguard filter system is an exhaust filtration unit. The exhaust filtration unit is designed as a series of filters and built IAW the requirements by the US Army's Chemical Demilitarization program. The function of the filter units is described below:

- Prefilter: Removes particulates remaining in the gas stream that may cause blinding or clogging of the downstream HEPA filter;
- High-Efficiency Particulate air (HEPA) Filter: Removes particulates down to 0.3 microns;
- Charcoal: Removes contaminants such as volatile and semi-volatile heavy metals;
- Charcoal: Serves as a backup for the first charcoal filter described above; and
- HEPA Filter: Ensures that there are no emissions of potentially contaminated particulates released to the atmosphere.

The filter housings are made of stainless steel and equipped with differential pressure monitors on all filters to ensure adequate flow and monitor for when a filter needs to be replaced. The safeguard filter system includes an ID fan to maintain negative pressure within system to protect against leakage.

Stack

The stack for discharge of cleaned gases meets the requirements of the American Conference of Governmental Industrial Hygienist Industrial Ventilation Manual.

5.0 DESCRIPTION OF FEED PROHIBITED INTERLOCK SYSTEM

The primary function of the Feed Prohibited Interlock (FPI) System is to prevent the feeding of munitions if SDC conditions are outside RCRA Permit limits. During upset conditions, the FPI System automatically prohibits the transfer of munitions from LC1 to 2 until all conditions are met or within range. Instrumentation is provided to monitor process conditions; provide data for ensuring compliance with regulatory requirements; and provide appropriate process response and control needs for operational flexibility, safety interlocking, and shutdown features (see Appendix B).

An automatic control system is used with a centralized control console (including closed-circuit television monitors for observing operations at various locations) and locally mounted programmable logic controllers (PLC). SDC processing and sequencing operations are

controlled automatically through a dedicated PLC. Interlocks are monitored and continuous checking is undertaken to determine any lack of completion of a programmed step. All upset conditions, operator entries into the system, and starting and stopping of equipment are logged with the time of occurrence by the Process Data Acquisition and Recording System (PDARS). Interlocks are provided to respond to various conditions. Shutdowns are either immediate or in stages, depending upon the situation.

6.0 OFF-GAS MONITORING EQUIPMENT

The CEMS is a complete system designed to measure CO and O_2 emissions from the SDC and OGT System IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE (see Appendix C). All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

The facility CEMS continuously monitor the off-gas, downstream of the OGT equipment, to include the ID fans and safeguard filter system. The CEMS have the ability to cause a FPI condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include an analyzer (primary or unit of record (UOR) and online backup. Both analyzers will be certified to allow for operational flexibility.

CEMS components are mounted in a National Electrical Manufacturers Association Instrument Control System (ICS) cabinet located in a monitoring shelter. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS.

7.0 LOCATION AND DESCRIPTION OF THE PROCESS CONTROL SYSTEM

The proper operation of the process control system is necessary to ensure consistent compliance with all RCRA/CAA Permit conditions and safe, efficient operation of the SDC and OGT Systems. The CON is the remote location where the SDC and OGT Systems are normally operated. The CON houses an operator control console, which includes closed-circuit television monitors for observing operations at various locations, as well as emergency shutdown controls. All remote operations, with exception of emergency shutdown, are performed through an operator keyboard using the equipment controls and indications displayed on HMI screens. Processing and sequencing operations are controlled automatically through the PLC, which continuously communicates with the operator console in the CON.

The PLC is programmed to continually scan for alarm conditions and to initiate alarms in the CON, alerting the operator of abnormal conditions. The process control software was designed to provide pre-alarms in the CON. These pre-alarms are used to warn the CON operator in time to take corrective action should a process variable approach a FPI condition.

The PDARS logs and notes the time of all abnormal conditions, as well as, the starting and stopping of equipment and operator entries. This system is also used to record process data such as temperature, pressure, and waste feed intervals. PDARS records data at varying intervals. The PDARS takes instantaneous readings at a maximum interval of fifteen seconds. The

collected data is then averaged on a 1-minute basis. All PDARS data collected for RCRA/CAA instrumentation is included in the SDC operating record as required by the CAA/RCRA Permits and applicable regulations.

8.0 STARTUP/SHUTDOWN PROCEDURES

The SDC and OGT Systems will be brought up to normal operating conditions before introducing WMM to the DC. The phrase "normal operating condition" means that operating parameters are within parameters for initiating feed. Before the SDC and OGT Systems can be started, all utilities, including the FPI System, must be operational IAW SDC procedures.

FPIs are continuously monitored and interlocked and will be in operation during the emission test. In addition, the system's operation will be monitored by CRO. If the operation of the system should deviate significantly from the desired range of operation or become unsafe, the CRO will manually secure feed. In the event of a major equipment or system failure, it may be necessary to shut down the SDC and/or OGT System completely. A shutdown of this type will be performed IAW the SDC procedures.

9.0 SCHEDULE

The ETP-C2 test could be executed as early as September 2016 in conjunction with the ETP-C1 or as a separate testing event. This plan is being submitted as an addendum to MODR45 which was submitted to ADEM in September 2015. The submittal of this plan will serve as the official 1-year MACT notice required for CPT-like emissions tests as well as the 180 calendar day notification as required under the RCRA Permit Condition V.D.(3)(E)(ii). Sixty days prior to the ETP-C2, ADEM (Land and Air Divisions) will be notified of the intended execution date.

The ETP-C2 will commence after SDC has received approval of this plan and successfully completed shakedown of the SDC System. If the ETP-C2 is conducted in conjunction with the ETP-C1, the combined activities will span approximately 11 days including: 2 days for preparation, 4 days for ETP-C1 testing, 4 days for ETP-C2 testing, and 1 day for clean-up.

As a separate testing event, the ETP-C2 activities will span approximately 7 days including: 2 days for preparation, 4 days for testing, and 1 day for clean-up.

The ETP-C2 will consist of a minimum of 3 valid test runs. One (1) run per day is planned. The off-gas stream will be sampled until a minimum of 3 cubic meters is collected or approximately 4 hours. This, combined with port changes, will cause total test time each day to be at least 6 hours. Assuming minimal interruption during the emission test, the SDC and OGT Systems are expected to operate for 8 or more hours per test day. A fourth test run may be conducted at the discretion of the site management.

10.0 RAMP-UP PERIOD

The principal objective of the ramp-up period is to prepare the SDC and OGT System to safely process the munitions at proposed setpoints. Because SDC is proposing to change the non-mass detonating energetics feed limit, a ramp-up period of up to 720 hours will be required.

11.0 EMISSIONS TEST PERIOD

From the initiation of the first test run to the completion of the last test run, the SDC and OGT Systems will be within an emissions test period and hours of operation will not be considered shakedown hours.

12.0 POST-TEST PERIOD

For the duration of the post-trial period, the SDC and OGT Systems will be operated IAW the performance standards listed in the RCRA Permit until approval of the ETP-C2 report and Notice of Compliance (NOC).

13.0 EMISSIONS TEST RESULTS

A final ETP-C2 report/NOC must be submitted to ADEM (Land and Air Divisions) documenting that the ETP-C2 has been carried out IAW the approved SDC ETP-C2 Plan within 90 days after completion of the last test run. All data and analyzed sample results from the ETP-C2 will be submitted in the final emission test report. A preliminary ETP-C2 report addressing demonstration of the intended performance standards and objectives will be submitted approximately 20 working days following receipt of the samples at the contracted laboratory(s).

14.0 FINAL PERMIT LIMITS

Other than non-mass detonating energetics feed rate, SDC does not intend to re-establish any FPI set points. Retention of the existing FPI setpoint will be requested after demonstrating successful operation within the previously establish operating envelope.

Table 1: FPI Conditions

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure Indication	MAX	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature Indication	MIN	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	MIN	1,741ºF
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	MAX	-0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	MAX	400º F
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	MAX	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Process Flow	MIN	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow	MIN	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	MAX	170ºF
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	MAX	200ºF
SDC-FPI-11	AIT-900	CO Concentration	MAX	100 ppm, dry basis @ 7% O_2 (Instantaneous)
SDC-CPI-12	QICA 36008	Neutral Scrubber pH	MIN	7.0 pH

Footnote:
(1) Operational parameter(s) interlock will prohibit the transfer from LC1 into LC2 until all conditions are met or within range.

APPENDIX A: SAP/QAPP

STATIC DETONATION CHAMBER (SDC)
EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX A
SAMPLING AND ANALYSIS (SAP)/QUALITY ASSURANCE PROJECT PLAN (QAPP)

REVISION 1, APRIL 2016

Approvals:

SDC Test Director	**Date**
SDC Test Coordinator	**Date**
Sampling and Analysis Contractor	**Date**
Sampling and Analysis Contractor QA Manager	**Date**
Contracted Laboratory Project Manager	**Date**
Contracted Laboratory QA Manager	**Date**
Contracted Laboratory Project Manager (if applicable)	**Date**
Contracted Laboratory QA Manager (if applicable)	**Date**

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LIST OF ACRONYMS AND ABBREVIATIONS

% .....percent
≤ .....less than or equal to
± .....plus or minus
°C .....degrees Celsius
~ .....approximate
< .....less than
> .....greater than

ADEM.....Alabama Department of Environmental Management
ASTM .....American Society for Testing and Materials

CEMS.....Continuous Emissions Monitoring System
CFR.....Code of Federal Regulations
Cl_2 .....diatomic chlorine
CLP .....Contract Laboratory Program
CO_2.....carbon dioxide
COA .....certificate of analysis
COC .....chain of custody

DI .....deionized
DL .....detection limit
DNT .....dinitrotoluene
DQO.....data quality objective

EPA.....Environmental Protection Agency

FHR.....front-half rinse
FID .....flame ionization detector

GC.....gas chromatography
GRAV .....gravimetric

H_2O_2 .....hydrogen peroxide
H_2SO_4.....sulfuric acid
HCl.....hydrogen chloride
HDPE .....high density polyethylene
HF .....hydrogen fluoride
HNO_3.....nitric acid
HPLC .....high-performance liquid chromatography

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

HRA .....health risk assessment
HRGC .....high resolution gas chromatography
HRMS .....high resolution mass spectrometry

IAW.....in accordance with
ID .....inner diameter

$KMnO_4$.....potassium permanganate

L .....liter
L/min.....liters per minute
LCS .....laboratory control sample
LCSD .....laboratory control sample duplicate
LIMS .....laboratory information management system

M0010 .....SW-846 Method 0010
M0023A .....SW-846 Method 0023A
M0031 .....SW-846 Method 0031
M0040 .....SW-846 Method 0040
M10 .....US EPA Method 10
M26A .....US EPA Method 26A
M29 .....US EPA Method 29
m^3 .....cubic meter
m^3/hr.....cubic meters per hour
M3A .....US EPA Method 3A
M3B .....US EPA Method 3B
MDL.....method detection limit
mg .....milligram
mL .....milliliter
mm .....millimeter
MM5E .....US EPA Modified Method 5 for Energetics
MS.....mass spectrometry
MS.....matrix spike
MSD.....matrix spike duplicate

N.....normality
NaOH .....sodium hydroxide
NO_x .....nitrogen oxides

O_2 .....oxygen

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

PCDD.....polychlorinated dibenzo-p-dioxin
PCDF.....polychlorinated dibenzofuran
PDARS.....Process Data Acquisition and Recording System
PIC .....product of incomplete combustion
PM.....particulate matter
POHC.....principal organic hazardous constituent

QA.....quality assurance
QAPP .....Quality Assurance Project Plan
QC.....quality control

RCRA.....Resource Conservation and Recovery Act
RL .....reporting limit
RPD.....relative percent difference
RSD.....relative standard deviation

SAC.....sampling and analysis contractor
SAP .....Sampling and Analysis Plan
SDC.....Static Detonation Chamber
SO_2 .....sulfur dioxide
SRM .....standard reference material
SVOC.....semivolatile organic compounds

TCO.....total chromatographic organic
TIC .....tentatively identified compound
TRM.....temporary reference method
TX .....Tenax®

US .....United States

VOA.....volatile organic analysis

WDC .....Washington Demilitarization Company, LLC

1.0 PROJECT DESCRIPTION

A minimum of 3 test runs will be conducted on the Static Detonation Chamber (SDC). The SDC emissions test will provide emissions results and system data that will allow the performance of the SDC to be compared to applicable emission and performance standards. The purpose and specific requirements that apply to the emissions test are listed in the SDC Emissions Test Plans for Condtions 1 and 2.

This Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) is an essential guidance document by which the test objectives will be demonstrated. The SAP/QAPP describes procedures that will be implemented during the emission test to demonstrate that all of the associated data are of sufficient quality to serve as the basis for regulatory decisions for the SDC. The primary purpose of the SAP/QAPP is to define all aspects of the quality assurance (QA)/quality control (QC) procedures that should be applied to the emissions tests while establishing detailed sampling and analytical quality indicators that will demonstrate the achievement of the emissions test objectives.

The general concept by which the goals and data quality objectives (DQO) were formulated is very simple. In order for any emission test data to be acceptable as representative of system performance, data must be collected from valid test runs. If a run is attempted and fails, then another run must be initiated and completed to replace it. Validity of the data is determined by the permittee(s) and Alabama Department of Environmental Management (ADEM).

The duration of the sampling events (time) and analytical test method sensitivity (mass) are used to calculate the emissions rates. Sampling duration, sample collection rates, and analytical methods have been selected to provide emission results of sufficient sensitivity to demonstrate the test objectives. In addition to issues of sensitivity, accuracy, and precision, objectives must be determined for the SDC emissions tests. These parameters are obtained from United (US) Environmental Protection Agency (EPA) guidance primarily, and are presented as target acceptance limits for percent recovery, relative percent difference, and related parameters that are defined elsewhere.

It must be understood that analytical test method DQO are target values. The US EPA has clearly defined validation processes for data review for the Contract Laboratory Program (CLP) that is published as the *National Functional Guidelines for Data Review*. Data that exceed target DQO are usually flagged as estimates. There are limited reasons for rejecting data as not usable. Ultimately, only the end data users can decide if data is acceptable for its intended purpose. For this document, US EPA guidance is the primary source of analytical DQO. Target acceptance criteria are defined for many of the measurements that will be made during the emissions tests in US EPA-625/6-89-023, *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration*. When this document does not provide accuracy and precision objectives directly, then the cited analytical test method was reviewed to obtain guidance. If these 2

sources of analytical DQO do not address the accuracy and precision requirements adequately, then laboratory data history will be used to define test objectives. This process ensures that the target DQO for analytical data meet standard recommendations.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The emissions tests will be conducted by Washington Demilitarization Company, LLC (WDC) along with a Sampling and Analysis Contractor (SAC).

2.1 WDC MANAGEMENT

WDC is responsible for operating the SDC. WDC has contracted a SAC to provide independent sampling and analysis support to include: performance of emissions sampling, packing, transporting of exhaust gas samples to the analytical laboratory(s), sample analysis, and QA/QC associated with these tasks. The SAC may also assist in the validation of laboratory reports and preparation of the final report as required.

2.2 SAC PROJECT MANAGER

The SAC will have a team of experienced personnel to perform the required sampling. In addition, the SAC will ship exhaust gas samples to the SAC's analytical laboratory. The SAC Project Manager is responsible for all SAC personnel. The SAC Project Manager will report to the SDC Test Coordinator. The SAC Project Manager will have signature authority for the SAC and will certify all reports from the SAC to WDC to be correct. The SAC Project Manager may delegate certain responsibilities to his/her team members.

2.3 QUALIFICATIONS/CERTIFICATIONS

WDC personnel have written qualification, certification, and recertification records certifying that each individual has the necessary proficiency to perform the duties assigned according to job title. SAC personnel will have appropriate training and qualifications as well. Objective evidence of personnel training/qualifications will be documented and maintained. All training and certification documentation will be available for review upon request.

3.0 SAMPLING OVERVIEW

3.1 SAMPLING AND ANALYSIS SCHEDULE

The schedule for the conducting the emissions test is divided into 3 phases:

- Preparation Phase –
  - Preparation and approval of the emission test plan
  - Procurement of sampling equipment and supplies
  - Equipment cleaning and calibration
  - Mobilization of equipment and supplies to SDC
  - Mobilization of personnel on-site
  - Preparation of the equipment for sampling
- On-site Sampling and Data Acquisition Phase –
  - Collect samples and data from a minimum of 3 valid test runs per condition
- Post-Test Phase –
  - Final preparation of the samples
  - Demobilization of the equipment
  - Transport and receipt of the samples by the SAC's analytical laboratory
  - Analytical program management of the samples through the SAC's analytical laboratories
  - Data reporting, review, reduction, and validation
  - Compilation of the emission test report

3.2 INTERRUPTIONS AND INCOMPLETE TEST RUNS

In the case of a system upset or other abnormal conditions, the Test Director will decide the appropriate course of action based on the actual conditions encountered. In all cases of sampling interruption, all sample collection logs will document when the interruption occurred and when sampling resumed. All exhaust gas sample volumes will be based on the actual time of sample collection and exclude all interruptions.

In the unlikely event of an incident that could constitute a safety problem, sampling activities will be suspended as determined by the Test Coordinator. An assessment will then be made by the Test Director of the conditions that led to the interruption to determine an anticipated restart time.

3.3 SAMPLING DESCRIPTION AND STRATEGY

The sampling implemented during the emissions testing will consist of all test samples including exhaust gas and QA/QC samples. The sampling will be founded on current US EPA sample collection methods. The sampling will be documented through the use of sample collection sheets, sample checklists, sample master logs, and chain-of-custody (COC) forms. Copies of all completed sample collection documentation will be compiled and presented in the emissions test report.

The primary objective of the emissions test sampling is to collect, over the duration of the test period, samples that are representative of the actual matrix encountered, and to deliver these samples to the SAC's analytical laboratory for analysis. To accomplish this objective, the samples will be handled in such a way as to:

- Avoid cross-contamination from the time of collection,
- Identify and document each sample during its collection,
- Chemically or physically preserve the sample in the field, and
- Inventory, package, and deliver the sample to the SAC's analytical laboratory under the US EPA guidelines of traceability.

The overall results of a successful implementation of this emissions test sampling will be to yield samples of uncompromised quality that are documented for analysis. Table A-1 summarizes the planned analysis, container, sampling method, frequency, and total number of samples to be collected for each sample type.

3.4 SAMPLING LOCATIONS

Exhaust duct sampling locations are accessed through flanged ports in the duct. The sampling locations will be evaluated prior to testing by utilizing US EPA Methods 1 and 2 for representativeness.

3.5 PRE-SAMPLING ACTIVITIES AND EQUIPMENT CALIBRATION

Presampling activities include equipment calibration, sample media preparation, precleaning of the sample train glassware, and other miscellaneous tasks. Each of these activities are described or referenced in the following subsections. Other presampling activities include such details as team meetings, equipment packing and shipping, equipment setup, and finalization of all details leading up to the start of the sampling program.

3.5.1 <u>Glassware Preparation</u>

Before use in the field, sample train glassware and sample containers will require specialized precleaning to avoid contamination of the sample from the collection container or devices. All bottle caps will be fitted with Teflon® liners which will be cleaned in the same manner as the

bottles themselves. Cleaning and storage procedures for sample train glassware, as applicable, are summarized below.

- SW-846 Method 0010 (M0010) – Semivolatile Organic Compounds (SVOC), Total Chromatographic Organics (TCO) Compounds, and Organics with Boiling Points 300°C or Higher (GRAV) Using Modified Method 5 Sampling Train: Soap and water wash, deionized (DI) water rinse 3 times, acetone rinse 3 times, methanol/methylene chloride rinse 3 times. Seal open ends with Teflon® tape and hexane rinsed aluminum foil.
- SW-846 Method 0023A (M0023A) – Sampling Method for Polychlorinated Dibenzo-p-Dioxins (PCDD)/Polychlorinated Dibenzofurans (PCDF) Emissions from Stationary Sources: Soap and water wash, DI water rinse 3 times, acetone rinse 3 times, methylene chloride rinse 3 times, toluene rinse 3 times. Seal open ends with Teflon® tape and aluminum foil.
- SW-846 Method 0031 (M0031) – Sampling Method for Volatile Organic Compounds: Sonicate 1 hour in solution of laboratory soap, rinse with hot tap water, high-performance liquid chromatography (HPLC)-grade water rinse 3 times, oven dry at 110 degrees Celsius (^{o}C). Seal open ends with Teflon® tape, aluminum foil, or other non-contaminating material.
- SW-846 Method 0040 (M0040) – Sampling of Principal Organic Hazardous Constituents (POHC) from Combustion Sources using Tedlar® Bags:
  - Glassware, Sample Lines, and Rigid Containers - Soap and water wash, 10 percent (%) nitric acid (HNO_3) rinse 3 times, DI water rinse 3 times, oven dry at 130°C for 2 hours. Seal open ends with Teflon® tape and aluminum foil.
  - Tedlar® Bags – Flush each bag 3 times with high purity nitrogen. Fill the bag with nitrogen and analyze for total organics.
- US EPA Method 26A (M26A) – Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources Isokinetic Method: Soap and water wash, DI water rinse 3 times, rinse front-half with acetone, air dry. Seal open ends with Parafilm®.
- US EPA Method 29 (M29) – Determination of Metals Emissions from Stationary Sources: Rinse with hot tap water, soap and water wash, hot tap water rinse 3 times, DI water rinse 3 times, 10% HNO_3 soak for 4 hours minimum, DI water rinse 3 times, acetone rinse, air dry. Seal open ends with Parafilm® or other non-contaminating material.
- US EPA Modified Method 5 - Modified Sampling Train for Energetic Compounds (MM5E): Soap and water wash, DI water rinse 3 times, methanol

rinse 3 times, methylene chloride rinse 3 times, air dry. Seal open ends with Teflon® tape and hexane-rinsed aluminum foil.

These cleaning techniques have proven to reliably produce clean glassware as demonstrated by samples from blank trains. Copies of the methods identified above will be maintained on-site and will be available for review upon request. All trains and their components will be sampled and analyzed for background contribution in the form of reagent blank samples and as blank trains at least once during the emissions test.

3.5.2 Sampling Equipment Calibration

An important aspect of presampling preparation is the inspection and calibration of the equipment. Equipment is inspected for proper operation and durability before calibration. Calibration of sampling equipment will be conducted in accordance with (IAW) the procedures outlined in the EPA's *Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III -- Stationary Source Specific Methods*, (EPA-600/4-77-027b and 600/R-94-038c), 40 Code of Federal Regulations (CFR) 60, and the specific equipment calibration requirements detailed in the applicable EPA sampling method source document. Table A-2 lists the calibration procedures for each piece of sampling equipment, their calibration criteria, and corrective actions.

The Orsat analyzer will be subject to an audit to demonstrate it is capable of producing acceptable results. Temporary Reference Method (TRM) Continuous Emissions Monitoring System (CEMS) will be used during the emissions test to monitor the exhaust gas for sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and oxygen (O_2). The TRM CEMS will be certified prior to use. Certification documentation will be available for review upon request.

3.5.3 Sampling Media Preparation

Resin used in the M0010, M0023A, and MM5E sampling trains will be packed in specially designed sorbent traps provided by the SAC. The resin will be purchased precleaned or prepared by the laboratory to meet or exceed all QC requirements specified in the method, as applicable. The date a batch of resin was cleaned will not be used to determine the usability of the resin. In all instances, resin will be used that has been cleaned and batch certified to be sufficiently clean for the applicable target analytes by the laboratory supplying the resin. The batch certification will be documented using copies of the actual analytical results used to batch certify the resin. A media request form will also accompany the resin traps that shows the batch identification of the resin used to prepare the traps and any spiking of the resin that was conducted.

Each M0010 and/or M0023A XAD-2 resin tube prepared will be spiked with a deuterated or isotopically labeled semivolatile compound and/or a labeled PCDD/PCDF isomer. Prior to use in the field, each XAD trap for the MM5E will be field-spiked with the surrogate

3,4-dinitrotoluene by the laboratory. In addition, the first impinger of the MM5E train will be spiked in the field with the surrogate 3,4-dinitrotoluene prior to sampling.

The M0031 sample tubes will be conditioned by the laboratory IAW procedures specified in the reference method. Laboratory preparation steps will meet or exceed all QC requirements specified in the method.

Before field use, filters designated for use in the M26A train will be given a unique sample number and tare weighed to a constant weight using a calibrated analytical balance in a laboratory. All tared train filters will be encased in cleaned petri dishes and sealed with Parafilm® and/or Teflon® tape until needed.

Sample containers that have been pre-cleaned to US EPA specifications and certified analyte-free will be purchased directly from the manufacturer/supplier and dedicated for use on this project. All containers will remain in their sealed shipping cartons until needed.

All chemical preservatives and reagents used in the trains will be purchased directly from the manufacturer/supplier and as specified in the applicable US EPA methods. These reagents will be ordered in small unit quantities so that they may remain sealed in their original shipping containers until needed.

4.0 ANALYTICAL METHODS AND PROCEDURES

4.1 ANALYTICAL PROGRAM DESCRIPTION AND STRATEGY

The analytical program that will be performed in support of the emissions test will consist of the analysis of all collected exhaust gas samples, their associated field QA/QC samples, as well as the analysis of all method-required and project-specific QA/QC analyses. This program will be founded on the latest US EPA and US Army analytical methods. The results of the sample analyses will be summarized on Certificates of Analysis (COA). A complete copy of all SAC analytical laboratory deliverables will be placed in the emissions test report. Table A-3 is a complete listing of all anticipated analyses, the sample types on which these will be performed, and their reference method.

The primary objective of the analytical program is to generate a database that most accurately reflects the composition of the samples being analyzed. This database will then be coupled with the sample collection information to complete the performance evaluation of the SDC. To accomplish this objective, the exhaust gas samples are prepared, extracted, and quantified in the SAC's analytical laboratory using procedures specified in the referenced analytical methodology and the resulting compiled data are reviewed to verify accuracy and completeness. The data is reviewed both internally at the SAC's analytical laboratory before publication and again during the reduction, interpretation, and evaluation phase of the project by the SAC.

This section also describes the procedures that will be followed during the analytical program and are available on-site. These procedures are founded on the referenced analytical methods but also address all project-specific QA/QC concerns. A separate procedure has been prepared for each analysis type listed in Table A-3. These procedures discuss the equipment to be used, holding times, and the details of the procedure. The procedures follow the US EPA and/or SW-846 methods.

4.2 ANALYTICAL METHODS, PROCEDURES, AND REFERENCES

Standard analytical reference methods, procedures, and techniques described in this plan will be followed during analysis of all samples collected and associated with the emissions test. The methods and procedures are discussed in detail in the following documents:

- *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*. SW-846 Third Edition, December 1996. EPA, Office of Solid Waste and Emergency Response (OSWER). Washington, D.C. 20460.
- 40 CFR 60, Appendix A, Methods 1 through 4, 26A, and 29.
- 40 CFR 60, Appendix B, Performance Specification 4B.
- Guidance for Total Organics, Final Report. EPA/600/R-96/033, EPA, March 1996.

The type of analysis, sample matrices, procedure descriptions, and associated reference methods (preparation and analysis) are summarized in Table A-3.

5.0 QA/QC OBJECTIVES

The QA/QC objective of the emissions test is to identify a complete data set that meets the criteria set forth in this plan. This data set will include all data quality indicators produced during the emissions test. In addition, the data acceptance criteria will be defined. The data acceptance criteria identify the target precision and accuracy limits that are used to assess the data quality. The overall DQO is to produce a database that will be suitable for completing an assessment of the operational performance of the SDC.

Personnel designated by the Test Director will review the field and analytical data obtained during the emissions test. The data quality will be discussed with regard to the planned data acceptance criteria and the overall emissions test objectives. Data that are determined to be outside of the target data QC limits will be evaluated to determine their impact on defining the SDC's performance. The data collection phase will be documented formally to provide complete traceability of the information pertinent to the system performance.

Table A-4 displays the target precision, accuracy, and frequency objectives, which have been defined for each type of analysis to be performed during the emissions test. The following definitions will be used.

Accuracy: Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that result from sampling and analytical operations.

Accuracy is determined by analyzing a reference method of known pollutant concentration or by reanalyzing a sample to which a material of known concentration or amount of pollutant has been added. Accuracy is usually expressed either as a percent recovery or as a percent bias. Determination of accuracy always includes the effects of variability (precision); therefore, accuracy is used as a combination of bias and precision.

Precision: Precision is a measure of agreement among replicate measurements of the same property, under prescribed conditions. This agreement is calculated as either the range or as the standard deviation(s). It may also be expressed as a percentage of the mean of the measurements, such as relative range or relative percent difference (RPD) for duplicates or relative standard deviation (RSD).

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system, expressed as a percentage of the number of valid measurements that should have been collected (i.e., measurements that were planned to be collected). Samples that are judged to be invalid on

the basis of field performance indicators or aborted runs will not be submitted to the laboratory for analysis. The completeness objective will be to obtain acceptable results for all parameters for all valid test runs. The completeness DQO will be met if these valid tests are obtained. The impact of any sample losses will be assessed with regard to the objective of obtaining valid runs. Analytical results will be reported in the emission test report for all samples that receive analytical testing per regulatory reporting requirements.

Representativeness: Representativeness is a measure of the degree to which data accurately and precisely represent a characteristic of a population parameter at a sampling point or for a process or environmental condition. Representativeness is a qualitative term that should be evaluated to determine whether in situ and other measurements are made and physical samples collected in such a manner that the resulting data appropriately reflect the media and phenomenon measured or studied. Representativeness in sampling is achieved through the use of US EPA standard sampling methodologies, which are found EPA-625/6-89/023, *Quality Assurance/Quality Control Procedures (QA/QC) for Hazardous Waste Incineration*. Isokinetic sampling will be performed when required, ensuring representative samples for the applicable parameters.

Comparability: Comparability is the qualitative term that expresses the confidence that 2 data sets can contribute to a common analysis and interpolation. Comparability must be carefully evaluated to establish whether 2 data sets can be considered equivalent in regard to the measurement of a specific variable or groups of variables. In a laboratory analysis, the term comparability focuses on method type comparison, holding times, stability issues, and aspects of overall analytical quantitation.

Bias: Bias is the systemic or persistent distortion of a measurement process that causes errors in 1 direction. Bias assessment for environmental measurements is made using personnel, equipment, and spiking materials or reference materials as independent as possible from those used in the calibration of the measurement system. When possible, bias assessments should be based on analysis of spiked samples rather than reference materials so that the effect of the matrix on recovery is incorporated into the assessment.

Several procedures will be used for monitoring the precision and accuracy objectives of the analytical program. Sampling and analytical activities will follow standard referenced procedures whenever possible. Standard reference materials (SRM), calibration standards,

internal standards, and spiking compounds will be high-purity materials that are commercially available. Typically, these materials are greater than 99% pure and have a concentration that has been certified by the manufacturer. Analytical instruments used will be calibrated per the reference method requirements prior to sample analysis in order to demonstrate that accurate performance levels are being met. Data precision and accuracy will be assessed by evaluating the results from the analysis of internal standards, spiking compounds, laboratory blanks, calibration check standards, reagent and method blanks, field and trip blanks, duplicate samples, and matrix or surrogate spiked samples.

Neither ADEM nor US EPA have established quantitative standards for the precision, accuracy, representativeness, comparability, and completeness parameters that must be met by the data produced from the emissions test. However, US EPA has defined QA objectives for each of its reference sampling methodologies. These objectives are extensively detailed in the *Quality Assurance Handbook for Air Pollution Measurement System, Volume III, Stationary Source Specific Methods* (EPA/600/4-77-027b). These criteria generally establish calibration procedures and equipment acceptance criteria. Additionally, there are specific QA objectives for accuracy and precision of the sample preparation and analysis procedures that will be used in the SAC's laboratory.

When analytical QC procedures reveal that a measurement's error has exceeded the target criterion, the source of the deviation will be identified, and corrective action will be taken. If the data fall outside the acceptable range of precision and accuracy after corrective action has been taken, the out-of-range data points will be flagged and discussed specifically in the emissions test report. Whenever possible, alternative procedures (either sampling or analytical) will be considered and recommended to the Test Director/Coordinator.

5.1 PRECISION

Analytical precision for a single analyte is expressed as the RPD based on a percentage, which is calculated as follows:

$$RPD = \left| \frac{Value\ 1 - Value\ 2}{Arithmetic\ Mean\ of\ Values\ 1\ and\ 2} \right| x\ 100$$

Precision will be determined through the use of duplicates, laboratory control samples (LCS), laboratory control sample duplicates (LCSD), matrix spikes (MS), and matrix spike duplicates (MSD), as applicable, for the analytical work performed, see Table A-4.

Tables A-5 through A-8 show the surrogate and matrix spiking compounds and matrix-specific recovery limits that will be employed for volatile and semivolatile organics, energetics, and PCDD/PCDF analyses. The target precision estimates presented in Table A-4 display acceptable target variability levels for replicate measurements of the same parameters and are expressed in terms of RPD for duplicate samples. Precision data will be calculated and presented in the emission test report.

5.2 ACCURACY

Accuracy values presented in Table A-4 represent components of both random error and bias, which are expressed as percent recovery of a "known" concentration of analyte spike, internal standard spike, standard reference material analysis, or audit sample analysis. Where direct analyses of a known standard material can be evaluated, accuracy may be assessed by analysis of a sample of the reference standard. In cases in which the matrix or sample preparation is to be evaluated for effects on accuracy, MSs will be evaluated in the samples. In some cases, a combination of these accuracy evaluation procedures will be used. The accuracy of organic determinations by gas chromatography/mass spectrometry (GC/MS) and some GC/flame ionization detector (FID) analysis will include spiking each sample with surrogate standards and selected samples with MS compounds.

An evaluation of accuracy on the M0031 will include an evaluation of the analysis of the front- and back-half traps analyzed separately to determine possible target analyte breakthrough to the Anasorb® portion of the sampling train. The analysis of an Anasorb® trap should indicate less than 30% of the concentration that is collected by the front-half Tenax® traps. Breakthrough of the Anasorb® trap above this level may cause loss of the desorption efficiency and result in a negative bias in the analytical result. This criterion does not apply when less than 75 nanograms are detected on the back trap. The accuracy of the analysis of each individual trap will be evaluated based on the recovery of surrogate standards spiked on to each trap prior to trap desorbtion and analysis.

5.3 COMPLETENESS

Data completeness represents the percentage of valid data collected from a measurement system as compared to the total amount expected to be obtained under optimal, normal conditions. The sampling completeness objective will be to obtain representative samples for all analytical parameters while operating the unit at the desired test specifications for each test run. The completeness objective will be to obtain acceptable results for all parameters (i.e., 100%). The completeness DQO will be met if the necessary valid test runs are obtained. If a test run is not completed, the abandoned test run data will not be included in the emissions test report. If a test run is completed and the data is lost or compromised, the available results will be included in the emissions test report. If the completeness DQO is not achieved, the lack of completeness will be investigated and any lessons learned will be incorporated into future plans.

5.4 REPRESENTATIVENESS

Representativeness is achieved through sampling program design. By ensuring that sampling locations are selected properly and that standard protocols are used, the resulting data will represent the exhaust conditions existing at the site at the time of sample collection.

5.5 COMPARABILITY

Comparability of the data set will be achieved by using the standard techniques to collect and analyze representative samples, and by reporting analytical results in appropriate units.

6.0 SAMPLING AND MONITORING PROCEDURES

The primary objective of the emissions test sampling and monitoring program is the collection of representative exhaust gas samples that will provide the analytical and/or screening data necessary to evaluate the performance and demonstrate compliance with the SDC regulatory requirements. This objective will be met by reducing the risk of all known potential sources of fugitive contamination or bias that may be introduced to the samples by the sampling equipment, ambient conditions, handling, and sample preservation techniques. Table A-1 summarizes the planned sampling techniques, methodology, and containers that are to be used for each sample type collected during the test.

Exhaust gas samples will be collected using standard US EPA methods from either SW-846 or CFR specifications or US Army procedures in instances where US EPA methods are not available. During the emissions test, all sampling and monitoring activities will be documented. US EPA and ADEM approval will be requested if deviations from these procedures are expected during the sampling and monitoring procedures. The samples that will be collected are listed in Table A-3.

Prior to the start of each sampling run, the SAC will be responsible for verifying that the sampling trains have been assembled properly and that calibrations have been performed properly. The SAC will also check to see that proper absorbing solutions have been used, required leak-check procedures are performed, and sample recovery is performed properly after completion of the test run.

6.1 EXHAUST GAS SAMPLING

The collection of exhaust gas samples will be completed by following the standard US EPA and/or SW-846 methods. The SAC is responsible for operation of the sampling equipment and collection of exhaust gas samples during each test run. The SAC is also responsible for proper recovery and preparation of the exhaust gas samples for shipment to the analytical laboratory. During the emissions test, the SAC will be responsible for monitoring the sampling team's adherence to the standard sampling procedures and for completing and performing final review of calibration documentation. QA procedures that will be specifically applied to the sampling activities are discussed in the following sections.

6.1.1 US EPA Methods 1 and 2

US EPA Methods 1 and 2 will be used to determine the correct traverse point locations and to measure exhaust gas velocities at each of the traverses, respectively. The absence of cyclonic flow will also be documented during a preliminary traverse. The SAC will review all calibration and calculation documentation prior to the emissions test. The SAC will inspect the data for correct traverse point selection, absence of cyclonic flow, correct number of sampling points, and orientation of sampling ports. Documentation of the application and review of US EPA Methods 1 and 2 will be included in the emissions test report. The sample ports will conform to

US EPA Method 1 in that they are 2 duct diameters downstream of a disturbance and one-half duct diameter upstream. Velocity variation across the port is not anticipated since the duct diameter is constant.

6.1.2 US EPA Method 3B

During each test run, US EPA Method 3B will be used for the collection and analysis of integrated exhaust gas samples collected in Tedlar® bags and analyzed for oxygen (O_2) and carbon dioxide (CO_2) using the Orsat method. Multi-point integrated Tedlar® bag samples will be taken in conjunction with an isokinetic sampling train during each run. The SAC will monitor the analytical procedure for adherence to procedures prescribed in the method. These determinations will be documented and reviewed by the SAC for completeness. Once during the emissions test audit samples will be analyzed. The audit samples will consist of 2 cylinders containing O_2 and CO_2 (each cylinder will have different concentrations of each gas).

6.1.3 US EPA Method 4

Although a separate EPA Method 4 train will not be run, moisture will be determined IAW US EPA Method 4. The principle of this method is to remove the moisture from the sample stream and determine moisture either volumetrically or gravimetrically for each sample train.

6.1.4 SW-846 Method 0010 (SVOC)

The M0010 (SVOC) sampling train will be used to collect exhaust gas for an assessment of semivolatile PIC/TIC. During each test run, the M0010 (SVOC) sampling train will be assembled and leak-checked before sampling begins. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 cubic meters (m^3) of exhaust gas during each test run. At the end of each test run, the sampling train will be disassembled, and all train samples will be collected.

To quantitate PIC, all M0010 (SVOC) train samples will be analyzed against, at a minimum, the site-specific list of semivolatile compounds listed in Table A-11, which is derived from the SDC Health Risk Assessment (HRA) Protocol. In addition, the 20 largest non-target peaks that are greater than 10% of the nearest internal standard will be identified and quantitated as TIC.

Liquid and solid sample train fractions will be prepared for extraction as appropriate using SW-846 Method 3542. The sample train fractions will be spiked with surrogate compounds prior to extraction. Analysis for the semivolatile PICs will be performed using GC/MS IAW SW-846 Method 8270. All analytical fractions will receive analysis for this list of compounds with each compound's individually determined response factors used in the quantitation of the target analytes.

A spiking program will be applied to the M0010 (SVOC) trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds will be placed on the components of the train at the different stages of the sampling

and analytical program so that the efficiency of the method's performance can be measured quantitatively. By assuming that these compounds have chemical characteristics that are identical to the semivolatile target compounds, the overall method efficiency can be assessed. Tables A-5 and A-6 summarize the spiking materials that will be applied to the M0010 train samples.

6.1.5 SW-846 Method 0010 (TCO/GRAV)

A separate M0010 (TCO/GRAV) train will be used to collect exhaust gas samples for total semivolatile and nonvolatile organics. The sampling and analysis methodology is similar to the methodology for semivolatiles, with these exceptions:

- Analysis of the extracts for semivolatile unspeciated mass will be performed by GC/FID;
- Nonvolatile organics will be analyzed by a gravimetric method; and
- Extreme care must be employed to avoid contamination of the sample collection apparatus and media by toluene, which is detected by this method.

6.1.6 SW-846 Method 0023A

The M0023A sampling train will be used to collect exhaust gas for an assessment of the PCDD/PCDF concentrations. During each test run, the M0023A sampling train will be assembled and leak-checked before sampling begins. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. At the end of each run, the sampling train will be disassembled and all train samples will be collected.

The front-half and back-half sample fractions will be extracted separately and the resulting extracts will be split into 2 equal portions with 1 split being analyzed for PCDD/PCDF and the remaining split will be archived. The following describes the extraction steps. The filter and front-half solvent rinse will be placed together into a Soxlet extractor and extracted with toluene. Prior to adding the filter to the extractor, the filter will be spiked with the same surrogate compounds the XAD-2 resin trap was spiked prior to being shipped to the site. Following the loading of the Soxhlet extractor, internal standards are added and are extracted and concentrated. The XAD-2 resin and back-half solvent rinse are placed into a Soxhlet extractor, spiked with internal standards and extracted in toluene. The specific PCDD/PCDF internal standard and surrogate compounds are defined in M0023A.

Analysis for PCDD/PCDF will be completed using high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) following SW-846 Method 8290 for all 2,3,7,8-chlorinated isomers and totals of all PCDD/PCDF by class (i.e., tetra – octa).

A spiking program will be applied to the M0023A trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds

will be placed on the components of the train at the different stages of the sampling and analytical program so that the efficiency of the method's performance can be measured quantitatively. The overall method efficiency can be assessed by assuming that these compounds have chemical characteristics that are identical to the PCDD/PCDF target compounds. Four types of spiking materials will be applied to the M0023A train samples. Tables A-5, A-7, and A-8 summarize the spiking materials that will be applied to the M0023A train samples.

6.1.7 SW-846 Method 0031

The M0031 sampling train will be used to sample exhaust gas onto Tenax® and Anasorb® resin tubes for analysis of volatile PIC/TIC. The sampling apparatus will be inspected and calibrated prior to the emissions test. During each run, the SAC will verify adherence to the prescribed sampling procedure as described in M0031. M0031 requires that 2 Tenax® tubes and 1 Anasorb® tube are to be used in a 2-tube configuration of the sampling train. Four sets of tubes will be used during the test run to sample a nominal 20 liters of exhaust gas per tube set. Four sets will be analyzed by combined SW-846 Methods 5041 and 8260; although only 3 sets are required. In order to ensure holding time requirements are met if 1 of the required data sets is lost or compromised during analysis, the fourth set will also be analyzed. Since the holding time for M0031 is 14 days, the analysis of the fourth pair with the others ensures its availability should it be needed. This ensures that the data completeness and final DQO are achieved. During the analysis, the 2 Tenax® tubes will be paired for analysis and the Anasorb® tubes will be analyzed separately so that breakthrough can be evaluated.

To quantitate PIC, all samples receiving M0031 analysis will be analyzed, at a minimum, against the site-specific list of volatile compounds in Table A-11, which is derived from the SDC HRA Protocol. In addition, the 10 largest non-target peaks that are greater than 10% of the nearest internal standard will be identified and quantitated as TIC.

A spiking program will be applied to the M0031 trains that will allow for complete assessment of the sampling and analytical effort regarding the overall method accuracy. Spiked compounds will be placed on the components of the train at the different stages of the sampling and analytical program so that the efficiency of the method's performance can be measured quantitatively. By assuming that these compounds have chemical characteristics that are identical to the volatile target compounds, the overall method efficiency can be assessed. Table A-9 summarizes the spiking materials that will be applied to the M0031 train samples.

6.1.8 SW-846 Method 0040

This method is used for the characterization of light organics with boiling points less than 100ºC. These light organics are collected in a Tedlar® bag and are measured by a GC/FID. The condensate from the collection of the sample is analyzed using a purge and trap GC/FID. The light organics compose 1 portion of the total organics number for the exhaust gas and are considered to be organic compounds C_1 to C_7. Each test run will produce the following samples:

- Tedlar® bag sample 1,
- Condensate sample 1,
- Tedlar bag sample 2,
- Condensate sample 2,
- Daily Tedlar bag field blank (i.e., only 1 field blank is collected each day), and
- Daily condensate field blank (i.e., only 1 field blank is collected each day)

During 1 of the test runs, a field control spike will be conducted. According to the method, a field control spike is performed by injecting known concentrations of target compounds directly into the Tedlar bag during the collection of a field sample. The field control spike replaces 1 of the field samples collected during a test run under this scenario. For the emissions tests, to ensure 2 valid samples are collected and reported for each run, the field control spike may be prepared by spiking known concentrations of target compounds into a field sample Tedlar bag after it has been analyzed.

6.1.9 US EPA Method 26A

A standard M26A will be used to collect exhaust gas samples for hydrogen chloride (HCl), hydrogen fluoride (HF), chlorine (Cl_2), and particulates matter (PM) analysis during each test run. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. An integrated gas sample is extracted from the sampling point and passed through a 0.1N sulfuric acid (H_2SO_4) solution. In this acidic solution, the HCl gas is solubilized and forms chloride ions. The acidified solution prevents the chlorine gas from solubilizing and allows this gas to pass on through to the next set of impingers that contains a 0.1N sodium hydroxide (NaOH) solution.

Sodium thiosulfate is added to the contents of the recovered hydroxide impingers to further the hydrolysis reaction. The chloride concentrations of the H_2SO_4 impinger samples and the NaOH impinger samples will be reported separately. Analyses of these samples will be conducted IAW M26A.

The exhaust gas PM emissions will be determined by weighing the solid residue collected from an acetone probe and filter housing rinse and by weighing the train particulate filter before and after sampling to determine total particulate by difference. The reported PM determination will be the sum of the probe rinse residue and particulate filter residue.

6.1.10 US EPA Method 29

A standard M29 sampling train will be used to collect exhaust gas samples for an assessment of metals. It is expected that a test run time of approximately 4 hours will be used to sample a minimum of 3 m^3 of exhaust gas during each test run. The M29 samples will be analyzed for the following metals: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, total

chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorous, selenium, silver, thallium, tin, vanadium, and zinc.

The probe rinse and the particulate filter digestate will be combined in the laboratory as the front-half composite sample and analyzed for the target metals. The back-half of the train consists of the following 4 samples collected in separate containers: the 5% HNO_3/10% hydrogen peroxide (H_2O_2) impinger catches from impingers 1 through 3, the empty impinger moisture gain (at position 4), the 4% potassium permanganate ($KMnO_4$)/10% H_2SO_4 impinger catches from impingers 5 and 6, and a final rinse of impingers 5 and 6 with 8N HCl. The 5% HNO_3/10% H_2O_2 impinger catches will be analyzed for the full target metals list, while the impinger 4 sample, the 4% $KMnO_4$/10% H_2SO_4 impinger catches, and the 8N HCl rinse will be analyzed separately for mercury only.

The use of hydrofluoric acid is required in the preparation of the particulate filter and probe rinse composite. The 5% HNO_3/10% H_2O_2 impinger composite will be analyzed separately for the target metal analyte list. A separate portion of the impinger composite will be prepared by SW-846 Method 7470 for mercury. The fourth impinger (empty at the start of a test), the 4% $KMnO_4$/10% H_2SO_4 impinger composite, and the 8N HCl impinger rinse will be prepared and analyzed separately for mercury using SW-846 Method 7470.

6.1.11 US EPA Modified Method 5 for Energetics

During the emissions test, a MM5E sampling train will be used to collect exhaust gas samples for an assessment of energetic compounds. The MM5E samples will be analyzed for the following analytes: nitroglycerin, 2,4-dinitrotoluene, 2,6- dinitrotoluene, 2,4,6-trinitrotoluene, cyclotrimethylenenitramine, and high melting explosives.

The first section of the XAD-2 resin trap is spiked by the laboratory with surrogate solution. Prior to assembling the sampling train, the first impinger is charged with 50 milliliters of DI water and spiked with surrogate solution. At the completion of sampling, the sample train will be recovered and shipped to the laboratory for extraction and analysis.

6.2 QC SAMPLES

QC samples will be collected during field and laboratory sampling activities to provide a measured indication of QA for the test samples. Table A-4 summarizes the field QC sample requirements that will be applied during sampling activities.

6.2.1 Laboratory Resin Blanks

After sample resin tube preparation, the resin will be certified to be free of target analyte contamination above the laboratory reporting limit (RL). Certification will be performed by analyzing the XAD-2 resin for the target semivolatile organics, PCDD/PCDF, and energetics. The Tenax® and Anasorb®tubes will be certified by analyzing a tube of each type from each preparation lot for the target volatile organics. Each analysis will be performed using the same

surrogate spiking compounds used for the field samples. Sample media will not be used in the field for analyses showing target analytes with detected concentrations above the laboratory RL.

6.2.2 Reagent Blanks

Reagent blanks are defined as samples of the reagent source water (ASTM Type II water, organic-free DI water), solvents, solutions, and other media used for sample collection. Each reagent blank will be analyzed for the same analytical parameters as the actual samples. The results from the analyses of these blanks will be used to demonstrate that these solvents, solutions, and filters are not potential sources of background contamination for samples requiring these sampling media during collection.

6.2.3 Field Blanks

For the isokinetic sampling trains, blank trains will be assembled and charged with all the required chemical reagents and sample collection media in the same manner as the actual test sample trains. They will be placed near the sampling point, heated to the appropriate temperature, and leak-checked the proper number of times. The blank trains will then be disassembled and the contents will be collected using the same recovery procedures as used for the actual test sample trains.

For the non-isokinetic sampling train used to collect volatile organics (M0031), the field blank will consist of blank Tenax®-GC and Anasorb®-747 tubes that are attached to the sampling train while the train is leak-checked and then removed and stored with the sample tubes. For the non-isokinetic sampling train used to collect volatile unspeciated organics (M0040), the field blank will be collected by assembling the sampling train and attaching a Tedlar® bag containing either zero air or nitrogen to the sample probe and collecting the organic-free gas in the same manner as a sample.

The results of the blank train samples are indicative of contamination from contaminated reagents, glassware preparation, sampling environment, train handling, and sample recovery technique.

During the emissions test, 1 blank train will be collected for each of the following trains: M0010, M0023A, M0040, M26A, M29, and MM5E. For M0031, 1 field blank will be collected per run. For M0040, 1 field blank will be collected per day. The field blank samples will be collected and analyzed to demonstrate that sample handling procedures at each sampling location do not expose the samples to contaminants. Field blanks will be considered to demonstrate good quality of background if the compound concentrations detected are less than the lowest standard as specified in the US EPA's *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration Handbook* (EPA/625/6-89/023), with the exception of low levels of common laboratory contaminants and products of resin degradation. For volatile organics, these include chloromethane, benzene, toluene, methylene chloride, acetone, and bromomethane. For semivolatile organics, these include benzoic acid, benzaldehyde, benzyl alcohol, bis(2-

ethylhexyl)phthalate, di-n-octyl phthalate, di-n-butyl phthalate, diethylphthalate, and naphthalene. Good laboratory practices and appropriate handling precautions will be taken to minimize these common laboratory contaminants and resin degradation products.

6.2.4 Trip Blanks

Trip blanks will consist of a set of clean, sealed M0031 Tenax® and Anasorb® tubes, an XAD-2 tube from both M0010 methods, the M0023A, and the MM5E sampling trains, a M0040 Tedlar bag filled with a "zero" gas, and volatile organic analysis vials filled with ASTM Type II DI water for the M0031 and M0040 sampling trains. With the exception of the M0040 Tedlar® bag which are analyzed on-site, these tubes and vials are transported from the field site to the laboratory for storage and analysis along with the field test samples. The trip blank data will demonstrate that the samples are not exposed to fugitive contamination during storage and transport to their final laboratory destination. Trip blanks are analyzed for the same analytical parameters as the actual test samples. Trip blanks will generally be considered to demonstrate good quality of background if the compound concentrations detected are less than the lowest calibration standard, as specified in the US EPA/625/6-89/023, *Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration Handbook*, with the exception of low levels of the following common laboratory contaminants and products of resin degradation:

- Volatiles: chloromethane, benzene, toluene, methylene chloride, acetone, and bromomethane.
- Semivolatiles: naphthalene, bis(2-ethylhexyl)phthalate, diethylphthalate, di-n-butyl phthalate, benzoic acid, benzaldehyde, benzyl alcohol, and di-n-octyl phthalate.

6.3 PROCESS MONITORING EQUIPMENT

Process data output is monitored by the SDC operators in order to maintain steady-state operating conditions. Process monitoring equipment is inspected and calibrated periodically.

Process Data Acquisition and Recording System (PDARS) information associated with Feed Prohibitive Interlock instrumentation is computed and the average of 15-second (at a minimum) readings recorded at least every 60 seconds. All applicable PDARS information will be provided to ADEM and included in the emissions test report.

A Relative Accuracy Test Audit will be conducted to verify the accuracy of the facility CEMS during the emissions test.

6.4 TRM CEMS

TRM CEMS for NO_x, SO_2, CO_2, CO, and O_2 will be used during the emissions test. The quality of data generated by this TRM CEMS will be evaluated by conducting system performance

checks before testing begins by conducting calibration checks and reviewing all data records obtained during the initial instrument performance evaluation.

The zero and span checks of monitors will be considered a verification of the quality of data received. If the zero and span show unacceptable accuracy and precision, then the monitor will be calibrated IAW the manufacturer's specifications. Data will be reported on 1-minute intervals and archived in the SAC's TRM CEMS data acquisition system. The quality of data generated by this TRM CEMS will be evaluated by conducting system performance checks before testing begins. The calibration gas will conform to the US EPA's *Traceability Protocols for Assay and Certification of Gaseous Calibration Standards* (RTI/6960/208-01F).

7.0 SAMPLE HANDLING, TRACEABILITY, AND HOLDING TIMES

Sample custody will be the responsibility of the SAC from the time of sample collection until delivery of the samples at the SAC's analytical laboratory. Thereafter, the SAC's analytical laboratory performing the analysis will maintain custody. Samples requiring preservation will be kept on ice, or equivalent, and shipped to the SAC's analytical laboratory in a secured cooler (see Table A-10).

Custody of samples will begin with the sampling team and be transferred to the SAC's analytical laboratory at the time of sample shipment. The custody procedures will include the following activities:

- Labeling of all samples with a unique sample number;
- Each sample train will be documented from setup through recovery;
- A list of all samples will be maintained in a sample logbook which will contain a master sample checklist;
- All containers used for shipping samples to the SAC's laboratory(s) will be sealed, signed, and dated by the SAC; and
- The original COC will be shipped with the samples to the SAC's analytical laboratory; a copy of the COC will be faxed to the SAC laboratory prior to shipping.

The intent of these procedures is to document the sample′s traceability, while providing a COC record for all samples collected. Possession and custody of the samples will be maintained in a competent fashion, and samples will be handled responsibly and stored at all times. Samples held overnight on-site will be stored on ice (or equivalent) in coolers or an on-site refrigerator that are secured within a trailer or other portable workspace, as required.

7.1 SAMPLE LABELING AND NUMBERING SCHEME

Samples will be collected in containers and appropriately labeled to distinctly identify each sample. The sample labels will be completed with the SDC identification, test description or identification, sample type, date, preservatives, analytical procedures, and test run number before sample collection. After all containers have been labeled, each will be staged in a sample cooler or an on-site refrigerator at its appropriate sampling location or temporary storage locations prior to shipment, as applicable.

7.2 SAMPLING DOCUMENTATION

The SAC will be responsible for ensuring that all field documentation of the sampling activities is complete and correct. Examples of the field documentation forms are available upon request. Additional documentation and QC records will be provided IAW applicable US EPA methods.

7.3 MASTER SAMPLE CHECKLIST

Upon finalization of the program analytical scope, i.e., plan approved, and in advance of the mobilization, a sample logbook will be prepared to include a complete listing of samples to be collected and analyzed in the program. This compilation of samples becomes the master sample checklist that will contain information such as the test and test run number, the sample number assigned, the sample description, the destination SAC's analytical laboratory, and an indication if the sample is a field sample or a QA/QC sample. This master sample checklist is carefully reviewed at the conclusion of each valid test run and prior to sample shipment for completeness and accuracy. The purpose of the master sample checklist is to serve as a complete sample inventory.

7.4 SAMPLE COC FORM

The COC form is the formal custody record. The original COC form will be sent to the SAC's analytical laboratory with the sample shipment and the SAC will retain 1 photocopy. As part of the SAC's analytical laboratory coding process, the samples are entered into the contracted laboratory(s)'s analytical Laboratory Information Management System (LIMS) and assigned a laboratory tracking number. The LIMS will then provide the main tracking mechanism for tracing sample status through analysis and reporting. Copies of all signed COC forms will be placed in the emissions test report.

The SAC will take an inventory of each shipment of samples and will sign and date the original COC form. Signed COC forms will be shipped along with the samples. The SAC's analytical laboratory personnel will then evaluate the sample shipment and note on the Sample Receipt Log portion of the COC form the date of receipt, temperature of samples, condition of the samples, and any sample loss or breakage when the coolers were received. The SAC will be notified immediately of any problems identified with shipped samples. The SAC's analytical laboratory will maintain custody of the samples until notification for release or disposal is received from the Test Coordinator or his/her designee.

7.5 SAMPLE PRESERVATION AND HOLDING TIMES

Samples will be placed on ice, or equivalent, in coolers or an on-site refrigerator during and after sampling, as required, and will be preserved as specified by Table A-10. The M0031 and M0040 (condensate) samples will be preserved before, during, and after testing by placing them on ice, or equivalent, in a dedicated sample cooler or an on-site refrigerator that is located away from other samples and recovery areas to avoid contamination (see Table A-10).

7.6 SAMPLE PACKING AND SHIPPING

At the time of collection, gathered samples will be segregated to avoid the possibility of cross contamination. At the end of each test run, the gathered samples will be inventoried against the master sample checklist. A final review of the sample label and checklist will be performed and then the sample will be packaged. For all train samples, Teflon® tape will be used to seal the

container lids of all recovered solutions. The level of solution on the bottle will be marked with a permanent marker. The utmost care will be taken to wrap all containers in a shock absorbing material and place into re-sealable bags. The samples will be packed and preserved on ice, or equivalent, in sample coolers or an on-site refrigerator, see Table A-10. Coolers will be kept in a designated sample storage area that can be locked for additional security. The samples will be managed to meet holding time requirements.

7.6.1 Transport by Hand Delivery

The SAC will be responsible for loading all collected exhaust gas samples and transporting them to the SAC's analytical laboratory(s). In this way, the samples will be handled with the utmost care and the risk for damage is greatly reduced. Additionally, sample custody, preservation, and coding are facilitated.

7.6.2 Transport by Overnight Courier

If shipping via overnight courier, every effort will be taken to secure a safe delivery of the samples to the SAC's analytical laboratory. Trip blank samples will be prepared and placed with each sample shipment, as required, to assess possible cross contamination. Samples will then be segregated by compatibility into approved containers, and proper shipping papers and labels will be completed IAW US Department of Transportation/International Air Transport Association regulations. A final review of all of the shipping papers and containers will be performed in the office of the overnight courier to confirm completeness and accuracy. The SAC's analytical laboratory will receive a complete COC form that will include all samples in that shipment. This COC form will be signed before shipping to release custody of the samples to the SAC's analytical laboratory. All forms, or equivalent, will be faxed to the SAC's analytical laboratory before shipping.

8.0 SPECIFIC CALIBRATION PROCEDURES AND FREQUENCY

Calibration procedures for SAC's instruments used for the SDC emissions tests are provided in the method procedure documents discussed in this section. The sampling components requiring calibration include dry gas meters, probe nozzles, pitot tubes, and temperature-indicating devices. The SAC's laboratory analytical instruments will be calibrated IAW the reference method requirements. The analytical methods are referenced in Table A-3.

8.1 PROCESS MONITORING EQUIPMENT

The SAC's process monitoring equipment includes: flow meters, weigh scales, thermocouples, and pressure-sensing devices. All calibration data for each instrument will be documented and should include the calibration procedures implemented, if different from the manufacturers' recommended procedures, as well as the following:

- Device being calibrated,
- Identification number (serial number or tag number),
- Reference device,
- Date of reference device's last calibration,
- Identification of reference device (such as serial number or lot number),
- Date of the performance of calibration, and
- Name of primary technician performing calibration.

8.2 SAMPLING EQUIPMENT

The M0010, M0023A, M0031, M0040, M26A, M29, and MM5E sampling train components will be calibrated as defined in the applicable method. The activity matrices for calibrating the equipment and apparatus are shown in Table A-2. Calibration of sampling equipment will be performed prior to the initiation of SDC emissions test sampling.

8.3 ORSAT

Prior to the analysis of samples, the Orsat gas analyzer will be leak-checked and inspected carefully. During the emissions test, multi-point integrated bag samples will be collected and analyzed for CO_2 and O_2 using an Orsat analyzer (US EPA Method 3B). Once per emissions test, the SAC will perform an audit of the Orsat analyzer. Two audit cylinders will be provided by the SAC to conduct this audit with each cylinder containing known concentrations of a mixture of CO_2 and O_2. The audit will be conducted by taking a sample from each cylinder containing known concentrations CO_2 and O_2, and analyzing IAW the procedure used for the samples. The found concentrations must agree with the known values plus or minus 0.5%.

9.0 ANALYTICAL OBJECTIVES AND PROCEDURES

The analytical project objective for the emissions test is to provide a database that appropriately and accurately reflects the composition of the samples being analyzed. This objective will be met by successful implementation of the analytical methodologies and procedures selected for the analysis of the demonstration test samples. The process of selecting the analytical methods and procedures took into consideration the sample matrix, composition, volume, and the analytes of interest.

9.1 ANALYTICAL LABORATORY

The following section and Table A-3 summarize the sample types and the methods of analysis to be used for the SDC emissions tests. The SAC's analytical laboratory qualifications will be submitted upon request.

9.2 ANALYTICAL PROCEDURES

Standard methods will be followed during the analyses of all samples collected during the emissions test. The samples to be collected, sample matrices, procedure descriptions and the associated reference methods are summarized in Table A-1.

10.0 SPECIFIC INTERNAL QC CHECKS

This section describes QC procedures that will be followed by the SAC's analytical laboratory during the analysis of the samples from the emissions test. The SAC's analytical laboratory will be required to monitor the precision and accuracy of their sample analyses. The SAC's analytical laboratory will use the following high-purity, commercially available materials for their QC procedures: SRM, calibration standards, internal standards, and spiking compounds. Using these materials, data precision and accuracy will be assessed by evaluating the results from an analysis of method blanks, laboratory blanks, and reagent blanks; duplicate samples; calibration check and internal (where appropriate) standards; matrix or internal standard spiked samples; and internal standard compound spike samples. Table A-4 summarizes the laboratory QC sample requirements. The analytical QC checks, frequencies, acceptance criteria, and corrective actions for each analytical method or other parameters are described in greater detail in the appropriate analytical reference method.

10.1 METHOD BLANKS

Method blanks contain all the reagents used in the preparation and analysis of samples and are processed through the entire analytical scheme to assess spurious contamination arising from reagents, glassware, and other materials used in the analysis.

10.2 ANALYTICAL INSTRUMENT CALIBRATION

Prior to sample analysis, initial and continuing calibrations will be performed IAW the prescribed reference method to compare linearity of response to concentration of known amounts of the analytes of interest. If acceptance criteria, as specified in the appropriate analytical methods for initial or continuing calibrations, are not met, sample analysis will not proceed until the analytical problem has been rectified and the criteria have been met. Linearity checks will be used to verify that response has not shifted significantly from the most recent calibration. The instrument initial calibration procedures and acceptance criteria will be those established in the analytical method.

10.3 LABORATORY CONTROL SAMPLES

These samples are generated from spikes prepared independently from the calibration concentrates. LCS are used to establish that an instrument or procedure is in control. A LCS is normally carried through the entire sample preparation and analysis procedure. A LCSD is prepared at the same time as the LCS. Precision and accuracy data can be determined from the analysis of LCS/LCSD pairs.

10.4 MATRIX SPIKE SAMPLES

These samples are generated by spiking an aliquot of an actual field sample with a known concentration of 1 or more analytes. The spiking solution(s) is prepared independently from the calibration concentrates. MS samples are used to establish that an analytical system or procedure

is in control. A MS sample is normally carried through the entire sample preparation and analysis procedure but may be performed as post-spiked analyses. A MSD is prepared at the same time as the MS sample. Precision and accuracy data can be determined from the analysis of MS/MSD pairs. For air matrices, these samples are generally not performed as the entire sample is consumed during analysis. For the exhaust gas samples, the MS/MSD will consist of LCS/LCSD as the entire sample is generally consumed during the analysis leaving no sample on which to perform MS. Exceptions include the MS/MSD for the back-half mercury fraction, the M26A samples, and in some instances, the M0031 and M0040 condensates. For metals other than mercury post-digestion spikes will be performed.

10.5 SURROGATE STANDARD SPIKES

The GC/MS analytical procedures require that each sample be spiked with surrogate standard compounds used to calculate recovery as an indicator of the general accuracy of sample preparation and analysis. Tables A-6 and A-8 provide the target QC percent recoveries for volatiles and semivolatile surrogate standard compounds, respectively. These surrogate standard compounds are the recommended spiking materials used for SW-846 Methods 8260 and 8270 for spiking samples being analyzed for volatiles and semivolatiles, respectively.

The M0010 and M0023A XAD-2 resin tubes will be spiked with 1 or more a field surrogates during sample tube preparation. The spiking standards used will be prepared from certified stock standards separate from the unlabeled standards used for calibration.

11.0 DATA REDUCTION, VALIDATION, AND REPORTING

This section describes the approach used to report, review, and reduce the field and laboratory data into an appropriate presentation format in the final report. The results will be presented in a manner that demonstrates compliance with the test objectives. The raw data will be generated as field sampling documentation, sample traceability documentation, laboratory processing documentation, and raw data from analytical instruments. The most significant aspect of data reporting will be the compilation of the analytical results from each laboratory. Analytical results will be compiled into analytical data packages. Following delivery of the analytical results to the designated personnel, a data verification effort will be undertaken to review the content of these deliverables for compliance with the emissions test plan requirements. The reported data also will be evaluated for compliance with the DQO. If the data are determined to have met the analytical requirements, they will then be used to demonstrate the test objectives.

11.1 DATA REPORTING

Data reporting is considered to be the compilation of the results from the laboratories. The laboratory deliverables that constitute this compilation are the hard copy analytical data packages. The style and format of the deliverables and the process for completing their compilation is discussed in this section.

11.1.1 Analytical Data Packages

Analytical data packages are formatted and organized in a manner similar to the EPA CLP format (CLP-like). These data packages are stand-alone deliverables that include the instrument raw data, parameter-specific QC documentation, calibration and calibration check performance, and instrumentation performance information. These data are included so an independent verification of the final analytical results can be conducted. In addition to the raw data, all analytical data packages will contain a narrative that identifies project-specific information and any pertinent information from the performing laboratory concerning data quality. The narrative also summarizes the QC data and any difficulties or analytical anomalies encountered during laboratory processing that are considered pertinent to achieving DQO or project-specific objectives. Each laboratory report will also include all COC records as well as a cross-reference for the field sample and laboratory sample identities.

The remaining analytical data package sections are specific to each type of analysis performed (the associated reference methods are summarized in Table A-3). Each validatable CLP-like data package will summarize the raw data on standard EPA forms (or on forms similar to the standard EPA forms). The summary forms are included to tabulate information that is relevant to the analysis in a more accessible fashion.

11.1.2 Certificates of Analysis

Certificates of analysis, or results pages, will be presented in a format that includes both sample collection information (i.e., date of collection) and analytical data. The results pages will summarize the analytical results and may provide a summary of the internal standard and surrogate recoveries, as applicable.

11.1.3 Analytical Data Results

Reporting of analytical results is dependent upon the analytical procedure employed. For this analytical program, detection limits (DL), RL, and method detection limits (MDL) will be reported.

The laboratory reports a DL when the analytical method (e.g., SW-846 Method 8290) specifies a minimum level at which results should be reported. The DL is calculated IAW the method requirements and values below the DL are not reported. It is isotope dilution methods typically report to a DL given the quantitation technique. For these methods, each sample is spiked with an isotopically labeled surrogate or internal standard for each target compound. On a sample-by-sample basis, the recovery of each surrogate or internal standard is determined; then, the analytical result is normalized to the recovery of the corresponding surrogate compound. In this manner, the DL for each sample and each compound can vary as the surrogate recovery varies.

The MDL is defined as the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero. It is a statistical limit that is matrix independent. The MDL, however, is an absolute measurement and, as such, does not factor in the accuracy of the quantitation. The laboratory-generated MDLs are evaluated to ensure their suitability. One evaluation criteria that is often employed is the comparison of the mean concentration of the replicate analyses from the study versus the statistically-derived MDL. Based on such evaluations, the limit of reliable detection may be established at a value that is greater than the statistically-derived value (e.g., the MDL may be based on the analysis of a low-level detection limit verification sample). The MDL is used with analyses that employ external or internal standard quantitation.

The RL is a laboratory-specific minimum concentration at which results are typically reported (i.e., values less than the reporting limit are generally not reported). For this program, results that are less than the RL but greater than the MDL will be reported. There is no specific requirement that establishes how a RL must be established. SW-846 guidance suggests that values below the lowest calibration standard should not be reported. In the absence of a specific requirement, RL are established based on the lowest concentration in the calibration curve, one-half of the lowest concentration in the calibration curve or a multiplier of the MDL. The RL may not be established at a value that is less than the MDL. Changes to extraction protocol, amount of sample used in preparation, or dilution applied to the sample can raise or lower the RL.

The results of sample analyses will be reported in concentration units. Sample results will be reported for all samples and parameters required for the emissions test. Exhaust gas sample results will be reported as a total mass at the DL. In all instances, results will be calculated following method requirements or standard reporting conventions. Based on guidelines found in the analytical method, data validation guidelines, or in this SAP/QAPP, each laboratory will assign qualifiers to the results, when appropriate. Qualifiers appearing on a results page will be defined on that results page or in the case narrative.

11.1.4 Report Preparation

Each laboratory will follow a standard operating procedure for the steps taken in the reporting process for the analytical data packages. Laboratory personnel will review the calculations to confirm the analytical results are correct. An analysis-specific data review checklist should be used to ensure all preparation and analysis documentation for the test run and the QC samples is included in the data package. Laboratory personnel will also check the accuracy and completeness of the CLP-like summarization forms. The data package should also be subject to peer review by the group leader, section head, or designated laboratory personnel. The laboratory manager, or designee, will perform the final review of the deliverables to check for completeness and to determine that the client's requirements for data quality were met.

11.2 DATA REVIEW

The data review process will be initiated when the designated personnel receives the analytical data packages from the laboratory and verifies each sample was analyzed correctly for the parameter requested on the COC forms. This review of the deliverables will confirm all required laboratory QC was performed and the results were reported. After this initial review, data reported on the results pages and raw data are compared to verify no transcription errors occurred during reporting. Next, the data for each analytical parameter will be reviewed thoroughly for each individual sample to ensure all the pertinent information is included in the analytical data package. This review will confirm the data are usable for an assessment of system performance.

If, during the review process, any errors or deficiencies are found in the analytical data packages, they will be noted by the reviewer and the laboratory will be notified so corrected pages can be issued for inclusion into the final report. The corrected pages are then reviewed upon submittal for accuracy before incorporation into the data package.

11.3 DATA REDUCTION

When the data review process is complete, the results will be summarized in tables for presentation in the final report and reduced into a form that is usable demonstrating the test objectives.

11.3.1 Analytical Data Summary

Analytical data summary tables will be included in the final report and will be categorized primarily by analytical parameter. Typically, these tables will summarize the analytical results and the results of the individual sampling trains, as applicable.

In the summary tables, the data for exhaust gas samples will be summarized for all test runs and/or on a run-by-run basis and presented. The data for exhaust gas samples will be presented on a per-fraction basis. Results for each fraction are reported from the laboratory in terms of total mass. Combining the results from each fraction produces a total to be used in calculating mass emission. In instances where the analyte concentration in a sample is reported as a nondetect, the RL and a "<" symbol will be the reported value in the table for the result. Any estimated quantitation reported from the laboratory or as indicated by the data validation effort will be discussed in the final report.

The results will be evaluated by designated personnel to determine if the project objectives have been met. If anomalous results are obtained, every effort will be made to identify the reason for the anomaly in the sample collection, sample preparation, or analysis. If any anomalies have occurred, the final report will include the results of the affected sample data, a thorough discussion of occurrence, and any perceived impact on overall data usability.

11.3.2 QC Data Summary

The QC data summary tables will be provided in the QA/QC report appendix of each final report and are organized by parameter. General types of QC data summary tables that may be provided include internal standard and surrogate recovery results and LCS/LCSD recovery results. The results will be checked against the target acceptance limits. Any data that fall outside of the target acceptance limits will be flagged or footnoted on the QC data summary tables. The data from the field-generated blanks will be sorted into categories such as field blanks, trip blanks, reagent blanks, and blank trains. The data from the field blanks and trip blanks will be interpreted in the QA/QC report to show that the samples could be handled in the field and transported to the laboratory without contamination problems. The reagent blank and blank train results will be interpreted to represent the amount of contamination from reagents or handling that will be present in a train before sampling has begun. Emissions results will not be adjusted based on blank results.

11.4 DATA VALIDATION

It is anticipated that ADEM and/or US EPA will perform a validation of the data packages submitted with the emissions test report. IAW the requirements of this QAPP, the SAC's laboratory is required to supply CLP-like analytical data packages which are intended to support data validation efforts. The SAC's laboratories will be required to submit data packages that are supported by QC test results and raw data.

The laboratory report prepared by the contracted laboratory(s) will be validated and included in the emissions test report. The validation protocols used to validate the data will be based on published US EPA data validation guidelines.

Three validation levels for the emissions testing program have been established. The 3 levels and a description each activity are identified below:

Level A - This level of validation includes:

- verification of required deliverables,
- requested versus reported analyses,
- evaluation of qualification of results based on holding times, and
- qualification of results based on method blank results.

Level B – This level of data validation includes all items identified in Level A plus evaluation and qualification of results based on the following:

- MS/MSD analysis,
- surrogate recoveries, and
- internal standards performance (HRGC/HRMS only).

Level C – This level of data validation includes all items identified in Levels A and B plus evaluation and qualification of results based on the following:

- initial and continuing instrument calibrations (standards and blanks),
- laboratory control samples,
- instrument tuning
- analytical sequence, and
- internal standards performance (GC/MS and ICP/MS).

All laboratory reports of emissions data generated during the emissions test will be prepared to allow validation to any level.

11.5 DATA MANAGEMENT

Data management consists of 5 areas where data is collected, analyzed, and reported: field sampling data, laboratory data, preliminary report, data validation, and final report. As much as possible, data will be transferred electronically through the data management areas to avoid transcription errors.

The SAC's laboratory will prepare and submit US EPA CLP-like analytical data packages.

12.0 ROUTINE MAINTENANCE PROCEDURES AND SCHEDULES

Routine maintenance of sampling and analytical equipment used by the SAC during the emissions test will be performed IAW the procedures and schedules set forth in manufacturers' maintenance manuals and as described in appropriate sections of standard methods. The methods in which the calibration requirements are defined are included in Table A-2. Sampling equipment is routinely tested and calibrated prior to deployment IAW the methods cited. Defective equipment will not be deployed. During the emissions test, equipment that does not meet calibration specifications, or fails the prescribed performance specification test, will be tagged out of service. The equipment will not be used until it is repaired and meets specifications. A maintenance log will be maintained for the emissions test and will become part of the permanent records.

Routine maintenance of all SAC's analytical instruments will follow the procedures and schedules as prescribed in the SAC's analytical laboratory QA manual and the standard operating procedures written for each instrument. These documents are available upon request. All routine maintenance performed will be recorded in a maintenance log for each instrument. If the maintenance procedure could have affected performance of the instrument then calibration check samples will be analyzed and the results recorded in the record notebook before any samples are analyzed. The serial number of the new parts will be logged into the maintenance log. When parts are replaced, check standards shall be analyzed to demonstrate correct operation of the system. Certain types of equipment, such as analytical balances, are re-certified by the service representative after repair. Routine preventative maintenance may be documented in the analytical run log.

Each SAC's analytical laboratory instrument or piece of equipment shall be uniquely identified. Bound maintenance logs shall be assigned to each instrument, and will be controlled by the SAC's analytical laboratory QA personnel.

13.0 ACCURACY, PRECISION, AND COMPLETENESS PROCEDURES

The SAC's QA activities implemented in the emissions test will provide a basis for assessing the accuracy and precision of the analytical measurements. The generalized form of the equations that will be used to calculate accuracy and precision are given below:

13.1 ACCURACY

$$Percent\ Recovery = \left(\frac{(X - S)}{T}\right) \quad x \quad 100$$

where: X = Experimentally determined concentration of the spiked sample
T = True concentration of the spike
S = Sample concentration before spiking

13.2 PRECISION

$$Relative\ Percent\ Difference\ (RPD) = \left(\frac{|D_1 - D_2|}{\left(\frac{D_1 + D_2}{2}\right)}\right) \quad x \quad 100$$

where: D_1 and D_2 = The results of duplicate measurements or as the standard deviation relative to the average value expressed as:

$$Relative\ Standard\ Deviation\ (\%\ RSD) = \left(\frac{\sigma_{(n-1)}}{\overline{X}\ (x_1 .. x_n)}\right) \times 100$$ where: $\sigma_{(n-1)}$ =

Standard deviation of the sample data
n = Number of duplicates
$X_{(x1....xn)}$ = Arithmetic mean of the sample data

13.3 COMPLETENESS

Data completeness is a measure of the extent to which the database resulting from a measurement effort fulfills objectives for the amount of data required. For the emissions test, completeness will be defined as the percentage of valid data for the total valid tests. The completeness objective will help to evaluate the accuracy and precision of the analytical measurements. Furthermore, if the data set is not complete it will not meet the requirements of the emissions test. Completeness is assessed by the following equation:

$$Completeness = \left(\frac{D_r}{D_c}\right) \quad x \quad 100$$

where: D_r = Number of samples for which valid results are reported

D_c = Number of valid samples that are collected and reach the laboratory for analysis

14.0 AUDIT PROCEDURES, CORRECTIVE ACTION, AND REPORTING

14.1 AUDIT PROCEDURES

The SAC, WDC, US EPA, and ADEM representatives will accomplish sampling performance audits through observation of the sampling operations. Adherence to methods/procedures will be maintained for each sampling train configuration. The field data sheets will constitute a complete record of the sampling activity. The SAC will assume full responsibility for review of the sampling data, which will include a summary of the sampling activity. If deemed necessary by the SAC, SRM will be submitted for analysis as blind QC samples.

14.2 CORRECTIVE ACTION-MINOR SYSTEM EVENTS

Corrective action is required whenever a circumstance arises that adversely affects the quality of the data output. In order for corrective action to be initiated, awareness of a discrepancy must exist. In most instances, the personnel conducting the field work and the laboratory analysis are in the best position to recognize events that will affect data quality. Awareness on their part can frequently detect minor instrument changes, drifts, or malfunctions, which can then be corrected, thus preventing a major breakdown of the system.

In the event that the SAC observes a condition that may adversely affect the quality of the data, he must first decide if he can fix the discrepancy before a serious effect occurs. An example would be any circumstance where instrumental conditions have to be changed to maintain isokinetic conditions within the allowed flow rate window. If this kind of circumstance occurs, the SAC should correct the discrepancy immediately, then note the discrepancy and the corrective action on the run sheet. A nonconformance report is not required to document minor system events.

14.3 CORRECTIVE ACTION—MAJOR SYSTEM EVENTS

If major sampling events arise, the SAC's technicians are in the best position to observe a need for corrective action and initiate a response immediately, thus minimizing data loss. Therefore, the field sampling personnel will have a prime responsibility for recognizing nonconforming conditions. The SAC must notify the Test Coordinator immediately when serious situations arise. The Test Director may authorize a temporary suspension of sampling while corrective action is defined and/or performed. If the event is deemed to be minor, the Test Director will then enter the event in his records and instruct the appropriate personnel that the test run will continue.

If testing is suspended, the corrective action must follow a more formal path. The Test Director/Coordinator and the SAC should obtain input from the appropriate personnel and initiate a closed-loop response. If the event cannot easily be contained, then alternative actions must be considered and communicated to oversight personnel.

Decisions on whether to take corrective action and what action(s) to take will be made by the Test Coordinator or the SAC. When a corrective action is taken by any of the sampling technicians, they will be responsible for notifying the SAC so that, if deemed necessary, QA surveillance of the affected sampling or analysis system can be intensified. The personnel identifying the event shall initiate nonconformance reports. Each nonconformance and corrective action report will become part of the emissions test report or the supporting data files.

14.4 CORRECTIVE ACTION—LABORATORY NONCONFORMANCE

The SAC's analytical laboratory analysis personnel will have a prime responsibility for recognizing the need for a nonconformance. The person originating it shall document each nonconformance. More significant events require the initiation of a non-conformance report. Minor events will be recorded in the analysis run log.

14.5 CORRECTIVE ACTION ARISING FROM REVIEW OF TEST, QC, OR AUDIT SAMPLE DATA

The SAC will be responsible for initiating corrective action during sample analysis. The appropriate management will then be responsible for instituting corrective action and verifying that the corrective actions produce the desired results. For example, if MS results are outside QC limits and sufficient sample remains to prepare and reanalyze the sample, the decision may be made to repeat the analysis if holding times have not expired.

Optionally, upon approval from the Test Coordinator, modified preparation techniques may be used if the analyst's observations indicate that the standard preparation is inadequate. If results cannot be obtained that meet the target criteria, then qualification may result. The entire situation will be reported on a nonconformance memo and discussed in the case narrative and emissions test report. Ultimately, the personnel performing and checking the sampling and analysis procedures and results must participate in decisions to take corrective actions. To reach the proper decision, each individual must understand the program objectives and data quality required to meet these objectives. Personnel involved in the emissions test will receive or have available to them an approved copy of this document and will be informed of these objectives. Each individual will have a responsibility to notify the respective field sampling or laboratory operations supervisor whenever a measurement system is not yielding data within these objectives.

14.6 QA REPORTING

The SAC will review the QAPP prior to initiation of the emissions test. The SAC will immediately notify the Test Coordinator of any event or occurrence that could have a significant effect on the validity of the results. Notification will be verbal, followed by a written memorandum, which include the proposed corrective action. Major events will be reported using the SAC's Nonconformance Report. QA reports will be submitted with the emissions test report.

Table A-1: Planned Sample Collection Methods, Frequency, and Containers

Sample Name	Analysis	Type of Container(s)[1]	Frequency	Samples/Condition[1]
M0010 SAMPLING TRAINS (2) Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Semivolatile PIC/TIC	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses	Semivolatile and Non-volatile Unspeciated Mass	XAD-2 resin tubes, 250-mL amber glass		
Impinger composite and glassware solvent rinses		1 gallon amber glass or multiple 1-L amber glass		
M0023A Sampling Train Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	PCDD/PCDF	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	
Back-Half Composite: XAD-2 resin tube, filter holder, and coil condenser solvent rinses		XAD-2 resin tubes, 250-mL amber glass		
M0031 Sampling Train 1 Tenax® and 1 Anasorb®resin tube per pair	Volatile PIC/TIC	Resin tubes	Collect 4 resin tube pairs, 40 minutes 0.5 L/min or 20 L per pair	16 pairs
Condensate		40-mL VOA vials	End of test run	4
M0040 Sampling Train	Volatile Unspeciated Mass	Tedlar® bags	2 Tedlar® bags per test run	8
		20-mL or 40-mL VOA vials	Condensate per Tedlar® bag	
M26A Sampling Train Particulate filter and acetone probe rinse	PM	Petri dish, 250-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
0.1N H_2SO_4 impinger composite	HCl/HF	1-L HDPE		
0.1N NaOH impinger composite	Cl_2	500-mL HDPE		
M29 Sampling Train Filter and HNO_3 probe rinse	Metals	Petri dish, 120-mL HDPE	Collect > 3 m^3 at ~ 0.75 m^3/hr	4
5% HNO_3/10% H_2O_2 impinger composite		1-L HDPE		
Empty Impinger	Mercury Only	120-mL HDPE		
4% $KMnO_4$/10% H_2SO_4 impinger composite and DI rinses		500-mL amber glass with vented lid		
8N HCl Rinsate		250-mL amber glass		

Table A-1: Planned Sample Collection Methods, Frequency, and Containers (Continued)

Sample Name	Analysis	Type of Container(s)(1)	Frequency	Samples/Condition(1)
MM5-E Front-Half Composite: Particulate filter, filter holder, and probe solvent rinses	Energetics: nitroglycerin, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, RDX, HMX	500-mL amber glass	Collect > 3 m^3 at ~ 0.75 m^3/hr.	4
Impinger composite and glassware solvent rinses				
XAD-2 resin tube		XAD-2 resin tubes		
M3B - Orsat	O_2 and CO_2	Tedlar® bag	1 Tedlar® bag per test run	4
TRM CEMS	CO	Not Applicable	Continuous	Not Applicable
	CO_2			
	O_2			
	SO_2			
	NOx			

Footnotes:

(1) Alternate container sizes may be used as required.

(2) Four test runs will be conducted but only 3 will be analyzed. A fourth run will be archived in case of sample loss or breakage.

Table A-2: Activity Matrix for Calibration of Equipment

Equipment	Acceptance Limits	Frequency and Method of Measurements	Method Reference	Action if Requirements Are Not Met
Dry gas meter	$Y_i = Y \pm 0.02\ Y$	Calibration versus wet test meter, reference dry gas meter that as been calibrated against a wet test meter, or calibrated orifice set: initially and when post-check exceeds Y ± 0.05	US EPA Method 5 and US EPA's *Quality Assurance Handbook of Air Pollution Measurement Systems* (EPA-600/4-77-027b)	Repair/replace and calibrate
Thermocouples	Impinger thermocouples ± 1°C; Dry gas thermocouple ± 3°C over range; Stack temperature sensor ± 1.5% of absolute temperature	Calibration prior to test against an ASTM mercury-in-glass thermometer		Adjust, determine a constant correction factor, or reject
Probe heating system	Capable of maintaining 120 ± 14°C	Periodic checks during sampling		Immediately increase the sampling train system to the proper temperature, otherwise Repair or replace, and then re-verify the calibration
	Capable of maintaining 130 ± 5°C			
Probe nozzle	Average of 3 ID measurements of nozzle; Difference between high and low < 0.1 mm	Measurement by micrometer to nearest 0.025 mm prior to test, visual inspection after test		Remove from service when nozzle becomes nicked, dented, or corroded
Barometer, aneroid (if used in lieu of obtaining barometric pressure from local National Weather Service station)	± 2.5 mm mercury of mercury-in-glass barometer	Calibrate against a mercury barometer or NIST-traceable barometer prior to the field test.		Adjust to agree with a certified barometer
Trip Balance	Standard weights measured ± 0.5 gram of stated value	Calibration verified upon receipt and daily		Adjust/repair
Standard pitot tube	All specifications met IAW US EPA Method 2 [Optional: Calibrated to NIST-traceable standard pitot in wind tunnel]	Calibration prior to test and visual inspection after each field test	US EPA Method 2C	Use pitot tubes that meet specifications, repair or replace, as required

Table A-3: Summary of Analytical Methods and Procedures

Sample Name	Sample Matrix	Analysis	Analysis Method
M0010	Moisture	Exhaust Gas	US EPA Method 4
	Semivolatile PIC/TIC	Front-Half Composite	SW-846 Method 8270
		Back-Half Composite	
		Impinger Composite and Glassware Solvent Rinses	
	Total Semivolatile and Non-volatile Organics	Front-Half Composite	SW-846 Method 3542 and EPA/600/R-96/033[s]
		Back-Half Composite	
		Impinger Composite and Glassware Solvent Rinses	
M0023A	Moisture	Exhaust Gas	US EPA Method 4
	PCDD/PCDF	Front-Half Composite	SW-846 Method 8290
		Back-Half Composite	
M0031	Volatile PIC/TIC	TX and Anasorb® resins	SW-846 Method 8260
		Condensate	SW-846 Methods 0030/8260/5041
M0040	Volatile Unspeciated Mass	Whole air exhaust gas	EPA/600/R-96/033
		Condensate	
M26A/M5	Moisture	Exhaust Gas	US EPA Method 4
	$HCl/Cl_2/HF$	Impinger solutions	US EPA Method 26A
	PM	Filter	US EPA Method 5
M29	Moisture	Exhaust Gas	US EPA Method 4
	Metals	Impinger solutions, particulate filters, and residues	US EPA Method 29 and SW-846 Methods 6010C/6020/7470/7471A
MM5E	Moisture	Exhaust Gas	US EPA Method 4
	Energetics	XAD-2 resin, filter, solvent probe rinses, impinger condensate	US EPA Modified Method 5 (site-specific procedure) and SW-846 Methods 8330/8332
M3A	CO_2 and O_2	Exhaust gas	US EPA Method 3A
M6C	SO_2	Exhaust gas	US EPA Method 6C
M7E	NO_x	Exhaust gas	US EPA Method 7E
M10	CO	Exhaust gas	US EPA Method 10

Table A-4: Summary of Target DQO for Precision, Accuracy, and Frequency

Parameter	QC Type	Precision [1,2]	Accuracy [3]	Frequency
M0010 (SVOC) Sampling Train	LCS/LCSD	≤ 35% RPD	See Table A-7	One (1) per analytical batch
	Surrogate spike	Not Applicable	See Table A-6	Every sample
	Sampling surrogate spike		See Table A-5	Every XAD-2 trap
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0010 (TCO) Sampling Train	LCS/LCSD	≤ 50% RPD	40 to 120%	One (1) per analytical batch
	Surrogate spike (n-Heptadecane)	Not Applicable	50 to 150%	Every sample
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0010 (GRAV) Sampling Train	Replicate weighing	± 0.5 mg	Not Applicable	Every sample
	LCS/LCSD	≤ 35% RPD	50 to 150%	One (1) per analytical batch
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M0023A Sampling Train	LCS/LCSD	≤ 20% RPD	See Table A-7	One (1) per analytical batch
	Internal standard	Not Applicable	See Table A-8	Every sample
	Sampling surrogate spike		See Table A-5	
	Recovery spike			
	Audit sample (if provided)		Established by provider	One (1) per emissions test
M0031 Sampling Train	Surrogate spike	Not Applicable	See Table A-9	Every sample
	Break through evaluation		< 30% PIC detected on Tenax tube pair	Every resin tube set
	LCS/LCSD	≤ 25% RPD	70 to 130% recovery	One (1) per analytical batch
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M0040 Sampling Train (C_1 to C_7)	Field spike	Not Applicable	80 to 120%	One (1) per emissions test
	Duplicate	≤ 20% RPD	Not Applicable	Every Tedlar® bag
	LCS	Not Applicable	75 to 125%	One (1) per analytical batch

Table A-4: Summary of Target DQO for Precision, Accuracy, and Frequency (Continued)

Parameter	QC Type	Precision [1,2]	Accuracy [3]	Frequency
M0040 Sampling Train (C_4 to C_7)	LCS/LCSD	≤ 35% RPD	50 to 150%	One (1) per analytical batch
	Surrogate spike (n-Heptadecane)	Not Applicable		Every sample
	Audit sample (if provided)	Not Applicable	Established by provider	One (1) per emissions test
M26A Sampling Train	MS/MSD	≤ 25% RPD	85 to 125%	One (1) per emissions test
	LCS	Not Applicable	90 to 110%	One (1) per analytical batch
	Replicate weighing (PM only)	± 0.5 mg	± 0.5 mg	Every sample
	Duplicate	≤ 5% RPD[4]	Not Applicable	One (1) per emissions test
	Audit sample (if provided)	Not Applicable	Established by provider	
M29 Sampling Train	LCS	Not Applicable	75 to 125%	One (1) per analytical batch
	MS/MSD, post-digestion spike			One (1) per emissions test
	Audit sample (if provided)		Established by provider	
MM5-E Sampling Train	LCS	Not Applicable	75 – 125%	One (1) per analytical batch
	Surrogate Spike		70 to 130%	Every resin and condensate sample
M3B (CO_2 / O_2)	US EPA audit gas	Not Applicable	± 0.5%	One (1) per emissions test
M7E (NO_x)	US EPA traceability gas	± 3% of span	± 5% of calibration gas value	Every run
M6C (SO_2)				
M3A (CO_2 and O_2)				
M10 (CO)				

Footnotes:

(1) Precision DQO are defined by RSD or RPD.

(2) The precision criteria do not apply when determinations are near the detection limit of the specific method being performed due to the inherent uncertainty of data determinations derived from trace level samples at or below the RL. However, in all instances where the criteria have not been met, the data will be flagged, and the acceptance of the data for its intended objectives will be discussed in the emissions test report.

(3) Accuracy is, in general, defined as percent recovery of spiked analytes or the bias associated with the measurements of SRM and standards. When SRM are analyzed as accuracy assessment samples, an acceptance range around the "true" value is used to evaluate accuracy.

(4) The RPD is < 5% between analyses of each sample and < 20% for actual duplicate analyses.

Table A-5: Sampling Surrogate Spike Compounds with Target Recovery Criteria for SW-846 Methods 0010/0023A and US EPA Modified Method 5 for Energetics

Compound	Target Recovery (%)
Semivolatiles	
$^{13}C_6$-Naphthalene	50 to 150
Energetics	
3,4-Dinitrotoluene	50 to 150
PCDD/PCDF	
$^{37}Cl_4$-2,3,7,8-TetraCDD	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8-HexaCDD	70 to 130
$^{13}C_{12}$-2,3,4,7,8-PentaCDF	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8-HexaCDF	70 to 130
$^{13}C_{12}$-1,2,3,4,7,8,9-HeptaCDF	70 to 130

Table A-6: Surrogate Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 8270C

Compound	Target Recovery (%)		
Surrogate Standards	***Front-half***	***Back-half***	***Condensate***
2-Fluorobiphenyl	48 to 110	48 to 111	56 to 109
2-Fluorophenol	37 to 105	42 to 104	29 to 90
2,4,6-Tribromophenol	34 to 121	51 to 125	40 to 127
Nitrobenzene-d_5	43 to 107	45 to 110	52 to 109
Phenol-d_5	48 to 114	50 to 118	19 to 134
Terphenyl-d_{14}	67 to 112	73 to 108	55 to 115
Spiking Compounds	***Front-half***	***Back-half***	***Condensate***
Benzoic acid	10 to 122	20 to 170	10 to 99
Benzyl alcohol	54 to 122	59 to 121	70 to 118
bis(2-Ethylhexyl) phthalate	77 to 128	84 to 125	80 to 123
Di-n-butyl phthalate	70 to 122	75 to 120	74 to 128
Di-n-octyl phthalate	73 to 123	78 to 122	78 to 118
Naphthalene	59 to 120	61 to 120	62 to 120

Table A-7: Internal Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 0023A

Compound	Target Recovery (%)
Internal Standards	
$^{13}C_{12}$-2,3,7,8-TetraCDD	40 to 135
$^{13}C_{12}$-2,3,7,8-TetraCDF	40 to 135
$^{13}C_{12}$-1,2,3,7,8-PentaCDD	40 to 135
$^{13}C_{12}$-1,2,3,7,8-PentaCDF	40 to 135
$^{13}C_{12}$-1,2,3,6,7,8-HexaCDD	40 to 135
$^{13}C_{12}$-1,2,3,6,7,8-HexaCDF	40 to 135
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDD	25 to 150
$^{13}C_{12}$-1,2,3,4,6,7,8-HeptaCDF	25 to 150
$^{13}C_{12}$-OctaCDD	25 to 150
Spiking Compounds	
2,3,7,8-TetraCDD	50 to 150
1,2,3,7,8-PentaCDD	50 to 150
1,2,3,4,7,8-HexaCDD	50 to 150
1,2,3,6,7,8-HexaCDD	50 to 150
1,2,3,7,8,9-HexaCDD	50 to 154
1,2,3,4,6,7,8-HeptaCDD	50 to 150
OctaCDD	50 to 150
2,3,7,8-TetraCDF	50 to 150
1,2,3,7,8-PentaCDF	50 to 150
2,3,4,7,8-PentaCDF	50 to 150
1,2,3,4,7,8-HexaCDF	50 to 150
1,2,3,6,7,8-HexaCDF	50 to 150
2,3,4,6,7,8-HexaCDF	50 to 160
1,2,3,7,8,9-HexaCDF	50 to 159
1,2,3,4,6,7,8-HeptaCDF	50 to 150
1,2,3,4,7,8,9-HeptaCDF	50 to 150
OctaCDF	50 to 150

Table A-8: Surrogate Standards and Spiking Compounds with Target Recovery Criteria for SW-846 Method 8260B

Compound	Target Recovery (%)
Surrogate Standards	
Toluene-d_8	50 to 150
4-Bromofluorobenzene	50 to 150
Dibromofluoromethane	50 to 150
1,2-Dichloroethane-d_4	50 to 150
Spiking Compounds	
1,1-Dichloroethene	50 to 150
Trichloroethene	50 to 150
Benzene	50 to 150
Toluene	50 to 150
Chlorobenzene	50 to 150

Table A-9: Summary of Field QC Sample Requirements

Sample	QC Sample Type	Frequency
M0010	Trip blank (resin tube)	One (1) per sample shipment
	Reagent blank	One (1) per emissions test: Methanol/methylene chloride solvent rinses Particulate filter Deionized water
	Field blank	One (1) per emissions test: Front-half composite Back-half composite Impinger condensate and glassware solvent rinses
	Audit Sample	One (1) per emissions test (if presented)
M0023A	Trip blank (resin tube)	One (1) per sample shipment
	Reagent blank	One (1) per emissions test: Acetone, toluene, and methylene chloride solvent rinses Particulate filter
	Field blank	One (1) per emissions test: Front-half composite Back-half composite
	Audit Sample	One (1) per emissions test (if presented)
M0031	Trip blank (sorbent tubes)	One (1) pair per sample shipment
	Trip blank (DI water)	One (1) per sample shipment
	Field blank	One (1) complete pair per valid test run
	Audit Sample	One (1) set of 4 pairs (if presented)
M0040	Trip blank (aqueous)	One (1) per sample shipment
	Field blank	One (1) per valid test run or at a minimum 1 per day: Fill Tedlar bag with hydrocarbon-free zero nitrogen Recover as with a normal stack sample
	Field spike	One (1) per emissions test
M26A	Reagent blank	One (1) per emissions test: 0.1N H_2SO_4 impinger composite 0.1N NaOH impinger composite Particulate filter Acetone probe rinse
	Field blank	
	Audit Sample	One (1) per emissions test (if presented)

Table A-9: Summary of Field QC Sample Requirements (Continued)

Sample	QC Sample Type	Frequency
M29	Reagent blank	One (1) per emissions test: 0.1N HNO_3 probe rinse solution and particulate filter 5% HNO_3 and 10% H_2O_2 impinger solution 4% $KMnO_4$ and 10% H_2SO_4 impinger solution 8N HCl rinse solution
	Field blank	One (1) per emissions test: 0.1N HNO_3 probe rinse solution and particulate filter 5% HNO_3 and 10% H_2O_2 impinger solution 4th impinger ONLY: 0.1N HNO_3 rinse 4% $KMnO_4$ and 10% H_2SO_4 impinger solution 8N HCl rinse solution
	Audit Sample	One (1) per emissions test (if presented)
MM5E	Reagent Blank	One (1) per emissions test: Acetonitrile Reagent water
	Trip blank (resin tube)	One (1) per sample shipment
	Field Blank	One (1) per emissions test: Front-half rinse/filter Impinger contents/rinse Resin trap

Table A-10: Sample Holding Time and Preservation Techniques

Measurement	Matrix	Preservation	Holding Time
Semivolatiles	All	Cool, 0 to 6°C	14 days to extraction, 40 days to analysis
PCDD/PCDF			30 days to extraction, 45 days to analysis
Volatiles	Tenax® and Anasorb®, condensate	Cool, < 10°C	14 days to analysis
Volatile Unspeciated Mass	Tedlar Bags	None	6 hours
	Aqueous condensates	Cool, 0 to 6°C	14 days to analysis
HCL, Cl_2, HF	All	None	28 days to analysis
Metals			6 months to analysis, 28 days to analysis (mercury only)
Energetics		Cool, 0 to 6°C	14 days to extraction (FHR/fitler requires no extraction), 40 days to analysis

Table A-11: Listing of Target Analytes

Volatile PIC		
Chloromethane (Methyl Chloride)	1,1,1-Trichloroethane	
Vinyl Chloride	Carbon Tetrachloride	Ethyl Benzene
	Benzene	m,p-Xylene
Chloroethane (Ethyl Chloride)	1,2-Dichloroethane	o-Xylene
Trichlorofluoromethane (Freon 11)	Trichloroethene	
		1,1,2,2-Tetrachloroethane
Carbon Disulfide		
Acetone		
Methylene Chloride		1,1,1,2-Tetrachloroethane
trans-1,2-Dichloroethene		
Hexane	1,1,2-Trichloroethane	Dichlorodifluoromethane
		1,3-Butadiene
Chloroform	Chlorobenzene	
Semivolatile PIC		
		Naphthalene
Benzyl alcohol		
Benzaldehyde		

Table A-11: Listing of Target Analytes (Continued)

Semivolatile PIC (Continued)		
	Fluoranthene	
bis(2-Ethylhexyl)-phthalate		
PCDD/PCDF		
2,3,7,8-TetraCDD	1,2,3,7,8-PentaCDD	1,2,3,4,7,8-HexaCDD
1,2,3,6,7,8-HexaCDD	1,2,3,7,8,9-HexaCDD	1,2,3,4,6,7,8-HeptaCDD
1,2,3,4,6,7,8,9-OctaCDD	2,3,7,8-TetraCDF	1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF	1,2,3,4,7,8-HexaCDF	1,2,3,6,7,8-HexaCDF
2,3,4,6,7,8-HexaCDF	1,2,3,7,8,9-HexaCDF	1,2,3,4,6,7,8-HeptaCDF
1,2,3,4,7,8,9-HeptaCDF	1,2,3,4,6,7,8,9-OctaCDF	
Metals		
Uranium	Antimony	Arsenic
Barium	Beryllium	Boron
Cadmium	Chromium	Cobalt
Copper	Lead	Manganese
Mercury	Nickel	Phosphorus
Selenium	Silver	Thallium
Tin	Vanadium	Zinc

Table A-11: Listing of Target Analytes (Continued)

Miscellaneous Pollutants		
Chlorine	Hydrogen Chloride	Hydrogen Fluoride Particulate
Energetics		
RDX	2,4-Dinitrotoluene	2,4,6-Trinitrotoluene
HMX	2,6-Dinitrotoluene	Nitroglycerine

APPENDIX B: CMS PLAN

STATIC DETONATION CHAMBER (SDC)
EMISSIONS TEST PLAN
FOR CONDITIONS 1 AND 2

APPENDIX B
CONTINUOUS MONITORING SYSTEM (CMS)
PERFORMANCE EVALUATION PLAN (PEP)

REVISION 1, APRIL 2016

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ACRONYMS AND ABBREVIATIONS

°F.....degree(s) Fahrenheit
@.....at
%.....percent

ADEM.....Alabama Department of Environmental Management

CD.....calibration drift
CEMS.....Continuous Emissions Monitoring System
cfm .....cubic feet per minute
CFR.....Code of Federal Regulations
CMS.....Continuous Monitoring System
CO.....carbon monoxide

DQO.....data quality objective

FPI.....Feed Prohibitive Interlock

IAW.....in accordance with

MACT.....Maximum Achievable Control Technology

NIST.....National Institute of Standards and Technology
NOx.....nitrogen oxides

O_2 .....oxygen

PDARS.....Process Data Acquisition and Recording System
PEP.....Performance Evaluation Plan
PLC .....programmable logic controller
ppm .....part(s) per million
psi.....pound(s) per square inch

QA.....quality assurance
QC.....quality control

RCRA.....Resource Conservation and Recovery Act

SDC.....Static Detonation Chamber
SO_2 .....sulfur dioxide

TRM.....temporary reference method

WDC .....Washington Demilitarization Company

1.0 OVERVIEW

The Washington Demilitarization Company, LLC, (WDC) has submitted this emission test plan to verify proper operation of the Static Detonation Chamber (SDC). The Alabama Department of Environmental Management (ADEM) has determined that while the SDC is not directly regulated under the Maximum Achievable Control Technology (MACT) standards, operation of the unit will be required to meet the standards found in MACT subpart EEE as applicable. As a result, the emissions tests for this unit will be conducted to demonstrate compliance with applicable EEE standards.

The Continuous Monitoring System (CMS) consists of the Continuous Emissions Monitoring System (CEMS), Process Data Acquisition and Recording System (PDARS), and Feed Prohibitive Interlock (FPI) System. The facility CEMS include the carbon monoxide (CO) and oxygen (O_2) analyzers. Temporary reference method (TRM) CEMS, provided by the sampling contractor for the duration of the emissions test, include sulfur dioxide (SO_2) and nitrogen oxides (NO_X) analyzers. MACT is only applicable to CO facility CEMS. The FPI System includes monitoring pollution control device operations and monitoring system operations (i.e., thermocouples, pressure gauges, etc.).

The MACT monitoring requirements are found in 40 Code of Federal Regulations (CFR) 63.1209 and in the MACT General Provisions (40 CFR 63.8). This document establishes the proposed CMS Performance Evaluation Plan (PEP) and has been designed to address the MACT CMS evaluation plan requirements found in 40 CFR 63.1207 for the emissions test requirements and 40 CFR 63.8 and 63.1209 for monitoring requirements.

All CMS required for the proper operation of the emission test will be installed, calibrated, and operational as per 40 CFR 63.7 and 63.1207 and the exceptions allowed under 40 CFR 63.1206(b) prior to operation of the unit. This CMS PEP describes the methodology that is used to verify the operational status of the CMS relevant to the test.

This CMS PEP includes a description of the CMS, CMS emission test requirements, performance evaluation program objectives, and summary for the CMS-related to proper operation. The quality assurance (QA)/quality control (QC) objectives for all CMS are contained in the SDC standard operating procedures. Equipment calibration procedures for the FPI are in the SDC Equipment Calibration Procedures (SDC-EQP-3.01, 3.02, and/or 3.03).

WDC has the responsibility for operating the SDC and conducting the emissions test as required, in addition to, calibration and performance auditing of the CMS that are associated with the operation of the facility, QA/QC associated with these tasks, and reporting of the results.

2.0 CMS PEP PROGRAM

2.1 OBJECTIVES

The objective of this CMS PEP is to demonstrate and maintain the effectiveness of the CMS related to the proper operation of the SDC IAW the requirements of 40 CFR 63.8, 40 CFR 63.1209 (d), and SDC Calibration Plan (SDC-MNT-002). Performance evaluation is defined as the conduct of calibration error testing and other measurements used in validating the CMS data.

2.2 APPROACH

The process and control instruments are tested in accordance with (IAW) the calibration and performance specification requirements. The CMS instruments and devices related to SDC operations are calibrated IAW SDC Calibration Plan (SDC-MNT-002). The frequency depends on CMS performance and audit results. These results are recorded on the instrument calibration record.

Prior to the emissions test, calibration and audit records are reviewed to ensure the precision and accuracy of the CMS relevant to the proper operation IAW the applicable CMS performance specifications. If, during the review of these records, the calibration and/or audit results indicate that any of the instruments and control devices do not meet the relevant standard; corrective action takes place to ensure the immediate repair or replacement of the CMS defective parts. Following the corrective action, the CMS is calibrated to ensure its operating within specification. Calibration or audit results are then evaluated to ensure the proper operation of the instrument. Results of the performance evaluation test results for the monitors will be documented in the emission test report.

2.3 PERFORMANCE EVALUATION CRITERIA

In order to provide uniformity in the assessment methods and reporting of data quality; the assessment methods for response drift and accuracy of the CEMS is IAW the SDC CEMS Certification Plan (SDC-ENV-003) and Subpart EEE of Part 63. These assessment methods are based on procedures included in the applicable Performance Specifications for CEMS per Appendix B of 40 CFR Part 60 as described in Section 3.0. Assessment methods for all other CMS instruments and control devices are based on manufacturers' recommended procedures.

2.3.1 <u>CEMS Performance Specification</u>

A summary of the performance specification requirements for the CEMS can be found in the SDC CEMS Certification Plan (SDC-ENV-003).

2.3.2 FPI System Performance Specification

All other FPI instruments related to the emissions test are verified "acceptable" based on the manufacturers' specifications for these systems. The SDC Calibration Plan (SDC-MNT-002) incorporates this data.

2.4 CORRECTIVE ACTION

There are three degrees of "control" for setting action and data quality criteria: acceptable, marginal, and out-of-control. Acceptable data is self-explanatory; the data is valid and the CMS is operating within specifications. Marginal data is still valid but some action is needed to prevent further deterioration to the point where the data is invalid and the CMS is out of specification. When the third level of control, i.e. "out-of-control", is reached a serious problem exists in the system and data is invalidated until the problem is identified and fixed.

If a CEMS is declared out-of-control, all data collected during the "out-of-control" period is considered invalid data. If any of the FPI that affect the specified Resource Conservation and Recovery Act (RCRA) set points is declared out-of-control, feed to the SDC is stopped. In the event a malfunction of the FPI System occurs during the emissions test, additional waste feed is automatically locked out.

3.0 DESCRIPTION OF THE CMS

Under MACT, a "Continuous Monitoring System" is a comprehensive term that includes the CEMS, FPI System, and/or other manual or automatic monitoring that is used for demonstrating compliance with an applicable regulation on a continuous basis as defined by the regulation. The definition of "continuous" as it relates to process parameters is that the CMS must sample the regulated parameter without interruption, and evaluate the detector. FPI instruments will be verified prior to initiating the destruction sequence for munitions processing.

SDC must use a CEMS to demonstrate and monitor compliance with the MACT CO standard. An O_2 CEMS is used to continuously correct the CO levels to 7 percent (%) O_2. SDC has installed, calibrated, maintained, and continuously operates the CEMS IAW the QA procedures provided in the appendix to 40 CFR Subpart EEE and Performance Specification 4B (CO and O_2) in 40 CFR 60, Appendix B or as specified in the SDC CEMS Certification Plan (SDC-ENV-003).

The SDC must use CMS (e.g., thermocouples, pressure transducers, etc.) to document compliance with the applicable operating parameter limits IAW 40 CFR 63.1209(b). Thermocouples, pressure transducers, etc., must be installed and operated IAW 40 CFR 63.8(c)(3) that requires the owner, at a minimum, to comply with the manufacturer's written specifications or recommendations for installation, operation, and calibration of the system. The span of the CMS detector must not be exceeded. The span limits must be verified to be within range prior to initiation of the destruction sequence.

For the purpose of this plan, CMS is defined as the total equipment (sample interface, analyzer, and data recording) required for determining emissions and/or operating parameters. The CEMS, FPI System, and PDARS are the three basic categories of CMS at SDC.

3.1 CEMS

The CEMS are used for continuously monitoring the exhaust gas from the SDC and associated Off-Gas Treatment System while in operation. The facility CEMS suite consists of CO and O_2 monitors which are located in the exhaust stack. The CO CEMS is linked to the FPI System and corrected to 7% O_2 based upon O_2 CEMS readings. The facility CEMS are individual units and may be challenged during processing at the SDC. Operation of the facility CEMS units is described in the SDC CEMS Certification Plan (SDC-ENV-003).

For the emissions test(s), TRM CEMS provided by the sampling contractor will be used to monitor for SO_2 and NO_X analyzers.

3.2 FPI SYSTEM

The FPI System is used to continuously monitor the source or pollution control device operating parameters. The FPI System is an integral part of the Control System. The Control System has a centralized control console, including closed-circuit television monitors for observing operations at various locations, and locally mounted programmable logic controllers (PLC). Most SDC

processing and sequencing operations are controlled automatically through the PLC. Interlocks are provided to prevent improper facility operation. Abnormal conditions, operator entries into the system, and starting and stopping of equipment are logged with the time of occurrence. The Control System provides continuous automatic control of the treatment process.

The instruments that are used to measure the FPI are listed in Table 2. All instruments are installed per manufacturers; specifications and calibrated IAW the SDC Calibration Plan (SDC-MNT-002) and Procedures (SDC-EQP-3.01, 3.02, and/or 3.03).

3.3 PDARS

The PDARS is a computer-based data collection, reporting, and archiving system for monitoring operations. The PDARS monitors many areas or parameters such as temperatures, flows, and instrument status. The CEMS instruments have status and output signals continuously monitored by the PDARS.

4.0 CMS PERFORMANCE EVALUATION TEST SUMMARY

The CMS performance evaluation tests are being conducted to measure and ensure precision and accuracy. These tests simulate malfunction and methods of calibration of all CMS instruments and devices. All results are documented as part of the RCRA Operating Record for the SDC.

4.1 ACCURACY AND PRECISION REQUIREMENTS

4.1.1 CMS Calibration

Calibration procedures are written for each applicable device. These procedures are available to personnel who operate the systems and regulatory personnel for review. References to "daily" checks or calibrations will normally be performed during operational hours.

Calibration audits of the CEMS conform to the quarterly absolute calibration audit IAW 40 CFR 63, Appendix to Subpart EEE of Part 63, *Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors*. Also, criteria for daily calibration checks conform to the SDC CEMS Certification Plan (SDC-ENV-003).

Calibrations are fully documented and take place IAW the schedule presented in the calibration procedures for the facility. At a minimum, the CMS is calibrated prior to installation or just after installation; whichever is most appropriate for the CMS. Whenever the CMS requires major maintenance or repair, a full calibration is performed before data is declared valid. The frequency depends upon CMS performance and audit results.

With the exception of daily zero checks on CO CEMS and daily span checks on O_2 CEMS using supplied air, the reference standards for CEMS are either by certified compressed gases or a sealed gas cell containing a gas whose concentration is certified. Certified standards are traceable to National Institute of Standards and Technology (NIST) standards. Calibration accuracy is dependent on the quality of the reference standard used. Ideally, compressed gas standards are either NIST-Standard Reference Materials, gas vendor Certified Reference Materials, or a Primary Standard gas. NIST traceable standard may be used providing the necessary documentation is available.

Typical reference standards for the FPI System are liquid (water or mercury) manometers, NIST traceable thermometers, NIST traceable pitot tubes, and Fluke 4-20 milliamperes.

4.1.2 Zero and Span Checks

Zero (low level) and span checks (i.e., calibration drift [CD]) for CEMS are performed IAW the SDC CEMS Certification Plan (SDC-ENV-003). The CMS response to zero or low level and span (high level) standards is recorded to evaluate the performance of the CEMS over a period of time. The CD checks are the first criteria for determining the degree of control of the CEMS.

The CD is checked at two levels, zero and high. If the instrument technology is such that it is not possible to check the zero level, a low level point is checked instead. The CD levels of instrument span are defined as follows:

- Zero ±0.25%,
- Low level = 0 to 20%, and
- High level = 50 to 100%.

4.1.3 Performance Audits for Data Accuracy

A CEMS audit will be conducted on operational days to verify that all equipment is in good working order to include the sample collection and transport system. The system audit includes, at a minimum, a review of electronic data; an inspection of the analyzer warning lights, gas flows, and PDARS. CEMS-specific system audit forms are included in the SDC-SOP-001, *Continuous Emissions Monitoring System (CEMS).*

4.1.4 System Audits

A system audit is performed by a person other than the person who does routine daily checks, repair and maintenance, or data reporting; preferably a supervisor who is familiar with the CMS but does not have daily contact with it. Generally, system audits are “paper audits”, concerned with verifying the existence of documentation, adherence to procedures as written, verifying complete documentation and the physical condition of the CEMS operation. Data resulting from routine daily checks are reviewed for completeness.

4.2 RECORD KEEPING

SDC maintains records of all CMS activities in a file and/or logbook. Records are maintained IAW the records management program and procedures controlled by SDC. The CMS operator responsible for ensuring that the CMS is operating correctly uses this record. The record can also be made available to ADEM upon request. The record includes, at a minimum, the following information:

- Records of routine observation checks,
- Records of routine maintenance and adjustments,
- Records of parts that are replaced,
- Records of CMS calibration,
- Records of CMS daily CD,
- Records of CMS audits,
- Records of corrective action taken to bring an out-of-control CMS into control, and
- Records of date and time when CMS is inoperative or out-of-control.

4.3 REPORTING

SDC is required to submit reports to ADEM. These reports must include, at a minimum, the following information:

- Reporting period (as determined by permit condition);
- CMS type, manufacturer, serial number, and location;
- Data recorded during periods of CMS breakdowns, repairs, audits, calibration checks, and zero and span adjustments will not be included in the data averages;
- The magnitude of excess emissions computed IAW any conversion factor(s), and the date and time of commencement and completion of each period of excess emissions;
- Specific identification of each period of excess emissions that occur during startups, shutdowns, and malfunction of the SDC, nature and cause of any malfunction (if known), corrective action taken or preventive measures adopted;
- The date and time identifying each period during which the CMS was inoperative (out-of-control) except for zero and span checks and nature of the CMS repairs or adjustments; and
- Results of all CMS audits conducted during the reporting period.

5.0 QA/QC PROCEDURE

The QA/QC requirements include the data quality objectives (DQO) and both an internal and external QA/QC program. DQO are the pre-evaluation expectations of precision, accuracy, and completeness of data. The internal QA/QC program includes, at a minimum, the activities planned by routine operators and analysts to provide an assessment of CMS performance. The external QA/QC program includes, at a minimum, systems audits that include the opportunity for on-site evaluation by the regulatory authorities of instrument calibration, data validation, sample logging, and documentation of QC data and field maintenance activities.

Table 1: Facility CEMS

Manufacturer	Model	Parameter	Identification	Quantity	Range
Teledyne-API	300EM	CO	03-SDC-AIT-900A/B	2	0-200, 0-5,000 ppmv
		O_2	03-SDC-AIT-901A/B		0-25%

Table 2: FPI Conditions

Item No.	Instrument Tag Number	Process Data Description	Range	Parameter[(1)]
SDC-FPI-01	PI 12007	Detonation Chamber Static Pressure	Maximum	18.32 psi
SDC-FPI-02	TI 12021	Detonation Chamber Temperature	Minimum	1,000ºF
SDC-FPI-03	TIC 310 AVG	Thermal Oxidizer Temperature	Minimum	1,741ºF
SDC-FPI-04	PIC 310 AVG	Thermal Oxidizer Pressure	Maximum	-0.01 psi
SDC-FPI-05	TIC 320 AVG	Spray Dryer Temperature	Maximum	400ºF
SDC-FPI-06	PDS 33001	Bag-house Differential Pressure	Maximum	0.18 psi
SDC-FPI-07	FIA 34204	Acid Scrubber Flow Rate	Minimum	3.2 cfm
SDC-FPI-08	FIS 34203	Quench Tower Flow Rate	Minimum	2.4 cfm
SDC-FPI-09	TIS 34003, 34004	Quench Tower Temperature	Maximum	170ºF
SDC-FPI-10	TIA 37002	Neutral Scrubber Discharge Temperature	Maximum	200ºF
SDC-FPI-11	AAHH-900	CO Concentration	Maximum	100 ppm, dry basis @ 7% O_2 (instantaneous)
SDC-FPI-12	QICA 36008	Neutral Scrubber pH	Minimum	7.0 pH

Footnote:
(1) Operational parameter(s) interlock will prohibit the transfer from LC1 into LC2 until all conditions are met or within range.

APPENDIX C: SDC CEMS CERTIFICATION PLAN

STATIC DETONTATION CHAMBER (SDC)

CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS) CERTIFICATION PLAN

SDC-ENV-003
Revision 0

Approved by:

Will Leslie, SDC Plant Manager	01SEP15 *Date*
Timothy K. Garrett, ACWA AFO	1 Sept 2015 *Date*

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ACRONYMS AND ABBREVIATIONS

± .....plus or minus
% .....percent
≤ .....less or equal to
≥ .....greater than or equal to
°F……degrees Fahrenheit

ACA.....absolute calibration audit
ACWA……Assembled Chemical Weapons Association
ADEM .....Alabama Department of Environmental Management
AFO……Anniston Field Office
AIT.....analyzer indicating transmitter
ANAD…….Anniston Army Depot

CAA……Clean Air Act
CD.....calibration drift
CE .....calibration error
CEMS .....continuous emissions monitoring system
CFR.....Code of Federal Regulations
CGA .....cylinder gas audit
CO.....carbon monoxide
CON.....Control Room

DQO.....data quality objective

EPA.....Environmental Protection Agency

FPI……..feed prohibitive interlock

GFC……gas filter correlation

IAW .....in accordance with
ICS .....Instrument Control System
ID .....induced draft (fan)
IR .....infrared

mA .....milliamp
M&TE.....measurement and test equipment
MACT.....Maximum Achievable Control Technologies

N_2……....nitrogen
NDIR .....non-dispersive infrared
NIST .....National Institute for Standards and Technology

O_2 .....oxygen
OGT……off gas treatment

ACRONYMS AND ABBREVIATIONS (Continued)

PDARS .....Process Data Acquisition and Recording System
PLC .....Programmable Logic Controller
PM.....preventive maintenance
ppm .....parts per million

QA.....quality assurance
QAPP .....Quality Assurance Project Plan
QC.....quality control

RA.....relative accuracy
RCRA .....Resource Conservation and Recovery Act
RT .....response time

SDC.....Static Detonation Chamber

µm .....micrometer
UOR.....unit of record
US .....United States

WMM……..waste military munitions
WDC .....Washington Demilitarization Company

1.0 INTRODUCTION

Continuous Emissions Monitoring Systems (CEMS) are used at the Static Detonation Chamber (SDC) to monitor stack emissions for both process efficiency and to provide evidence of compliance with the Clean Air Act (CAA) and Resource Conservation and Recovery Act (RCRA) permit. The Alabama Department of Environmental Management (ADEM) has the authority to administer RCRA programs.

The SDC facility is designed for treatment or destruction of waste military munitions (WMM), recovered WMM from within the State of Alabama, and munitions components which are either explosively or non-explosively configured. The SDC facility is located within the Ammunition Limited Area on the west side of G block within Anniston Army Depot (ANAD).

This plan includes information relating to the CEMS used to comply with the SDC permits. This plan combines the format of the SDC CEMS Certification Plan with the information specific of the SDC CEMS Equipment and Monitoring Strategy Plan into one cohesive document which satisfies the requirements found in the Code of Federal Regulations (CFR) and standards that are subject to Maximum Achievable Control Technologies (MACT) requirements.

1.1 Purpose

This document allows for continuous operational control of the CEMS to ensure the requirements listed in the SDC permits are met during certification activities and normal operations by providing the following:

- Location of CEMS,
- Initial certification activities/specifications,
- Continuing certification requirements,
- Calibration drift (CD) determination and adjustment,
- Preventive maintenance (PM) (including spare parts), and
- Data recording, calculations, and reporting.

This plan describes the regulations, certification methods, performance specifications, and quality assurance (QA)/quality control (QC) methods used to assure reliable and accurate data. Also included is a description of the CEMS sample location along with expected operating parameters. The CEMS analyzer theory of operation, manufacturer, model number, and ranges of operation are also provided. Detailed activities used for operations of the CEMS can be found in SDC-SOP-001, Continuous Emissions Monitoring System (CEMS).

These requirements are necessary for the control, improvement, and assessment of the quality of CEMS data used to demonstrate compliance with the standards provided in the SDC permits. This plan either meets or exceeds the intent of the requirements of 40 CFR 63, Subpart EEE and 40 CFR 60 for carbon monoxide (CO) and oxygen (O_2) CEMS. This plan may be revised on an “as needed” basis, but will be reviewed annually, at a minimum to ensure validity.

This plan is written in a 12 point format based on a guidance document published by the United States (US) Environmental Protection Agency (EPA) for writing QA project plans in order to provide consistency with the contents of most plans reviewed by regulatory officials. The outline of this document has been cross-referenced to the US EPA Quality Assurance Project Plan (QAPP) elements provided in the following US EPA documents (See Table 1):

- EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000;
- EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G 5, Office of Environmental Information, December 2002; and
- EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001.

1.2 Scope

The requirements of this plan are applicable to all SDC personnel performing any CEMS activities for the SDC. These standards reflect guidance found in 40 CFR 63 Subpart EEE, as specified by Section 112 of the CAA. Additionally, this plan incorporates the requirements for reference methods found in 40 CFR 60 Appendix A, as well as, the Performance Specifications found in Appendix B.

1.3 Responsibilities

The CEMS requirements are to provide continuous monitoring for CO, one (1) of six (6) "criteria" air pollutants for which emission standards have been established by the EPA. Since the reporting standard established for CO is corrected to 7 percent (%) O_2 to allow for data comparability, the CEMS will continuously monitor for both CO and O_2. Washington Demilitarization Company (WDC) has the responsibility for certification and operation of the CEMS. WDC is also responsible for reporting all data to support initial and continuing certification of the CEMS. This data will be compiled into a certification report and submitted to ADEM by the Anniston Field Office (AFO) for approval.

SDC personnel responsible for CEMS monitoring are listed below in hierarchical order to include duties and reporting responsibilities by position down to the technician level.

1.3.1 SDC Operations Manager

(a) Reports to the SDC Plant Manager.

(b) Provides adequate staffing to support CEMS activities.

(c) Oversees scheduling of CEMS related activities.

(d) Ensures that the CEMS provide reliable and accurate readings.

(e) Researches applicable environmental permit and regulatory requirements and supervise monitoring staff in accordance with (IAW) those requirements.

(f) Verifies that the CEMS are certified and operating IAW this plan during all operations.

(g) Reviews the data archiving process to ensure that complete and accurate CEMS data is maintained.

(h) Ensures that corrective actions are developed and implemented for CEMS malfunctions.

1.3.2 Duty Area Supervisor

(a) Assigns certified operators to ensure the CEMS are functioning properly.

(b) Determines CEMS status and work that must be performed.

(c) Ensures that the CEMS are operating correctly and the data collection system is working properly.

(d) Facilitates ordering replacements of consumables and spare parts.

(e) Ensures CEMS calibrations are performed.

(f) Responds to CEMS alarms/malfunctions as directed by Control Room (CON) Operators.

1.3.3 CEMS Technician/Operator

(a) Provides the on-site technical expertise for CEMS monitoring.

(b) Performs maintenance, repair, and calibration of CEMS equipment.

(c) Conducts initial, quarterly and annual certification activities relative to CEMS.

(d) Responds to alarms and malfunctions to determine cause and resolve.

(e) Performs data logging and ensures that the Process Data Acquisition and Recording System (PDARS) are operating correctly.

(f) Compiles the data used for the quarterly CEMS report.

(g) Mentors, trains, and assists with technician/operator certifications.

1.3.4 Maintenance Superintendent

(a) Reports to the SDC Operations Manager.

(b) Provides an independent overview of the CEMS.

(c) Inspects and monitors the CEMS certification, calibration, and quarterly audits.

(d) Observes audits and validates the performance of the CEMS personnel.

(e) Reviews CEMS documentation for accuracy.

(f) Performs routine inspections of the CEMS.

(g) Observes the actions of the CEMS personnel.

(h) Observes CEMS calibrations to verify the recorded calibration data.

(i) Observes CEMS audits to verify they are performed correctly.

(j) Verifies CEMS documentation.

1.4 Personnel Training and Certification Requirements

SDC personnel have written qualification and certification records to ensure each individual has the necessary proficiency to perform the duties assigned. Objective evidence of personnel training/qualifications will be documented and maintained. All training and certification documentation will be available for review upon request.

2.0 GENERAL OVERVIEW

The SDC is designed for the destruction of munitions and components by indirect heating in a stainless steel chamber. The chamber uses electricity to maintain an operating temperature of greater than or equal to (≥) 1,000 degrees Fahrenheit (°F). Heated sweep air may be added to the chamber during operations. The gases from the destruction process are transferred into and cleaned by an Off-Gas Treatment (OGT) System comprised of a thermal oxidizer, spray dryer, bag house filter, quench unit, acid scrubber, and neutral scrubber. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required to effectively treat the off gases from the SDC. An additional flow of secondary air is automatically added to ensure an oxidizing environment. Effluent temperatures are reduced by the spray drier, quench, and scrubbers. Downstream of the scrubbers are a series of induced draft (ID) fans and safeguard filter system. Prior to reaching the ID fans, the effluent pressure remains slightly below atmospheric pressure to ensure no potentially untreated off gas is released into the environment.

During operations, the CEMS will continuously monitor the exhaust, downstream of the OGT equipment, to include the ID fans and filter system. The CEMS have the ability to cause a feed prohibitive interlock (FPI) condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include two (2) analyzers (primary or unit of record (UOR) and an online backup). Both analyzers will be certified to allow for operational flexibility; however, only one is required to be operational in order to feed. More detailed sample location information can be found in Section 4. The CEMS sample locations and interferences are identified in Table 2 and detailed drawings for both can be found in Figures 1 and 2.

CEMS components are mounted in a National Electrical Manufacturers Association 1 Instrument Control System (ICS) cabinet located in a monitoring house. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS. Detailed information for the major CEMS subcomponents can be found in Section 3. Detailed data transmission information can be found in Section 6.

2.1 Type/Make of Instrument Shelter

The CEMS monitoring house is constructed of composition panels that provide weather protection and insulation. The monitoring house is heated and cooled to provide continuous temperature control. The CEMS equipment is powered by an uninterruptible power supply to ensure continuous monitoring. Required calibration and certification gases are plumbed from ground level cylinder storage racks to the monitoring house, which is approximately 10 feet above ground level.

2.2 System Type

The SDC will utilize extractive CEMS with redundant analyzers and all components necessary to provide the capability for reporting CO emissions in parts per million (ppm) corrected to dry O_2 units. The manufacturer, model, and ranges of the analyzers are detailed in Section 3.

Close-coupled conditioning of the extracted sample will be made using a dual-pass thermoelectric chiller with Kynar/Glass impingers and with final filtration and moisture carryover alarms. Dual peristaltic pumps continuously drain condensed moisture away from the condenser system. The system utilizes a flange-mounted sampling probe with heated 24 inches probe stinger assembly and heated ceramic primary filter. The probe is connected directly to the inlet of the close-coupled chiller assembly mounted below the probe at the stack sampling point. Sample is then transported via an unheated Teflon tubing bundle to the ICS cabinet.

The close-coupled probe and chiller assembly assures delivery of a suitable dry sample to the ICS cabinet housing the redundant analyzers, flow controls, pumps and programmable logic controller (PLC). Both analyzers have their own internal sample pump to provide the necessary motive force to move the sampled gas from the stack, through the conditioning equipment and through the gas analyzers.

2.3 CEMS Certification

Prior to operations, the CEMS equipment will complete initial certification testing, to include response time (RT), calibration error (CE), 7-day CD and alternative relative accuracy (RA) tests IAW the applicable performance specifications of 40 CFR 60, Appendix B. These specifications and supporting tests are detailed in Section 5. After initial certification, daily CD checks are performed on operational days, CE tests (or equivalent) are performed quarterly, and alternative RA tests are performed annually.

During quarterly and annual certification testing, the data will be compiled into a CEMS certification report, which will include summary results of the performance specification tests. This certification report will include the applicable field data sheets and calibration gas certifications and will be submitted to ADEM within 60 days of the completion of the testing.

3.0 DETAILED INFORMATION

The CEMS is a complete system designed to measure CO and O_2 emissions from the exhaust stack of the SDC which is equipped with air pollution controls IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE. Gas monitoring will be conducted at the stack with gas conditions saturated and at approximately 170 to 180°F. All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

3.1 <u>CEMS Analyzers</u>

Manufacturer:	Teledyne Instruments-API Advanced Pollution Instrumentation 9480 Carroll Park Drive San Diego, CA 92121-5201
Model Number:	300EM
CO Ranges:	Range 1 (Low) = 0 to 200 ppm Range 2 (High) = 0 to 5000 ppm
Measurement Principle:	Non-dispersive Infrared (NDIR) with Gas Filter Correlation (GFC)

The analyzer measures CO by comparing infrared (IR) energy absorbed by a sample to that absorbed by a reference gas IAW the Beer-Lambert law or Beer's Law. This scientific principle defines how light of a specific wavelength is absorbed by a particular gas molecule over a certain distance. This is accomplished by using a heated element to generate a beam of broad-band IR light with a known intensity (measured during instrument calibration). This beam is directed through multi-pass cells filled with sample gas. The sample cell uses mirrors at each end to reflect the IR beam back and forth through the sample gas a number of times. Upon exiting the sample cell, the beam shines through a band-pass filter that allows only light at a wavelength of 4.7 micrometers (um) to pass. Finally, the beam strikes a solid-state photo-detector that converts the light signal into a modulated voltage signal representing the attenuated intensity of the beam.

Water vapor can also absorb light at a wavelength of 4.7 um. To overcome potential interfering effects from water vapor, the light is also passed through a GFC wheel. This wheel has two chambers, one filled with pure nitrogen (N_2) (measurement cell) and the other with a combination of N_2 mixed with a high concentration of CO (reference cell). As the wheel spins, the IR light alternatively passes through both cells. This causes a fluctuation in the intensity of the IR light striking the photo-detector resulting in two separate and distinct peaks. The analyzer determines the ratio between the peaks of the measure pulse and the reference pulse and then uses a look-up table, with interpolation, to linearize the response. This response value is combined with calibration slope and offset values to produce a CO concentration which is then normalized for changes in sample pressure. If an interfering gas, such as water vapor is introduced into the sample, the peak heights will change identically, but their ratios will not be affected. In this case, the GFC rejects the effects of interfering gases so that the analyzer only responds to the presence of CO.

The analyzer has dual range capabilities in the ranges specified above and has auto ranging capability to move directly from low (0 to 200 ppm) to high (0 to 5000 ppm) range in the event measured values exceed the 200 ppm span of the low range.

O_2 Range: 0 to 25%

Measurement Principle: Paramagnetic

The paramagnetic analyzer is based on the scientific principle that O_2 is a paramagnetic material, which means that it can be easily attracted into a magnetic field, or is "magnetically susceptible." Magnetic susceptibility is a measure of the intensity of the magnetism of a substance when it is placed in a magnetic field. O_2 has an exceptionally high magnetic susceptibility compared to other gases – actually several hundred times greater than that of most gases. This allows for fast and accurate measurements.

This type of paramagnetic detector is known as the magnetodynamic or "dumbbell" type. The sensor's core is made up of two N_2 filled glass spheres which are mounted on a rotating suspension within a magnetic field (shaped like a dumbbell). A mirror is mounted centrally on the suspension and light is shone onto the mirror that reflects the light onto a pair of photocells. The signal generated by the photocells is passed to a feedback loop, which outputs a current to a wire winding mounted on the suspended mirror. This results in a small direct current electric motor. O_2 from the sample stream is attracted to the magnetic field displacing the N_2 filled spheres, causing the suspended mirror to rotate. This displacement changes the amount of light reflected onto the photocells thereby changing their output levels. This feedback loop increases the amount of current fed into the winding in order to move the mirror back into its original position. The more O_2 present, the more the mirror moves and the more current is fed into the winding by the feedback control loop.

Although the O_2 range can be as great as 0 to 100% with 0.1% precision and accuracy, the CEMS units will only be operated in the 0 to 25% range IAW 40 CFR 60, Performance Specification 4B.

3.2 Operational Data

The FPI set point is derived from the RCRA Permit. The CO FPI set point of 100 ppm is instantaneous and corrected to 7% O_2, dry basis. Expected operating ranges for CO and O_2 are provided in Table 4.

3.3 Cylinder Gas Calibration Standards

Table 5 lists the gas standards used for daily calibrations and audits of the CEMS. The CEMS rack has its own calibration system. The calibration system, with appropriate calibration gases, regulators, valves, and interconnecting tubing has the capability of verifying the zero and upscale response of each CEMS analyzer. The gas is introduced into the CEMS sampling system as close to the distal end of the heated sample probe as possible to ensure it passes through all CEMS components used during normal sampling. The duration of each gas injection during calibrations is adjustable and has been established to ensure that the CEMS surfaces are adequately conditioned.

3.4 Alternative Sampling

There are no alternate sampling methods or equipment. All compliance analyzers are calibrated on operational days and audited quarterly/annually. The CEMS cabinet contains two analyzers; one to serve as the UOR while the other remains an online backup, when available. In the event both units fail and cannot be repaired in a timely manner, SDC will utilize a like kind replacement strategy for the compromised units. When a malfunctioning analyzer is replaced, the replacement analyzer will have a successful calibration and CE test performed to validate the precision and accuracy of the new instrument before it can become the UOR. The new unit will assume the future quarterly and annual recertification dates of the replaced unit.

3.5 PM Program

The PM Program consists of taking diagnostic readings that identify the operating condition of the CEMS analyzers. These checks include the calibration check, inspection of the recording system, control panel warning lights, and sample transport and interface system IAW 40 CFR 60 and 40 CFR 63, Subpart EEE. The PM checks are included as a part of SDC-SOP-001, Continuous Emissions Monitoring System (CEMS). In addition, there may also be weekly, quarterly, semi annual, and annual PM performed on various parts of the CEMS to include the support systems.

4.0 SAMPLE LOCATION

Table 2 summarizes the probe location for the CEMS. A probe located at the centroidal area of the duct at the stack location is the introduction point for the sample. The sample probe site was selected IAW the methods outlined in the applicable performance specifications listed in Section 5.0.

The stack sampling location has a designed duct inner diameter of 14 inches. As the drawing in Figure 1 indicates, the nearest upstream flow disturbance is a 45° “Y” in the duct, where the OGT duct transitions to the stack. It is located approximately 5.5 duct diameters away. The nearest downstream flow disturbance is a taper where the stack diameter drops from 14 to 12 inches. This taper is located approximately 10 duct diameters away.

The monitoring house type is described in Section 2.1 and a detailed drawing can be found in Figure 2. As the drawing indicates, the house is positioned so that the stack penetrates through the monitoring house. Floor of the monitoring house is approximately 10 feet above ground-level and the CEMS sample port is approximately another 2 feet 6 inches above the floor inside the house. The CEMS ICS cabinet will also be located inside this monitoring house. This configuration allows for the entire system to remain protected from the elements and under consistently stable temperature conditions. Additionally, this design ensures minimum sample line distance (10 to 15 feet), and extremely fast response to changes in monitored process parameters.

5.0 PERFORMANCE REQUIREMENTS

The CEMS performance testing requirements adhere to the requirements of 40 CFR 60, Appendix B, as well as, 40 CFR 63, Subpart EEE guidelines. The performance specifications and guidelines that apply include:

- US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources,
- US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources (incorporating Performance Specification 4A by reference), and
- 40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors.

5.1 CEMS Audit

A CEMS audit will be conducted on operational days to verify that all equipment is in good working order to include the sample collection and transport system. The system audit includes, at a minimum, a review of electronic data; an inspection of the analyzer warning lights, gas flows, and PDARS. CEMS specific system audit forms are included in the SDC SOP 001, Continuous Emissions Monitoring System (CEMS).

5.2 Calibration Drift

SDC will conduct the seven day CD test upon initial startup of the CEMS analyzers, IAW 40 CFR 60, Section 1 of the applicable performance specification. The CD demonstrates the stability of the calibration over time and is defined as the deviation of the output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment takes place. If any adjustments are made to the zero and/or span settings, they are recorded prior to performing the adjustments.

Following an initial calibration, the monitors are challenged every 24 hours for an additional seven consecutive days with a low-level (zero) and high-level (span) calibration gas. The gas is introduced into the sampling system as close to the sample probe outlet as practical and passes through all components used during normal monitoring. The response for each "challenge" is recorded at the end of the period and subtracted from the reference value (calibration gas) to determine the CD. The CD is calculated using the following equations:

For CO: $$CD = \left(\frac{|A - R|}{S} \right) x 100$$

For O_2: $$CD = |A - R|$$

Where:

CD	=	% CD
A	=	Actual monitor response to gas
R	=	Reference value of zero or span gas
S	=	Span of the instrument

The seven day CD test was completed at the time of or soon after installation of CEMS analyzers. The CD test will not be performed during annual testing that occurs after the initial CD test is completed. Ongoing CD assessments will be conducted on operational days following the completion of the initial seven day CD test.

5.3 Calibration Error

The CE test documents the accuracy and linearity of the analyzer over the entire measurement range. The CE is defined as the difference between the concentration indicated by the CEMS and the known concentration of the US EPA Protocol calibration gas.

Each CO and O_2 monitor will be challenged three nonconsecutive times at three measurement points within the ranges specified in Table 6. This is IAW the requirements for an absolute calibration audit (ACA) under MACT. The terms ACA and CE test are used interchangeably throughout this document as they are in the Federal Regulations, but the tests are identical.

The calibration gas will be injected into the sampling system as close to the sample probe outlet as practical and will pass through all CEMS components used during normal monitoring. The difference between the instrument response and the reference value (certified gas value) will be calculated and the resulting differences will be averaged to determine the CE at each measurement point.

All calculations for CE determination have been programmed into an automated worksheet to eliminate mathematical errors, provide consistent rounding, and report all values to the correct decimal place IAW guidelines in the CFR. These worksheets automatically determine the PASS/FAIL status of the test results based on the criteria in the applicable CFR. The equations used for CE determination are listed below.

For CO:

$$CE = \left(\frac{Avg.Difference \left| \; d \; \right|}{InstFullScale(FS)} \right) x\, 100$$

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non-consecutive times
FS	=	Span of the instrument

For O_2:

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non consecutive times

5.4 Response Time

The RT test is performed upon initial startup of the CEMS to document the response rate of the monitoring equipment to a step change in the system-input value. The RT is defined as the time interval between the start of an abrupt change in the system input and the time when the data recorder displays 95% of the final value.

To conduct the RT test, each monitor is challenged with a zero gas. After the system output has stabilized at this condition (no change greater than 1% of full scale for 30 seconds), the monitor is challenged with a high-level calibration gas. The time required to reach 95% of the final stable value at this new condition is determined (upscale response time). Next, the zero gas is reintroduced and allowed to stabilize. The time required to reach 95% of the final stable value at this new condition is determined (downscale response time). The entire procedure is repeated three (3) times to determine the mean upscale and downscale response times. The longer of the two (2) mean values is considered the system response time.

In accordance with the applicable 40 CFR 60 performance specifications, RT tests are completed at the time of or soon after installation of CEMS analyzers.

5.5 Relative Accuracy

40 CFR Part 60, Appendix B, Performance Specification 4B, Section 7.3, states the following:

> *"Alternate RA Procedure. Under some operating conditions, it may not be possible to obtain meaningful results using the RA test procedure. This includes conditions where consistent, very low CO emission or low CO emissions interrupted periodically by short duration, high level spikes are observed. It may be appropriate in these circumstances to waive the RA test and substitute the following procedure.*
>
> *Conduct a complete CEMS status check following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions, sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. All parts of the CEMS must be functioning properly before the RA requirement can be waived. The instrument must also successfully pass the CE and CD specifications. Substitution of the alternate procedure requires approval of the Regional Administrator."*

Based on the regulatory guidance cited above, SDC proposes the use of the alternate RA procedure be allowed at SDC. This is based on Mass Balance calculations which show that the SDC generates an average of 0.0188 lb/hr (1.88E-08 ppm/hr) of CO. The SDC will also occasionally experience periods of time after a detonation when the CO will spike for a short time and then will decline. And, as noted in the US EPA Performance Specification 4B, meaningful data may be hard to obtain from a CEMS unit that undergoes a Relative Accuracy Test Audit when the system is unable to produce consistent higher levels of CO. These factors make the SDC a prime candidate for the alternate RA procedure. To conduct the alternate RA test for the CEMS, the units will successfully pass a daily CD assessment and CE test to ensure all parts of the CEMS are functioning properly. These results will be included in the certification report to be submitted to the state as outlined in Section 2.3.

5.6 Certification Data – Handling and Custody Procedures

All measurements made to support CEMS certification will be made on-site. The CEMS data will be recorded by PDARS. All final data results will be presented in the final report.

6.0 DATA MANAGEMENT

Data generated in the field is not considered final until reviewed by the CEMS personnel. Data from PDARS is automatically transmitted and accuracy is verified on a routine basis.

6.1 Data Quality Objectives (DQO)

DQO include accuracy, precision, completeness, comparability, and representativeness. Because data is generally pulled from PDARS, two other DQO must be achieved. The first is data availability (see Section 6.2) and the second is to ensure the data recorded by PDARS represents the data generated at the analyzer. CEMS data is generated at the analyzers and transmitted through the PLC. Due to the variability associated with data transmission through these signal loops, CEMS data from the field is checked to ensure it matches the data stored in PDARS. To do this, daily calibration values are recorded in the field and verified against the calibration data recorded in PDARS. If the field-recorded span values vary from the PDARS values by more than 2% of the instrument range, the signal loops are checked, and recalibrated if necessary.

Accuracy: Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. With CEMS, this is measured by CD on a daily basis.

Precision: Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions expressed in terms of the standard deviation.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that is expected to be obtained under correct, normal conditions. If a CEMS analyzer loses the ability to communicate with the PLC, a malfunction alert is generated and the backup unit is automatically selected.

Comparability: Comparability is the measure of the confidence with which one data set or method can be compared with another. Since all CEMS that measure a particular analyte use the same type of analyzer, measurements from any type CEMS will be 100% comparable with any other measurement taken from that type of CEMS. The only variability between two instruments at the same location would normally be the individual accuracy differences between instruments.

Representativeness: The use of standard sampling techniques and methods of analysis will provide data that is representative of actual conditions. Since CEMS are sampling the actual stack gases, they are representative of the conditions.

6.2 Data Availability

The CEMS provide system availability by utilizing a primary and backup unit. Only the UOR is required to store data and generate alarms. Monitoring will automatically switch to the backup unit when the primary CEMS is unavailable due to malfunction conditions or periods of service. During these events, the PLC will generate an FPI only if both units (primary and backup) simultaneously experience a malfunction. The backup monitor will provide continuity of monitoring to allow for sustained operations.

Daily CEMS calibrations may be conducted during the operational day, resulting in downtime for which emissions data will not be available. During these times, the SDC may continue to process waste for a maximum of 20 minutes while completing the calibrations. A PLC timer will generate an FPI condition if the calibration event exceeds this limit IAW 40 CFR 63, Appendix EEE, Section 6.2.

There are three primary conditions that have the ability to reduce CEMS availability. These are calibrations, malfunctions and maintenance.

Calibrations: The calibration is a manually initiated, automatic function that requires approximately 10 to 15 minutes to complete. The PDARS records the unadjusted concentration measurement prior to resetting the monitor to the corrected value for calibrations. Data recorded during calibrations is not system conditions, so it is not factored into the emission averages reported for compliance purposes.

Malfunctions: Malfunctions are conditions that may indicate an actual or pending problem with the CEMS unit. Examples of conditions that may generate malfunction alarms include, but are not limited to, failed calibrations, heater/cooler temperatures out of tolerance, broken electrical connections, sample pressure too high/low and moisture too high/low. A malfunction alarm does not necessarily mean a CEMS should be taken out of service. Rather, it is a signal for the technician to investigate the cause and determine the source of the malfunction. In the event this occurs on the UOR and the backup unit is unavailable, or it occurs with both units simultaneously, waste feed may not continue until the condition is resolved.

Maintenance: Maintenance requires the instrument or unit to be intentionally taken off line to perform testing or some type of corrective or PM activity. During times when this must take place on both units simultaneously, additional waste feed will be prevented by the FPI.

6.3 Data Recording/Reporting

All outputs from each analyzer will be directed to an Allen Bradley Compact Logix Series PLC. The PLC is configured with eight (8) analog inputs, 16 digital inputs, 16 digital relay inputs as well as communication capability with PDARS. The PLC is located in the system cabinet for data integration and output to PDARS. A cabinet-mounted touch screen PC is also located in the cabinet for local display and control functions. The PDARS will be the only official repository for archiving and retrieving official compliance data. PDARS data will be retained in the facility operating record for a minimum of five years IAW MACT requirements found in 40 CFR 63, Appendix EEE.

6.3.1 Calibration Data

Calibration data is recorded at three locations:

(a) PDARS records all CEMS readings including calibrations;

(b) CEMS readings are recorded in the cabinet-mounted programmable computer for up to seven days and the calibration data is annotated in the instrument logbook; and

(c) A calibration worksheet is completed.

6.3.2 PDARS Data Discrepancies

If the calibration values recorded on the CEMS daily worksheet do not agree with information recorded by PDARS within the tolerances outlined in Section 6.1, a SDC-SOP-001-0003.FRM, CEMS PDAR Data Discrepancy Form, is completed documenting the problem. This form is included with the daily calibration package. Any discrepancies are addressed and revised as appropriate.

6.3.3 Instrument Log

A permanently bound logbook with consecutively numbered pages will be located in the proximity of the CEMS cabinet. This log will contain a running history of the instruments assigned to that rack. Each entry will include as a minimum the date, time, activity description, applicable data and technician identification of the person making the entry.

Current calibration certifications are maintained in the Monitoring House. This will help serve as a record of the gas cylinders used and to ensure all gases installed have current certifications prior to their installation.

6.3.4 Data Archiving

Electronic CEMS data will be archived. Hard copy data (e.g., logbooks, forms, etc.) is maintained IAW document control procedures.

6.4 Data Collection, Reduction, and Validation

Regulations require that CEMS data be collected at least once each 15 seconds, but average data values need to be recorded as one-minute averages. CEMS data is collected and used to update the CO corrected to 7% O_2 every 15-seconds, regardless of the presence or absence of hazardous waste in the chamber.

6.5 Data Calculations

Through the ICS rack, the analyzers output CEMS data to the PLC. The PLC continuously receives CEMS data and records the values for PDARS storage at least every 15 seconds. The PLC corrects CO 15-second to 7% O_2 as follows:

$$CO_A = CO_I \times \left(\frac{21\% - 7\%}{21\% - O_{2A}} \right)$$

Where:

CO_A	=	Advisor screen displayed CO concentration as calculated by PLC
CO_I	=	CO concentration read by PLC from the CO monitor
O_{2A}	=	Advisor screen displayed O_2 concentration

6.6 Missing Data

Because of redundant data collection methods for CEMS data, it is highly unlikely that there will be any missing data. Should there be missing data; the cause for the missing data will be determined and the following accomplished:

- Replication of the missing data, if possible;
- Documentation that data was lost; and
- Corrective action taken to prevent a future reoccurrence of missing data.

All of the above will be included in the CEMS quarterly report.

7.0 QUALITY CONTROL

7.1 Type/Frequency

All CEMS undergo system audits and CD checks. Table 5 lists the CEMS gas standards to be used for calibrations. The QC Inspector reviews the calibration forms and certificates ensuring that all data and related standards are recorded and calculated IAW SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), . QC Personnel may observe calibration of CEMS to validate the accuracy of the calibrations, determine if the reported CD is correct, and review the quarterly CEMS audits.

In addition to the activities above, the CEMS may also undergo weekly, quarterly, semi-annual, and annual PM procedures. The PM activities are based on manufacturer's recommendations to ensure long-term stability or trending data indicating potential problems. Quarterly data assessment and annual certification audits are also performed.

7.2 Control Limits and Actions during Calibrations

The control limits and actions stated here relate to operations of the CEMS. During calibrations, the CD is evaluated to determine excessiveness as follows:

O_2 Excessive:	CD is determined to be excessive if the 1 to 2% (zero) or the 20.9% (span) reading differs from the reference value by more than 0.5% O_2. If the CD is excessive, the calibration must be adjusted.
CO Excessive:	CD is determined to be excessive if the zero or span reading differs from the reference value by more than six (6) ppm for the low range (200 ppm) or more than 150 ppm for the high range (5,000 ppm). If the CD is excessive, the calibration must be adjusted.
CO/ O_2 Out of Control:	The CEMS is determined to be out of control if the CD for zero or span exceeds two times the limits stated above, or if the cumulative adjustment (zero and span) exceeds three (3) times the limit stated above. If this occurs, corrective maintenance will be performed and a new CD will be performed within the limits stated above. The CEMS cannot be the UOR until a CE test has been successfully completed.

If the CD evaluation indicates that the CEMS are out of control, the following steps will be taken:

- Identify and correct the cause for the excessive drift;
- Complete an "out of control" report; and
- Ensure corrective action is developed to prevent future occurrences of the same type of problem where possible.

8.0 QUALITY ASSURANCE

8.1 Audit Procedures

The CEMS also undergo quarterly and annual audits to further ensure data reliability. Audits and surveillances of the CEMS fall into two categories internal and external.

8.1.1 Internal Audits and Surveillances

RCRA CEMS will have an ACA or CE test performed IAW 40 CFR 63, Subpart EEE. Normally, this test may only be conducted for three of the four calendar quarters of a given year, unless an alternative test procedure is utilized. Under the alternative RA test procedure, the SDC facility will conduct these tests in all four calendar quarters in lieu of an RA test during one of the quarters.

ACA or CE tests may also be conducted more than three quarters in succession if the affected system(s) are shutdown for an extended period of time and, as a result, the RA test (if required) cannot be completed due to the absence of thermal loading at the affected facility. In these instances, ADEM will be notified and an extension (or reschedule) will be requested for the impending test date.

A QA representative may provide oversight during operations or audits and verify the accuracy of the data generated. The SDC Plant Manager may schedule surveillances aimed at observing all types of monitoring operations. These surveillances may include the CEMS during any given period. All results of surveillances will be documented and forwarded to the SDC Plant Manager upon request.

8.1.2 External Audits and Surveillances

The US EPA or ADEM may conduct audits and surveillances of the CEMS as deemed necessary. These may be scheduled or unscheduled at the discretion of the agency conducting the audit or surveillance.

8.2 National Institute for Standards and Technology (NIST) Traceability

The measurement accuracy for the standards used to calibrate the CEMS and the measurement and test equipment (M&TE) are traceable to the NIST. The accuracy certificate for the CEMS calibration gases is maintained on file and made a part of certification and calibration records. US EPA protocol certified gases will be used for all cylinder gas accuracy audits including ACA or CE tests. CEMS CD determination may use US EPA certified cylinder gas, protocol gas, certified N2, or plant-supplied instrument air.

8.3 Operational Procedures

SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), details operations performed on CEMS instruments to include startup, shut down, calibrations, CE testing, RT testing, alarm/malfunction response, and performance of maintenance activities. All SOP require approval by SDC management and are validated in the field prior to use. However, SOP may be revised, at any time, if a change is necessary to comply with changes to applicable requirements or if conditions exist that will not allow CEMS operations to be performed IAW the prescribed method.

8.4 Operator Training

All personnel with CEMS responsibilities will be trained and certified prior to working unsupervised on any CEMS instruments.

8.5 Measurement & Test Equipment Calibration

The M&TE used in support of certification, technical audits, daily CEMS calibrations, and PM are calibrated using standards that are traceable to the NIST. M&TE used to support CEMS operations are calibrated as follows:

8.5.1 M&TE that is a "built-in" component of the ICS rack will be certified with the system during the initial CEMS certification. The calibrations and quarterly audits of the CEMS prove the accuracy of this type of support equipment on an ongoing basis. If a CEMS fails a calibration due to a faulty piece of integral M&TE, that piece is replaced and the system has a new calibration performed to prove its accuracy. Since this calibration is maintained as a system, the individual components do not need separate calibrations or "calibration due" stickers placed on them.

8.5.2 M&TE that is used to troubleshoot the CEMS equipment has its calibration maintained through the SDC Maintenance Department. The M&TE will be verified against a known accurate instrument to ensure the calibration was performed correctly. A label on each piece of M&TE indicates when the next calibration is due. A computerized recall system is used to help ensure that no out-of-date M&TE is left in the work place where it may be used.

9.0 QUARTERLY DATA ASSESSMENT REPORT

A quarterly data assessment report is submitted to the ADEM no later than 60 days after the end of each calendar quarter IAW SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan. This report details CEMS malfunctions resulting in FPI and provides information about maintenance activities conducted on the CEMS.

Table 1: Comparison to US EPA QAPP Elements

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
Title Page	A1 Title and Approval Sheet	Not Applicable
Table of Contents	A2 Table of Contents	Not Applicable
1.0 Introduction	A4 Project/Task Organization A5 Problem Definition/Background A6 Project/Task Description	Step 1: State the problem Step 2: Identify the decision Step 3: Identify the inputs to the decision Step 6: Specify limits on decision errors
2.0 General Overview	A6 Project/Task Description C2 Reports to Management D1 Data Review, Verification, and Validation	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
3.0 Detailed Information	B1 Sampling Process Design B7 Instrument/Equipment Calibration and Frequency B8 Supplies and Consumables	Step 1: State the problem Step 2: Identify the decision Step 4: Define boundaries Step 5: Develop a decision rule Step 6: Specify limits on decision errors
4.0 Sample Location	A6 Project/Task Description B1 Sampling Process Design	Step 4: Define boundaries Step 5: Develop a decision rule Step 7: Optimize the design for obtaining data
5.0 Performance Requirements	A7 Quality Objectives and Criteria A9 Documentation and Records B2 Sampling Methods B3 Sample Handling and Custody B4 Analytical Methods D2 Verification and Validation Methods	Step 3: Identify the inputs to the decision Step 4: Define boundaries Step 6: Specify limits on decision errors

Table 1: Comparison to US EPA QAPP Elements (Continued)

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
6.0 Data Management	A7 Quality Objectives and Criteria A9 Documentation and Records B10 Data Management D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
7.0 Quality Control	A7 Quality Objectives and Criteria D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
8.0 Quality Assurance	A7 Quality Objectives and Criteria A8 Special Training/Certification B6 Instrument/Equipment Testing, Inspection, and Maintenance B7 Instrument/Equipment Calibration and Frequency C1 Assessments and Response Actions	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
9.0 Quarterly Data Assessment Report	A9 Documentation and Records C2 Reports to Management	Step 5: Develop a decision rule Step 6: Specify limits on decision errors

Table 2: CEMS Sample Locations

Tag Number	Analyte	FPI	Upstream Interference	Downstream Interference	Duct ID (inches)
03-SDC-AIT-900A	CO/O_2	Yes	45° connecting duct to stack	Stack Taper	14
03-SDC-AIT-900B					

Table 3: Analyzer Types

Quantity	Parameters	Manufacturer	Model	Range
2	CO	Teledyne-API	300EM	0 to 200ppmv 0 to 5,000 ppmv
2	O_2			0 to 25%

Table 4: Operational Data

System	Analyte	Instrument Range	Instrument Accuracy	FPI Set Point	Expected Concentration
SDC	CO	0 to 200ppmv 0 to 5,000 ppmv	$\pm$ 2% of range	100 ppm	0 to 10 ppm
	O_2	0 to 25%		Not Applicable	8 to 12%

Table 5: Calibration Gas Standards

Gas Standard ID(1)	Gas Value/Type	Purpose
CG1	99.99% N_2 [pure]	Zero gas for O_2, CO-L and CO-H daily; Low gas for CE testing - ALL
CG2(2)	8 to 10% O_2 / 60 to 80ppm CO [blended]	Mid gas for CE testing O_2 and CO-L
CG3(2)	14 to 16% O_2 / 140 to 160ppm CO [blended]	Span gas for O_2 and CO-L daily; High gas for CE testing O_2 and CO-H
CG4	1,500 to 2,000 ppm	Mid gas for CE testing CO-H
CG5	3,500 to 4,000 ppm	Span gas for CO-H daily; High gas for CE testing CO-H
CG6	Not Applicable	Spare/Test Gas

Footnotes:

(1) The accuracy for the gas standards may be certified for 24 to 36 months, depending on the vendor supplying the gas.

(2) Blended gases will be used to allow for consolidation of cylinders based on space limitations and reducing the amount of calibration gas control equipment necessary to facilitate testing.

Table 6: Test Gas Range Measurement Points

Calibration Gas Range	CO-Low (0 to 200 ppm)	CO-High (0 to 5,000 ppm)	O_2 (0 to 25%)
Zero/Low	0 to 40	0 to 600	0 to 2
Mid	60 to 80	1,500 to 2,000	8 to 10
High	140 to 160	3,500 to 4,000	14 to 16

Table 7: QC Requirements

Specification	Requirement
CO Performance Specification 4A/B	
CD (24 hours)	≤ 3% of span value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 5% of full scale
RT	≤ 2 minutes
RA	As specified in performance specification, presently 10% of RM or 5 ppm, whichever is greater, unless alternative is used. When alternative is used the default is the ACA specification.
O_2 Performance Specification 3/4B	
CD (24 hours)	≤ 0.5% of reference value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 0.5% of reference value
RT	≤ 2 minutes
RA	As specified in performance specification, presently ≤ 1% O_2, unless alternative is used. When alternative is used the default is the ACA specification.

Figure 1: Stack Configuration

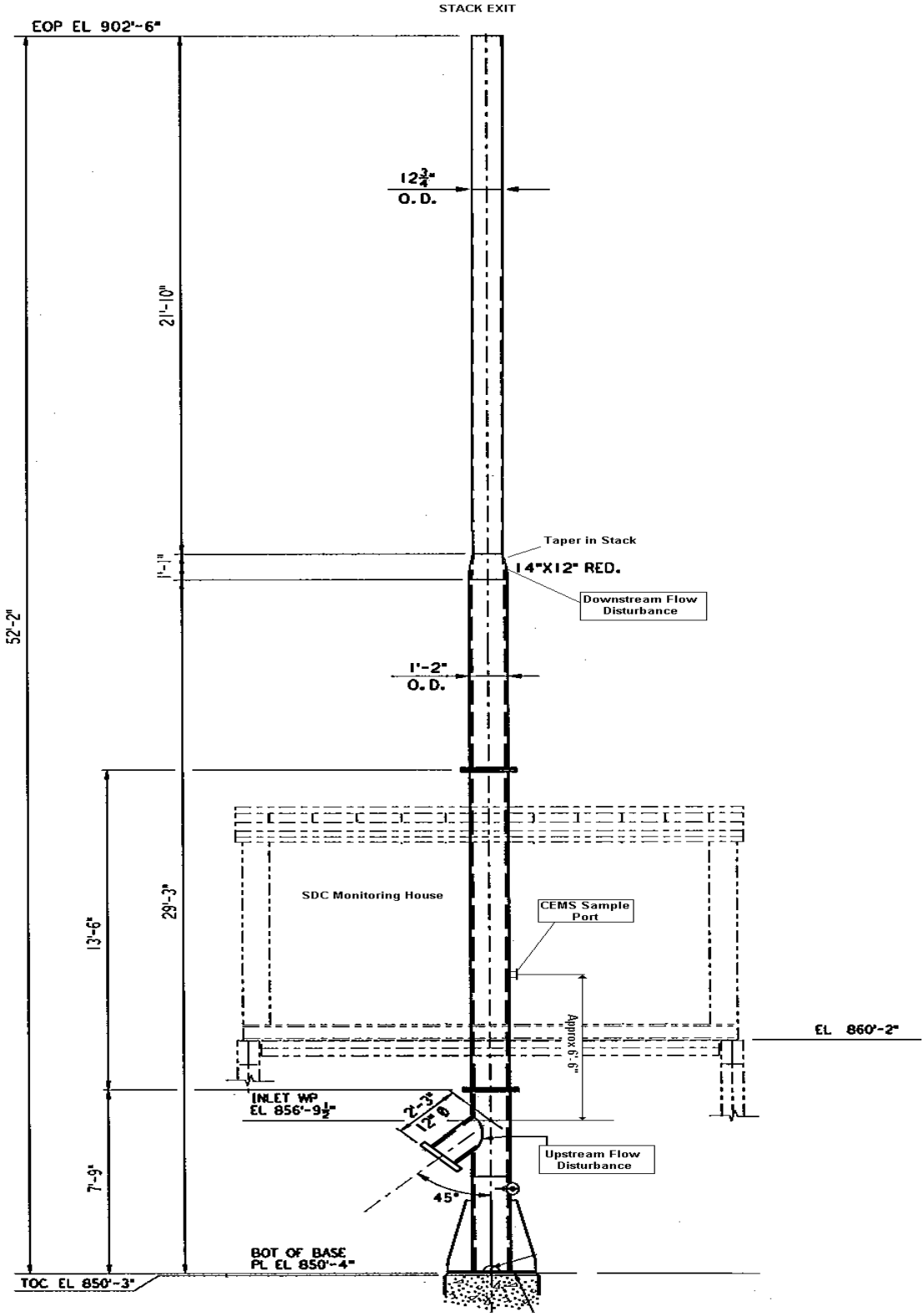
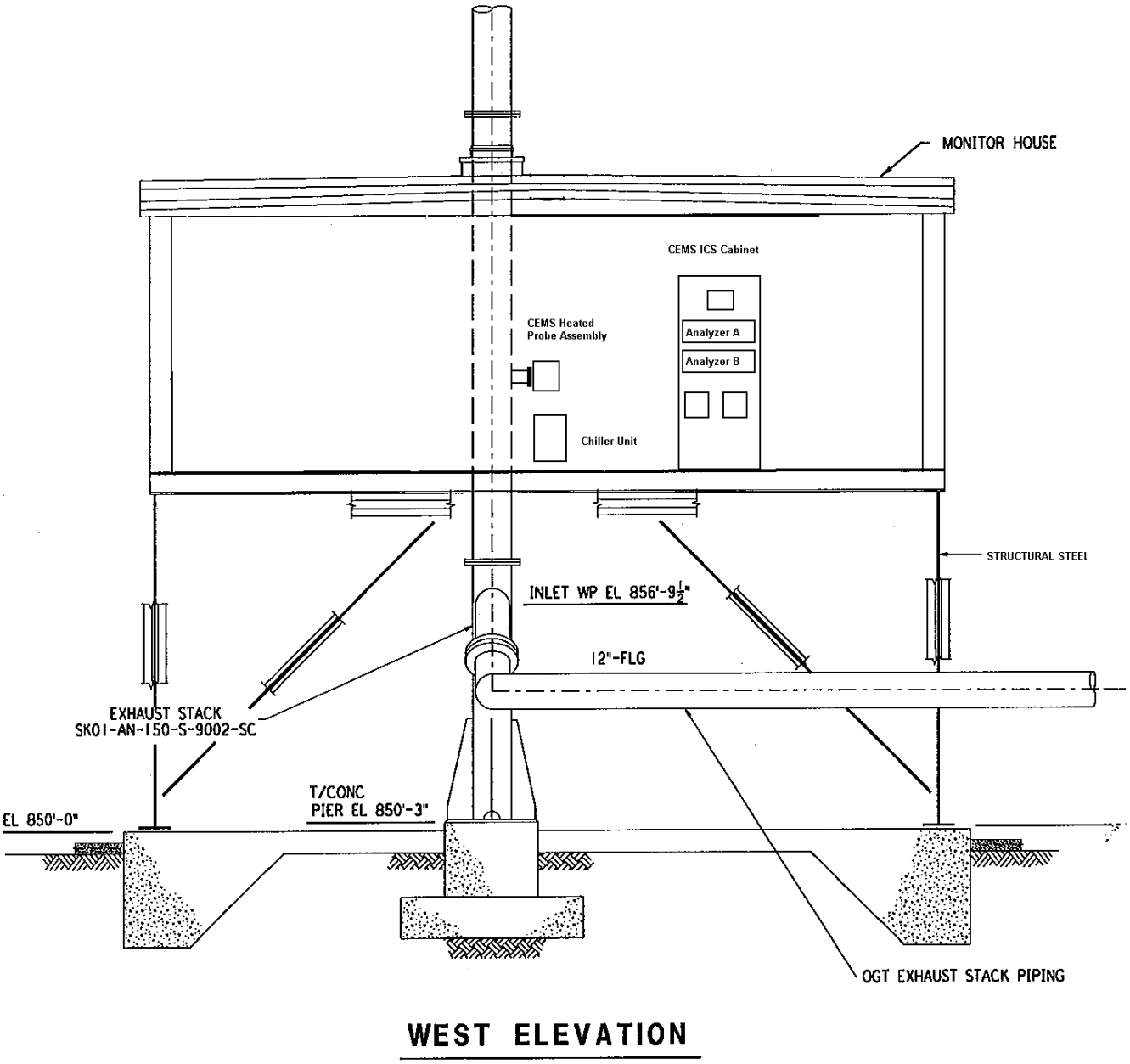


Figure 2: CEMS Monitoring Location



Appendix A: References

SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan

SDC-SOP-001, Continuous Emissions Monitoring System

EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000

EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G-5, Office of Environmental Information, December 2002

EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001

US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources

US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources

40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors

APPENDIX D: SCHEMATIC OF SAMPLING LOCATION

Evaluation of the SDC Exhaust Duct Sampling Ports for Compliance with EPA Method 1 and EPA Method 2

EPA Method 1 Evaluation

EPA Method 1, Sample and Velocity Traverses for Stationary Sources, provides guidance for the selection of sampling ports and traverse points at which sampling for air pollutants will be performed pursuant to applicable regulations. The method is applicable to gas streams flowing in exhaust ducts and cannot be used when: (1) the flow is cyclonic or swirling; or (2) a duct is smaller than 0.30 meter (12 inches) in diameter. The simplified procedure described in the method cannot be used when the measurement site is less than two duct diameters downstream or less than a half diameter upstream from a flow disturbance.

Drawings AN-150-P-9007-SC (Revision 0) provides the off-gas treatment exhaust stack piping plan. These drawings show eight (8) ports sets to be used for sampling of the exhaust gas and include distances from upstream and downstream disturbances. The drawings show the duct diameter to be twelve (12) inches at the planned sampling location which is the minimum diameter allowed for the simplified procedure described inn EPA Method 1. Each port set was evaluated and all were found to be at least two (2) duct diameters downstream and a half (0.5) diameter upstream from the nearest flow disturbance. Table 1 provides a summary of this evaluation.

Having reviewed the EPA Method 1 requirements and the applicable drawings that show the exhaust ducting and sampling ports it has been determined that the planned sampling locations meet the requirements of EPA Method 1. It is noted that it is not possible to establish if the flow is cyclonic or swirling without directly measuring the as-built system for this condition.

EPA Method 2 Evaluation

EPA Method 2, Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube), is applicable for the determination of the average velocity and the volumetric flow rate of a gas stream. The method is not applicable at measurement sites that fail to meet the criteria of EPA Method 1. The average gas velocity in an exhaust duct is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. The method does not specify a minimum flow requirement but based on the limitations of the standard Type S pitot and standard inclined manometers, flow rates should generally be greater than ten (10) feet per second.

The sampling locations were found to meet the EPA Method 1 requirements as described previously. The mass and energy balance for the 4.2-Inch condition (see 4.2 inch-10-PC3.xls) show a flow rate of eight (8) meters per second which is equivalent to 26.24 feet per second and is greater than the ten (10) feet per second minimum. As both the EPA Method 1 and minimum flow requirements have been satisfied, EPA Method 2 may be employed at the proposed sampling locations on the exhaust duct.

Table 1. EPA Method 1 Evaluation of SDC Sampling Locations

Sample Port	Duct Diameter, inches	Nearest Upstream Flow Disturbance, inches	Duct Diameters Downstream from Upstream Flow Disturbance	Nearest Downstream Flow Disturbance, inches	Duct Diameters Upstream from Downstream Flow Disturbance	Satisfies EPA Method 1
N1/N2	12.00	261.75	21.81	216.00	18.00	YES
N3/N4	12.00	285.75	23.81	192.00	16.00	YES
N5/N6	12.00	309.75	25.81	168.00	14.00	YES
N7/N8	12.00	333.75	27.81	144.00	12.00	YES
N9/N10	12.00	357.75	29.81	120.00	10.00	YES
N11'N12	12.00	381.75	31.81	96.00	8.00	YES
N13/N14	12.00	405.75	33.81	72.00	6.00	YES
N15/N16	12.00	429.75	35.81	48.00	4.00	YES

Notes:

1. EPA Method 1 may not be used when the duct diameter is smaller than twelve (12) inches.
2. EPA Method 1 may not be used when the measurement site is less than two (2) duct diameters downstream or less than a half (0.5) diameter upstream from a flow disturbance.

APPENDIX E: MACT CROSS-WALK OF REQUIREMENTS

Item	63 CFR 1207	Requirement	Location
1	(f)	Provisions of §§63.7(c)(2)(i)-(iii) and (v) regarding the content of the test plan apply	See 62 – 81
2	(f)(1)(i)	An analysis of each feedstream, including hazardous waste, other fuels, and industrial furnace feedstocks, as fired, that includes	Section 3.4
3	(f)(1)(i)(A)	Heating value, levels of ash (for hazardous waste incinerators only), levels of semivolatile metals, low volatile metals, mercury, and total chlorine (organic and inorganic)	RCRA Permit Table 5-3 governs feed rates.
4	(f)(1)(i)(B)	Viscosity or description of the physical form of the feedstream	Section 3.4
5	(f)(1)(ii)	For organic hazardous air pollutants established by 42 U.S.C. 7412(b)(1), excluding caprolactam (CAS number 105602) as provided by §63.60	---
6	(f)(1)(ii)(A)	Except as provided by paragraph (f)(1)(ii)(D) of this section, an identification of such organic hazardous air pollutants that are present in each hazardous waste feedstream	Section 3.3
7	(f)(1)(ii)(B)	An approximate quantification of such identified organic hazardous air pollutants in the hazardous waste feedstreams, within the precision produced by analytical procedures of §63.1208(b)(8)	Section 3.3
8	(f)(1)(ii)(C)	A description of blending procedures, if applicable, prior to firing the hazardous waste feedstream, including a detailed analysis of the materials prior to blending, and blending ratios	Not applicable No blending will occur.
9	(f)(1)(ii)(D)	The Administrator may approve on a case-by-case basis a hazardous waste feedstream analysis for organic hazardous air pollutants in lieu of the analysis required under paragraph (f)(1)(ii)(A) of this section if the reduced analysis is sufficient to ensure that the POHCs used to demonstrate compliance with the applicable DRE standards of this subpart continue to be representative of the most difficult to destroy organic compounds in your hazardous waste feedstreams	Not Applicable No variance is requested.
10	(f)(1)(iii)	A detailed engineering description of the hazardous waste combustor, including ***Note: The SDC is not a hazardous waste combustor but is subject to these regulations by permit only.***	Section 4.0
11	(f)(1)(iii)(A)	Manufacturer's name and model number of the hazardous waste combustor	CAA Permit 301-0050-Z013
12	(f)(1)(iii)(B)	Type of hazardous waste combustor	Section 1.0
13	(f)(1)(iii)(C)	Maximum design capacity in appropriate units	Section 3.4
14	(f)(1)(iii)(D)	Description of the feed system for each feedstream	Section 4.0
15	(f)(1)(iii)(E)	Capacity of each feed system	Section 3.4
16	(f)(1)(iii)(F)	Description of automatic hazardous waste feed cutoff system(s)	Section 5.0
17	(f)(1)(iii)(G)	Description of the design, operation, and maintenance practices for any air pollution control system	Section 4.0
18	(f)(1)(iii)(H)	Description of the design, operation, and maintenance practices of any stack gas monitoring and pollution control monitoring systems	Sections 6.0 & 7.0
19	(f)(1)(iv)	A detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis	Section 3.3 & SAP/QAPP
20	(f)(1)(v)	A detailed test schedule for each hazardous waste for which the performance test is planned, including date(s), duration, quantity of hazardous waste to be burned, and other relevant factors	Section 9.0
21	(f)(1)(vi)	A detailed test protocol, including, for each hazardous waste identified, the ranges of hazardous waste feedrate for each feed system, and, as appropriate, the feedrates of other fuels and feedstocks, and any other relevant parameters that may affect the ability of the hazardous waste combustor to meet the emission standards	Section 3.4
22	(f)(1)(vii)	A description of, and planned operating conditions for, any emission control equipment that will be used	Section 4.0

Item	63 CFR 1207	Requirement	Location
23	(f)(1)(viii)	Procedures for rapidly stopping the hazardous waste feed and controlling emissions in the event of an equipment malfunction	Sections 4.0 & 5.0
24	(f)(1)(ix)	A determination of the hazardous waste residence time as required by §63.1206(b)(11)	Not applicable Variable by waste type.
25	(f)(1)(x)	If you are requesting to extrapolate metal feedrate limits from comprehensive performance test levels under §§63.1209(l)(1)(v) or 63.1209(n)(2)(vii)	Not Applicable No waste extrapolation is proposed for this test. Will maintain current approved feed limitations for metals.
26	(f)(1)(x)(A)	A description of the extrapolation methodology and rationale for how the approach ensures compliance with the emission standards	Not Applicable
27	(f)(1)(x)(B)	Documentation of the historical range of normal (i.e., other than during compliance testing) metals feedrates for each feedstream	Not Applicable
28	(f)(1)(x)(C)	Documentation that the level of spiking recommended during the performance test will mask sampling and analysis imprecision and inaccuracy to the extent that the extrapolated feedrate limits adequately assure compliance with the emission standards	Not Applicable
29	(f)(1)(xi)	If you do not continuously monitor regulated constituents in natural gas, process air feedstreams, and feedstreams from vapor recovery systems under §63.1209(c)(5), you must include documentation of the expected levels of regulated constituents in those feedstreams	CAA Permit 301-0050-Z013
30	(f)(1)(xii)	Documentation justifying the duration of system conditioning required to ensure the combustor has achieved steady-state operations under performance test operating conditions, as provided by paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
31	(f)(1)(xiii)	For cement kilns with in-line raw mills, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
32	(f)(1)(xiv)	For preheater or preheater/precalciner cement kilns with dual stacks, if you elect to use the emissions averaging provision of this subpart, you must notify the Administrator of your intent in the initial (and subsequent) comprehensive performance test plan, and provide the information required by the emission averaging provision	Not Applicable
33	(f)(1)(xv)	If you request to use Method 23 for dioxin/furan you must provide the information required under §63.1208(b)(1)(i)(B)	SW-846 Method 0023A will be used.
34	(f)(1)(xvi)	If you are not required to conduct performance testing to document compliance with the mercury, semivolatile metals, low volatile metals, or hydrogen chloride/chlorine gas emission standards under paragraph (m) of this section, you must include with the comprehensive performance test plan documentation of compliance with the provisions of that section	Section 3.3
35	(f)(1)(xvii)	If you propose to use a surrogate for measuring or monitoring gas flowrate, you must document in the comprehensive performance test plan that the surrogate adequately correlates with gas flowrate, as required by paragraph (m)(7) of this section, and §63.1209(j)(2), (k)(3), (m)(2)(i), (n)(5)(i), and (o)(2)(i)	Not Applicable
36	(f)(1)(xviii)	You must submit an application to request alternative monitoring under §63.1209(g)(1) not later than with the comprehensive performance test plan, as required by §63.1209(g)(1)(iii)(A)	Not Applicable
37	(f)(1)(xix)	You must document the temperature location measurement in the comprehensive performance test plan, as required by §§63.1209(j)(1)(i) and 63.1209(k)(2)(i)	Table 1
38	(f)(1)(xx)	If your source is equipped with activated carbon injection, you must document in the comprehensive performance test plan	Not Applicable
39	(f)(1)(xx)(A)	The manufacturer specifications for minimum carrier fluid flowrate or pressure drop, as required by §63.1209(k)(6)(ii)	Not Applicable

Item	63 CFR 1207	Requirement	Location
40	(f)(1)(xx)(B)	Key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, if you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, as required by §63.1209(k)(6)(iii)	Not Applicable
41	(f)(1)(xxi)	If your source is equipped with a carbon bed system, and you elect not to specify and use the brand and type of carbon used during the comprehensive performance test, you must include in the comprehensive performance test plan key parameters that affect carbon adsorption, and the operating limits you establish for those parameters based on the carbon used during the performance test, as required by §63.1209(k)(7)(ii)	Not Applicable
42	(f)(1)(xxii)	If you feed a dioxin/furan inhibitor into the combustion system, you must document in the comprehensive performance test plan key parameters that affect the effectiveness of the inhibitor, and the operating limits you establish for those parameters based on the inhibitor fed during the performance test, if you elect not to specify and use the brand and type of inhibitor used during the comprehensive performance test, as required by §63.1209(k)(9)(ii)	Not Applicable
43	(f)(1)(xxiii)	If your source is equipped with a wet scrubber and you elect to monitor solids content of the scrubber liquid manually but believe that hourly monitoring of solids content is not warranted, you must support an alternative monitoring frequency in the comprehensive performance test plan, as required by §63.1209(m)(1)(i)(B)(1)(i)	Not Applicable See Section 4.0
44	(f)(1)(xxiv)	If your source is equipped with a particulate matter control device other than a wet scrubber, baghouse, or electrostatic precipitator, you must include in the comprehensive performance test plan	---
45	(f)(1)(xxiv)(A)	Documentation to support the operating parameter limits you establish for the control device, as required by §63.1209(m)(1)(iv)(A)(4)	Section 1.0 & Table 1
46	(f)(1)(xxiv)(B)	Support for the use of manufacturer specifications if you recommend such specifications in lieu of basing operating limits on performance test operating levels, as required by §63.1209(m)(1)(iv)(D)	Not Applicable
47	(f)(1)(xxv)	If your source is equipped with a dry scrubber to control hydrogen chloride and chlorine gas, you must document in the comprehensive performance test plan key parameters that affect adsorption, and the limits you establish for those parameters based on the sorbent used during the performance test, if you elect not to specify and use the brand and type of sorbent used during the comprehensive performance test, as required by §63.1209(o)(4)(iii)(A)	Not Applicable
48	(f)(1)(xxvi)	For purposes of calculating semivolatile metal, low volatile metal, mercury, and total chlorine (organic and inorganic), and ash feedrate limits, a description of how you will handle performance test feedstream analytical results that determines these constituents are not present at detectable levels	RCRA Permit Table 5-3 governs feed rates.
49	(f)(1)(xxvii)	Such other information as the Administrator reasonably finds necessary to determine whether to approve the performance test plan	Not Applicable No additional data has been requested.
50	(g)	Operating conditions during testing. You must comply with the provisions of §63.7(e). Conducting performance testing under operating conditions representative of the extreme range of normal conditions is consistent with the requirement of §63.7(e)(1) to conduct performance testing under representative operating conditions	See 82 – 93
51	(g)(1)(i)	Comprehensive performance testing—(i) Operations during testing. For the following parameters, you must operate the combustor during the performance test under normal conditions (or conditions that will result in higher than normal emissions)	Section 3.0
52	(g)(1)(i)(A)	Chlorine feedrate. You must feed normal (or higher) levels of chlorine during the dioxin/furan performance test	Section 2.0
53	(g)(1)(i)(B)	Ash feedrate. For hazardous waste incinerators, you must conduct the following tests when feeding normal (or higher) levels of ash: The semivolatile metal and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 2.0

Item	63 CFR 1207	Requirement	Location
54	(g)(1)(i)(C)	Cleaning cycle of the particulate matter control device. You must conduct the following tests when the particulate matter control device undergoes its normal (or more frequent) cleaning cycle: The particulate matter, semivolatile metal, and low volatile metal performance tests; and the dioxin/furan and mercury performance tests if activated carbon injection or a carbon bed is used	Section 4.0
55	(g)(1)(ii)	Modes of operation. Given that you must establish limits for the applicable operating parameters specified in §63.1209 based on operations during the comprehensive performance test, you may conduct testing under two or more operating modes to provide operating flexibility	Not Applicable Operating limits are already established.
56	(g)(1)(iii)(A)	Steady-state conditions. (A) Prior to obtaining performance test data, you must operate under performance test conditions until you reach steady-state operations with respect to emissions of pollutants you must measure during the performance test and operating parameters under §63.1209 for which you must establish limits. During system conditioning, you must ensure that each operating parameter for which you must establish a limit is held at the level planned for the performance test. You must include documentation in the performance test plan under paragraph (f) of this section justifying the duration of system conditioning	Section 3.0 & SAP/QAPP Section 6.3
57	(g)(1)(iii)(B)	If you own or operate a hazardous waste cement kiln that recycles collected particulate matter (i.e., cement kiln dust) into the kiln, you must sample and analyze the recycled particulate matter prior to obtaining performance test data for levels of selected metals that must be measured during performance testing to document that the system has reached steady-state conditions (i.e., that metals levels have stabilized).	Not Applicable
58	(h)(1)	Operating conditions during subsequent testing. (1) Current operating parameter limits established under §63.1209 are waived during subsequent comprehensive performance testing	Not Applicable No waiver of current approved operating limits is requested.
59	(h)(2)	Current operating parameter limits are also waived during pretesting prior to comprehensive performance testing for an aggregate time not to exceed 720 hours of operation (renewable at the discretion of the Administrator) under an approved test plan or if the source records the results of the pretesting. Pretesting means	Not Applicable No waiver of current approved operating limits is requested.
60	(h)(2)(i)	Operations when stack emissions testing for dioxin/furan, mercury, semivolatile metals, low volatile metals, particulate matter, or hydrogen chloride/chlorine gas is being performed	Not Applicable No waiver of current approved operating limits is requested.
61	(h)(2)(ii)	Operations to reach steady-state operating conditions prior to stack emissions testing under paragraph (g)(1)(iii) of this section	Section 3.0 & SAP/QAPP Section 6.3
62	63.7(c)(2)(i)	Submission of site-specific test plan. Before conducting a required performance test, the owner or operator of an affected source shall develop and, if requested by the Administrator, shall submit a site-specific test plan to the Administrator for approval. The test plan shall include a test program summary, the test schedule, data quality objectives, and both an internal and external quality assurance (QA) program. Data quality objectives are the pretest expectations of precision, accuracy, and completeness of data	Conditions 1/2 & SAP/QAPP
63	63.7(c)(2)(ii)	The internal QA program shall include, at a minimum, the activities planned by routine operators and analysts to provide an assessment of test data precision; an example of internal QA is the sampling and analysis of replicate samples	SAP/QAPP Section 6.0
64	63.7(c)(2)(iii)	The performance testing shall include a test method performance audit (PA) during the performance test	SAP/QAPP Section 5.0
65	63.7(c)(2)(iii)(A)	The source owner, operator, or representative of the tested facility shall obtain an audit sample, if commercially available, from an AASP for each test method used for regulatory compliance purposes. No audit samples are required for the following test methods: Methods 3A and 3C of appendix A-3 of part 60; Methods 6C, 7E, 9, and 10 of appendix A-4 of part 60; Methods 18 and 19 of appendix A-6 of part 60; Methods 20, 22, and 25A of appendix A-7 of part 60; and Methods 303, 318, 320, and 321 of appendix A of part 63	SAP/QAPP Sections 5.0 & 14.5

Item	63 CFR 1207	Requirement	Location
66	63.7(c)(2)(iii)(B)	An AASP shall have and shall prepare, analyze, and report the true value of audit samples in accordance with a written technical criteria document that describes how audit samples will be prepared and distributed in a manner that will ensure the integrity of the audit sample program. An acceptable technical criteria document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
67	63.7(c)(2)(iii)(B)(1)	Preparing the sample	SAP/QAPP Sections 5.0 & 14.5
68	63.7(c)(2)(iii)(B)(2)	Confirming the true concentration of the sample	SAP/QAPP Sections 5.0 & 14.5
69	63.7(c)(2)(iii)(B)(3)	Defining the acceptance limits for the results from a well qualified tester. This procedure must use well established statistical methods to analyze historical results from well qualified testers. The acceptance limits shall be set so that there is 95 percent confidence that 90 percent of well qualified labs will produce future results that are within the acceptance limit range	SAP/QAPP Sections 5.0 & 14.5
70	63.7(c)(2)(iii)(B)(4)	Providing the opportunity for the compliance authority to comment on the selected concentration level for an audit sample	SAP/QAPP Sections 5.0 & 14.5
71	63.7(c)(2)(iii)(B)(5)	Distributing the sample to the user in a manner that guarantees that the true value of the sample is unknown to the user	SAP/QAPP Sections 5.0 & 14.5
72	63.7(c)(2)(iii)(B)(6)	Recording the measured concentration reported by the user and determining if the measured value is within acceptable limits	SAP/QAPP Sections 5.0 & 14.5
73	63.7(c)(2)(iii)(B)(7)	Reporting the results from each audit sample in a timely manner to the compliance authority and to the source owner, operator, or representative by the AASP	SAP/QAPP Sections 5.0 & 14.5
74	63.7(c)(2)(iii)(B)(8)	Evaluating the acceptance limits of samples at least once every two years to determine in consultation with the voluntary consensus standard body if they should be changed	SAP/QAPP Sections 5.0 & 14.5
75	63.7(c)(2)(iii)(B)(9)	Maintaining a database, accessible to the compliance authorities, of results from the audit that shall include the name of the facility tested, the date on which the compliance test was conducted, the name of the company performing the sample collection, the name of the company that analyzed the compliance samples including the audit sample, the measured result for the audit sample, the true value of the audit sample, the acceptance range for the measured value, and whether the testing company passed or failed the audit	SAP/QAPP Sections 5.0 & 14.5
76	63.7(c)(2)(iii)(C)	The accrediting body shall have a written technical criteria document that describes how it will ensure that the AASP is operating in accordance with the AASP technical criteria document that describes how audit samples are to be prepared and distributed. This document shall contain standard operating procedures for all of the following operations	SAP/QAPP Sections 5.0 & 14.5
77	63.7(c)(2)(iii)(C)(1)	Checking audit samples to confirm their true value as reported by the AASP	SAP/QAPP Sections 5.0 & 14.5
78	63.7(c)(2)(iii)(C)(2)	Performing technical systems audits of the AASP's facilities and operating procedures at least once every two years	Not Applicable
79	63.7(c)(2)(iii)(C)(3)	Providing standards for use by the voluntary consensus standard body to approve the accrediting body that will accredit the audit sample providers	Not Applicable
80	63.7(c)(2)(iii)(D)	The technical criteria documents for the accredited sample providers and the accrediting body shall be developed through a public process guided by a voluntary consensus standards body (VCSB)	Not Applicable
81	63.7(c)(2)(v)	The Administrator may request additional relevant information after the submittal of a site-specific test plan	Not Applicable

Item	63 CFR 1207	Requirement	Location
82	63.7(e)(1)	Conduct of performance tests. (1) Performance tests shall be conducted under such conditions as the Administrator specifies to the owner or operator based on representative performance (i.e., performance based on normal operating conditions) of the affected source. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test, nor shall emissions in excess of the level of the relevant standard during periods of startup, shutdown, and malfunction be considered a violation of the relevant standard unless otherwise specified in the relevant standard or a determination of noncompliance is made under §63.6(e). Upon request, the owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of performance tests	Section 3.0 & SAP/QAPP Section 6.3
83	63.7(e)(2)	Performance tests shall be conducted and data shall be reduced in accordance with the test methods and procedures set forth in this section, in each relevant standard, and, if required, in applicable appendices of parts 51, 60, 61, and 63 of this chapter unless the Administrator	Sections 3.0 & 4.0, CMS Plan Section 4.0
84	63.7(e)(2)(i)	Specifies or approves, in specific cases, the use of a test method with minor changes in methodology (see definition in §63.90(a)). Such changes may be approved in conjunction with approval of the site-specific test plan (see paragraph (c) of this section); or	Section 3.3
85	63.7(e)(2)(ii)	Approves the use of an intermediate or major change or alternative to a test method (see definitions in §63.90(a)), the results of which the Administrator has determined to be adequate for indicating whether a specific affected source is in compliance; or	Not Applicable
86	63.7(e)(2)(iii)	Approves shorter sampling times or smaller sample volumes when necessitated by process variables or other factors; or	Not Applicable
87	63.7(e)(2)(iv)	Waives the requirement for performance tests because the owner or operator of an affected source has demonstrated by other means to the Administrator's satisfaction that the affected source is in compliance with the relevant standard	Not Applicable
88	63.7(e)(3)	Unless otherwise specified in a relevant standard or test method, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the relevant standard. For the purpose of determining compliance with a relevant standard, the arithmetic mean of the results of the three runs shall apply. Upon receiving approval from the Administrator, results of a test run may be replaced with results of an additional test run in the event that	Section 9.0
89	63.7(e)(3)(i)	A sample is accidentally lost after the testing team leaves the site; or	SAP/QAPP Section 5.3
90	63.7(e)(3)(ii)	Conditions occur in which one of the three runs must be discontinued because of forced shutdown; or	Section 9.0
91	63.7(e)(3)(iii)	Extreme meteorological conditions occur; or	SAP/QAPP Section 5.0
92	63.7(e)(3)(iv)	Other circumstances occur that are beyond the owner or operator's control	SAP/QAPP Section 5.0
93	63.7(e)(4)	Nothing in paragraphs (e)(1) through (e)(3) of this section shall be construed to abrogate the Administrator’s authority to require testing under section 114 of the Act	Not Applicable No additional requests have been made at this time.

STATIC DETONTATION CHAMBER (SDC)

CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS) CERTIFICATION PLAN

SDC-ENV-003
Revision 0

Approved by:

Will Leslie, SDC Plant Manager	01SEP15 *Date*
Timothy K. Garrett, ACWA AFO	1 Sept 2015 *Date*

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ACRONYMS AND ABBREVIATIONS

± .....plus or minus
% .....percent
≤ .....less or equal to
≥ .....greater than or equal to
°F……degrees Fahrenheit

ACA.....absolute calibration audit
ACWA……Assembled Chemical Weapons Association
ADEM .....Alabama Department of Environmental Management
AFO……Anniston Field Office
AIT.....analyzer indicating transmitter
ANAD…….Anniston Army Depot

CAA……Clean Air Act
CD.....calibration drift
CE .....calibration error
CEMS .....continuous emissions monitoring system
CFR.....Code of Federal Regulations
CGA .....cylinder gas audit
CO.....carbon monoxide
CON.....Control Room

DQO.....data quality objective

EPA.....Environmental Protection Agency

FPI……..feed prohibitive interlock

GFC……gas filter correlation

IAW .....in accordance with
ICS .....Instrument Control System
ID .....induced draft (fan)
IR .....infrared

mA .....milliamp
M&TE.....measurement and test equipment
MACT.....Maximum Achievable Control Technologies

N_2……....nitrogen
NDIR .....non-dispersive infrared
NIST .....National Institute for Standards and Technology

O_2 .....oxygen
OGT……off gas treatment

ACRONYMS AND ABBREVIATIONS (Continued)

PDARS .....Process Data Acquisition and Recording System
PLC .....Programmable Logic Controller
PM.....preventive maintenance
ppm .....parts per million

QA.....quality assurance
QAPP .....Quality Assurance Project Plan
QC.....quality control

RA.....relative accuracy
RCRA .....Resource Conservation and Recovery Act
RT .....response time

SDC.....Static Detonation Chamber

µm .....micrometer
UOR.....unit of record
US .....United States

WMM……..waste military munitions
WDC .....Washington Demilitarization Company

1.0 INTRODUCTION

Continuous Emissions Monitoring Systems (CEMS) are used at the Static Detonation Chamber (SDC) to monitor stack emissions for both process efficiency and to provide evidence of compliance with the Clean Air Act (CAA) and Resource Conservation and Recovery Act (RCRA) permit. The Alabama Department of Environmental Management (ADEM) has the authority to administer RCRA programs.

The SDC facility is designed for treatment or destruction of waste military munitions (WMM), recovered WMM from within the State of Alabama, and munitions components which are either explosively or non-explosively configured. The SDC facility is located within the Ammunition Limited Area on the west side of G block within Anniston Army Depot (ANAD).

This plan includes information relating to the CEMS used to comply with the SDC permits. This plan combines the format of the SDC CEMS Certification Plan with the information specific of the SDC CEMS Equipment and Monitoring Strategy Plan into one cohesive document which satisfies the requirements found in the Code of Federal Regulations (CFR) and standards that are subject to Maximum Achievable Control Technologies (MACT) requirements.

1.1 Purpose

This document allows for continuous operational control of the CEMS to ensure the requirements listed in the SDC permits are met during certification activities and normal operations by providing the following:

- Location of CEMS,
- Initial certification activities/specifications,
- Continuing certification requirements,
- Calibration drift (CD) determination and adjustment,
- Preventive maintenance (PM) (including spare parts), and
- Data recording, calculations, and reporting.

This plan describes the regulations, certification methods, performance specifications, and quality assurance (QA)/quality control (QC) methods used to assure reliable and accurate data. Also included is a description of the CEMS sample location along with expected operating parameters. The CEMS analyzer theory of operation, manufacturer, model number, and ranges of operation are also provided. Detailed activities used for operations of the CEMS can be found in SDC-SOP-001, Continuous Emissions Monitoring System (CEMS).

These requirements are necessary for the control, improvement, and assessment of the quality of CEMS data used to demonstrate compliance with the standards provided in the SDC permits. This plan either meets or exceeds the intent of the requirements of 40 CFR 63, Subpart EEE and 40 CFR 60 for carbon monoxide (CO) and oxygen (O_2) CEMS. This plan may be revised on an “as needed” basis, but will be reviewed annually, at a minimum to ensure validity.

This plan is written in a 12 point format based on a guidance document published by the United States (US) Environmental Protection Agency (EPA) for writing QA project plans in order to provide consistency with the contents of most plans reviewed by regulatory officials. The outline of this document has been cross-referenced to the US EPA Quality Assurance Project Plan (QAPP) elements provided in the following US EPA documents (See Table 1):

- EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000;
- EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G 5, Office of Environmental Information, December 2002; and
- EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001.

1.2 Scope

The requirements of this plan are applicable to all SDC personnel performing any CEMS activities for the SDC. These standards reflect guidance found in 40 CFR 63 Subpart EEE, as specified by Section 112 of the CAA. Additionally, this plan incorporates the requirements for reference methods found in 40 CFR 60 Appendix A, as well as, the Performance Specifications found in Appendix B.

1.3 Responsibilities

The CEMS requirements are to provide continuous monitoring for CO, one (1) of six (6) "criteria" air pollutants for which emission standards have been established by the EPA. Since the reporting standard established for CO is corrected to 7 percent (%) O_2 to allow for data comparability, the CEMS will continuously monitor for both CO and O_2. Washington Demilitarization Company (WDC) has the responsibility for certification and operation of the CEMS. WDC is also responsible for reporting all data to support initial and continuing certification of the CEMS. This data will be compiled into a certification report and submitted to ADEM by the Anniston Field Office (AFO) for approval.

SDC personnel responsible for CEMS monitoring are listed below in hierarchical order to include duties and reporting responsibilities by position down to the technician level.

1.3.1 SDC Operations Manager

(a) Reports to the SDC Plant Manager.

(b) Provides adequate staffing to support CEMS activities.

(c) Oversees scheduling of CEMS related activities.

(d) Ensures that the CEMS provide reliable and accurate readings.

(e) Researches applicable environmental permit and regulatory requirements and supervise monitoring staff in accordance with (IAW) those requirements.

(f) Verifies that the CEMS are certified and operating IAW this plan during all operations.

(g) Reviews the data archiving process to ensure that complete and accurate CEMS data is maintained.

(h) Ensures that corrective actions are developed and implemented for CEMS malfunctions.

1.3.2 Duty Area Supervisor

(a) Assigns certified operators to ensure the CEMS are functioning properly.

(b) Determines CEMS status and work that must be performed.

(c) Ensures that the CEMS are operating correctly and the data collection system is working properly.

(d) Facilitates ordering replacements of consumables and spare parts.

(e) Ensures CEMS calibrations are performed.

(f) Responds to CEMS alarms/malfunctions as directed by Control Room (CON) Operators.

1.3.3 CEMS Technician/Operator

(a) Provides the on-site technical expertise for CEMS monitoring.

(b) Performs maintenance, repair, and calibration of CEMS equipment.

(c) Conducts initial, quarterly and annual certification activities relative to CEMS.

(d) Responds to alarms and malfunctions to determine cause and resolve.

(e) Performs data logging and ensures that the Process Data Acquisition and Recording System (PDARS) are operating correctly.

(f) Compiles the data used for the quarterly CEMS report.

(g) Mentors, trains, and assists with technician/operator certifications.

1.3.4 Maintenance Superintendent

(a) Reports to the SDC Operations Manager.

(b) Provides an independent overview of the CEMS.

(c) Inspects and monitors the CEMS certification, calibration, and quarterly audits.

(d) Observes audits and validates the performance of the CEMS personnel.

(e) Reviews CEMS documentation for accuracy.

(f) Performs routine inspections of the CEMS.

(g) Observes the actions of the CEMS personnel.

(h) Observes CEMS calibrations to verify the recorded calibration data.

(i) Observes CEMS audits to verify they are performed correctly.

(j) Verifies CEMS documentation.

1.4 Personnel Training and Certification Requirements

SDC personnel have written qualification and certification records to ensure each individual has the necessary proficiency to perform the duties assigned. Objective evidence of personnel training/qualifications will be documented and maintained. All training and certification documentation will be available for review upon request.

2.0 GENERAL OVERVIEW

The SDC is designed for the destruction of munitions and components by indirect heating in a stainless steel chamber. The chamber uses electricity to maintain an operating temperature of greater than or equal to (≥) 1,000 degrees Fahrenheit (°F). Heated sweep air may be added to the chamber during operations. The gases from the destruction process are transferred into and cleaned by an Off-Gas Treatment (OGT) System comprised of a thermal oxidizer, spray dryer, bag house filter, quench unit, acid scrubber, and neutral scrubber. The thermal oxidizer uses natural gas as a fuel to enable the development of the high temperatures required to effectively treat the off gases from the SDC. An additional flow of secondary air is automatically added to ensure an oxidizing environment. Effluent temperatures are reduced by the spray drier, quench, and scrubbers. Downstream of the scrubbers are a series of induced draft (ID) fans and safeguard filter system. Prior to reaching the ID fans, the effluent pressure remains slightly below atmospheric pressure to ensure no potentially untreated off gas is released into the environment.

During operations, the CEMS will continuously monitor the exhaust, downstream of the OGT equipment, to include the ID fans and filter system. The CEMS have the ability to cause a feed prohibitive interlock (FPI) condition in the event they are in alarm, malfunction, or not available for monitoring. During these times, waste cannot be charged into the chamber until the condition causing the FPI is resolved. The CEMS will include two (2) analyzers (primary or unit of record (UOR) and an online backup). Both analyzers will be certified to allow for operational flexibility; however, only one is required to be operational in order to feed. More detailed sample location information can be found in Section 4. The CEMS sample locations and interferences are identified in Table 2 and detailed drawings for both can be found in Figures 1 and 2.

CEMS components are mounted in a National Electrical Manufacturers Association 1 Instrument Control System (ICS) cabinet located in a monitoring house. The ICS cabinet contains the sample pumps, calibration gas controllers and analyzers, along with the electronic equipment necessary to control the analyzers as well as display data and transmit data to PDARS. Detailed information for the major CEMS subcomponents can be found in Section 3. Detailed data transmission information can be found in Section 6.

2.1 Type/Make of Instrument Shelter

The CEMS monitoring house is constructed of composition panels that provide weather protection and insulation. The monitoring house is heated and cooled to provide continuous temperature control. The CEMS equipment is powered by an uninterruptible power supply to ensure continuous monitoring. Required calibration and certification gases are plumbed from ground level cylinder storage racks to the monitoring house, which is approximately 10 feet above ground level.

2.2 System Type

The SDC will utilize extractive CEMS with redundant analyzers and all components necessary to provide the capability for reporting CO emissions in parts per million (ppm) corrected to dry O_2 units. The manufacturer, model, and ranges of the analyzers are detailed in Section 3.

Close-coupled conditioning of the extracted sample will be made using a dual-pass thermoelectric chiller with Kynar/Glass impingers and with final filtration and moisture carryover alarms. Dual peristaltic pumps continuously drain condensed moisture away from the condenser system. The system utilizes a flange-mounted sampling probe with heated 24 inches probe stinger assembly and heated ceramic primary filter. The probe is connected directly to the inlet of the close-coupled chiller assembly mounted below the probe at the stack sampling point. Sample is then transported via an unheated Teflon tubing bundle to the ICS cabinet.

The close-coupled probe and chiller assembly assures delivery of a suitable dry sample to the ICS cabinet housing the redundant analyzers, flow controls, pumps and programmable logic controller (PLC). Both analyzers have their own internal sample pump to provide the necessary motive force to move the sampled gas from the stack, through the conditioning equipment and through the gas analyzers.

2.3 CEMS Certification

Prior to operations, the CEMS equipment will complete initial certification testing, to include response time (RT), calibration error (CE), 7-day CD and alternative relative accuracy (RA) tests IAW the applicable performance specifications of 40 CFR 60, Appendix B. These specifications and supporting tests are detailed in Section 5. After initial certification, daily CD checks are performed on operational days, CE tests (or equivalent) are performed quarterly, and alternative RA tests are performed annually.

During quarterly and annual certification testing, the data will be compiled into a CEMS certification report, which will include summary results of the performance specification tests. This certification report will include the applicable field data sheets and calibration gas certifications and will be submitted to ADEM within 60 days of the completion of the testing.

3.0 DETAILED INFORMATION

The CEMS is a complete system designed to measure CO and O_2 emissions from the exhaust stack of the SDC which is equipped with air pollution controls IAW the monitoring requirements of 40 CFR 60 and 40 CFR 63 Subpart EEE. Gas monitoring will be conducted at the stack with gas conditions saturated and at approximately 170 to 180°F. All CEMS components required to successfully conduct the monitoring are integrated into a custom system, designed by Air Techniques, Inc. The complete system was fully tested at their Marietta, Georgia, facility prior to installation at the SDC.

3.1 <u>CEMS Analyzers</u>

Manufacturer:	Teledyne Instruments-API Advanced Pollution Instrumentation 9480 Carroll Park Drive San Diego, CA 92121-5201
Model Number:	300EM
CO Ranges:	Range 1 (Low) = 0 to 200 ppm Range 2 (High) = 0 to 5000 ppm
Measurement Principle:	Non-dispersive Infrared (NDIR) with Gas Filter Correlation (GFC)

The analyzer measures CO by comparing infrared (IR) energy absorbed by a sample to that absorbed by a reference gas IAW the Beer-Lambert law or Beer's Law. This scientific principle defines how light of a specific wavelength is absorbed by a particular gas molecule over a certain distance. This is accomplished by using a heated element to generate a beam of broad-band IR light with a known intensity (measured during instrument calibration). This beam is directed through multi-pass cells filled with sample gas. The sample cell uses mirrors at each end to reflect the IR beam back and forth through the sample gas a number of times. Upon exiting the sample cell, the beam shines through a band-pass filter that allows only light at a wavelength of 4.7 micrometers (um) to pass. Finally, the beam strikes a solid-state photo-detector that converts the light signal into a modulated voltage signal representing the attenuated intensity of the beam.

Water vapor can also absorb light at a wavelength of 4.7 um. To overcome potential interfering effects from water vapor, the light is also passed through a GFC wheel. This wheel has two chambers, one filled with pure nitrogen (N_2) (measurement cell) and the other with a combination of N_2 mixed with a high concentration of CO (reference cell). As the wheel spins, the IR light alternatively passes through both cells. This causes a fluctuation in the intensity of the IR light striking the photo-detector resulting in two separate and distinct peaks. The analyzer determines the ratio between the peaks of the measure pulse and the reference pulse and then uses a look-up table, with interpolation, to linearize the response. This response value is combined with calibration slope and offset values to produce a CO concentration which is then normalized for changes in sample pressure. If an interfering gas, such as water vapor is introduced into the sample, the peak heights will change identically, but their ratios will not be affected. In this case, the GFC rejects the effects of interfering gases so that the analyzer only responds to the presence of CO.

The analyzer has dual range capabilities in the ranges specified above and has auto ranging capability to move directly from low (0 to 200 ppm) to high (0 to 5000 ppm) range in the event measured values exceed the 200 ppm span of the low range.

O_2 Range: 0 to 25%

Measurement Principle: Paramagnetic

The paramagnetic analyzer is based on the scientific principle that O_2 is a paramagnetic material, which means that it can be easily attracted into a magnetic field, or is "magnetically susceptible." Magnetic susceptibility is a measure of the intensity of the magnetism of a substance when it is placed in a magnetic field. O_2 has an exceptionally high magnetic susceptibility compared to other gases – actually several hundred times greater than that of most gases. This allows for fast and accurate measurements.

This type of paramagnetic detector is known as the magnetodynamic or "dumbbell" type. The sensor's core is made up of two N_2 filled glass spheres which are mounted on a rotating suspension within a magnetic field (shaped like a dumbbell). A mirror is mounted centrally on the suspension and light is shone onto the mirror that reflects the light onto a pair of photocells. The signal generated by the photocells is passed to a feedback loop, which outputs a current to a wire winding mounted on the suspended mirror. This results in a small direct current electric motor. O_2 from the sample stream is attracted to the magnetic field displacing the N_2 filled spheres, causing the suspended mirror to rotate. This displacement changes the amount of light reflected onto the photocells thereby changing their output levels. This feedback loop increases the amount of current fed into the winding in order to move the mirror back into its original position. The more O_2 present, the more the mirror moves and the more current is fed into the winding by the feedback control loop.

Although the O_2 range can be as great as 0 to 100% with 0.1% precision and accuracy, the CEMS units will only be operated in the 0 to 25% range IAW 40 CFR 60, Performance Specification 4B.

3.2 Operational Data

The FPI set point is derived from the RCRA Permit. The CO FPI set point of 100 ppm is instantaneous and corrected to 7% O_2, dry basis. Expected operating ranges for CO and O_2 are provided in Table 4.

3.3 Cylinder Gas Calibration Standards

Table 5 lists the gas standards used for daily calibrations and audits of the CEMS. The CEMS rack has its own calibration system. The calibration system, with appropriate calibration gases, regulators, valves, and interconnecting tubing has the capability of verifying the zero and upscale response of each CEMS analyzer. The gas is introduced into the CEMS sampling system as close to the distal end of the heated sample probe as possible to ensure it passes through all CEMS components used during normal sampling. The duration of each gas injection during calibrations is adjustable and has been established to ensure that the CEMS surfaces are adequately conditioned.

3.4 Alternative Sampling

There are no alternate sampling methods or equipment. All compliance analyzers are calibrated on operational days and audited quarterly/annually. The CEMS cabinet contains two analyzers; one to serve as the UOR while the other remains an online backup, when available. In the event both units fail and cannot be repaired in a timely manner, SDC will utilize a like kind replacement strategy for the compromised units. When a malfunctioning analyzer is replaced, the replacement analyzer will have a successful calibration and CE test performed to validate the precision and accuracy of the new instrument before it can become the UOR. The new unit will assume the future quarterly and annual recertification dates of the replaced unit.

3.5 PM Program

The PM Program consists of taking diagnostic readings that identify the operating condition of the CEMS analyzers. These checks include the calibration check, inspection of the recording system, control panel warning lights, and sample transport and interface system IAW 40 CFR 60 and 40 CFR 63, Subpart EEE. The PM checks are included as a part of SDC-SOP-001, Continuous Emissions Monitoring System (CEMS). In addition, there may also be weekly, quarterly, semi annual, and annual PM performed on various parts of the CEMS to include the support systems.

4.0 SAMPLE LOCATION

Table 2 summarizes the probe location for the CEMS. A probe located at the centroidal area of the duct at the stack location is the introduction point for the sample. The sample probe site was selected IAW the methods outlined in the applicable performance specifications listed in Section 5.0.

The stack sampling location has a designed duct inner diameter of 14 inches. As the drawing in Figure 1 indicates, the nearest upstream flow disturbance is a 45° “Y” in the duct, where the OGT duct transitions to the stack. It is located approximately 5.5 duct diameters away. The nearest downstream flow disturbance is a taper where the stack diameter drops from 14 to 12 inches. This taper is located approximately 10 duct diameters away.

The monitoring house type is described in Section 2.1 and a detailed drawing can be found in Figure 2. As the drawing indicates, the house is positioned so that the stack penetrates through the monitoring house. Floor of the monitoring house is approximately 10 feet above ground-level and the CEMS sample port is approximately another 2 feet 6 inches above the floor inside the house. The CEMS ICS cabinet will also be located inside this monitoring house. This configuration allows for the entire system to remain protected from the elements and under consistently stable temperature conditions. Additionally, this design ensures minimum sample line distance (10 to 15 feet), and extremely fast response to changes in monitored process parameters.

5.0 PERFORMANCE REQUIREMENTS

The CEMS performance testing requirements adhere to the requirements of 40 CFR 60, Appendix B, as well as, 40 CFR 63, Subpart EEE guidelines. The performance specifications and guidelines that apply include:

- US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources,
- US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources (incorporating Performance Specification 4A by reference), and
- 40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors.

5.1 CEMS Audit

A CEMS audit will be conducted on operational days to verify that all equipment is in good working order to include the sample collection and transport system. The system audit includes, at a minimum, a review of electronic data; an inspection of the analyzer warning lights, gas flows, and PDARS. CEMS specific system audit forms are included in the SDC SOP 001, Continuous Emissions Monitoring System (CEMS).

5.2 Calibration Drift

SDC will conduct the seven day CD test upon initial startup of the CEMS analyzers, IAW 40 CFR 60, Section 1 of the applicable performance specification. The CD demonstrates the stability of the calibration over time and is defined as the deviation of the output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment takes place. If any adjustments are made to the zero and/or span settings, they are recorded prior to performing the adjustments.

Following an initial calibration, the monitors are challenged every 24 hours for an additional seven consecutive days with a low-level (zero) and high-level (span) calibration gas. The gas is introduced into the sampling system as close to the sample probe outlet as practical and passes through all components used during normal monitoring. The response for each "challenge" is recorded at the end of the period and subtracted from the reference value (calibration gas) to determine the CD. The CD is calculated using the following equations:

For CO: $$CD = \left(\frac{|A - R|}{S} \right) x 100$$

For O_2: $$CD = |A - R|$$

Where:

CD	=	% CD
A	=	Actual monitor response to gas
R	=	Reference value of zero or span gas
S	=	Span of the instrument

The seven day CD test was completed at the time of or soon after installation of CEMS analyzers. The CD test will not be performed during annual testing that occurs after the initial CD test is completed. Ongoing CD assessments will be conducted on operational days following the completion of the initial seven day CD test.

5.3 Calibration Error

The CE test documents the accuracy and linearity of the analyzer over the entire measurement range. The CE is defined as the difference between the concentration indicated by the CEMS and the known concentration of the US EPA Protocol calibration gas.

Each CO and O_2 monitor will be challenged three nonconsecutive times at three measurement points within the ranges specified in Table 6. This is IAW the requirements for an absolute calibration audit (ACA) under MACT. The terms ACA and CE test are used interchangeably throughout this document as they are in the Federal Regulations, but the tests are identical.

The calibration gas will be injected into the sampling system as close to the sample probe outlet as practical and will pass through all CEMS components used during normal monitoring. The difference between the instrument response and the reference value (certified gas value) will be calculated and the resulting differences will be averaged to determine the CE at each measurement point.

All calculations for CE determination have been programmed into an automated worksheet to eliminate mathematical errors, provide consistent rounding, and report all values to the correct decimal place IAW guidelines in the CFR. These worksheets automatically determine the PASS/FAIL status of the test results based on the criteria in the applicable CFR. The equations used for CE determination are listed below.

For CO:

$$CE = \left(\frac{Avg.Difference \left| \; d \; \right|}{InstFullScale(FS)} \right) x\, 100$$

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non-consecutive times
FS	=	Span of the instrument

For O_2:

Where:

CE	=	% CE
d	=	Mean difference between CEMS response and reference concentration challenged three (3) non consecutive times

5.4 Response Time

The RT test is performed upon initial startup of the CEMS to document the response rate of the monitoring equipment to a step change in the system-input value. The RT is defined as the time interval between the start of an abrupt change in the system input and the time when the data recorder displays 95% of the final value.

To conduct the RT test, each monitor is challenged with a zero gas. After the system output has stabilized at this condition (no change greater than 1% of full scale for 30 seconds), the monitor is challenged with a high-level calibration gas. The time required to reach 95% of the final stable value at this new condition is determined (upscale response time). Next, the zero gas is reintroduced and allowed to stabilize. The time required to reach 95% of the final stable value at this new condition is determined (downscale response time). The entire procedure is repeated three (3) times to determine the mean upscale and downscale response times. The longer of the two (2) mean values is considered the system response time.

In accordance with the applicable 40 CFR 60 performance specifications, RT tests are completed at the time of or soon after installation of CEMS analyzers.

5.5 Relative Accuracy

40 CFR Part 60, Appendix B, Performance Specification 4B, Section 7.3, states the following:

> *"Alternate RA Procedure. Under some operating conditions, it may not be possible to obtain meaningful results using the RA test procedure. This includes conditions where consistent, very low CO emission or low CO emissions interrupted periodically by short duration, high level spikes are observed. It may be appropriate in these circumstances to waive the RA test and substitute the following procedure.*
>
> *Conduct a complete CEMS status check following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions, sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. All parts of the CEMS must be functioning properly before the RA requirement can be waived. The instrument must also successfully pass the CE and CD specifications. Substitution of the alternate procedure requires approval of the Regional Administrator."*

Based on the regulatory guidance cited above, SDC proposes the use of the alternate RA procedure be allowed at SDC. This is based on Mass Balance calculations which show that the SDC generates an average of 0.0188 lb/hr (1.88E-08 ppm/hr) of CO. The SDC will also occasionally experience periods of time after a detonation when the CO will spike for a short time and then will decline. And, as noted in the US EPA Performance Specification 4B, meaningful data may be hard to obtain from a CEMS unit that undergoes a Relative Accuracy Test Audit when the system is unable to produce consistent higher levels of CO. These factors make the SDC a prime candidate for the alternate RA procedure. To conduct the alternate RA test for the CEMS, the units will successfully pass a daily CD assessment and CE test to ensure all parts of the CEMS are functioning properly. These results will be included in the certification report to be submitted to the state as outlined in Section 2.3.

5.6 Certification Data – Handling and Custody Procedures

All measurements made to support CEMS certification will be made on-site. The CEMS data will be recorded by PDARS. All final data results will be presented in the final report.

6.0 DATA MANAGEMENT

Data generated in the field is not considered final until reviewed by the CEMS personnel. Data from PDARS is automatically transmitted and accuracy is verified on a routine basis.

6.1 Data Quality Objectives (DQO)

DQO include accuracy, precision, completeness, comparability, and representativeness. Because data is generally pulled from PDARS, two other DQO must be achieved. The first is data availability (see Section 6.2) and the second is to ensure the data recorded by PDARS represents the data generated at the analyzer. CEMS data is generated at the analyzers and transmitted through the PLC. Due to the variability associated with data transmission through these signal loops, CEMS data from the field is checked to ensure it matches the data stored in PDARS. To do this, daily calibration values are recorded in the field and verified against the calibration data recorded in PDARS. If the field-recorded span values vary from the PDARS values by more than 2% of the instrument range, the signal loops are checked, and recalibrated if necessary.

Accuracy: Accuracy is a measure of the closeness of an individual measurement or the average of a number of measurements to the true value. With CEMS, this is measured by CD on a daily basis.

Precision: Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions expressed in terms of the standard deviation.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that is expected to be obtained under correct, normal conditions. If a CEMS analyzer loses the ability to communicate with the PLC, a malfunction alert is generated and the backup unit is automatically selected.

Comparability: Comparability is the measure of the confidence with which one data set or method can be compared with another. Since all CEMS that measure a particular analyte use the same type of analyzer, measurements from any type CEMS will be 100% comparable with any other measurement taken from that type of CEMS. The only variability between two instruments at the same location would normally be the individual accuracy differences between instruments.

Representativeness: The use of standard sampling techniques and methods of analysis will provide data that is representative of actual conditions. Since CEMS are sampling the actual stack gases, they are representative of the conditions.

6.2 Data Availability

The CEMS provide system availability by utilizing a primary and backup unit. Only the UOR is required to store data and generate alarms. Monitoring will automatically switch to the backup unit when the primary CEMS is unavailable due to malfunction conditions or periods of service. During these events, the PLC will generate an FPI only if both units (primary and backup) simultaneously experience a malfunction. The backup monitor will provide continuity of monitoring to allow for sustained operations.

Daily CEMS calibrations may be conducted during the operational day, resulting in downtime for which emissions data will not be available. During these times, the SDC may continue to process waste for a maximum of 20 minutes while completing the calibrations. A PLC timer will generate an FPI condition if the calibration event exceeds this limit IAW 40 CFR 63, Appendix EEE, Section 6.2.

There are three primary conditions that have the ability to reduce CEMS availability. These are calibrations, malfunctions and maintenance.

Calibrations: The calibration is a manually initiated, automatic function that requires approximately 10 to 15 minutes to complete. The PDARS records the unadjusted concentration measurement prior to resetting the monitor to the corrected value for calibrations. Data recorded during calibrations is not system conditions, so it is not factored into the emission averages reported for compliance purposes.

Malfunctions: Malfunctions are conditions that may indicate an actual or pending problem with the CEMS unit. Examples of conditions that may generate malfunction alarms include, but are not limited to, failed calibrations, heater/cooler temperatures out of tolerance, broken electrical connections, sample pressure too high/low and moisture too high/low. A malfunction alarm does not necessarily mean a CEMS should be taken out of service. Rather, it is a signal for the technician to investigate the cause and determine the source of the malfunction. In the event this occurs on the UOR and the backup unit is unavailable, or it occurs with both units simultaneously, waste feed may not continue until the condition is resolved.

Maintenance: Maintenance requires the instrument or unit to be intentionally taken off line to perform testing or some type of corrective or PM activity. During times when this must take place on both units simultaneously, additional waste feed will be prevented by the FPI.

6.3 Data Recording/Reporting

All outputs from each analyzer will be directed to an Allen Bradley Compact Logix Series PLC. The PLC is configured with eight (8) analog inputs, 16 digital inputs, 16 digital relay inputs as well as communication capability with PDARS. The PLC is located in the system cabinet for data integration and output to PDARS. A cabinet-mounted touch screen PC is also located in the cabinet for local display and control functions. The PDARS will be the only official repository for archiving and retrieving official compliance data. PDARS data will be retained in the facility operating record for a minimum of five years IAW MACT requirements found in 40 CFR 63, Appendix EEE.

6.3.1 Calibration Data

Calibration data is recorded at three locations:

(a) PDARS records all CEMS readings including calibrations;

(b) CEMS readings are recorded in the cabinet-mounted programmable computer for up to seven days and the calibration data is annotated in the instrument logbook; and

(c) A calibration worksheet is completed.

6.3.2 PDARS Data Discrepancies

If the calibration values recorded on the CEMS daily worksheet do not agree with information recorded by PDARS within the tolerances outlined in Section 6.1, a SDC-SOP-001-0003.FRM, CEMS PDAR Data Discrepancy Form, is completed documenting the problem. This form is included with the daily calibration package. Any discrepancies are addressed and revised as appropriate.

6.3.3 Instrument Log

A permanently bound logbook with consecutively numbered pages will be located in the proximity of the CEMS cabinet. This log will contain a running history of the instruments assigned to that rack. Each entry will include as a minimum the date, time, activity description, applicable data and technician identification of the person making the entry.

Current calibration certifications are maintained in the Monitoring House. This will help serve as a record of the gas cylinders used and to ensure all gases installed have current certifications prior to their installation.

6.3.4 Data Archiving

Electronic CEMS data will be archived. Hard copy data (e.g., logbooks, forms, etc.) is maintained IAW document control procedures.

6.4 Data Collection, Reduction, and Validation

Regulations require that CEMS data be collected at least once each 15 seconds, but average data values need to be recorded as one-minute averages. CEMS data is collected and used to update the CO corrected to 7% O_2 every 15-seconds, regardless of the presence or absence of hazardous waste in the chamber.

6.5 Data Calculations

Through the ICS rack, the analyzers output CEMS data to the PLC. The PLC continuously receives CEMS data and records the values for PDARS storage at least every 15 seconds. The PLC corrects CO 15-second to 7% O_2 as follows:

$$CO_A = CO_I \times \left(\frac{21\% - 7\%}{21\% - O_{2A}} \right)$$

Where:

CO_A	=	Advisor screen displayed CO concentration as calculated by PLC
CO_I	=	CO concentration read by PLC from the CO monitor
O_{2A}	=	Advisor screen displayed O_2 concentration

6.6 Missing Data

Because of redundant data collection methods for CEMS data, it is highly unlikely that there will be any missing data. Should there be missing data; the cause for the missing data will be determined and the following accomplished:

- Replication of the missing data, if possible;
- Documentation that data was lost; and
- Corrective action taken to prevent a future reoccurrence of missing data.

All of the above will be included in the CEMS quarterly report.

7.0 QUALITY CONTROL

7.1 Type/Frequency

All CEMS undergo system audits and CD checks. Table 5 lists the CEMS gas standards to be used for calibrations. The QC Inspector reviews the calibration forms and certificates ensuring that all data and related standards are recorded and calculated IAW SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), . QC Personnel may observe calibration of CEMS to validate the accuracy of the calibrations, determine if the reported CD is correct, and review the quarterly CEMS audits.

In addition to the activities above, the CEMS may also undergo weekly, quarterly, semi-annual, and annual PM procedures. The PM activities are based on manufacturer's recommendations to ensure long-term stability or trending data indicating potential problems. Quarterly data assessment and annual certification audits are also performed.

7.2 Control Limits and Actions during Calibrations

The control limits and actions stated here relate to operations of the CEMS. During calibrations, the CD is evaluated to determine excessiveness as follows:

O_2 Excessive:	CD is determined to be excessive if the 1 to 2% (zero) or the 20.9% (span) reading differs from the reference value by more than 0.5% O_2. If the CD is excessive, the calibration must be adjusted.
CO Excessive:	CD is determined to be excessive if the zero or span reading differs from the reference value by more than six (6) ppm for the low range (200 ppm) or more than 150 ppm for the high range (5,000 ppm). If the CD is excessive, the calibration must be adjusted.
CO/ O_2 Out of Control:	The CEMS is determined to be out of control if the CD for zero or span exceeds two times the limits stated above, or if the cumulative adjustment (zero and span) exceeds three (3) times the limit stated above. If this occurs, corrective maintenance will be performed and a new CD will be performed within the limits stated above. The CEMS cannot be the UOR until a CE test has been successfully completed.

If the CD evaluation indicates that the CEMS are out of control, the following steps will be taken:

- Identify and correct the cause for the excessive drift;
- Complete an "out of control" report; and
- Ensure corrective action is developed to prevent future occurrences of the same type of problem where possible.

8.0 QUALITY ASSURANCE

8.1 Audit Procedures

The CEMS also undergo quarterly and annual audits to further ensure data reliability. Audits and surveillances of the CEMS fall into two categories internal and external.

8.1.1 Internal Audits and Surveillances

RCRA CEMS will have an ACA or CE test performed IAW 40 CFR 63, Subpart EEE. Normally, this test may only be conducted for three of the four calendar quarters of a given year, unless an alternative test procedure is utilized. Under the alternative RA test procedure, the SDC facility will conduct these tests in all four calendar quarters in lieu of an RA test during one of the quarters.

ACA or CE tests may also be conducted more than three quarters in succession if the affected system(s) are shutdown for an extended period of time and, as a result, the RA test (if required) cannot be completed due to the absence of thermal loading at the affected facility. In these instances, ADEM will be notified and an extension (or reschedule) will be requested for the impending test date.

A QA representative may provide oversight during operations or audits and verify the accuracy of the data generated. The SDC Plant Manager may schedule surveillances aimed at observing all types of monitoring operations. These surveillances may include the CEMS during any given period. All results of surveillances will be documented and forwarded to the SDC Plant Manager upon request.

8.1.2 External Audits and Surveillances

The US EPA or ADEM may conduct audits and surveillances of the CEMS as deemed necessary. These may be scheduled or unscheduled at the discretion of the agency conducting the audit or surveillance.

8.2 National Institute for Standards and Technology (NIST) Traceability

The measurement accuracy for the standards used to calibrate the CEMS and the measurement and test equipment (M&TE) are traceable to the NIST. The accuracy certificate for the CEMS calibration gases is maintained on file and made a part of certification and calibration records. US EPA protocol certified gases will be used for all cylinder gas accuracy audits including ACA or CE tests. CEMS CD determination may use US EPA certified cylinder gas, protocol gas, certified N2, or plant-supplied instrument air.

8.3 Operational Procedures

SDC-SOP-001, Continuous Emissions Monitoring System (CEMS), details operations performed on CEMS instruments to include startup, shut down, calibrations, CE testing, RT testing, alarm/malfunction response, and performance of maintenance activities. All SOP require approval by SDC management and are validated in the field prior to use. However, SOP may be revised, at any time, if a change is necessary to comply with changes to applicable requirements or if conditions exist that will not allow CEMS operations to be performed IAW the prescribed method.

8.4 Operator Training

All personnel with CEMS responsibilities will be trained and certified prior to working unsupervised on any CEMS instruments.

8.5 Measurement & Test Equipment Calibration

The M&TE used in support of certification, technical audits, daily CEMS calibrations, and PM are calibrated using standards that are traceable to the NIST. M&TE used to support CEMS operations are calibrated as follows:

8.5.1 M&TE that is a "built-in" component of the ICS rack will be certified with the system during the initial CEMS certification. The calibrations and quarterly audits of the CEMS prove the accuracy of this type of support equipment on an ongoing basis. If a CEMS fails a calibration due to a faulty piece of integral M&TE, that piece is replaced and the system has a new calibration performed to prove its accuracy. Since this calibration is maintained as a system, the individual components do not need separate calibrations or "calibration due" stickers placed on them.

8.5.2 M&TE that is used to troubleshoot the CEMS equipment has its calibration maintained through the SDC Maintenance Department. The M&TE will be verified against a known accurate instrument to ensure the calibration was performed correctly. A label on each piece of M&TE indicates when the next calibration is due. A computerized recall system is used to help ensure that no out-of-date M&TE is left in the work place where it may be used.

9.0 QUARTERLY DATA ASSESSMENT REPORT

A quarterly data assessment report is submitted to the ADEM no later than 60 days after the end of each calendar quarter IAW SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan. This report details CEMS malfunctions resulting in FPI and provides information about maintenance activities conducted on the CEMS.

Table 1: Comparison to US EPA QAPP Elements

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
Title Page	A1 Title and Approval Sheet	Not Applicable
Table of Contents	A2 Table of Contents	Not Applicable
1.0 Introduction	A4 Project/Task Organization A5 Problem Definition/Background A6 Project/Task Description	Step 1: State the problem Step 2: Identify the decision Step 3: Identify the inputs to the decision Step 6: Specify limits on decision errors
2.0 General Overview	A6 Project/Task Description C2 Reports to Management D1 Data Review, Verification, and Validation	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
3.0 Detailed Information	B1 Sampling Process Design B7 Instrument/Equipment Calibration and Frequency B8 Supplies and Consumables	Step 1: State the problem Step 2: Identify the decision Step 4: Define boundaries Step 5: Develop a decision rule Step 6: Specify limits on decision errors
4.0 Sample Location	A6 Project/Task Description B1 Sampling Process Design	Step 4: Define boundaries Step 5: Develop a decision rule Step 7: Optimize the design for obtaining data
5.0 Performance Requirements	A7 Quality Objectives and Criteria A9 Documentation and Records B2 Sampling Methods B3 Sample Handling and Custody B4 Analytical Methods D2 Verification and Validation Methods	Step 3: Identify the inputs to the decision Step 4: Define boundaries Step 6: Specify limits on decision errors

Table 1: Comparison to US EPA QAPP Elements (Continued)

SDC CEMS Certification Plan	US EPA QA/G-5 and R-5 Elements	US EPA QA/G-4 Elements
6.0 Data Management	A7 Quality Objectives and Criteria A9 Documentation and Records B10 Data Management D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 1: State the problem Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
7.0 Quality Control	A7 Quality Objectives and Criteria D1 Data Review, Verification, and Validation D2 Verification and Validation Methods D3 Reconciliation with User Requirements	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
8.0 Quality Assurance	A7 Quality Objectives and Criteria A8 Special Training/Certification B6 Instrument/Equipment Testing, Inspection, and Maintenance B7 Instrument/Equipment Calibration and Frequency C1 Assessments and Response Actions	Step 3: Identify the inputs to the decision Step 7: Optimize the design for obtaining data
9.0 Quarterly Data Assessment Report	A9 Documentation and Records C2 Reports to Management	Step 5: Develop a decision rule Step 6: Specify limits on decision errors

Table 2: CEMS Sample Locations

Tag Number	Analyte	FPI	Upstream Interference	Downstream Interference	Duct ID (inches)
03-SDC-AIT-900A	CO/O_2	Yes	45° connecting duct to stack	Stack Taper	14
03-SDC-AIT-900B					

Table 3: Analyzer Types

Quantity	Parameters	Manufacturer	Model	Range
2	CO	Teledyne-API	300EM	0 to 200ppmv 0 to 5,000 ppmv
2	O_2			0 to 25%

Table 4: Operational Data

System	Analyte	Instrument Range	Instrument Accuracy	FPI Set Point	Expected Concentration
SDC	CO	0 to 200ppmv 0 to 5,000 ppmv	$\pm$ 2% of range	100 ppm	0 to 10 ppm
	O_2	0 to 25%		Not Applicable	8 to 12%

Table 5: Calibration Gas Standards

Gas Standard ID(1)	Gas Value/Type	Purpose
CG1	99.99% N_2 [pure]	Zero gas for O_2, CO-L and CO-H daily; Low gas for CE testing - ALL
CG2(2)	8 to 10% O_2 / 60 to 80ppm CO [blended]	Mid gas for CE testing O_2 and CO-L
CG3(2)	14 to 16% O_2 / 140 to 160ppm CO [blended]	Span gas for O_2 and CO-L daily; High gas for CE testing O_2 and CO-H
CG4	1,500 to 2,000 ppm	Mid gas for CE testing CO-H
CG5	3,500 to 4,000 ppm	Span gas for CO-H daily; High gas for CE testing CO-H
CG6	Not Applicable	Spare/Test Gas

Footnotes:

(1) The accuracy for the gas standards may be certified for 24 to 36 months, depending on the vendor supplying the gas.

(2) Blended gases will be used to allow for consolidation of cylinders based on space limitations and reducing the amount of calibration gas control equipment necessary to facilitate testing.

Table 6: Test Gas Range Measurement Points

Calibration Gas Range	CO-Low (0 to 200 ppm)	CO-High (0 to 5,000 ppm)	O_2 (0 to 25%)
Zero/Low	0 to 40	0 to 600	0 to 2
Mid	60 to 80	1,500 to 2,000	8 to 10
High	140 to 160	3,500 to 4,000	14 to 16

Table 7: QC Requirements

Specification	Requirement
CO Performance Specification 4A/B	
CD (24 hours)	≤ 3% of span value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 5% of full scale
RT	≤ 2 minutes
RA	As specified in performance specification, presently 10% of RM or 5 ppm, whichever is greater, unless alternative is used. When alternative is used the default is the ACA specification.
O_2 Performance Specification 3/4B	
CD (24 hours)	≤ 0.5% of reference value on high or low range for six (6) out of seven (7) test days (initial certification only)
CE Test - ACA	≤ 0.5% of reference value
RT	≤ 2 minutes
RA	As specified in performance specification, presently ≤ 1% O_2, unless alternative is used. When alternative is used the default is the ACA specification.

Figure 1: Stack Configuration

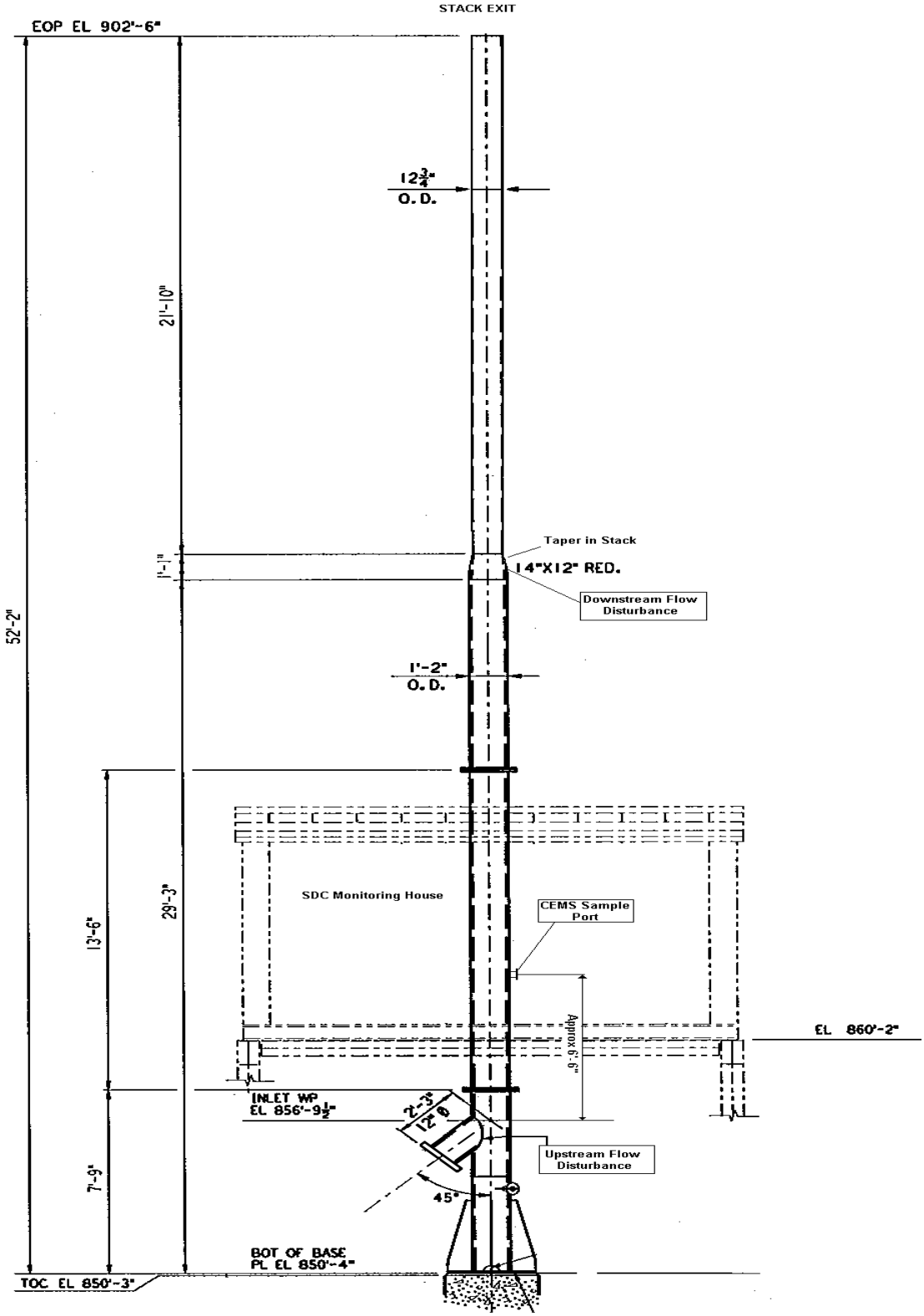
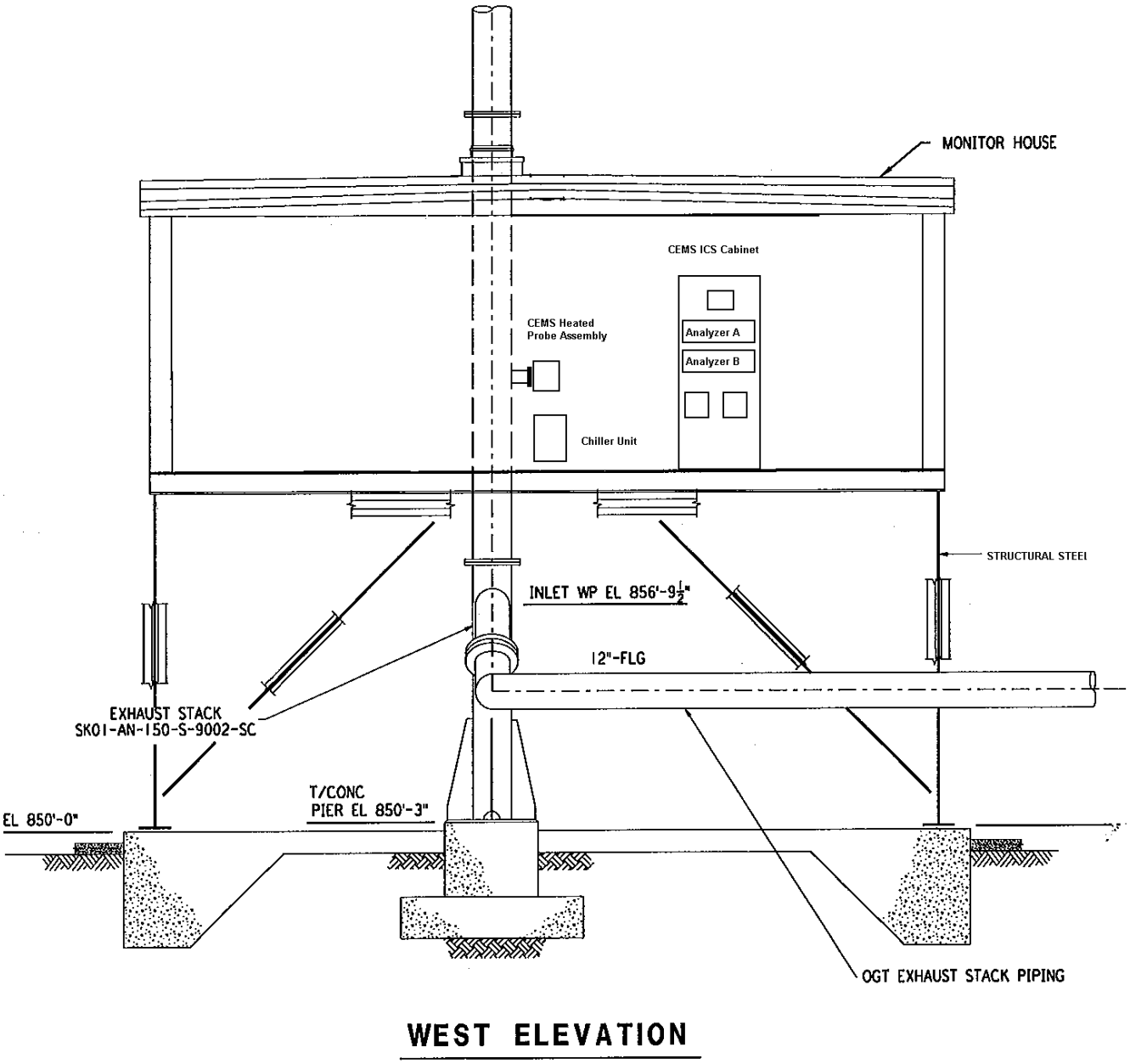


Figure 2: CEMS Monitoring Location



Appendix A: References

SDC-ENV-1.02, MACT Startup, Shutdown, and Malfunction Plan

SDC-SOP-001, Continuous Emissions Monitoring System

EPA/600/R-96/055, Guidance for the Data Quality Objectives Process – EPA QA/G-4, Office of Environmental Information, August 2000

EPA/240/R-02/009, Guidance for Quality Assurance Project Plans – EPA QA/G-5, Office of Environmental Information, December 2002

EPA/240/B-01/003, EPA Requirements for Quality Assurance Project Plans – EPA QA/R-5, Office of Environmental Information, March 2001

US EPA Performance Specification 3, Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources

US EPA Performance Specification 4B, Specifications and Test Procedures for CO and O_2 Continuous Monitoring Systems in Stationary Sources

40 CFR 63, Subpart EEE, Quality Assurance Procedures for Continuous Emissions Monitors Used for Hazardous Waste Combustors

DEPARTMENT OF THE ARMY
PROGRAM EXECUTIVE OFFICE
ASSEMBLED CHEMICAL WEAPONS ALTERNATIVES
ANNISTON ARMY DEPOT
7 FRANKFORD AVE, BLDG 75
ANNISTON, ALABAMA 36201

REPLY TO ATTENTION OF:

October 20, 2016

Site Project Manager

SUBJECT: Resource Conservation Recovery Act (RCRA) Permit Modification Request Number 45 (RMODR45) Emissions Test Plan Replacement Page

Mr. Phil Davis
Chief, Land Division
Alabama Department of Environmental Management
P. O. Box 30130-1463
Montgomery, AL 36130

Received
OCT 24 2016
Land Division

Dear Mr. Davis:

Reference AECOM letter, SDC-16-0032, October 19, 2016, subject: Emissions Test Plan Replacement Page (enclosed). The referenced letter is being submitted in order to request a change to Table 2 of Condition 2 Emissions Test Plan submitted with the RCRA Permit Modification Request Number 45 that is currently under review with your office. The point of contact for this action is the undersigned at (256) 238-1652, ext. 245.

Sincerely,

Timothy K. Garrett
Anniston Field Office
Site Project Manager

Enclosure

Copies Furnished: (w/o enclosure)
AECOM/Ms. Tracy Greenwood (electronically)
AECOM/Mr. Will Leslie
ANAD, TAAN-RK/Mr. Bruce Williams
ADEM/Ms. Chrystal Strickland (w/enclosure)
ADEM/Mr. Will Bacon (w/enclosure)
ANAD, TAAN-CO/Martine S. Kidd, Colonel, LG, Commanding
PCAPP, BNI/Mr. Neil A. Brill
PCAPP, BNI/Mr. Sean J. Jodoin
ANAD, TAAN-RK/Mr. Greg Jones (electronically)
ANAD, TAAN-L/Ms. LaVette Lyas-Brown (electronically)

RECEIVED OCT 1 9 2016

AECOM

SDC-160032

October 19, 2016

Mr. Will Leslie, Static Detonation Chamber (SDC) Plant Manager
Washington Demilitarization Co., LLC (WDC)
7 Frankford Avenue, Building 695
Anniston, AL 36201

Mr. Timothy K. Garrett
Anniston Field Office (AFO)
7 Frankford Avenue, Building 75
Anniston, AL 36201

Subject: Emissions Test Plan (ETP) Replacement Pages

Dear Mr. Garrett:

WDC is submitting the attached change pages from the Condition 2 ETP for delivery to the Alabama Department of Environmental Management (ADEM). The Condition 2 ETP is currently under review with the ADEM Air and Land Divisions as was submitted under the Notice of Deficiency Response for Modification Request No. 45. Since submittal of the Condition 2 with the NOD response, it has been decided to increase the spiking rate for zinc. Only Table 2 from the Condition 2 ETP was affected by these changes. The replacement pages are to replace the corresponding page in the redline-strikeout and proof versions of the pages.

Any questions or comments should be directed to Brian Brasher at (256) 419-2282.

Sincerely,

Will Leslie
SDC Plant Manager

Enclosure(s)
cc: DCC

FILE

Table 2: Metal Spiking

Metal	Current Feed Rate (lb/hr)	Metal Oxide	CAS #	Spiking Rate[1, 2] (lb/hr)
Arsenic	0.31	Arsenic Oxide	1327-53-3	0.41
Beryllium	0.0024	Beryllium Sulfate	7787-56-6	0.028
Cadmium	0.0083	Cadmium Oxide	1306-19-0	0.0095
Chromium	2.64	Chromium Acetate, Monohydrate	1066-30-4	12.55
Copper	0.41	Copper Oxide	1317-38-0	0.51
Lead	25.8	Lead Oxide	1309-60-0	29.78
Mercury	0.017	Mercury Oxide	21908-53-2	0.018
Phosphorous	2.25	Sodium Phosphate	10049-21-5	34.87
Silver	0.012	Silver Oxide	20667-12-3	0.013
Vanadium	0.0046	Sodium Metavanadate	13718-26-8	0.011
Zinc	0.31	Zinc Oxide	1314-13-2	1,560.39

Footnotes:

(1) Spiking rates are based on the current planned feed rate for C2condition 2 of 5 trays per hour. The actual rate demonstrated during C2condition 2 may increase.

(2) Metals which are found within the WMM processed during the emissions test are not included in this value but will be assessed in determining final demonstrated feed rates.

Table 2: Metal Spiking

Metal	Current Feed Rate (lb/hr)	Metal Oxide	CAS #	Spiking Rate[1, 2] (lb/hr)
Arsenic	0.31	Arsenic Oxide	1327-53-3	0.41
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Chromium	2.64	Chromium Acetate, Monohydrate	1066-30-4	12.55
Copper	0.41	Copper Oxide	1317-38-0	0.51
Lead	25.8	Lead Oxide	1309-60-0	29.78
Mercury	0.017	Mercury Oxide	21908-53-2	0.018
Phosphorous	2.25	Sodium Phosphate	10049-21-5	34.87
Silver	0.012	Silver Oxide	20667-12-3	0.013
Vanadium	0.0046	Sodium Metavanadate	13718-26-8	0.011
Zinc	0.31	Zinc Oxide	1314-13-2	1.56

Footnotes:

(1) Spiking rates are based on the current planned feed rate for C2 of 5 trays per hour. The actual rate demonstrated during C2 may increase.

(2) Metals which are found within the WMM processed during the emissions test are not included in this value but will be assessed in determining final demonstrated feed rates.