ATTACHMENT 1- PROCESS DESCRIPTION AND SPECIFICATIONS

1.1. List of SOPs for the EDS

The Permittee shall comply with the procedures in the SOPs listed in Table 1.

Table 1– EDS Phase 2 Standing Operating Procedures

	Title
	Checklists for Establishing the EDS Site
	Checklists for EDS Setup Procedures
	Fill Supply Tanks
	Prepare EDS Firing System
	Select Fragment Suppression System and Explosives for Munition
	Transfer Munition
	Assembly of Fragment Suppression System and Munition
	Closing and Sealing EDS Containment Vessel Door
	Detonate Munition
	Chemically Treat EDS Containment Vessel Contents
	Collect Neutralent Sample
	Remove Neutralent from EDS Containment Vessel
	Rinse and Drain EDS Containment Vessel
	Collect Vapor Sample
	Open EDS Containment Vessel Door
	Remove Solid Waste from EDS Containment Vessel
	Clean and Prepare Equipment
	Drain Supply Tanks
	Monitor and Decontaminate the EDS
	Break Down EDS Operations Area

Note:

EDS = Explosive Destruction System

1.2. Treatment Levels

The Permittee shall comply with the use of the treatment reagent and treatment level for each chemical fill as indicated in Table 2**.** Chemical agent analysis will be performed on every treatment batch of chemical agent neutralent and rinsewater generated.

Table 2- Chemical Fills, Treatment Reagents and Treatment Levels

Chemical Fill	Treatment Reagent and Temperature	First Water Rinse Temperature	Treatment Level[a]
Sulfur Mustards H, HD, HT[b]	90 vol.% MEA at 60°C	100°C	≤ 50 mg/L mustard agent
Nitrogen Mustard (HN-3)	90 vol.% MEA at 60°C	100°C	≤ 50 mg/L mustard agent
Sarin (GB) Tabun (GA)	45 vol.% MEA at 25°C	100°C	≤ 1 mg/L
Sulfur Trioxide/ Chlorosulfonic Acid (FS)	20 wt.% NaOH (heating not required)	Ambient	pH ≥ 10
Titanium Tetrachloride (FM)	20 wt.% NaOH (heating not required)	Ambient	pH ≥ 10

Notes:

[a] Treatment levels shown are for neutralent and rinsewaters.

[b] H, HT and HD will be monitored as HD

MEA = monoethanolamine
mg/L = milligram per liter
NaOH = sodium hydroxide
vol.% = volume percent
wt.% = weight percent

The Permittee shall follow the treatment sequence listed below for each EDS unit:

Overpacked RCWM items will be brought to the unpack area of an Environmental Enclosure. The RCWM items may or may not be removed from the overpack depending on the condition of the item inside. In some cases, the entire overpack with items contained therein will be processed.

The items to be processed shall be placed into an expendable metal holder. Once inside the expendable metal holder, they shall be placed into either an expendable structural framework known as the Fragment Suppression System or the reusable Advanced Fragment Suppression System with expendable steel rods. The decision on which FSS to use shall be made appropriately, based on the number and types of items to be treated. Both frameworks shall serve to connect, hold and align explosive charges that open the main body of items being treated to expose chemical fill and to protect the containment vessel interior from the high velocity fragments resulting during detonation of shaped charges, buster casings and munitions (or other items) Once the charges are attached, a final detonator connection is made. The containment vessel door will then be closed and sealed. The FSS are show in Figures 9, 10 and 11.

Prior to shaped charge detonation, a vacuum check is conducted to confirm the integrity of the vessel seal. If a leak is detected, the detonation shall not commence. Corrective action will be implemented as required per the SOP.

Once the seal is confirmed, the firing system is used to remotely and simultaneously initiate the shaped charges, causing the burster (if present) to detonate. If detonation fails, operators will follow the appropriate EDS SOP.

Following detonation, excess treatment reagent will be pumped/sprayed into the Containment Vessel in accordance with the current SOPs. The Containment Vessel will be heated (if specified) to a minimum specified temperature depending on the chemical fill to be treated. The vessel will be rotated to agitate the contents of the vessel. The Permittee will ensure a complete reaction. Containment Vessel temperature and pressure will be monitored during the treatment process. A SOP shall specify the minimum temperature and maximum pressure allowable. If temperature falls under or pressure exceeds specification listed in the appropriate SOP, the operator shall respond according to procedures in the appropriate SOP.

The length of treatment shall be specified in an SOP. After the treatment time specified in the appropriate SOP, a liquid sample will be collected from the Containment Vessel to monitor the progress of the reaction and/or confirm treatment is complete. Once the treatment level (presented in Table 2) is met, heating and agitation may be stopped. Cool-down temperature shall be specified in an SOP. After cooling to the temperature specified in the appropriate SOP, liquid wastes (neutralent) will be drained from the Containment Vessel into a waste container. The waste transfer flow diagram is depicted in Figure 7.

After the neutralent is drained from the vessel, rinsewater is pumped into the vessel to remove neutralent residue and the vessel is rotated. The first water rinse may be ambient temperature for FS or FM smokes but must be heated to 100^0C minimum for mustard, GA or GB wastes. After cooling to the temperature specified in the appropriate SOP, the Containment Vessel will be drained to a waste container separate from the container used for the neutralent waste.

After draining rinsewater, the Containment Vessel headspace will be flushed with nitrogen or helium, forcing gases to the carbon filter and a headspace vapor sample will be collected in accordance with the site specific sampling and analysis plan to assess the vapor concentration in the vessel.

Once the vapor concentration has been confirmed safe as specified in Table 3 the Containment Vessel door will be opened. The solid wastes will be visually inspected for any unexploded energetic material. Any observed unexploded energetic components will be removed from the

EDS, placed in a compatible container and held on-site for reprocessing in the EDS or will be transferred to EOD for disposition. All other solid wastes shall be manually removed from the vessel and placed into waste containers for solid waste.

Table 3 - Chemical Fills, Treatment Reagents, Treatment and Vapor Screening Levels

Chemical Fill	Treatment Reagent and Temperature	Treatment Level[a]	Vapor Screening Level[bf]	Vessel Clearance Level[cf]
Sulfur Mustards[d] H, HD, HT	90 vol.% MEA at 60°C	≤ 50 mg/L mustard agent	<0.003 mg/m^3	< 0.003 mg/m^3
Nitrogen Mustard (HN-3)[e]	90 vol.% MEA at 60°C	≤ 50 mg/L mustard agent	<0.003 mg/m^3	< 0.003 mg/m^3
Sarin (GB) Tabun (GA)	45 vol.% MEA at 25°C	≤ 1 mg/L	<0.0001 mg/m^3	< 0.0001 mg/m^3
Sulfur Trioxide/Chlorosulfonic Acid (FS)	20 wt.% NaOH (heating not required)	pH ≥ 10	N/A	N/A
Titanium Tetrachloride (FM)	20 wt.% NaOH (heating not required)	pH ≥ 10	N/A	N/A

Notes:

a Treatment levels shown are for neutralent and rinsewaters.
b VSL values are for solid wastes associated with chemical agent only.
c The vessel clearance level was established to determine that the containment vessel door is safe to open. The door may be opened if the clearance level exceeds the level of the table but only with approval from CMA management.
d H, HT and HD shall be monitored as HD.
e HN-3 will be monitored as HN-3.
f Alarm at .7 VSL but screening level and clearance level is 1 VSL.

MEA = monoethanolamine
mg/L = milligram per liter
mg/m^3= milligram per cubic meter
N/A = not applicable
NaOH= sodium hydroxide
vol.% = volume percent
wt.% = weight percent

Once the solid wastes are removed, the Containment Vessel shall then be manually rinsed with water to remove any remaining debris. This rinsewater from the vessel shall be collected in a debris pan that will be located underneath the Containment Vessel. The rinsewater will then be pumped from the debris pan through a strainer into a waste drum that stores only rinsewater. Any remaining solid materials will be placed into a solid waste drum. Both liquid and solid wastes will be transferred to a less than 90-day hazardous waste storage area pending shipment offsite to a permitted treatment, storage, and disposal facility for further treatment and/or ultimate disposal.

Prior to treating subsequent chemical-filled item(s), the Containment Vessel interior will be cleaned and the interior wall of the vessel, its sealing surface, and its door will be visually inspected. If the inspection finds any issues that could possibly compromise future treatments the EDS will be shut down until repairs are made and the unit re-inspected. The Containment Vessel door metal seal and O-ring shall be replaced after each treatment operation. The electrical connection feedthroughs will be replaced as necessary. The containment vessel door is depicted in Figure 12.

The results of all measurements, monitoring, analytical, inspections, repairs, and tests shall be maintained in the operating record. These results shall be clearly labeled according to corresponding and specific treatments.

The Permittee shall never use more than 4.8 pounds of TNT equivalent in each detonation in the EDS (this includes donor charge and any burster).

1.3.0 Components of the EDS

For the purposes of this Permit, The EDS shall be comprised of the following subsystems:

- Trailer Subsystem
- Lift Assist Subsystem
- Containment Vessel Subsystem
- Clamp Hanger Subsystem
- Hydraulic Nut Subsystem
- Rotary Agitation Subsystem
- Reagent Supply Subsystem
- Waste Transfer Subsystem
- Electrical Subsystem
- Explosive Opening Subsystem
- Helium Supply and Leak Detection Subsystem

The characteristics of the subsystems are detailed in Table 4 and a depiction of the subsystems is in Figure 4:

Table 4 - EDS Phase 2 Unit Characteristics Summary

Component	Characteristics
Trailer Subsystem	
Gross Weight of Trailer	Approximately 57,300 pounds
Dimensions of Trailer	39.5 feet long x 8.5 feet perimeter frame dual-axle, single-drop trailer with a fold-up wing
Dimensions of Trailer Containment Pan	154.75 inches long x 69 inches wide by 2.34-5.00 inches deep (approximately 169.64 gallons)
Working Surface of the Trailer	Approximately 42 inches above the ground
Leveling Jacks	Four hydraulic leveling jacks; one between each set of dual wheels and one at each front corner of the trailer
Access to Trailer	Fold-down steps on each side midway to the front and one set of steps for the rear
Safety Railings	4.5-foot high (54 inches) safety railing surrounds the trailer
Additional Feature	Four fold-down platform extensions for additional work area and accessibility

Containment Vessel Subsystem (Measurements are approximate.)	
Outside Length	63 inches
Outside Diameter	36.5 inches
Inside Length	56 inches
Inside Diameter	29 inches
Side Wall Thickness	3.625 inches
Rear Wall Thickness	6.5 inches
Assembly Weight	18,000 pounds
Design Volume	22 cubic feet or 160 gallons
Working Volume	112 gallons
Maximum Explosive	4.8 pounds TNT equivalent

Rating[a]	
Containment Vessel Subsystem (continued)	
Number of Paddles	Two welded in-line, T-shaped paddles to aid in agitation, each 19 inches long x 4 inches wide x 3-1/16 inches tall
Protection Shields/Plates	Four stainless steel blast shields and one blast plate and protection caps
Access Door to the Interior of the Containment Vessel	A 9-inch thick door provides access to the interior of the Containment Vessel
External Heater	Six 7.5 kW, 480-volt band heaters

Clamp Hanger Subsystem	Two sets of clamp hangers with proximity sensors, two drive-pin assemblies and a lead screw
Hydraulic Nut Subsystem	Two Grayloc® clamp halves attached to four threaded steel rods with hydraulic nuts
Lift Assist Subsystem	Lift Assist: Comprised of articulated arm jib crane with iLift, a computer controlled electric winch iLift Winch Dimensions: Approximately 20.5 inches wide x 9.5 inches high x 21 inches deep iLift Winch Lifting capacity: 500 pounds iLift Power Requirement: 220 VAC, Max Current Draw is 15 Amps iLift Approximate Weight: 133 pounds Articulated Arm Jib Crane Dimensions: Approximately 7 feet long boom (fully extended) and 2 feet high above the clamp hanger structure Construction: Mild steel painted with epoxy paint Lifting Capacity: 500 pounds
Rotary Agitation Subsystem	Rotates 360^o at 1 rpm for 15 rotations and then reverses for the same time and revolutions 3-hp, 480-volt, 3-phase motor

Reagent Supply Subsystem	
Supply Tanks Tank Heater Pumps	Two 65-gallon supply tanks with heaters; one tank holds water while the other tank holds reagent An 8 kW 480 V heater per tank Two pneumatic double diaphragm pumps, each rated at 2 gpm at 1,000 psi (to Supply Tanks) Two air-driven pumps rated at 3 gpm (to Containment Vessel)

Dimensions of Secondary Containment Pan	72.34 inches long x 58.69 inches wide x 5.821 inches deep (approximately 106 gallons)
Waste Transfer Subsystem	Consists of four drums: Drums W1 and W1A will be used to collect liquids from the Containment Vessel; Drum W2 will be used to capture vapors from Drums W1 and W1A. Drum W3 will be used for any liquids from the secondary containment pans/sumps. Each liquid waste drum is provided with secondary spill containment.

Electrical Subsystem	Two 480-volt distribution panels and two 120-volt distribution panels for the trailers and their subsystem
Explosive Opening Subsystem	One firing system capable of being positioned 50 feet from the trailer. Control module can be moved up to 300 feet from the firing system panel for remote operation or up to 350 feet from the Containment Vessel.
Helium Supply and Leak Detection Subsystem	Mounted on trailer
Dimensions of Debris Pan	Approximately 52 inches long x 30 inches wide x 11.5 inches deep (approximately 50 gallons)

Reference: Table compiled from information contained in the Project Manager for Non-Stockpile Chemical Materiel *Operations and Maintenance Manual for Explosive Destruction System Phase 2 Series*, current revision.

Notes:

[a] Total net explosive weight including donor charges

gpm = gallons per minute

hp	=	horsepower
kW	=	kilowatt
psi	=	pounds per square inch
rpm	=	revolutions per minute
TNT	=	trinitrotoluene
V	=	volt
VAC	=	volts alternating current

For the purposes of this Permit, The EDS shall contain the following components of each subsystem:

1.3.1 Components of the EDS Trailer Subsystem:

The EDS trailer provides the transportation and work area platform for the EDS unit and has on-board secondary containment for the Reagent Supply Subsystem and the Containment Vessel.

The trailer subsystem shall provide on-board secondary containment for the Containment Vessel using a stainless steel pan of approximately 169.64 gallon capacity.

The EDS trailer subsystem is a dual-axle, single-drop trailer, with four hydraulic leveling jacks, one between each of the dual wheels that provide the capability to stabilize and level the trailer during setup. The Containment Vessel is mounted in front of the axles of the trailer with the Containment Vessel door facing toward the front of the trailer. The area between these components serves as operations and munitions loading areas. The electrical distribution panels, power conditioners, power panels, utility panel, and process panel are mounted at the front of the trailer on the gooseneck. The process controls and instrumentation displays are readily available from the operations and munitions loading area. The controls and displays for the vessel and supply tank heaters, tank level indicators, and hydraulic nut pump controls are located in the front of the operations and munitions loading area. The reagent supply platform is located on the curbside of the trailer. This platform houses the reagent supply panel, water and reagent supply tanks, valves, pumps, and piping. The hydraulic nut pump is controlled from the Vessel control panel located on the roadside of the trailer. The processing valves are located on both the reagent supply platform and the Containment Vessel door. The main piping and electrical conduit run on the underside of the trailer deck.

The working surface of the trailer is about 11 inches below the Containment Vessel mounting surface and is made of stainless steel for compatibility with chemical agents and/or treatment reagents. The trailer has an open stainless steel grid over a stainless steel secondary containment pan. The area around the secondary containment, gooseneck, and vessel is covered with 1/4-inch stainless steel diamond plate. The secondary containment pan floor is sloped from the gooseneck toward the Containment Vessel and is equipped with spray nozzles to wash down the pan. The rails and the structure below the stainless steel working surface are made of carbon steel.

The trailer is accessed from three fold-down stairs and has additional foldout platforms on each side for access around the vessel and the clamp hanger superstructure. A safety rail surrounds the trailer, including the area where the electrical panels are mounted onto the gooseneck.

1.3.2 Components of the Lift Assist Subsystem:

The EDS trailer is equipped with a Lift Assist that is mounted to the overhead clamp hanger support frame. The Lift Assist is an articulated arm crane (jib crane) with a computer-controlled electric winch (iLift) that allows vertical lift and positioning from ground level to the EDS Containment Vessel loading area. The Lift Assist comprises two main components: the iLift winch and the articulated arm jib crane.

1.3.3 Components of the Containment Vessel Subsystem:

The EDS Containment Vessel is where the RCWM being destroyed is accessed and the chemical fill is treated. The Containment Vessel is designed to contain the explosive blast and fragments created when the explosive is detonated as well as prevent the release of chemical agent liquid and vapors. The vessel serves as the reactor vessel for treating the chemical fill and explosive component residue, providing mixing and heating (when needed) to facilitate treatment. The cylindrical Containment Vessel is made of forged type 316 stainless steel. A hinged door allows easy access for inserting items to be treated and removing debris. The door is secured with two large clamp-halves attached to four threaded rods with hydraulic nuts (refer to the Hydraulic Nut Subsystem). The Containment Vessel relies on its all-metal seal to contain each detonation and chemical fill. An ethylene propylene diene monomer (EPDM) O-ring, along with the all-metal seal, provides an annular airspace to measure the stability of the annular space vacuum and to test the vessel door helium leak rate. Following detonation, treatment reagents are delivered into the Containment Vessel.

The interior of the EDS Containment Vessel is equipped with two in-line, T-shaped paddles to aid with mixing during the treatment process. The Containment Vessel contains the following components:

- Door assembly with door valves and fittings
- Containment Vessel heaters
- Door hinge and support jack.

Door Assembly

The door assembly provides access to the interior of the Containment Vessel, ports for liquid and vapor sample transfer, and feedthrough connections for firing. Metal-to-metal seals for the door and feedthrough flange ensure total containment of solid, liquid, and vapor byproducts. An EPDM seal (O-ring) is also on the door and feedthrough flange to allow for leak testing the metal seal.

The door has four stainless steel blast (protector) covers mounted on the interior side to protect connections during detonation operations.

Manual medium pressure valves control flow through the fill and drain ports on the door assembly.

A thermocouple monitors the internal temperatures during processing operations.

The medium pressure, high-temperature, packed-stem valves protect the system components from the pressure spike during detonation.

Manual medium pressure valves control flow of liquids and vapors to and from the Containment Vessel.

Manual medium pressure valve assemblies are used to collect liquid and vapor samples.

Quick disconnect fittings are provided for liquid and vapor flow.

High voltage electrical feedthroughs connect the Firing System to the detonators inside the Containment Vessel.

A depiction of the vessel door is in Figure 12.

Containment Vessel Heater

The Containment Vessel has six external band heaters (each band heater consists of two pieces) that provide conductive heating to the contents inside the Containment Vessel when required to facilitate treatment.

An insulating blanket surrounds the Containment Vessel and band heaters to prevent heat loss to the surrounding area and to provide a barrier between operating personnel and vessel surfaces that can reach 428°F during operation.

Temperature monitoring from the thermocouple provides feedback to the temperature controller located on the Containment Vessel control panel. The desired temperature can be set within a range of ±9°F on the Containment Vessel control panel.

Door Hinge and Support Jack

The door hinge assembly consists of a pin, bushings, features to open and close the door, adjustments for alignment with the Containment Vessel, and a mechanical stop that prevents the door from unintentionally closing when open.

The worm gear-driven machine screw jack incorporates an alloy steel worm, which drives a high-tensile bronze worm gear. The worm shaft is supported on antifriction bearings with seals that prevent loss of lubrication. The housing is made of ductile iron that is rated to support the unit load. Fabric-type boot protectors are provided to cover the exposed portion of the lifting screw. The jack provides support for the Containment Vessel door and hinge when the door is open.

1.3.4 Components of the Clamp Hanger Subsystem:

Clamp Hanger Subsystem is used for opening and closing the Containment Vessel door clamps and supporting their weight while the Containment Vessel door is open. This subsystem consists of two clamp hanger assemblies (one for each clamp half) with proximity sensors, two drive-pin assemblies that each attach to a clamp hanger assembly and a lead screw with an electric drive motor, weight-supporting superstructure, control panel, and pendant control (used in lieu of control panel when precise movement is necessary).

1.3.5 Components of the Hydraulic Nut Subsystem

The Hydraulic Nut Subsystem shall provide sufficient hydraulic pressure to adequately seal the Containment Vessel and door. The Hydraulic Nut Subsystem consists of the following components:

- Hydraulic tensioner power unit
- Grayloc® clamps
- Hydraulic nut assembly
- Pressure gauges
- Hydraulic hoses and connections
- Pendant controller.

Two Grayloc clamp halves attached to four threaded steel rods with hydraulic nuts are clamped around the Containment Vessel door. The Containment Vessel relies on a Grayloc all-metal seal to contain the detonation and the chemical agent. As the nuts are tensioned, the steel rods apply pressure to the flange, pressing the door into the metal ring and forming a metal-to-metal seal between the door, the metal ring, and the Containment Vessel. Hydraulic nuts are used to provide the required pre-load on the clamp to ensure gas-tight Containment Vessel operation.

1.3.6 Components of the Rotary Agitation Subsystem:

The Rotary Agitation Subsystem rotates the Containment Vessel 360 degrees at 1 revolution per minute (rpm) for 15 rotations and then reverses the direction for the same amount of time and revolutions, unless halted. The absolute encoder tracks Containment Vessel movement so that if halted in mid-cycle, the rotation is restarted in the direction and for the number of rotations required to complete the cycle.

The Rotary Agitation Subsystem includes the following components:

- Drive motor and mount assembly
- Vessel support assembly
- Hub/shaft assembly
- Absolute encoder

• Incremental encoder
• Fan motor.

Drive Motor and Mount Assembly

An electric motor and gearbox are mounted on the motor support structure. The gearbox output shaft provides a mechanical coupling with hub/shaft assembly. The Drive Motor and Mount Assembly includes the motor support structure, motor and gearbox to vessel hub coupler, and bearing assembly.

Vessel Support Assembly

The support structure near the front of the Containment Vessel holds the two casters that support the Containment Vessel as it rotates. The support structure at the rear of the Containment Vessel is a two-piece safety ring and mount assembly used during transport or if performing maintenance that requires the rotation shaft assembly to be disconnected from the Containment Vessel.

Hub/Shaft Assembly

The Hub/Shaft Assembly is located between the Containment Vessel and the drive motor gearbox output shaft. The drive motor turns the Containment Vessel through the Hub/Shaft Assembly. A slip ring, a coupler, and a bearing are installed on the hub/shaft. The slip ring is rated at 480 V/50 amperes (amp) and provides power to the Containment Vessel heaters during rotation. The coupler attaches the hub/shaft to the gearbox of the motor and takes up any misalignment between the two assemblies. The bearing holds the rotating shaft and attaches to the mount assembly.

Absolute Encoder

The Absolute Encoder is mounted on the aft (rear) shaft of the drive motor gearbox. The data from the encoder is used by the drive system to stop the Containment Vessel at the "home," "fill," and "drain" positions, in addition to rotating the Containment Vessel. Additionally, the encoder tracks the Containment Vessel position, ensuring an equal number of revolutions in the clockwise and counterclockwise directions.

Incremental Encoder

The Incremental Encoder located inside the electric drive motor controls the number of Containment Vessel revolutions.

Fan Motor

A fan motor is mounted on the top of the electric motor to prevent overheating of the drive motor.

1.3.7 Components of the Reagent Supply Subsystem:

The Reagent Supply Subsystem is used to hold, heat, and transfer reagent and water used to treat the chemical fill and water to rinse the Containment Vessel.

The Reagent Supply Subsystem supplies the two stainless steel tanks located on the reagent supply platform with appropriate reagent, solvent, or water pending transfer to the Containment Vessel for chemical neutralization. Tank 1 is for water, and Tank 2 is for reagents. The reagent supply platform is located on the curbside of the trailer. The platform contains hydraulic cylinders, a secondary containment pan, supply tanks, pumps, valves, and tubing for the Reagent Supply Subsystem. The hydraulic cylinders fold the platform onto the trailer deck for shipping and extend the platform for operations. The platform is slightly higher than the working deck of the trailer in the extended position. The adjustable folding legs support the platform. All the pumps are located on a pump rack, near the back edge of the platform.

The tanks are equipped with external heaters for freeze protection and to make viscous fluids easier to pump. Two pneumatic double diaphragm source pumps transfer water and reagents through lines and manually controlled valves to the tanks. Two high-pressure supply pumps transfer water and reagents through lines and valves to the Containment Vessel. A valve panel allows for the sampling and removal of waste fluids from the Containment Vessel. Valves are located on the platform, the Containment Vessel door valve panel, and the secondary containment pan.

The Reagent Supply Subsystem includes the following components:

- Reagent supply panel
- Hose docking station
- Water and reagent tanks
- Pan pump panel
- Pan pump
- Vacuum pump
- Water and reagent supply pumps
- Reagent source pump
- Water source pump
- Air panel
- Waste drum quick-disconnect bracket.

Reagent Supply Panel

This panel provides the operator with access to the mounted valves to control the reagent supply system. Cutout windows allow visual access to the magnetic float level indicators on the supply tanks.

Hose Docking Station

The station located to the right of the reagent supply panel holds the QE (effluent drain hose), QS (reagent, helium, and water supply hose), QV (vacuum hose), and LD (vacuum flange on helium leak detector hose) during Containment Vessel rotation. The Hose Docking Station also holds the hydraulic tensioner pump hose during vessel rotation. Proximity switches initiate Containment Vessel rotation only when the hoses are in their docking station.

Water and Reagent Tanks

The two stainless steel tanks have electrical resistance heaters mounted on the bottom to heat the water and reagents. Tanks have thermocouples for temperature control and side-mounted float level indicators with high- and low-level switches. The low-level switch, when activated, will shut off the external tank heaters and sound an audible alarm.

Pan Pump Panel

A panel located on the rear of the reagent supply platform on the pump rack contains a quick-connect and three hose storage connections. Three storage quick-connects cap the hose lines to the trailer secondary containment pan, reagent supply platform secondary containment pan, and the strainer during non-operational periods. The functional quick-connect leads through a valve to a pneumatic pan pump and then to the pan waste drum.

Pan Pump

A pneumatic double diaphragm pump is used for removing wastes from the secondary containment pan.

Vacuum Pump

The vacuum pump evacuates sample lines prior to collecting a liquid or vapor sample. The vacuum pump exhaust is routed through a process waste container with attached drum filter in the Waste Transfer Subsystem (as applicable depending on the chemical fill being treated) and/or the Environmental Enclosure air filtration system.

Water and Reagent Supply Pumps

Two high-pressure supply pumps are used to supply water and reagent to the Containment Vessel from the tanks. Pneumatic motors drive the pumps with the pneumatic motor input set to 80 pounds per square inch gauge (psig) for normal operations. The pneumatic motor input pressure can be increased to a maximum of 100 psig to overcome higher than normal Containment Vessel pressures. These pumps may be interchangeable, when necessary.

Reagent Source Pump

A pneumatic double diaphragm pump, rated for 14 gallons per minute (gpm) at 100 psi, is used for filling the reagent tank from 55-gallon drums of reagent.

Water Source Pump

The pneumatic double diaphragm pump, rated for 14 gpm at 100 psi, is used to fill the water tank from a non-pressurized water source and can supply pressurized water to the nozzles in the trailer secondary containment pan.

Air Panel

A panel located on the side of the reagent supply platform next to the curb side stairs contains two air pressure regulators, a helium regulator, four quick-connects, and two valves. The air regulators control the maximum air pressure to the source pumps and the supply pumps. The helium regulator limits the maximum helium pressure for leak rate testing to approximately 20 psi. The two valves provide an auxiliary air connection for pneumatic tools, etc. The four quick-connects provide water or reagent to the spray nozzles in the trailer secondary containment pan, pneumatic inlet to the reagent supply platform, and helium inlet to the reagent supply platform.

Waste Container Quick-Connect Bracket

The bracket on the aft side of the reagent supply platform provides the hose quick-connects to a waste container. The bracket also contains an effluent sample collection station.

1.3.8 Components of the Waste Transfer Subsystem:

Drums 1 and 1A will be used to collect liquids from the Containment Vessel; Drum 2 will be used to capture vapors from Drums 1 and 1A. Drum 3 will be used for any liquids from the secondary containment pans/sumps.

Each liquid waste drum shall be provided with secondary spill containment that is in excess of the volume of the drum.

Also included in the Waste Transfer system is all the ancillary piping, valves and equipment depicted in Figures 7 and 8.

The waste transfer subsystem equipment is used to:

• Drain liquid and vent vapors from the Containment Vessel.

• Drain/pump out liquid from the trailer secondary containment pan and the reagent supply platform secondary containment pan for further transfer to applicable liquid waste containers.

• Filter vented system vapors through an ASZM-TEDA drum filter (depending on chemical fill being treated).

• Contain liquid wastes.

The liquid and vapor will be drained and vented from the Containment Vessel to 55-gallon, United Nations (UN) rated, liquid waste drums. The drum assemblies use weight scales to monitor drum weight as a means to account for all effluents and prevent overfilling.

Four waste containers will be initially used. The Containment Vessel waste transfer and secondary containment pan waste transfer diagrams (Figures 7 and 8) depict a typical waste transfer setup using liquid waste drums. Waste drums 1 and 1A are connected to a three-way selector valve in the drain line from the Containment Vessel. The valve can be switched to fill each liquid waste drum with its designated fill of either neutralent or rinsate. The liquid and vapor generated from chemical treatment and rinsing will be transferred from the Containment Vessel through a hose connected to waste drums 1 and 1A (Figure 7). The vapor vents out of the liquid waste drums into a 55-gallon, UN rated, liquid waste drum 2 where it vents to an attached silica gel/ASZM-TEDA drum filter (as applicable) and/or connected to the air filtration system carbon filter system. Waste container 3 is used to contain liquids generated from wash-downs contained in the trailer and platform secondary containment pans (Figure 8). Open-head drums will be used to contain solid waste materials.

The liquid waste drums will be placed within a portable secondary containment pan.

1.3.9 Components of the Electrical Subsystem:

The Electrical Subsystem provides the required 480 V, 3-phase electrical power for the vessel, supply tank heaters, rotary agitation, and drive motor via two distribution panels. Conditioned 120 V power from two distribution panels is supplied to other subsystems. Electrical power can be supplied by utility power (130 amp minimum) or by a generator.

1.3.10 Components of the Explosive Opening Subsystem:

The Explosive Opening Subsystem shall consist of the Fragment Suppression System (FSS) with explosive shaped charges or the Advanced Fragment Suppression System (AFSS) plus, the Firing System and donor charges. Both frameworks must serve to connect, hold and align explosive charges that open the main body of items being treated to expose chemical fill and to protect the containment vessel interior from the high velocity fragments that result during detonation of shaped charges, burster casing and munitions (or other items).

Donor charges are used to access the RCWM fill, thereby releasing the chemical fill into the Containment Vessel. The donor charges are also used in destroying the munitions' burster explosive (if present).

Fragment Suppression System

The FSS shall be constructed of 1018 steel or compatible mild steel and shall be comprised of the following:

a. A cylinder. Top, bottom cradle, stopper block (as required) and end plates or rings (as required).
b. Munition Holder. Varies in configuration to accommodate various munitions and size (for example, 75mm, 155mm, 4-inch Stokes, etc.)

End plates shall be placed on each end of the FSS to further protect the rear wall of the containment vessel and the interior surface of the vessel door.

The FSS comes in seven sizes and requires twelve similar but specific munition holders.

The FSS shall be fully assembled with items to be destroyed, FSS and shaped charges before it is placed in the containment vessel for processing.

Figures 9 and 10 show components of the FSS. Table 5 states the physical characteristics of the Fragment Suppression System.

Table 5 - Fragment Suppression System Characteristics

Fragment Suppression System[a]	Length (in.)	Width (in.)	Height (in.)	Weight (lbs.)
75mm Shell FSS	24.75	15	14.38	130
4.2-inch Mortar FSS	24.75	15	14.38	130
Livens Projectile FSS	24.75	15	14.38	130
M139 Bomblet FSS	30.75	15	14.38	165
155mm Projectile FSS	36	19	18.375	456
8-inch Projectile FSS	36	18.375	19	300
3-round 75mm Shell Multiple Munition Fragment Suppression System (MMFSS)	30	14.25	14.875	329
3-round 4.2-inch Mortar MMFSS	30	14.25	14.875	304
6-round 75mm Shell MMFSS	44	17.63	19.55	502
6-round 4.2-inch Mortar MMFSS	44	17.63	19.55	452

Notes:

[a] Weights and dimensions are an assembled FSS configuration, without munitions.

FSS = Fragment Suppression System

in = inches

lbs. = pounds

MMFSS = Multiple Munition Fragment Suppression System

Advanced Fragment Suppression System

The Advanced Fragment Suppression System is a reusable framework with expendable steel rods designed to contain a metal holder with munitions or other items within.

The Advanced Fragment Suppression System consists of the main unit weldment, insert weldment, front capture plate, front spacer, 86 short rods, paddle gap cover, and two support plates. Figure 11 shows the Advanced Fragment Suppression System and associated components. Table 6 states the characteristics of the AFSS.

Table 6 - Advanced Fragment Suppression System Characteristics Summary

Component	Characteristics
Rods	1.25 inches diameter x 51.0 inches long; cold drawn steel
Support Plates	.1196 inches thick x 19.5 inches or 17.5 inches wide x 44 inches long; mild steel
Paddle Gap Cover	.5 inches thick x 4 inches tall x 10 inches long; hot roll steel
Front Spacer	1.88 inches outside diameter x 1.35 inches inside diameter x 0.775 inches long; cold drawn steel
Front Capture Plate	.75 inches thick x 5.0 inches high x 10.0 inches long; hot roll steel
Insert Weldment	.75 inches thick x 5.0 inches high x 10.0 inches long with 1.25-inch diameter rods
Main Unit Weldment	29 inches outside diameter x 23 inches inside diameter x 51.0 inches long
AFSS Weight	1,660 lbs

Note:

AFSS = Advanced Fragment Suppression System

Donor (Explosive) Charges

Donor charges shall consist of either linear-shaped charges (LSCs) or conical shaped charges (CSCs). The LSCs are used in both the FSS and AFSS to access the main body of the munition or item to expose the contents for chemical treatment and to disrupt the explosive train of the munitions. The primary requirement, cutting the walls of the munition(s) or item(s), is accomplished with pre-formed length(s) of copper-sheathed LSC with a cyclonite (RDX)-based explosive filler. The shape, length, and grains per foot of the LSC are specific for the type of munition(s) or item(s) to be treated. When processing multiple munitions, up to three LSCs may be used.

CSCs may be used in addition to an LSC in the FSS to puncture a munition burster and to detonate the burster explosives. Depending on the munition (or other item) type and x-ray result, one or two CSCs may be positioned on the upper shell of the FSS above the munition. CSCs shall not be used when processing multiple items nor when using the AFSS.

Detonators

Exploding bridge–wire detonators shall be used to initiate donor charges. The Firing System is used to electrically initiate the donor charges. The detonators used to initiate the LSCs shall be Reynolds type RP-1®. CSCs shall be initiated by Reynolds type RP-2®.Both detonator types shall be insensitive to unexpected or undesirable energy inputs (static, impact, etc.) and shall be detonated by the discharge of high current through the bridge-wire. The bridge-wire explodes and produces a shock wave, which, in turn, initiates the explosive in the shaped charges. The firing system shall be used to simultaneously initiate the LCSs and CSCs.

Firing System

The Firing System is a high-voltage capacitor discharge unit capable of firing four to six exploding bridge-wire detonators. The Firing System is connected to the detonators in the Containment Vessel by cables, and is remotely operated through a detachable control module that allows the operator to arm and fire the Firing System from up to 350 feet away. The firing system includes various features necessary to safely fire the detonators and to test and monitor the system and detonator cables. One of these features is a safety interlock plug to prevent inadvertent operation of the system.

1.3.11 The Helium Supply and Leak Detection Subsystem consist of the following main components:

Components of the Helium Supply and Leak Detection subsystem:

- Helium compressed gas cylinder
- Pressure regulators and gauges
- Flexible hoses
- Leak detector.

The functions of the Helium Supply and Leak Detection Subsystem are as follows:

- Pressurizes the Containment Vessel to test the integrity of the Grayloc seal and the EPDM O-ring

- Measures the annular space vacuum and helium leak rate between the seal and O-ring

- Flushes vapors from the Containment Vessel and piping (alternatively nitrogen may be used.).

There are essentially two parts to the Helium Supply and Leak Detection Subsystem: the helium supply and the leak detector. The helium supply components will provide helium gas for pressurizing the vessel for the leak check and for flushing the headspace. The helium compressed gas cylinder is an approved Department of Transportation (DOT) steel cylinder. The helium bottles are located on the side of the right side set of stairs and secured to the helium bottle bracket.

Helium supply and leak detection are separate subsystems that will be used together to test the Containment Vessel seal.

The leak detector is mounted in the helium leak detector box on the trailer.

1.4. General Operating Conditions and Specifications of the EDS, including Subpart AA, BB and CC Compliance:

Waste transfer system shall consist of four drums: Drums 1 and 1A will be used to collect liquids from the Containment Vessel; Drum 2 will be used to capture vapors from Drums 1 and 1A. Drum 3 will be used for any liquids from the secondary containment pans/sumps. Each liquid waste drum is provided with secondary spill containment that is larger than the volume of the drum.

Liquid and gaseous waste effluents from the Containment Vessel shall be drained through flexible hoses connected to 55-gallon waste drums 1 and 1A. Emissions from waste drums 1 and 1A shall be diverted to a 55-gallon drum fitted with an ASZM-TEDA drum filter and will be diverted to the air filtration system carbon filter system. The flow diagram for wastes from the containment vessel is depicted in Figure 7.

Each EDS unit shall be on a trailer equipped with 169 gallons of on-board secondary containment for the containment vessel and located within an Environmental Enclosure consisting of a ceiling, sides, and impermeable flooring. The entire trailer shall reside within a secondary containment pan. Prior to operation, the ground surrounding the Environmental Enclosures for the EDS units shall be graded to direct the flow of liquids away from the structure. The flow diagram for liquids in the secondary containment pan is depicted in Figure 8.

The Permittee shall prevent any wastes from contacting the soil.

If any environmental hazard such as thunderstorm, flooding or earthquake occurs prior to or during operation, the Permittee shall suspend operations at the soonest opportunity it is safe to do so. Operations shall remain suspended until the area is deemed fit for use by the supervisor of EDS operations. Rationale shall be documented in the operating record.

Work areas will be monitored for the appropriate chemical agent vapors, depending on the type of chemical fill being treated.

Workspace air will be vented to each Environmental Enclosure Air Filtration System. The air filtration system carbon will use sulfur impregnated carbon (SIC) to address any mercury contamination. Fire safety equipment designed for chemical and electrical fires will be staged in the support areas and other support will be provided by the TEADS fire department, as necessary.

Operators will be trained in the function and operations of the EDS and associated equipment.

EDS treatment operations will be conducted remotely; no personnel will be present inside the Environmental Enclosure during detonations.

Operations will be observed and recorded through the use of closed-circuit televisions.

Personnel operating the EDS equipment will wear appropriate PPE.

Operators shall keep a log of events that occur during a work shift. These events include activities before, during, and following the destruction of RCWM items, all near real-time (NRT) monitoring alarms, and historical monitoring confirmations. Datasheets will enable operators to review historical analysis and records.

The EDS shall only be located in a specific area of TEADS. The area permitted for the EDS to operate is depicted in Figure 2.

Each Environmental Enclosure shall be equipped with an Air Filtration System. The Air Filtration System consists of a prefilter, high efficiency particulate air (HEPA) filter, two banks of sulfur impregnated carbon filters, and another HEPA filter along with fan and ductwork.

Each Air Filtration System shall have process controls that will allow operators to monitor the status of the systems to ensure they are performing within design specifications. The system also shall include air-monitoring devices that will allow operators to determine if chemical agent vapors are present between the carbon filter banks. The Permittee shall ensure that no chemical agent vapors are emitted at the stack. This shall be verified by monitoring of the air exhaust.

The Permittee shall supply continuous power to the EDS. If the main power is supplied by TEADS then a backup generator shall also be available on-site to power the EDS in case the TEADS power fails. If the Permittee supplies its own power via generators it shall have a minimum of one primary and one backup generator to power operations. Each EDS unit shall be equipped with an emergency power generating system that will be located adjacent to the Environmental Enclosure. The system will consist of one emergency diesel generator capable of carrying the entire emergency load of the corresponding EDS unit. The emergency power generating system will provide backup power to all critical and essential loads in case of a power outage (for example, monitoring and lighting).

The explosive opening subsystem shall consist of one firing system capable of being positioned 50 feet from the trailer. The control module can be moved up to 300 feet from the firing system panel for remote operation or up to 350 feet from the Containment Vessel.

Each EDS unit shall be placed inside an Environmental Enclosure that provides weather protection and interior environmental control for worker comfort and safety. Each enclosure shall have an air filtration system that contains a carbon filter system to maintain a negative pressure within the structure relative to the outside air and to capture any vapors that may result from a release.

The EDS and Environmental Enclosure shall be placed on a concrete pad large enough to cover the surface area of the Environmental Enclosure, Personnel Decontamination Station, and Unpack Area; or a layer of geotextile material shall be placed on the ground inside the enclosure followed by a 6-mil (minimum) plastic sheeting layer with end sections placed up the side walls to form a containment basin. Interlocking track flooring will be placed over top of the two layers for added protection.

Spill containment pans or portable berm areas will be placed underneath any equipment, liquid waste containers, and work areas that have a potential to leak or spill liquids. All secondary containment will exceed the volume of liquids contained within. Environmental Enclosures shall be provided with full coverage impervious bases.

The Environmental Enclosures will be one of two types described below. No matter which type of enclosure is used, it will be equipped with doors for entrance and egress and will be connected to an air filtration system that consists of pre-filters, high efficiency particulate air (HEPA) filters, and carbon filters along with an agent monitoring system, fan, and ductwork.

Environmental Enclosure option 1 - **General Purpose Operations Shelter (GPOS).** The GPOS is a tent-like, all-weather mobile shelter consisting of a series of arched rigid ribs and tentage.

Environmental Enclosure option 2 - **Vapor Containment Structure (VCS).** The VCS is a fully-enclosed pre-engineered steel building consisting of a series of arched aluminum ribs integrally connected by modular architectural membrane panels.

Inside the environmental enclosure, the air filtration system contains a modulating flow control damper, a filter housing containing a prefilter, HEPA filter, two high-efficiency gas adsorber (HEGA) filter banks in series, another HEPA filter, and an exhaust fan powered by a motor. The exhaust fan, in conjunction with the modulating damper, maintains a constant flow rate through the carbon filter unit. The filter unit draws air from the Environmental Enclosure. The Environmental Enclosure will be maintained at negative pressure relative to the atmosphere by manually throttling the air intake damper. The carbon filter unit discharges to the environment.

The prefilter is designed to remove large particulate matter from the air stream prior to reaching the downstream HEPA filter. The upstream HEPA filter protects the HEGA filters from particulate matter and the downstream HEPA traps any carbon fines that escape from the HEGA filters. Prefilters and HEPA filters are replaced when the pressure drop across individual filters exceeds established criteria. The carbon bed control efficiency is 99.9 percent for chemical agent.

Each HEGA filter bank contains nine ASTM Type I cells. Each cell contains 18 inches of sulfur-impregnated charcoal. (The two banks in series provide a total carbon thickness of 36 inches.)

The HEGA filters are replaced when carbon filter performance deteriorates to the point where chemical agent breakthrough of the carbon bed occurs. MINICAMS® are used to monitor the concentration between the two HEGA banks and will detect any chemical agent breakthrough at 0.7 Z (where Z is equivalent to the exposure limit). If detection is confirmed, the operation will be brought to a safe shutdown state. The first carbon filter will be removed and disposed of, the second carbon filter will be moved to the first, and new carbon will be added to the second filter. Upon completion, all filters will be leak checked and monitoring capabilities restored before operations resume.

All filters (prefilter, HEPA, HEGA) are of the bag in/bag out type, which allows filters to be replaced from the exterior of the filter housing without exposing personnel to the contents of the spent filters. Plastic bags surrounding the access openings encapsulate the filters prior to removal.

Overhead lighting will be provided throughout each Environmental Enclosure. Process water from a potable water supply line will be provided for showers, eyewash stations, and decontamination. Station and instrument air will be available for operation of air-operated process equipment and maintenance tools. Breathing air for emergency operations will be provided from a cascading air system.

Air monitoring equipment will be housed in a module for each EDS unit at the EDS site. Sampling lines from the air monitoring equipment will be installed to each sampling point for each EDS unit. All critical near real-time (NRT) monitoring equipment will be connected to an uninterruptible power supply.

An operational Command Post Trailer shall be located at the EDS site and will be equipped with the necessary computers and communications equipment to assist with the control of operations and collection of data for operations.

Explosives used during EDS operations at the EDS site shall be stored in service magazine(s) in accordance with Department of the Army policy. Explosives will be transferred to each EDS unit as needed.

A Personnel Decontamination Station for each EDS unit shall be set up at each Environmental Enclosure in accordance with the site-specific Health and Safety Plan for personnel to decontaminate personal protective equipment (PPE) and equipment when leaving the exclusion zone of each operation.

Facilities will be provided for personnel to don PPE and to shower after passing through the Personnel Decontamination Station.

A mobile chemical laboratory trailer will be set up at the EDS site to provide onsite chemical agent laboratory analysis services for air and liquid samples. The laboratory will analyze air samples from confirmational and historical samples. Liquid neutralent samples will be analyzed to screen for the particular chemical fill being treated.

During the EDS site operations, near real-time monitoring shall be performed using MINICAMS®. MINICAMS alarms will be confirmed using Depot Area Air Monitoring System (DAAMS) (for chemical agent). Historical monitoring will be performed using DAAMS tubes for chemical agent. No historical monitoring is required for industrial chemicals. In the event of a monitoring alarm, the munition will be secured and the source of the alarm will be investigated.

The Air Filtration System consists of a pre-filter, HEPA filter, two HEGA filter banks in series, another HEPA filter and a motor-powered exhaust fan to maintain a negative pressure within the structure relative to the outside air and to capture vapors. The filter unit draws air from the Environmental Enclosure and the carbon filter unit component discharges to the atmosphere.

Contaminants entering the air inside the Environmental Enclosure or produced by EDS operations are captured by the AFS and must pass through the filters before being emitted to the atmosphere.

The vapor and liquid effluents generated by treatment process shall be either vented or drained from the EDS Containment Vessel into the Waste Transfer System consisting of two 55-gallon drums with a 55-gallon Surge Drum. Neutralent waste shall be collected in one of the drums while the other drum collects rinsate from water rinses of the EDS Containment Vessel. After the final rinse, the EDS Containment Vessel shall be purged with either nitrogen or helium. The vapors expelled from the EDS Containment Vessel shall be vented through the Rinsate Waste Drum. Vapors vented from the Waste Transfer System shall pass through a silica gel/ASZM-TEDA carbon filter attached to the Surge Drum and will be directed to the enclosure AFS. The two HEGA filter banks in the enclosure AFS shall be composed of sulfur-impregnated carbon (SIC) beds.

The drum assemblies shall use weigh scales to monitor weight as a means of accounting for effluents and to prevent overfilling. The waste containers shall be protected from over-pressurization by a 10 pounds per square inch (psi) rupture disc. If the rupture disk should function, an alarm shall sound and a valve must automatically close to halt the flow of effluent into the waste drum. The rupture disk shall be replaced with a new one after each occurrence and before the system may be placed back into operation.

The waste effluent drums for rinsate and neutralent shall be closed at all times except as necessary to add or remove waste.

The waste effluent drums must not be opened, handled or stored in a manner which may rupture the container or cause it to leak.

Spilled or leaked waste must be removed from all EDS containment systems in as timely of a manner as necessary to prevent over flow of the containment system and at a minimum before the next treatment operation begins.

EDS carbon filters shall be tested before first use, after each changeout of carbon filters, and before restarting operations after a temporary closeout. Testing shall be in accordance with the

American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) standard N510-2007, "Testing of Nuclear Air Cleaning System."

MINICAMS® and Depot Area Air Monitoring System (DAAMS) confirmation monitoring shall be used to monitor the enclosure AFS. The presence of chemical agent at the mid-bank shall be monitored continuously; the filters must be replaced should breakthrough be confirmed. Monitoring shall be performed to provide sufficient warning so that corrective action can be taken before a release of chemical agent occurs.

Carbon filters shall be changed out when (1) mid-bank monitoring confirms breakthrough of chemical agent at a concentration at or above the VSL alarm level and (2) after completing EDS treatment operations (RCRA closure) if the carbon cannot be reused. If a carbon mid-bank monitoring detection is confirmed the operation shall be brought to a safe shutdown state. The first carbon filter shall be removed and disposed of as a hazardous waste, the second carbon filter shall be moved to the first, and a new carbon filter shall be added as the second filter. All filters shall be leak checked in accordance with the ANSI N510 standard before processing may resume. The Permittee must certify mechanical integrity of the filter units before bringing them back into service after the carbon changeout.

Subpart AA, BB and CC Compliance

The subpart AA, BB and CC regulations control air emissions from certain process vents and equipment leaks, as well as air emissions from certain tanks, containers, and surface impoundments.

Subpart AA requirements are not applicable to the EDS. This section details applicability and compliance with BB and CC regulations.

Subpart BB requirements (R315-8-18) are applicable to the EDS equipment. The EDS Subpart BB equipment to be monitored is as follows:

1. Valves located on the Containment Vessels and valves located in the waste transfer systems (valves on process waste drums 1 and 1A) for each EDS unit.
2. Sample connection systems (in each EDS unit).
3. Double diaphragm pan pumps located in each EDS trailer containment pan.

Each EDS unit will be operating in a batch process. When first placed into operation at TEADS and prior to initially processing munitions/items, a vacuum leak check shall be performed to test adequacy of the Containment Vessel as well as a leak check on the vessel seals, feedthroughs, valves, and fittings. The EDS must pass this check prior to processing munitions/items in the EDS. During every treatment campaign, there shall be a helium leak check performed on these parts. The leak check shall be conducted in accordance with the approved SOP. This helium leak check shall be performed as follows: After the Containment Vessel door is closed, the vessel shall be pressurized with helium and the high voltage feedthroughs, door valves, and door fittings are helium leak checked using a sniffer probe. Next, the helium leak detector shall be used to determine if there is any helium leakage from the interior of the Containment Vessel across the Grayloc® metal seal ring into the annular space created by the metal seal ring and the O-ring mounted on the vessel door. The last part shall be the helium leak check on the high-voltage feedthrough flange, which is fitted with a smaller Grayloc metal seal ring and O-ring that creates an annular space between the two, same as the Containment Vessel door.

Leaking equipment will be replaced as soon as operationally feasible but no later than prior to processing the next munition. The unit must pass post-repair testing on the affected area of the system. Post-repair testing is defined as conducting a helium leak check after a detected leak is repaired. After routine preventive maintenance, the EDS units will be returned to service and monitored in accordance with monitoring criteria in this attachment. Results from the all leak checks and monitoring will be recorded in the facility operating files.

Operating hours will be recorded for equipment items identified as exempt under 40 CFR 264.1050(f) per requirements in 40 CFR 264.1064(k) using the form in Figure 13. All required reports will be submitted in accordance with 40 CFR 264.1065. The operating hours will be reviewed every three months. If it is determined that the operating hours are on projection to exceed 300 hours in a revolving calendar year, the Permittee shall begin monitoring exempt equipment. The sheet to track waste transfer times for Subpart BB compliance is depicted in Figure 13.

All wastes entering and exiting the EDS units and entering the less than 90-day hazardous waste storage area for storage shall be subject to the Subpart CC requirements unless a particular waste stream or waste management unit meets an exclusion or exemption and that exclusion or exemption is documented in the operating record.

Containers larger than 26 gallons that store wastes with organic content greater than 500 ppmw shall be subject to Subpart CC requirements. All containers in the EDS Waste Transfer System are subject to Subpart CC requirements. These containers shall be kept closed except when adding, removing, or sampling wastes.

The Permittee shall ensure all closure devices (lids, bungs, covers) are in good condition (closed securely, no visible damage that would impair storage or cause vapor or liquid spillage or liquid leakage). Containers must be visually inspected for defects at the time the waste is first placed in the container or when accepted at the facility (in this case the less than 90-day hazardous waste storage area). A visual inspection will be recorded when the containers are connected to the EDS Waste Transfer System to ensure good condition prior to processing wastes in an EDS, and also when waste containers are placed in the less than 90-day waste storage area. Upon discovering any defect, the container must be repaired within 24 hours. The container defect must be repaired or the container removed from service immediately if leaking. All inspections and corrective actions shall be documented in the operating record.