BECHTEL PARSONS BLUE GRASS
A Joint Venture of Bechtel National, Inc. and Parsons Government Services Inc.

Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)

Environmental Document

Attachment I – Closure Plan

Contract W52P1J-09-C-0013
(CDRL A010)

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prepared for
Program Executive Office –
Assembled Chemical Weapons Alternatives (PEO ACWA)

Approval

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3	31 OCT 2023	Revised to address KDEP comments.
2	25 OCT 2022	Rewritten to address KDEP comments.
1	20 MAR 2019	Updated to Address KDEP Comments.
0	09 SEP 2014	Initial issue

List of Changes

Change No.	Effective Date of Change	Brief Change Description
0	31 OCT 2023	See Record of Revision description.

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1.0 PURPOSE

401 Kentucky Administrative Regulations (KAR) 39:090 Section 1; 40 Code of Federal Regulations (CFR) 264.112(a) and 761.65

This closure plan describes the processes that will be used to close the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) Main Plant and supporting facilities to achieve Resource Conservation and Recovery Act (RCRA) non-residential clean closure of the facility. Additionally, this closure plan addresses closure of Toxic Substances Control Act (TSCA)-regulated polychlorinated biphenyl (PCB) waste storage and processing areas as part of final closure activities for the Main Plant.

2.0 SCOPE

The RCRA and TSCA permitted units addressed by this plan are located in the Container Handling Building (CHB), Munitions Demilitarization Building (MDB), Supercritical Water Oxidation (SCWO) Processing Building (SPB), Hydrolysate Storage Area (HSA), SCWO Tank Area (STA), Waste Transfer Station (WTS), Container Storage Facility (CSF), and Non-Contaminated Rocket Motor (NCRM) Storage igloos.

3.0 GENERAL INFORMATION

In addition to the Main Plant and associated facilities, the BGCAPP also operates two Static Detonation Chamber (SDC) systems to augment the Main Plant operations, but their hazardous waste operating permits are separate from the Main Plant RCRA Permit. The SDC systems will be closed under separate closure plans.

The objectives of closure are to clean close the facility in a manner that is protective of human health and the environment and to eliminate the possibility of any future releases. There are two major components that must be addressed for non-residential clean closure of the BGCAPP Main Plant facility: (1) closure performance standards and (2) closure verification. The closure performance standards identify the requirements or conditions that must be satisfied to close the facility in a manner that is protective of human health and the environment, and they are addressed in this closure plan. The closure performance standards address RCRA, chemical agent, and TSCA closure performance standards, as well as the treatment standards for hazardous debris. This closure plan describes how the Main Plant facility will be closed to satisfy the closure performance standards for non-residential clean closure.

The second component of closure is closure verification. Closure verification provides confirmation that the non-residential clean closure criteria have been met through an approved sampling and analysis plan. The non-residential clean closure criteria are quantitative concentrations or levels of contaminants that, if not exceeded, will ensure protection of human health and the environment, and they are defined in the Closure Verification Sampling and Analysis Quality Assurance Project Plan (CVQAPP). The CVQAPP is a separate, stand-alone plan that compliments this Closure Plan. The CVQAPP presents the policies, organization, functions, field sampling design and Quality Assurance/Quality Control (QA/QC) requirements designed to achieve the data quality goals associated with field and Lab sampling operations for BGCAPP closure verification sampling.

4.0 DEFINITIONS

The following terms are used in this closure plan and are defined as follows:

Action Level	Monitoring level established for each airborne exposure limit (AEL) using each applicable monitoring method at which precision and accuracy studies demonstrate there is a 95% confidence the corresponding AEL concentration will not be exceeded Previous chemical demilitarization facilities have applied an action level of 0.7 Z, where Z is the corresponding AEL. Implementing procedures will document applicable action levels for specific monitoring methods and agents.
Active Life	The period from the initial receipt of hazardous waste until the Director receives certification of final closure The active life of the unit or facility includes the closure period prior to final closure certification.
Active Portion	That portion of a facility where hazardous waste treatment, storage or disposal operations are being, or have been, conducted and which is not a closed portion
Air Wash	A decontaminating method that allows equipment, process systems, and areas to be exposed to ambient atmosphere within engineering controls to remove agent-vapor-based contamination
Airborne Exposure Limit (AEL)	Allowable concentrations of airborne chemical agent for workplace and general population exposures AELs include general population limits (GPLs), worker population limits (WPLs), short term exposure limits (STELs), and immediately dangerous to life or health (IDLH) values.
Ancillary Equipment	Any device including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps, that is used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment unit, between hazardous waste storage and treatment units, or to a point of shipment for disposal offsite unless it is specifically identified as a permitted hazardous waste management unit in the BGCAPP RCRA Permit
Container Accumulation Area (CAA)	Any onsite hazardous waste container accumulation area with hazardous waste accumulating in containers (less than 90-days) subject to the large quantity generator requirements of 401 Kentucky Administrative Regulations (KAR) 39:080 Section 1 (40 CFR 262.17) that meets the conditions for exemption from the storage facility requirements in 40 CFR 124, 264 through 268, and 270

Clean Closure	Decontamination and/or removal of all equipment, systems, and areas containing, or contaminated with, hazardous waste (including agent) or hazardous constituents in a manner that is protective of human health and the environment and such that no post-closure care is required Non-residential clean closure is achieved by achieving clean closure standards applicable to non-residential land uses.
Clean Closure Criteria	Quantitative concentrations or levels of contaminants that, if not exceeded, will ensure protection of human health and the environment Criteria may consider reasonably expected future land use such that non-residential exposure assumptions may be applied provided continued maintenance and use as non-residential land.
Closed Portion	That portion of a facility that an owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements
Closure Performance Standards	Requirements or conditions that must be satisfied to close the facility in a manner that is protective of human health and the environment; they are addressed in this closure plan The closure performance standards address RCRA, chemical agent, and TSCA closure performance standards as well as the treatment standards for hazardous debris.
Closure Verification	Confirmation that the non-residential clean closure criteria have been satisfied through an approved sampling and analysis plan Achieving the non-residential clean closure criteria will allow BGCAPP to close without the need for further maintenance or controls (post-closure care) for future non-residential land use. Analytical results from closure verification sampling and analysis will be used to demonstrate that non-residential clean closure criteria have been met as part of the closure certification process.
Closure Verification Sampling and Analysis Quality Assurance Project Plan (CVQAPP)	The CVQAPP defines the methodology and quality requirements for closure verification sampling that will demonstrate that the decontamination, decommissioning, and demolition activities described in the Closure Plan have been performed effectively such that hazardous waste and hazardous constituents have been removed in a manner that is protective of human health and the environment so that no post-closure care is required.
Contamination	The deposit, absorption, or adsorption of a hazardous substance on surfaces, equipment, structures, personal protective equipment, or personnel Agent-contaminated items are those where agent is known or suspected to be on or contained within the matrix at some level of potential health concern such that safeguards are required.
Debris	A solid material exceeding a 60 mm particle size that is intended for disposal and that is any of the following: • A manufactured object • Plant or animal matter

	• A natural geologic material A mixture of debris and other material is still classified as debris if the mixture is comprised primarily of debris by volume based on visual inspection. A mixture of debris that has not been treated to meet the chemical agent and PCB closure performance standards in this closure plan and the hazardous debris treatment standards provided by Appendix B [401 KAR 39:060 Section 4, (40 CFR 268.45)] that is combined with other material is subject to regulation as hazardous debris if the mixture is comprised primarily of debris, by volume, based on visual inspection. Any material that has a specific treatment standard defined in 40 CFR 268 is not debris. Examples of items which are not debris include cadmium batteries; process residuals such as residues from the treatment of waste, wastewater, sludge, air emission residues; and intact containers of hazardous waste that are not ruptured and that retain at least seventy-five percent of their original volume. BGCAPP may use the conditioned exclusion of treated debris (40 CFR 268.45 [c]) for decontaminated items that meet the chemical agent closure standards in this closure plan and the applicable performance standards defined in the *Alternative Treatment Standards for Hazardous Debris*, Table 1, 40 CFR 268.45.
Decommission	Withdrawal of the facility or equipment from service followed by decontamination and transition to the required end-state configuration Decommissioning ensures readiness for demolition or turnover.
Decontamination and Decommissioning Package (DDP)	Defines the prerequisites, boundaries, and scope of field work to be performed to close a system, room, area, or building to prepare the facility for demolition and disposal or for turnover to other tenants.
Decontamination	The process of making safe any person, object, or area by absorbing, destroying, neutralizing, making harmless, or removing the hazardous substance (e.g., chemical agent) on that person, object, or area Physical or chemical means to remove, deactivate, or destroy hazardous substance (e.g., chemical agents) on the surface and in the matrix of protective clothing, object, or equipment.
Demolition	Dismantling, destruction, or wrecking of facilities or equipment for scrap recovery followed by offsite disposition and/or disposal Precision, or targeted, demolition is a labor-intensive and detailed approach to dismantle and size-reduce items into manageable or salvageable components for scrap recovery, further use, or disposal offsite. Mass demolition is large-scale wrecking and destruction of equipment and structures utilizing conventional mechanical equipment or explosives to reduce manual labor and facilitate resource recovery and offsite disposal.
Designated facility (40 CFR 761.3)	Specific facility serving as the offsite disposer or commercial storer of PCB waste designated on the manifest as the facility that will receive a manifested shipment of PCB waste

Director	"Director" means "Cabinet" as defined by KRS 224.1-010(8) and is a reference to the Director of the Division of Waste Management within the Kentucky Department for Environmental Protection The terms "Cabinet," "Director," "Division," and "Manager" can be used interchangeably (401 KAR 39:005, Section 1) in this closure plan.
Dismantle	Disassembly and breaking down equipment or systems into multiple pieces that can be removed from their existing location for decontamination and/or disposal
Disposal	Under RCRA, the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters (40 CFR 262.10) Under TSCA, disposal means intentionally or accidentally to discard, throw away, or otherwise complete or terminate the useful life of PCBs and PCB items. Disposal includes spills, leaks, and other uncontrolled discharges of PCBs as well as actions related to containing, transporting, destroying, degrading, decontaminating, or confining PCBs and PCB items (40 CFR 761.3).
Engineering Controls	The device, room, or structure immediately surrounding the agent source that provides the primary protection to the workers from the chemical agent hazard and is under negative pressure relative to the location of unprotected workers Examples of engineering controls are hoods, gloveboxes, or rooms under negative pressure relative to the adjacent vestibule, corridor, or room.
Excluded Scrap Metal [40 CFR 261.1(c)(9) and 261.4(a)(13)]	Processed scrap metal, unprocessed home scrap metal, and unprocessed prompt scrap metal being recycled (collectively referred to as excluded scrap metal) are all excluded from the definition of solid waste and therefore not subject to RCRA Subtitle C regulations. • Processed scrap metal is scrap metal which has been manually or physically altered to either separate it into distinct materials to enhance economic value or to improve the handling of materials. Processed scrap metal includes, but is not limited to scrap metal which has been baled, shredded, sheared, chopped, crushed, flattened, cut, melted, or separated by metal type (i.e., sorted), and, fines, drosses and related materials which have been agglomerated. • Home scrap metal is scrap metal as generated by steel mills, foundries, and refineries such as turnings, cuttings, punchings, and borings (not applicable to BGCAPP). • Prompt scrap metal is scrap metal as generated by the metal working/fabrication industries and includes such scrap metal as turnings, cuttings, punchings, and borings. Prompt scrap is also known as industrial or new scrap metal (not applicable to BGCAPP). The exemption from Subtile C hazardous waste management regulation applies at the point of generation. Scrap metal that does not meet the

	conditions of the 40 CFR 261.4(a)(13) exclusion (i.e., all other scrap metal) is considered a solid waste but continues to be exempt from substantive Subtitle C regulation if being reclaimed [40 CFR 261.6(a)(3)(ii)].
Facility	All contiguous land, and structures, other appurtenances, and improvements on the land used for treating, storing, or disposing of hazardous waste The Main Plant facility includes multiple treatment and storage operational units, some of which are detached (e.g., Non-Contaminated Rocket Motor storage igloos) (§260.10).
Federal Acquisition Regulations (FAR)	Federal regulations governing the acquisition and disposition of real and personal property acquired, owned, and dispositioned by the Federal government
Final Closure	Closure of all hazardous waste management units at the facility in accordance with all applicable closure requirements so that hazardous waste management activities under 40 CFR parts 264 and 265 are no longer conducted at the facility unless subject to the provisions in 40 CFR 262 for hazardous waste generators Closure verification will be performed as part of final closure.
General Population Limit (GPL) (68 FR 58348)	A highly protective vapor exposure criterion for a 24-hour/day lifetime exposure of the general population including those more susceptible individuals A GPL is a no-observed-adverse-effect-level (NOAEL) representing an exposure at or below which there are no anticipated adverse health effects from either short- or long-term repeated exposures (i.e., that occur 24 hours daily for up to 70 years). GPLs are 24-hr time averages for GB ($1x10^{-6}$ mg/m^3) and VX (6×10^{-7} mg/m^3); and 12-hr time averages for H ($2x\ 10^{-5}$ mg/m^3).
Hazardous Debris	Debris that contains a hazardous waste listed in 401 KAR 39:060, Section 3, in addition to those substances listed in Subpart D of 40 CFR, part 261, or that exhibits a characteristic of hazardous waste identified in Subpart C of 40 CFR part 261 Any deliberate mixing of prohibited hazardous waste with debris that changes its treatment classification (i.e., from waste to hazardous debris) is not allowed under the dilution prohibition in 40 CFR 268.3. This definition only applies to debris that is subject to Subtitle C regulations when it is generated. A mixture of items ≤ 60 mm in size and items > 60 mm in size that is comprised mostly of larger items (> 60 mm) is considered debris and is subject to the applicable debris treatment standard if contaminated with hazardous waste. Hazardous debris that is also contaminated with a PCB waste that is regulated under 40 CFR part 761 is subject to the applicable treatment and disposal requirements of either 40 CFR part 761 or the requirements of 40 CFR 268.45, whichever are more stringent.

Hazardous Waste Control Limit (HWCL)	The concentration limit below which a hazardous constituent can be released from controls prohibiting its treatment or disposal at a permitted hazardous waste facility Concentration limits for chemical agent are those established by the United States Army Public Health Command (USAPHC) (see Chemical *Agent Health-Based Standards and Guidelines Summary*, Table 2: "Criteria for Water, Soil, Waste," July 2011, or current revision) using chronic toxicity criteria and risk assessment modeling similar to that used by EPA Region IX. While such facilities may be expected to safely manage/treat/dispose of chemical agents at much higher levels, the HWCL values established for chemical agents apply conservative exposure scenarios to limit any potential adverse impacts from occasional exposure to agent at permitted hazardous waste facilities.
Hazardous Waste Management Unit (HWMU)	A contiguous area of land on or in which hazardous waste is placed or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed. (Refer to Code of Federal Regulations [CFR] Title 40, Part 260.10.) A permitted unit does not become a HWMU until the initial receipt of hazardous waste.
Headspace Monitoring	The process of monitoring off-gassing vapors from a substance in an enclosed, unventilated space Effective headspace monitoring requires appropriate definition of environmental conditions (time, temperature, mixing), minimization of potential dilution air, and prior verification that object monitored does not sorb agent (e.g., activated carbon) or contain cavities/crevasses where liquid agent may remain isolated from the headspace (refer to 24915-GEN-5PL-00-00006, *Equipment Decontamination Plan*).
Immediately Dangerous to Life and Health (IDLH)(68 FR 58348)	Atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere The IDLH for chemical agent is the maximum airborne concentration from which one could escape within 30 minutes. The IDLH levels for chemical agents are 0.1 mg/m^3 for GB, 0.7 mg/m^3 for H, and 0.003 mg/m^3 for VX.
Non-Hazardous Waste Control Limit (NHWCL)	The concentration limit of a hazardous constituent below which a waste material may be released for disposal at a non-RCRA disposal facility Concentration limits for chemical agent constituents are those established by the USAPHC (see *Chemical Agent Health-Based Standards and Guidelines Summary*, Table 2: "Criteria for Water, Soil, Waste," July 2011, or current revision) using chronic toxicity criteria and risk assessment modeling similar to that used by EPA Region IX. The NHWCL values established for chemical agents apply conservative exposure scenarios to limit any potential adverse impacts from occasional

	exposure to agent at public and private disposal facilities receiving municipal solid waste.
Non-liquid PCBs (40 CFR 761.3)	Materials containing PCBs that by visual inspection do not flow at room temperature (25 °C or 77 °F) or from which no liquid passes when a 100 g or 100 ml representative sample is placed in a mesh number 60 ±5 percent paint filter and allowed to drain at room temperature for 5 minutes
Non-Residential Clean Closure	Decontamination and/or removal of all equipment, systems, and areas containing, or contaminated with, hazardous waste (including agent) or hazardous constituents in a manner that is protective of human health and the environment which relies on non-residential exposure assumptions to determine the level of decontamination necessary to satisfy the “remove or decontaminate” standard. Non-residential clean closure requires continued maintenance of nonresidential land use and any necessary additional cleanup should land use change through institutional controls
Occluded Space	Confined volume within a system, structure, or component that can potentially trap liquid agent, prevent contact with a decontamination solution, and/or prevent agent vapors from trapped liquid agent from being detected during unventilated monitoring Examples of occluded spaces are as follows: • A screw or bolt may create an occluded space if while it was removed agent was splashed down into the tapped hole and was then replaced. Agent contained behind the screw or bolt may not be detectable by air monitoring. • An agent pipe that has been blinded, capped, or otherwise sealed on both ends so that none of the air inside can escape for air monitoring. • The space under a floor mat, support plate, or something movable which covers a contaminated surface. If the floor is splashed with agent before the pad, mat, or plate is placed, then there exists a potential for the pad, mat, or plate to prevent decontamination solution from contacting the surface and also prevent monitoring from detecting agent contamination. • Internal check valves or complex geometry valves have the potential to trap liquid agent in packing, behind double seal O-rings, or in internal spaces where decontamination solution will also be prevented from contacting potential agent. Air monitoring may not detect materials contained in these locations. • Many of the tools in process areas may have been contaminated with agent. If these tools were not decontaminated and were placed into a closed toolbox, the toolbox would be considered an occluded space.

Other Scrap Metal	Material that meets the definition of scrap metal but not the definition of "excluded scrap metal" in 40 CFR 261.4(a)(13) Other scrap metal is a solid waste under 40 CFR 261.2(c)(3) when sent for recycling/reclamation and is considered a hazardous waste if it exhibits a characteristic or has become contaminated with a listed waste. 40 CFR 261.6(a)(3)(ii) exempts hazardous scrap metal that is sent for recycling/reclamation from 40 CFR Parts 262-270. Therefore, the need to make a hazardous waste determination in accordance with 40 CFR 262.11 does not apply so long as the materials are not mixed with hazardous waste (e.g., no significant liquid component) and are properly managed to minimize any releases to the environment.
Point Source Monitoring	A method of monitoring designed to identify agent emission sources (i.e., to locate a known or suspected area of contamination on an item or within a room that is under engineering controls) and is distinct from area or room monitoring Point source monitoring may be conducted by encapsulating (e.g., tenting) a suspected area of contamination and performing headspace monitoring or by placing the monitoring sampling line close to the presumed contaminated area. In general, encapsulation is the preferred method as it minimizes potential dilution air and thereby provides a direct assessment of potential agent emissions at the location. However, other methods may be employed depending on specific operational needs and limitations. Point source monitoring is a targeted approach used to support confirmation that potential "hot-spots" have been appropriately identified and mitigated to the required risk-based level in preparation for follow-on work activities or monitoring tests. The point source monitoring strategy may be either judgmental or systematic in nature.
Polychlorinated Biphenyl	A class of aromatic, synthetic chemicals which do not occur naturally in the environment They consist of the biphenyl structure with two linked benzene rings in which some or all of the hydrogen atoms have been substituted by chlorine atoms ($C_{12}H_{10-x}Cl_x$). Depending on the number and position of chlorine atoms attached to the biphenyl ring structure, 209 different PCB congeners can be formed.
Scabble	Physical extraction technologies that remove surfaces or layers of concrete, which include abrasive blasting, scarification, grinding, planing, spalling, vibratory finishing
Scrap Metal	Bits and pieces of metal parts (e.g., bars, turnings, rods, sheets, wire) or metal pieces that may be combined together with bolts or soldering (e.g., radiators, scrap automobiles, railroad box cars), which when worn or superfluous can be recycled
Secondary Waste	Waste generated as a result of hazardous waste operations (e.g., personal protective equipment (PPE), filters, plastic sheeting) that requires additional treatment, storage and/or offsite disposal

Solid Material	A material that retains its volume at room temperature without the need for support Common examples of solid materials that are debris if intended for discard and if their particle size is 60 mm or greater include glass, concrete, tanks, pipes, valves, scrap metal, plastic and rubble. Metallic components that are legitimately recycled are exempt from the Land Disposal Restriction (LDR) treatment standards under the scrap metal exemption in 40 CFR 261.6(a)(3)(ii).
Solid Waste Management Unit (SWMU)	Any discernable unit that has ever accumulated, treated, stored, or disposed of solid wastes, irrespective of whether the units were intended for waste management SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).
Standard Wipe Sample	A sample collected for chemical extraction and analysis using a standard wipe test Commonly used for determining PCB contamination, the related standard wipe sampling and testing are defined in 40 CFR § 761.123.
Structures, Systems, and Components (SSCs)	Manufactured items designed, built, or installed to support the operation of the facility A structure is an element or a collection of elements to provide support or enclosure such as a building, freestanding tank, basin, dike, or stack. A system is a collection of components assembled to perform a function such as piping; cable trays; conduits; or heating, ventilation, and air conditioning. A component is an item of equipment such as a pump, valve, relay, or an element of a larger array such as a length of pipe, elbow, or reducer. For purposes of this closure plan, SSCs include all primary, secondary, and ancillary RCRA, TSCA, and Clean Air Act Title V equipment and structures.
Triple Rinse	A flushing process for removal of residual (waste) material. Generally, triple rinsing should be performed by flushing three times with 10% or more capacity of a tank, pipe, pump, container, or other type of enclosed volume using a suitable solvent such that all potentially contaminated surfaces are contacted. Floors or other surface are considered triple rinsed when three successive rinses are performed. No strict requirements apply, however; factors such as waste properties, potential solvent options, container configuration and ability to manipulate, and waste minimization efforts all factor into the design of the triple rinse operation. 40 CFR § 261.7(b)(3) allows for an alternate method to be used when triple rinsing is determined to be inappropriate.
Uncontrolled Environment	A situation where the atmosphere is not continuously monitored during the presence of a chemical agent to determine concentration levels or the type of agent hazard (vapor, aerosol, liquid) is unknown, or cannot be identified (such as a storage magazine)

Unventilated	A condition achieved within an enclosed space (e.g., room) where air is not mechanically exchanged or replaced with exterior air
Unventilated Monitoring Test (UMT)	A test involving the collection of a representative air sample while the area is isolated from ventilation Final unventilated monitoring may be conducted after decontamination of all liquid-contaminated and potentially-liquid-contaminated equipment, process systems, or areas has been completed and after an occluded space survey (and resolution of any identified occluded spaces) has been completed. The real property being monitored is first isolated from the building ventilation system and sealed to minimize exchange of air. Fans are installed, as needed, to ensure homogeneity of the air volume. The UMT should be performed using a hold-time of not less than 4 hours and a temperature of not less than 70°F.
Universal Waste (UW)	Hazardous wastes that are subject to the UW requirements of 401 KAR 39:080 and 40 CFR 273 UW includes batteries, pesticides, mercury-containing equipment, lamps, and aerosol cans.
Vapor Screening Level (VSL)	The agent concentration level to which an item is monitored under unventilated conditions to determine the level of cleanliness For BGCAPP, the VSLs for H, GB, and VX are the results of a single near-real-time (NRT) monitoring cycle and are based on the STEL concentration for each agent (0.003 mg/m^3 for H, 0.00001 mg/m^3 for VX, and 0.0001 mg/m^3 for GB).
Worker Population Limit (WPL) (68 FR 58348)	The maximum time-averaged allowable concentration that an unmasked worker could be exposed to for an 8- or 12-hour workday 40 hours per week for 30 years without adverse effects For GB, the WPL for 8 hours without respiratory protection is 0.00003 mg/m^3. For H, the WPL for 8 hours without respiratory protection is 0.0004 mg/m^3. For VX, the WPL for 8 hours without respiratory protection is 0.000001 mg/m^3.

5.0 FACILITY END STATE

All facilities, equipment, and other infrastructure constructed or acquired by the Program Executive Office – Assembled Chemical Weapons Alternatives (PEO ACWA) will be appropriately decommissioned, disassembled as necessary, and dispositioned in accordance with contract requirements, environmental permits, and other applicable regulatory requirements. Regulatory requirements include closure of the facility in accordance with both RCRA and TSCA regulations and permits.

PEO ACWA is a tenant on BGAD which owns all real property at the Main Plant facility. All real property consisting of facilities and other infrastructure constructed or acquired by PEO ACWA will be removed and dispositioned or retained in accordance with BGAD requirements and instructions. Personal property (e.g., tools, supplies, equipment, items, and materials) owned by PEO ACWA will be dispositioned in accordance with applicable Federal Acquisition Regulations (FAR) governing the disposition of Federal government property.

6.0 APPLICABILITY

401 KAR 39:090 Section 1; 40 CFR 264.110 and 761.65

The RCRA requirements of 40 CFR Sections 264.111 through 264.115 apply to closure of the BGCAPP hazardous waste management facility and cover the active life of the facility. The requirements at 40 CFR Sections 264.116 through 264.120 do not apply since BGCAPP does not operate any disposal facilities and post-closure care is not anticipated. In addition, the TSCA requirements of 40 CFR 761.65 apply to closure of PCB waste storage and processing areas addressed in the TSCA PCB Storage and Treatment Approval. A detailed discussion of these requirements is provided here.

The active life of a RCRA Treatment, Storage or Disposal Facility (TSDF) means the period from the initial receipt of hazardous waste at the facility until the Director receives certification of final closure. The Project first received hazardous waste on 09 JAN 2020 when four Enhanced Onsite Containers (EONCs) containing chemical munitions were transported from the Blue Grass Chemical Activity (BGCA) Chemical Limited Area (CLA) to the BGCAPP CHB. Although the facility was managing hazardous wastes onsite prior to 09 JAN 2020, those activities were conducted under the Hazardous Waste Generator provisions of 401 Kentucky Administrative Regulations (KAR) 39:080, Section 1 (40 CFR Part 262). Therefore, 09 JAN 2020 is considered the date for which the BGCAPP permitted facility, specifically the Main Plant, commenced active hazardous waste operations. Any regulated units identified in the BGCAPP Part B RCRA Permit on, or after, 09 JAN 2020 will be closed in accordance with this Kentucky Department for Environmental Protection (KDEP) approved closure plan.

An extensive record of RCRA-permitted units constructed for the purpose of hazardous waste operations and approved for use by KDEP exists in the facility operating record. This record includes the Facility Construction Certification (FCC) documentation for permitted units that has been submitted to KDEP in accordance with the requirements of 401 KAR 39:060, Section 5, and 40 CFR 270.30(l)(2). Obsolete or never-used units that have not been granted closure status and still appear in the record after 09 JAN 2020 or in the Main Plant RCRA Permit are addressed by this closure plan regardless of whether they are still in place or if they have been partially or fully disassembled (e.g., conversion of rocket processing equipment).

The RCRA and TSCA permitted units addressed by this plan are located within areas of the Main Plant facility which include the CHB, MDB, HSA, WTS, CSF and NCRM storage igloos. Permitted units within BGCAPP include 40 CFR Subpart I, Containers; Subpart J, Tanks; Subpart X, Miscellaneous Units; and TSCA waste storage and processing areas. Closure of BGCAPP facilities will address the clean closure requirements of 40 CFR 264.111 through 264.115. However, the closure and post-closure care requirements of 40 CFR 264.116 through 264.120 will not apply unless the non-residential clean closure requirements cannot be achieved.

The PCB processing and storage areas that will be closed under the TSCA Approval include EONCs used for permitted munitions transport operations, the CHB storage area, the Unpack Area (UPA)-1 used for assessment of the rockets in the Rocket Non-Destructive Examination (RNDE) system, Explosion Containment Vestibules (ECVs) containing the Vertical Rocket Cutting Machines (VRCMs) and ancillary equipment, various material handling systems and equipment including robots and conveyors within the MDB, and various PCB-item storage areas, including the Metal Parts Treater (MPT) cool down area, Motor Packing Room (MPR), Motor Shipping Room (MSR), Box Transfer Rooms (BTRs), and NCRM storage igloos.

Closure of BGCAPP facilities will occur after agent operations are complete and will proceed in accordance with this plan, and no partial closure activities are anticipated. Notably, replacement of all or part of an operational Hazardous Waste Management Unit (HWMU) with functionally equivalent equipment or early disassembly and decontamination of obsolete equipment or areas does not constitute closure or partial closure of the unit. Certain pieces of equipment may fail and require replacement during the operating life of the facility (e.g., pumps, valves) and will be replaced as part of routine maintenance activities not related to facility closure. Similarly, equipment no longer required for completion of agent operations may be disassembled and decontaminated during operations to protect the workforce prior to closure of the facility. For example, the VX-contaminated Munitions Washout System (MWS) equipment used for processing projectiles has been partially dismantled and decontaminated in accordance with 24915-CL-5PL-MWS-00001, *Munitions Washout System (MWS) Decontamination Plan*, to support agent changeover from VX to GB, and final closure of the system will occur after agent operations are complete.

This plan also addresses the TSCA requirements for closure of PCB storage and processing areas as part of final closure. The facility will undergo TSCA closure concurrently with RCRA closure in a manner that eliminates the potential for post-closure releases of PCBs which may present an unreasonable risk to human health or the environment (40 CFR 761.65).

Post-closure care is not anticipated for permitted RCRA or TSCA units since all PCB waste, hazardous waste, and hazardous waste constituents are expected to be removed or decontaminated in order to satisfy non-residential clean closure criteria in accordance with the approved closure plan. If BGCAPP discovers that not all contaminated structures and subsoils can be practicably removed or decontaminated, then BGCAPP will close the system(s) and perform post-closure care in accordance with the applicable requirements of 40 CFR 264.116-120, 264.197(b), 264.603, 264.1102(b), and 761.65(e).

6.1 Permitted Hazardous Waste Management Units to be Closed

401 KAR 39:090 Section 1; 40 CFR 264.111 and 761.65

This plan is focused on closure of permitted HWMUs that have received and managed hazardous waste and/or PCB waste. Permitted units that manage TSCA-regulated PCB waste are described in Section 6.2 and permitted units that were constructed but never placed into service are discussed in Section 6.2.

The permitted HWMUs are designed, operated, and maintained to prevent releases to the environment, and the expectation at closure of the facility is to clean close the units and verify that hazardous waste management activities at BGCAPP did not result in contamination of the site.

Table 1 lists the RCRA permitted HWMUs that received and managed hazardous waste on or after 09 JAN 2020 will be closed in accordance with this closure plan.

Table 1 – RCRA-Permitted HWMUs to be Closed

RCRA-Permitted HWMUs to be Closed				
Permit Condition	**40 CFR 264 Subpart I Container Storage Area[1]**	**Location**	**Type/Amount of Waste Permitted[6]**	**Secondary Containment[2]**
A.III. I(9).(a)	Container Handling Building	CHB	Munitions (projectiles and rockets) inside EONCs. Each EONC is permitted to hold a maximum of 36 GB projectiles, 72 VX projectiles, or 30 rockets (GB or VX). Rockets also have rocket motors and shipping and firing tubes which contain PCBs. Rocket warheads contain bursters in addition to agent.	Secondary containment for munitions while they are in the CHB is provided by EONCs.
A.III.I.(9).(b)	Waste Transfer Station	WTS	WTS building shall store up to 24,000 gallons; tanker storage area shall store up to 120,000 gallons; bulk solids storage area shall store up to 135,000 gallons. The wastes are various secondary wastes that will be generated at the BGCAPP prior to shipment to treatment and disposal facilities	Inside the container storage building, containers with liquids shall be stored on spill pallets In the tanker storage area, tankers shall be stored in three secondary containment areas which shall provide not less than 39,778 gallons capacity each
A.III.I.(9).(c)	Box Transfer Areas 1 and 2	Room 07-165 Room 07-166	Separated rocket motors and shipping and firing tubes (SFTs). Each room shall store up to eight boxes containing thirty rocket motors per box	Not applicable – no free liquids
A.III.I.(9).(d)	Agent Neutralization System (ANS) Storage Area	Room 07-123	Various secondary wastes and spent decontamination solution, not to exceed 2,750 gallons	Liquid in sumps shall be transferred to the Spent Decontamination System (SDS) tanks
A.III.I.(9).(e)	Tray/Container Transfer Room	Room 07-124	Up to four skids of 25 containerized warheads and up to eight 55-gallon drums of miscellaneous secondary waste. Overpacked munitions up to the quantities allowed by the Department of Defense Explosives Safety Board (DDESB)-approved Site Safety Plan.	Coated concrete floor with curb and sump
A.III.I.(9).(f)	Metal Parts Treater Cooling Conveyor Storage Area	Room 07-150	MPT treated metal for recycle, MPT treated secondary waste, spent particulate filter cartridges, and SFT segments	Spill pallets for wastes with free liquids
A.III.I.(9).(g)	Toxic Maintenance Area Storage Area	Room 07-125	Permitted storage shall be limited to the storage of miscellaneous waste in drums, contaminated equipment, and leaking munitions. Overpacked munitions up to the quantities allowed by the DDESB-approved Site Safety Plan.	Coated concrete floor with curb and sump
A.III.I.(9).(h)	Explosive Containment Vestibule Storage Areas 1 and 2	Room 07-103 Room 07-106	Chemical warfare agent in rockets shall be stored prior to treatment. Overpacked munitions up to the quantities allowed by the DDESB-approved Site Safety Plan.	Coated concrete floor, sumps, and perimeter curbs and walls
A.III.I.(9).(i)	Unpack Areas 1 and 2	Room 07-101 Room 07-128	Munitions and various secondary wastes. Overpacked munitions up to the quantities allowed by the DDESB-approved Site Safety Plan.	Storage of containers shall be inside of an EONC or on a secondary containment pallet
A.III.I.(9).(j)	Motor Packing Room	Room 07-163	2 boxes of 30 rocket motors and 2 boxes of shipping and firing tubes	Not applicable – no free liquids
A.III.I.(9).(k)	Motor Shipping Room	Room 07-164	Two boxes of 30 rocket motors and 2 boxes of shipping and firing tubes	Not applicable – no free liquids
A.III.I.(9).(l)	Explosive Containment Room Storage Areas 1 and 2	Room 07-104 Room 07-105	Various secondary wastes, reject warheads, and reject warheads in canisters. Overpacked	Coated concrete floors, sumps, curbs, and walls

RCRA-Permitted HWMUs to be Closed				
			munitions up to the quantities allowed by the DDESB-approved Site Safety Plan.	
A.III.I.(9).(m)	Munitions Washout System Room	Room 07-135	Chemical agent GB and VX projectiles and up to 2,750 gallons of miscellaneous secondary waste	Coated concrete floor with drainage to sumps
A.III.I.(9).(o)	Container Storage Facility (CSF)	CSF	49,280 gallons maximum capacity of waste generated from Explosive Destruction Technology (EDT) and Main Plant Operations.	No free liquids stored except on spill pallets or storage lockers providing containment as required by A.III.I.(5)
A.III.I.(9).(p)	Rocket Motor Storage	Igloo F1001 Igloo F1002 Igloo F1203 Igloo F1205 Igloo F1206 Igloo F1303 Igloo F1304 Igloo F1305 Igloo F1307	16,000 gallons maximum capacity of containerized non-contaminated rocket motors and shipping and firing tubes from either VX or GB rockets	No free liquids stored
A.III.I.(9).(q)	Energetics Batch Hydrolyzers (EBH) Room	Room 07-111	Up to two skids of 25 containerized warheads and miscellaneous secondary wastes. Overpacked munitions up to the quantities allowed by the DDESB-approved Site Safety Plan.	Coated concrete floor with curb and sump
A.III.I.(9).(r)	Toxic Maintenance Area (TMA) Equipment Room	Room 07-133	Permitted storage shall be limited to the storage of up to two rocket warhead skids with 25 containerized warheads per skid, miscellaneous secondary waste, and contaminated equipment	Concrete floor with curbs, sump
A.III.I.(9).(s)	UPA Equipment Room	Room 07-134	Permitted storage shall be limited to the storage of miscellaneous secondary waste in containers	Concrete floor with curbs, sump. Containers with liquids shall be stored on spill pallets
A.III.I.(9).(t)	Off-Gas Treatment System – Energetics (OTE)	Room 07-140	Permitted storage shall be limited to the storage of miscellaneous secondary waste in containers.	Concrete floor with curbs, sump. Containers with liquids shall be stored on spill pallets.
A.III.I.(9).(u)	Off-Gas Treatment System for the Metal Parts Treater (OTM)	Room 07-141	Permitted storage shall be limited to the storage of miscellaneous secondary waste in containers.	Concrete floor with curbs, sump. Containers with liquids shall be stored on spill pallets.
Permit Condition	**40 CFR 264 Subpart J Tank System[3]**	**Designation**	**Type of Waste**	**Secondary Containment**
A.III.J.(8)(a)	Agent Hydrolysate Storage Tanks	MT-HSS-0105, MT-HSS-0205, MT-HSS-0104	Agent hydrolysate	Coated concrete containment basin
A.III.J.(8)(b)	OTM Condensate (OTMC) Storage Tanks	MT-HSS-0604, MT-HSS-0704	OTM condensate	Coated concrete containment basin
A.III.J.(8)(c)	Agent Holding Tank	MT-ACS-0105	VX and GB agent	Coated concrete floor with curbs and sumps
A.III.J.(8)(d)	Agent Surge Tank	MT-ACS-0106	VX and GB agent	Coated concrete floor with curbs and sumps
A.III.J.(8)(e)	Agent Neutralization Reactors	MV-ANS-0101, MV-ANS-0201	VX and GB agent, agent hydrolysate	Coated concrete with curbs and sumps
A.III.J.(8)(f)	Agent Hydrolysate Sampling Tanks	MT-ANS-0103, MT-ANS-0203, MT-ANS-0303	Agent hydrolysate	Coated concrete with curbs and sump
A.III.J.(8)(h)	Spent Decontamination System Tanks	MV-SDS-0101, MV-SDS-0201, MV-SDS-0301	Spent decontamination solution	Coated concrete floor with curb and sump

RCRA-Permitted HWMUs to be Closed				
Permit Condition	**40 CFR Subpart X Miscellaneous Unit**	**Designation**	**Quantity and types of waste**	**Secondary containment**
A.III.X.(4)(a)	Crimp Station	MJ-RWCS-0107, MJ-RWCS-0108	Approximately 51,700 rockets containing approximately 10.7 pounds of GB: approximately 17,700 rockets containing 10.1 pounds of VX	Coated concrete floor with curb and sump
A.III.X.(4)(b)	Nose Closure Removal System (NCRS)	MY-NCR-0101	Approximately 12,816 projectiles containing approximately 6.0 pounds of VX each.	Coated concrete floor with curb and sump
A.III.X.(4)(c)	Vertical Rocket Cutting Machines	MJ-VRCM-0106 MJ-VRCM-0107 MJ-VRCM-0126 MJ-VRCM-0127	Approximately 51,700 rockets containing approximately 10.7 pounds of GB; approximately 17,700 rockets containing approximately 10.1 pounds of VX	Coated concrete floor with curb and sump.
A.III.X.(4)(d)	Rocket Shear Machine (RSM)	MY-RHS-0101, MY-RHS-0102	Approximately 51,700 rocket warheads containing 10.7 pounds of GB. Approximately 17,740 rocket warheads containing 10.0 pounds of VX.	Coated concrete floor with curb and sump
A.III.X.(4)(e)	Metal Parts Treaters [4]	ME-MPT-0101, ME-MPT-0201	Drained munitions, secondary wastes.	Coated concrete floor with curb and sump
A.III.X.(4)(f)	Munitions Washout System	MZ-MWS-0101A, MZ-MWS-0101B, MZ-MWS-0101C	Approximately 12,816 projectiles containing approximately 6.0 pounds of VX each.	Coated concrete floor with curb and sump
A.III.X.(4)(j)	Handling of chemical agent compounds and chemical munitions (EONCs and Tray Handling System [THS] components)[5]	N/A	Chemical agent GB contained in approximately 51,700 rockets and VX contained in approximately 17,700 rockets	N/A
A.III.X.(4)(k)	Drum Compactor (Room 07-125)	N/A	Maximum 3,575 Gallons Per Day	Coated concrete floor with curb and sump
A.III.X.(4)(l)	Rocket Non-Destructive Examination System	MJ-RNDE-0101	Nominal 25 rockets per hour per each examination unit	Coated concrete floor with curb and sump

Notes:

1. Container storage areas that are permitted for the storage of liquid chemical agent-bearing items are required to possess emissions control equipment to satisfy the requirements of 40 CFR 264 Subpart CC. The MDB heating, ventilation, and air conditioning (HVAC) exhaust filtration system will be closed in accordance with Section 9.3.5.
2. Secondary containments are provided for permitted units, and some containments may be shared by multiple permitted units. Secondary containments in the MDB will be closed in accordance with Section 9.3.4.
3. Coating systems and sumps that provide secondary containment as specified in RCRA Permit Conditions A.III.A.(9) and A.III.J.(3)(c) for permitted units identified in this table will be closed in accordance with Section 9.3.4.
4. The OTM is operated under the BGCAPP Title V air permit as an air pollution control system that will be closed in accordance with Section 9.3.5.
5. Not all EONCs have been placed into hazardous waste service at BGCAPP. EONCs that were never placed into hazardous waste service at BGCAPP are considered to be equipment/material that may be dispositioned as excess property or scrap in accordance with applicable Federal property regulations. An administrative evaluation will be performed in which the operating record will be reviewed to confirm the hazardous waste service status, and documentation of administrative closure will be placed in the facility operating record stating that no further actions are required for closure.
6. The total aggregate permitted container storage capacity for the MDB is 51,695 gallons. The individual capacities shown in Table 1 reflect the estimated maximum inventories over the active life of the facility (40 CFR 264.112(b)(3).

6.2 Permitted TSCA Units to be Closed

40 CFR 761.65

In addition to RCRA, this closure plan also addresses final closure of permitted TSCA storage and processing units at the BGCAPP Main Plant. The PCB storage and processing units are designed, operated, and maintained to prevent releases to the environment, and the expectation at closure of the facility is to clean close the TSCA units and verify that PCB bulk product waste management activities at BGCAPP did not result in contamination of the site.

Table 2 lists the TSCA permitted units that are subject to this closure plan.

Table 2 – TSCA-Permitted Units to be Closed

TSCA-Permitted Units to be Closed[1]		
Area	**Designated Area/Equipment**	**Process or Storage**
Container Handling Building[2]	EONCs	Munition receipt and storage awaiting processing (EONCs)
UPA-1	Room 07-101 MJ-RNDE-0101	Storage (EONCs) and leaker assessment (RNDE)
Explosive Containment Vestibules	Room 07-103 Room 07-106 MJ-VRCM-0106 MJ-VRCM-0107 MJ-VRCM-0126 MJ-VRCM-0127	Separation of SFTs and warhead from rocket (includes Rocket Handling System [RHS] and VRCMs); separation of SFTs from rocket motors, PCB secondary wastes; rocket overpacks
Motor Packing Room	Room 07-163	Containerization and monitoring of separated SFT segments and rocket motors with SFTs
Motor Shipping Room	Room 07-164	Temporary storage of separated SFT upper segments and containerized rocket motors with SFTs
Box Transfer Rooms 1 and 2	Room 07-165 Room 07-166	Temporary storage of containerized segments and rocket motors with SFTs prior to movement for storage or shipment offsite
Metal Parts Treater Cooling Conveyor Storage Area	Room 07-150	SFT segments removed from the warheads shall be transferred to a roll-off bin in the RCRA-permitted Metal Parts Treater Cooling Conveyor Storage Area
RCRA-Permitted Igloos[3]	Igloo F1001 Igloo F1002 Igloo F1203 Igloo F1205 Igloo F1206 Igloo F1303 Igloo F1304 Igloo F1305 Igloo F1307	Non-contaminated rocket motors with SFT segments in containers/boxes; rocket overpacks
Waste Transfer Station	WTS Building Containment Bay 1 Containment Bay 2 Containment Bay 3 Bulk Solids Storage Area	Tankers containing hydrolysate with PCBs, Roll-off bins containing SFT segments are stored at the WTS facility prior to shipment offsite for disposal, PCB secondary wastes in containers
Container Storage Facility	Building 110	Storage of containers with PCB bulk product waste residue generated from Main Plant Operations.

Notes:

1. In accordance with the TSCA Approval, SFTs, rocket motors with SFT segments, and PCB secondary wastes may be stored in any RCRA-permitted storage areas. Additional RCRA-permitted storage areas not listed above will be evaluated for applicable PCB contamination if they are placed in service for PCB Bulk Product Waste management during the active life of the facility. Waste storage volumes of these units will not exceed the RCRA-permitted storage capacity or increase the maximum quantity of PCBs managed at BGCAPP.
2. EONCs are sealed air-tight and provide secondary containment for M55 rockets transported to the CHB. EONCs are never opened in the CHB. Therefore, the CHB does not require decontamination for PCB residue. EONCs that were used to transport M55 rockets will be inspected for evidence of PCB residue and decontaminated as necessary using any methods described in Appendix A.
3. NCRM igloos store boxes of SFTs with non-contaminated rocket motors. The SFTs and rocket motors are in a sealed bag within the storage boxes which prevents the release of PCB residues. Therefore, the NCRM igloos are not expected to require decontamination for PCB residue. The igloos will be inspected for evidence of PCB residues, and in the event that PCBs are discovered, they will be decontaminated as necessary using any of the above methods in Appendix A.

6.3 Permitted Units Never Placed in Service

401 KAR 39:090 Section 1; 40 CFR 264.111

Several permitted units have been designed and constructed at BGCAPP to support the destruction of chemical weapons but were never placed into service because the strategy for destroying the chemical weapon stockpile was modified to ensure safe and timely completion of the mission. By definition, a permitted unit that has never received or never been used to manage hazardous waste is not an HWMU, and most, if not all, of the closure performance standards will not apply to that specific unit. Instead, an administrative evaluation will be performed in which the operating record will be reviewed to confirm the status, and documentation of administrative closure will be placed in the facility operating record stating that no further actions are required for closure in accordance with this plan.

Any permitted units that were never placed into service but may have been exposed to chemical agent or other hazardous waste because of their proximity to chemical agent destruction or other hazardous waste operations will be evaluated and decontaminated as necessary to meet the closure performance standards of this plan for demolition, disposal, or re-use.

Table 3 lists the RCRA-permitted units at the Main Plant facility that were never placed into hazardous waste management service.

Table 3 – RCRA-Permitted Units Never Placed in Service

RCRA-Permitted Units Never Placed in Service				
Permit Condition	**40 CFR 264 Subpart I Container Storage Area**	**Location**	**Type of Waste**	**Secondary Containment**
A.III.I.(9).(p)	Rocket Motor Storage	Igloo F1102 Igloo F1207 Igloo F1301 Igloo F1401 Igloo F1402 Igloo F1407 Igloo E301 Igloo E302 Igloo E303 Igloo E401 Igloo E402 Igloo E403 Igloo E404 Igloo E405 Igloo E406 Igloo E407 Igloo E501 Igloo E502 Igloo E503 Igloo E810 Igloo E907 Igloo E908	Never Received Hazardous Waste	No free liquids stored
A.III.I.(9)(n)	SCWO Processing Building Container Storage Area	SPB	Never Received Hazardous Waste	Coated concrete floor with curbs, spill pallets

Permit Condition	40 CFR 264 Subpart J Tank System	Equipment Designation	Type of Waste	Secondary Containment
(N/A)	Energetics Neutralization Reactors	MV-ENS-0101 MV-ENS-0102 MV-ENS-0103	Never Received Hazardous Waste	Coated concrete floor with curb and sump
(N/A)	Energetics Hydrolysate Collection Tank	MT-EBH-1901	Never Received Hazardous Waste	Coated concrete floor with curb and sump
(N/A)	Aluminum Precipitation Reactors	MV-APS-0101 MV-APS-0102	Never Received Hazardous Waste	Coated concrete floor with curb and sump
A.III.J.(8)(k)	Off-Spec Effluent Tank	MT-SCWO-0041	Never Received Hazardous Waste	Coated concrete floor with curbs and sumps
A.III.J.(8)(l)	Emergency Relief Tank	MT-SCWO-0040	Never Received Hazardous Waste	Coated concrete floor with curbs and sumps
A.III.J.(8)(m)	Hydrolysate Blend Tank	MT-SCWO-0030, MT-SCWO-0031	Never Received Hazardous Waste	Coated concrete floor with curbs and sumps
A.III.J.(8)(n)	Batch Hydrolysate Holding Tank	MT-SCWO-0032	Never Received Hazardous Waste	Coated concrete floor with curbs and sumps
(N/A)	Aluminum Filtration Feed Tank	MT-AFS-1010, MT-AFS-2010	Never Received Hazardous Waste	Coated concrete floor with curb and sump
(N/A)	Aluminum Filtrate Tank	MT-AFS-1012	Never Received Hazardous Waste	Coated concrete floor with curb and sump
A.III.J.(8)(q)	RO Reject Tank	MT-RO-0106, MT-RO-0206	Never Received Hazardous Waste	Coated concrete floor with curbs and sumps
A.III.J.(8)(r)	SCWO Effluent Tanks	MT-SCWO-0101, MT-SCWO-0201, MT-SCWO-0301	Never Received Hazardous Waste	Coated concrete containment basin
A.III.J.(8)(s)	RO Permeate Tanks	MT-SWS-0101, MT-SWS-0201	Never Received Hazardous Waste	Coated concrete containment basin
Permit Condition	**40 CFR Subpart X Miscellaneous Unit**	**Equipment Designation**	**Quantity and types of waste**	**Secondary containment**
(N/A)	Energetics Batch Hydrolyzers	MV-EBH-1101, MV-EBH-1201, MV-EBH-1301	Never Received Hazardous Waste	Coated concrete floor with curb and sump.
(N/A)	Rocket Cutting Machines (RCM)	MX-RHS-0113, MX-RHS-0114	Never Received Hazardous waste. Removed with SCRs 24915-SYS-5CR-00-02066 and 24915-SYS-5CR-00-02067 prior to VX Rocket campaign	N/A
(N/A)	Aluminum Filtration Units	ML-AFS-1040, ML-AFS-2040	Never Received Hazardous Waste	Coated concrete floor
A.III.X.(4)(h)	Reverse Osmosis (RO) Units	ML-RO-0101, ML-RO-0201, ML-RO-0301	Never Received Hazardous Waste.	Coated concrete floor with curb and sump.
A.III.X.(4)(i)	SCWO Reactors	MV-SCWO-1030, MV-SCWO-2030, MV-SCWO-3030	Never Received Hazardous Waste	Coated concrete floor with curb and sump.

6.4 BGCAPP Support Infrastructure

The BGCAPP facility includes structures, systems, and equipment that are shared by the Main Plant, SDC 1200, and SDC 2000. Key infrastructure that is shared among the three agent destruction facilities includes the Laboratory Building (LAB) and Medical Facility (MF).

The LAB, Building #17870, does not contain permitted units, but there are two <90-day container accumulation areas (CAAs) at the facility, and there are several Satellite Accumulation Areas (SAAs) located in rooms within the building. The LAB supports chemical agent monitoring and analytical activities, including work with Research, Development, Test, and Evaluation (RDTE) materials.

The Medical Facility (MF), Building #17875, does not contain permitted units, CAAs, or SAAs but could potentially become contaminated by an upset condition requiring immediate medical treatment of agent-exposed personnel. The MF System's heating, ventilation, and air conditioning (HVAC) exhaust filtration system has a set of carbon filters to capture agent vapors during such an event, along with a decontamination room with an associated spent decontamination collection tank.

The LAB and MF have remained continuously operated and occupied to date and are considered clean and not agent-contaminated. However, the status of these facilities will be reevaluated at completion of agent operations for potential contamination as described in Section 9.2.2. Decommissioning and disposition of these structures and other facility infrastructure is outside the scope of RCRA and TSCA closure and will coincide with the overall closure of the BGCAPP facility.

7.0 PRIMARY TYPES OF CONTAMINATION

The BGCAPP Main Plant is designed and operated to demilitarize chemical weapons stockpiled at BGAD. The original stockpile of chemical weapons included munitions filled with either GB, VX, or mustard chemical agent contained in projectiles, rockets, and Department of Transportation (DOT) bottles. These items were stored onsite at BGAD in the CLA managed by the BGCA prior to demilitarization.

The two primary types of contamination that are associated with demilitarization of chemical weapons at the BGCAPP Main Plant are nerve agents (GB and VX) and PCBs. Items containing mustard blister agent (H) were processed at the EDT facility and were not managed or processed in the Main Plant. However, containerized H contaminated secondary wastes were transferred from the EDT to the CSF or WTS prior to offsite shipment. There is an extremely low probability that either the CSF or WTS were contaminated with H because containers are never opened within those storage facilities, and there have been no agent spills or releases at these facilities. To date, only one container of <1 vapor screening level (VSL) GB waste containing bagged waste (0.34 VSL) has been opened at the WTS, and there was no agent contamination within the WTS building from the activity. Project procedures are in place to prevent any other containers from being opened in those facilities (24915-SAF-5PR-00-00023, *Toxic Chemical Agent Safety,* and 24915-OPS-5PR-00-00026, *Waste Characterization and Environmental Sampling*). The CSF and WTS are not considered agent-contaminated but will be reevaluated at completion of agent operations for potential future contamination events as described in Section 9.2.2.

The M55 rocket assemblies processed at the Main Plant also contain energetic materials (propellant and explosive charges). Energetic materials are fully contained in the rocket assemblies, and the materials are not accessed as part of the demilitarization process in the Main Plant. Since the energetic materials are fully contained, it is unlikely that contamination from propellant and explosives will occur in the Main Plant. Therefore, energetic materials are not considered to be a significant contaminant that will be encountered during closure of the facility.

One-time accidental spills that are cleaned up immediately are not considered significant events that cause contamination to the surfaces of structures, systems, and components (SSCs) or environmental media (i.e., one-time spills are not automatically considered to be categorized as a Solid Waste Management Unit [SWMU]). All spills at the BGCAPP facility are cleaned up immediately in accordance with Project procedures (24915-GEN-5PR-00-00018, *Emergency Response Procedure – Blue Grass Chemical Agent-Destruction Pilot Plant,* and related documents) and are not addressed in this closure plan.

The following sections provide more detail on the major types of contamination expected to be encountered during closure of the Main Plant facilities. Minor amounts of hazardous constituents other than PCBs and chemical agents are likely to be encountered during closure, but the decontamination methods that are effective for PCBs and chemical agents will be effective for those contaminants as well.

7.1 Chemical Agent Contamination

This section identifies areas that are likely to be contaminated with nerve agent as closure begins and defines the categories of agent contamination that will be encountered during closure. Areas and equipment within toxic areas of the MDB are routinely decontaminated during demilitarization operations and also during agent changeover periods to minimize or prevent the spread of contamination. The DDP-specific agent contamination status will be captured in the closure planning risk assessment which will be used to guide decontamination and decommissioning activities during the closure period.

7.1.1 Probable Areas of Agent Contamination

Chemical agent demilitarization activities are constrained to the MDB, and chemical agent exposure will be one of the potential hazards encountered during closure of areas and equipment within the MDB and the HVAC filtration system. For all areas and equipment within the scope of this plan, no agent contamination has occurred outside of engineering controls to date.

Agent vapor that is generated from demilitarization activities within the MDB is pulled from the building with the cascading ventilation system and captured in the HVAC exhaust carbon filtration system, and clean air is discharged to the atmosphere. Therefore, interior portions of the HVAC carbon filtration system are potentially contaminated with chemical agent.

The demilitarization process also generates agent-contaminated secondary wastes which are routinely containerized and managed at the CSF and WTS, but agent hazards are mitigated through engineering and administrative controls, and those storage areas are highly unlikely to be agent-contaminated.

7.1.2 Categories of Agent Contamination

Chemical agent-contaminated areas and items are subject to Army regulations as well as Kentucky hazardous waste regulations. The following categories of agent contamination support health-based risk assessments in determining how areas and equipment are managed during the closure period to achieve the physical end state configuration of the BGCAPP facility in a manner that is protective of both human health and the environment. Specific decontamination criteria for reuse of potentially agent-contaminated equipment, process systems, and areas are provided in document 24915-GEN 5PL-00-00006, *Equipment Decontamination Plan* (EDP).

The following sections apply to items that will be dismantled and disposed of offsite.

7.1.2.1 Liquid Agent Contaminated

Areas or items that were exposed to liquid agent or agent aerosols are considered contaminated with liquid agent. Liquid agent-contaminated SSCs are confined to the MDB, and chemical agent contamination assessments will be performed through the risk assessment process for areas and items potentially contaminated with liquid agent to verify levels of contamination. If left in place for demolition, these areas or items require decontamination, removal of absorptive items (e.g., carbon), evaluation and elimination of occluded spaces, and localized headspace monitoring (enclosed to minimize/eliminate airflow) to verify effective decontamination, followed by final unventilated monitoring to <1 VSL (with a 0.7 VSL action level) for all campaign agents prior to demolition. Alternatively, these items may be dismantled and decontaminated with methods shown in Appendix A and managed for offsite disposition in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

7.1.2.2 Vapor Agent Contaminated

Items that are exposed to an atmosphere exceeding the IDLH level and items within an uncontrolled environment or uncontrolled areas with potential for vapor exposure are considered to be vapor agent contaminated. Items/areas exposed to an atmosphere above the VSL are assessed through a health-based risk assessment process to determine whether they are classified as vapor agent contaminated. If left in place for demolition, vapor agent-contaminated items require decontamination, removal of absorptive items (e.g., carbon), and decontamination verification using unventilated monitoring to <1 VSL (with a 0.7 VSL action level) prior to demolition. Alternatively, these items may be dismantled and/or decontaminated with methods shown in Appendix A and managed for offsite disposition in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

7.1.2.3 Clean for Unrestricted Use

In accordance with DA PAM 385-61, areas maintained in a continuously controlled environment that have never been exposed to agent-vapor concentrations greater than the IDLH may be considered clean based on a risk assessment that addresses, at a minimum, the following factors:

- Temperature during time of exposure
- Type of process, operation, or task applicable to the equipment/area exposed
- Concentration, duration, and frequency of agent exposures
- Materials of construction for equipment/areas exposed to agent vapor
- Historical documentation for similar operations and items
- Type of equipment/area
- Potential contamination based on considerations for the source of vapor and predominant airflow direction

The closure risk assessment summarizes the process applied in determining decontamination and decontamination-verification release criteria of equipment and areas used to support agent operations with the potential for agent contamination. Areas that have no potential for agent contamination are not included. The area risk assessments define the boundary for potential agent contamination and specify decontamination, decontamination-verification criteria, and disposition options in accordance with the EDP; 24915-OPS-5PR-00-00043, *Decontamination Process*; and 24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*.

For each area, this risk assessment provides the following:

- The tasks and activities performed in each area
- A summary of equipment and material included in each area
- The type and level of agent air monitoring performed within the area
- A listing of any liquid-agent spills that may have occurred or potential for liquid-agent contamination based on specific activities conducted within that area
- A summary of agent-vapor concentrations observed during operations
- Information on historical decontamination efforts conducted within that specific area

Items that are classified as *Clean for Unrestricted Use* do not require further decontamination or verification with a UMT if removed for reuse or disposal or left in place for demolition. Alternatively, items may be dismantled and decontaminated with methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

7.1.2.4 Not Agent Contaminated

Areas and items that have never been in an agent environment or exposed to agent are not agent contaminated.

7.1.3 Basis for Agent Contamination

Based on available information, most of the ventilation category A process areas in the MDB have been exposed to agent vapor >1 IDLH with varying levels of exposure to liquid agent or agent aerosols. A portion of the ventilation category A/B and B areas have been exposed to agent vapor, and the environmentally controlled areas with the lowest potential for agent exposure are ventilation category C areas. Certain ventilation category C areas have experienced low levels of transient agent vapor but are expected to be categorized as uncontaminated. Ventilation category D areas have never been exposed to agent vapor and are therefore expected to be uncontaminated. This information will be updated as chemical agent operations are completed and closure of the facility commences.

The chemical agent exposure history and potential for agent contamination determine decontamination criteria for release of SSCs for demolition or reutilization. Specific decontamination criteria for reuse of potentially agent-contaminated equipment, process systems, and areas are provided in the EDP.

7.2 PCB Contamination

The sources of PCBs at the Main Plant facility are the SFTs and residues generated from their processing. Processing equipment within the MDB may generate fiberglass fragments, cuttings, or dust (collectively referred to as residue) that are defined as a non-liquid PCB bulk product waste.

The solid physical state of the PCBs in the SFTs and residue prevents contamination of processing equipment and structures beyond the immediate surface(s) in contact with the SFT/residue under ambient temperatures. Based on the physical and chemical properties of the PCB bulk product waste managed at BGCAPP, all surfaces in contact with PCBs are considered non-porous for decontamination purposes.

Agent decontamination activities in the MDB where the SFTs were processed are likely to generate spent decontamination liquids that will carry non-liquid PCB residues suspended in the liquid. The liquids with PCB residues in suspension are routinely collected in floor sumps which are pumped to the SDS storage tanks, and the contents of the SDS tanks are eventually processed through the ANS and/or transferred to the HSA tanks prior to offsite shipment and disposal. For the purposes of this closure plan, any PCB solids in liquid suspension will continue to be managed as PCB bulk product waste that is derived from processing SFTs, and the requirements for decontamination of *liquid PCBs* do not apply to BGCAPP.

This section identifies areas that are likely contaminated with PCBs and the criteria for determining PCB contamination which will be used to guide decontamination and decommissioning activities during the closure period.

7.2.1 Potential Areas of PCB Contamination

The PCB management areas and processing equipment covered by TSCA closure activities include the EONCs that are used to transport the M55 rockets to the CHB, the UPA-1 used for storage and assessment of the rockets in the RNDE system, ECVs containing the VRCM and supplemental equipment, the MPR, various material handling systems and equipment including robots and conveyors within the MDB, and various PCB-item storage areas used for the handling and storage of containerized SFTs, including the MSR, BTRs, the MPT Cooling Conveyor Storage Area, the WTS, and NCRM storage igloos. Additional RCRA-permitted storage areas not described above will be evaluated for applicable PCB contamination if they are placed into service for PCB bulk product waste management during the active life of the facility. Waste storage volumes of these units will not exceed the RCRA-permitted storage capacity or increase the maximum quantity of PCBs managed at BGCAPP.

Decontamination liquids containing non-liquid PCB bulk product waste may be transferred from floors, trenches, and sumps to the SDS. The PCB-contaminated SDS waste will generally be processed through the ANS reactors and sampled for agent prior to being transferred to the agent hydrolysate storage tanks. The PCB-contaminated SDS waste that is cleared for agent in the MDB may be sent directly to the Hydrolysate Storage System (HSS) storage tanks in the HSA. From the HSS tanks, the combined agent hydrolysate (AH) and SDS waste storage tanks are pumped to a loading station in the STA for offsite disposal at a properly permitted facility.

7.2.2 Basis for PCB Contamination

The PCB-contaminated wastes managed at BGCAPP are the SFTs and the wastes derived from processing them. The SFTs are manufactured products known to contain non-liquid PCBs that are embedded in the resin matrix of the fiberglass tube. The PCB concentration varies within the SFTs, but the mean PCB concentration in the fiberglass material exceeds 50 parts per million (ppm). The SFTs and any residues derived from storage or processing activities are regulated as PCB bulk product waste which are subject to TSCA disposal requirements at 40 CFR 761.62.

8.0 CLOSURE PERFORMANCE STANDARDS

401 KAR 39:090 Section 1; 40 CFR 264.111, 264.601, and 761.65

This closure plan identifies the closure performance standards that must be satisfied to close the facility in a manner that is protective of human health and the environment. The closure performance standards address RCRA, chemical agent, and TSCA closure performance standards, as well as the treatment standards for hazardous debris. All structures, equipment, bases, liners, and other materials containing, or contaminated with, hazardous wastes, waste constituents, PCBs or residues must meet the closure performance standards identified in this closure plan to achieve non-residential clean closure.

The RCRA closure performance standards may be divided into two parts: the general standards applicable to all permitted TSDFs and the technical standards for specific types of HWMUs located within the facility. Chemical agents and secondary wastes that are derived from their treatment are listed hazardous wastes in the Commonwealth of Kentucky which are also subject to closure performance standards designated by US Army policies and regulations. The chemical agent performance standards are discussed in Section 8.2.

The TSCA closure performance standards closely parallel the RCRA performance standards, and closure performance standards specific to closure of TSCA permitted units are discussed in Section 8.3. The closure performance standards for treatment of hazardous debris apply to solid materials that are intended to be discarded, and they are discussed in Section 8.4.

8.1 RCRA Closure Performance Standards

Hazardous waste management units that are required to be closed must satisfy the RCRA regulations for procedural and technical closure requirements. Closure means that a HWMU, including <90-day CAAs, has been taken out of service and has met the applicable closure performance standards.

8.1.1 General Performance Standards for RCRA

401 KAR 39:090 Section 1; 40 CFR 264.111, 264.601

This closure plan is designed to ensure that the BGCAPP facility will be closed in a manner that achieves the following:

- Eliminates the need for further maintenance or post-closure care
- Controls, minimizes, or eliminates the escape of hazardous wastes or hazardous constituents from the closed facility to the extent necessary to protect human health and the environment
- Complies with the applicable closure provisions of Commonwealth of Kentucky environmental statutes and regulations (which incorporate, by reference, Federal closure requirements) and 40 CFR Subpart G

As part of meeting these standards for non-residential clean closure, BGCAPP will remove all wastes from the closing units and remove or decontaminate all waste residues, contaminated containment system components, contaminated soils (including ground water and any other environmental media contaminated by releases from the closing units), and structures and equipment contaminated with hazardous waste and hazardous constituents.

8.1.2 Technical Performance Standards for RCRA

401 KAR 39:090 Section 1; 40 CFR 264.178, 264.197 and 264.601 – 264.603

The technical performance standards of 40 CFR Subpart G require BGCAPP to close permitted units in a manner that complies with the applicable closure requirements of 264.178 (containers), 264.197 (tank systems), and 264.601 through 264.603 (miscellaneous units). The requirements for meeting the technical performance standards are addressed in following sections.

8.1.2.1 Subpart I Container Storage Areas – 401 KAR 39:090 Section 1; 40 CFR 264.178

Technical Standard: For closure of Subpart I container storage areas, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

This technical standard will be met by:

- Removal of all containers of wastes and portable containments from Subpart I-permitted container storage areas
- Removal of all visible waste residues from storage areas and fixed containment systems
- Characterization and offsite disposal of removed wastes at a properly-permitted treatment and/or disposal facility
- Decontamination of agent-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Decontamination of PCB-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Dismantlement of container storage areas and removal from site or clean close and leave in place
- Performance of required closure verification (sampling and analysis)
- Placement of supporting documentation in the operating record for closure certification

Soils beneath the permitted container storage areas are not expected to be contaminated as a result of operations. Containments for all Subpart I container storage areas are maintained in good operating condition and are routinely inspected for defects in accordance with the applicable requirements of the RCRA Permit to prevent releases to the environment. The results of the inspections are maintained in the facility operating record and will be reviewed at closure along with performing a visual inspection of the containments to identify cracks, defects, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if contaminated liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an area of concern [AOC]) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the constituent of potential concern (COPC) lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Descriptions of how Subpart I container storage areas will be closed are discussed in Section 9.3.1.

8.1.2.2 Subpart J Tank Systems – 401 KAR 39:090 Section 1; 40 CFR 264.197

Technical Standard: At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components, contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste unless 40 CFR 261.3(d) applies. If any contaminated soils beneath the tank system cannot be removed or decontaminated, then the owner or operator must close the unit and perform post-closure care.

This technical standard will be met by:

- Removal of wastes and waste residues from Subpart J-permitted tanks and associated ancillary equipment
- Characterization and offsite disposal of all removed wastes at a properly-permitted treatment and/or disposal facility
- Decontamination of agent-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Decontamination of PCB-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Dismantlement of the tank system and removal from site or clean close and leave in place
- Performance of required closure verification (sampling and analysis)
- Placement of supporting documentation in the operating record for closure certification

Soils beneath the permitted tank systems are not expected to be contaminated as a result of operations. Containments for all Subpart J tank systems are maintained in good condition and are routinely inspected for defects in accordance with the applicable requirements of the RCRA Permit to prevent releases to the environment. The results of the inspections are maintained in the facility operating record and will be reviewed at closure along with performing a visual inspection of the containments to identify cracks, defects, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if contaminated liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Descriptions of how Subpart J Tank Systems will be closed are discussed in Section 9.3.2.

8.1.2.3 Subpart X Miscellaneous Units – 401 KAR 39:090 Section 1; 40 CFR 264.601-603

Technical Standard: For closure of Subpart X Miscellaneous Units, all hazardous waste and hazardous waste residues must be removed, and the units must be closed in a manner that will ensure protection of human health and the environment. If any contaminated soils beneath the Subpart X unit cannot be removed or decontaminated, then the owner or operator must close the unit and perform post-closure care.

This technical standard will be met by:

- Removal of wastes and waste residues from Subpart X-permitted units and associated equipment (e.g., conveyors and THS equipment)

- Characterization and offsite disposal of all removed wastes at a treatment and/or disposal facility that has the proper permits
- Decontamination of agent-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A
- Decontamination of PCB-contaminated items to meet the applicable closure performance standards of this closure plan for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A
- Dismantlement of the miscellaneous unit and associated equipment, and removal from site or clean close and leave in place
- Performance of required closure verification (sampling and analysis)
- Placement of supporting documentation in the operating record for closure certification

The active Subpart X Miscellaneous Units at the BGCAPP Main Plant facility are located within the MDB secondary containment system that is shared with other permitted hazardous waste management units, and soils beneath the miscellaneous units are not expected to be contaminated as a result of operations. Containments for all Subpart X Miscellaneous Units are maintained in good condition and are routinely inspected for defects in accordance with the applicable requirements of the RCRA Permit to prevent releases to the environment. The results of the inspections are maintained in the facility operating record and will be reviewed at closure along with performing a visual inspection of the containments to identify cracks, defects, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if contaminated liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Descriptions of how Subpart X Miscellaneous Units will be closed are discussed in Section 9.3.3.

8.1.2.4 Large Quantity Generator Accumulation Units – 401 KAR 39:080 Section 1, 40 CFR 262.17(a)(8)

The large quantity generator (LQG) closure performance standards apply to <90-day CAAs that were established during the operating life of the facility on or after the effective date of the of the Hazardous Waste Generator Improvements Rule (GIR) at 401 KAR 39:080 which was July 1, 2018. The operating life of the facility includes construction, startup, systemization, operation, and closure of the facility. During the operating life of the facility, BGCAPP operated multiple CAAs and placed notices in the operating record to track the operating history and location of these units beginning with the GIR effective date. When an individual unit is closed, the notices in the operating record satisfy the applicable requirements of 40 CFR 262.17(a)(8)(i)(A).

BGCAPP also operated multiple SAAs in accordance with 40 CFR 262.15 during the operating life of the facility. However, SAAs are exempt from the closure performance standards of 40 CFR 262.17(a)(8) as stated in 40 CFR 262.17(a)(8)(v). The location and operation of the SAAs are tracked in the operating record, and each SAA will be removed from service in accordance with 24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*.

BGCAPP will meet the closure performance standards for CAAs by closing the waste accumulation areas in a manner that:

- Minimizes the need for further maintenance by controlling, minimizing, or eliminating, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere [40 CFR 262.17(a)(8)(iii)(A)(1)]
- Removes or decontaminates all contaminated equipment, structures, and soil and any remaining hazardous waste residues from waste accumulation units including containment system components (e.g., pads, liners), contaminated soils and subsoils, bases, and structures and equipment contaminated with waste unless § 261.3(d) of this chapter applies [40 CFR 262.17(a)(8)(iii)(A)(2)]
- Any hazardous waste generated in the process of closing either the generator's facility or unit(s) accumulating hazardous waste must be managed in accordance with all applicable standards of parts 262, 263, 265 and 268 of 40 CFR, including removing any hazardous waste contained in these units within 90 days of generating it and managing these wastes in a RCRA Subtitle C hazardous waste permitted treatment, storage and disposal facility or interim status facility [40 CFR 262.17(a)(8)(iii)(A)(3)].

For closure of CAAs, all containers, hazardous waste and hazardous waste residues must be removed from the containment system. Remaining liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

These performance standards will be met by:

- Removal of all containers of wastes and portable containments from LQG container storage areas
- Removal of all visible waste residues from storage areas and fixed containment systems
- Characterization and offsite disposal of removed wastes at a properly permitted treatment and/or disposal facility
- Performance of an agent risk assessment in container storage areas that may have been exposed to chemical agent
- Decontamination of agent-contaminated items to meet health-based screening levels for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Decontamination of PCB-contaminated items to meet health-based screening levels for items that are to be left in place for demolition or reuse. Decontamination methods are described in Appendix A.
- Performance of closure verification inspections of the storage area
- Placement of supporting documentation in the operating record for closure certification

In general, if an LQG has been managing its hazardous waste CAAs in accordance with the provisions of 40 CFR 262.17 including proper accumulation standards and spill clean-up, then clean closure will consist of removing the containers from the accumulation area. The LQG container storage areas within the MDB will be assessed for PCB and chemical agent contamination as part of RCRA closure and decontaminated to the extent necessary for demolition or turnover to BGAD for future use. At a minimum, containments for container storage areas that are outside of the MDB will be visually inspected for contamination, and any residues will be removed and managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*).

In accordance with the applicable requirements of 40 CFR 262.17, container accumulation areas are inspected weekly to verify that the containers are in good condition and do not show signs of leakage. Any leaks or deficiencies discovered during the inspection are corrected immediately. Additionally, containers are kept in spill pallets or other containment devices to prevent releases to the environment.

At closure of the facility, BGCAPP will satisfy the notification requirements of 40 CFR 62.17(a)(8)(ii) and meet the closure performance standards of 40 CFR 262.17(a)(8)(iii) for closure of container accumulation areas. The Project did not operate <90-day hazardous waste tanks, containment buildings, or drip pad units, and the closure requirements for those units are not applicable.

The notification requirements will be met by notifying the Director at least 30 days prior to closing the facility, and BGCAPP will notify the Director within at least 90 days after complying with facility closure performance standards of 40 CFR 262.17(a)(8)(iii). The CAA units may be closed sequentially or in parallel as the needs of the facility change during RCRA closure of the facility. In accordance with 40 CFR 262.17(a)(8)(ii)(B), BGCAPP will notify the Director if the closure performance standards for CAAs cannot be met.

For closure of an individual CAA, all containers of hazardous waste and any visible residues will be removed and managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). After the containers are removed, a visual inspection of the areas will be conducted to verify that there are no signs of leaks or spills that would have allowed hazardous waste or hazardous constituents to reach the underlying surfaces or soils. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

The expectation at closure of the facility is to clean close the CAAs by verifying that container accumulation activities at BGCAPP did not result in contamination of the site.

8.2 Closure Performance Standards for Chemical Agent

401 KAR 39:090 Section 1; 40 CFR 264.111

This section defines the closure performance standards for chemical agent-contaminated SSCs that will ensure applicable HWMUs are closed in a manner that is protective of human health and the environment and eliminates the need for post-closure care. These non-residential closure performance standards are based on the RCRA non-residential closure performance standards and the health-based criteria established in Department of the Army (DA) documents including *Implementation Guidance Policy for Revised Airborne Exposure Limits for GB, GA, GD, GF, VX, H, HD, and HT* (DA, 2004) and *Derivation of Health-Based Environmental Screening Levels for Chemical Warfare Agents* (U.S. Army Center for Health Promotion and Preventive Medicine,1999). The health-based criteria for chemical agent have been incorporated into DA Pamphlet (DA PAM) 385-61, *Toxic Chemical Agent Safety Standards*, and are applicable to the reuse and disposal of potentially contaminated facilities, items, and materials associated with chemical agent facilities and operations.

Agent-contaminated items that are considered for reuse are addressed by the BGCAPP EDP which has been approved by the KDEP Division of Waste Management. The EDP outlines agent decontamination criteria and monitoring levels for each applicable airborne exposure limit (AEL) that are protective of both human health and the environment such that agent-exposed materials may be safely reused. Release criteria for decontaminated facilities deemed appropriate for reuse after completion of closure are also addressed in the EDP. SSCs that are reused and satisfy the decontamination requirements of both DA PAM 385-61 and the EDP are considered clean closed for the purpose of meeting chemical agent closure performance standards. Reuse of potentially-contaminated items is further discussed in Section 9.7.

The closure performance standard for chemical agent contamination is effective decontamination which is demonstrated with physical sampling and/or airborne agent monitoring to meet the appropriate AELs for the designated end state. The MDB and HVAC exhaust filtration system will undergo decontamination and demolition followed by offsite shipment of demolition debris and the appropriate AEL is the short-term exposure limit (STEL) with an airborne concentration that is equivalent to 1 VSL. Prior to demolition of the MDB and HVAC exhaust filtration system, agent-contaminated SSCs that have been decontaminated must be cleared to less than (<) 1 VSL screening criterion with headspace monitoring or UMT as described in Section 11.0. Demolition debris that has met the treatment standards in this plan and has been successfully verified to meet the UMT clearance criteria may be managed as non-hazardous debris and either disposed in a Subtitle D landfill or sent for resource recovery. In addition, liquid agent-contaminated concrete will be scabbled as stated in Section 8.4.1.1, and the remaining clean concrete surface must be sampled and verified to clear the non-hazardous waste control limits (< NHWCL) for applicable chemical agent concentrations specified in U.S. Army Public Health Command (USAPHC) *Chemical Agent Health Based Standards and Guidelines* (July 2011) prior to disposition at a Subtitle D landfill.

8.3 Closure Performance Standards for TSCA

40 CFR 761.61, 761.65 and 761.79

The applicable requirements of 40 CFR 761.65(e) establish the closure performance standards for storage and processing units that are subject to the provisions of the TSCA Approval. The closure performance standards require permitted TSCA units to be closed in a manner that eliminates the potential for post-closure releases of PCBs which may present an unreasonable risk to human health or the environment. If any contaminated soils beneath the permitted TSCA units cannot be removed or decontaminated, then the owner or operator must close the unit and perform post-closure care. These standards will be met by:

- Removal of PCB bulk product waste and waste residues from TSCA permitted units and associated ancillary equipment
- Characterization and offsite disposal of all removed wastes as required by 40 CFR 761.62
- Performance of a contamination assessment of any units that may have been exposed to PCB bulk product waste
- Decontamination of PCB-contaminated items to meet PCB remediation waste cleanup levels for high-occupancy areas for items that are to be left in place
- Dismantlement of the storage and processing units and removal from site or non-residential clean closure and left in place
- Performance of required closure verification sampling and analysis
- Placement of supporting documentation in the operating record for closure certification

Soils beneath the permitted TSCA units are not expected to be contaminated as a result of operations, and no post-closure care related to management of PCBs is anticipated. Containments for all TSCA units are maintained in good condition and are routinely inspected for defects in accordance with the requirements of the TSCA Approval and the RCRA Permit to prevent releases to the environment. The results of the inspections are maintained in the facility operating record and will be reviewed at closure along with performing a visual inspection of the containments to identify cracks, defects, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if contaminated liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Descriptions of how TSCA-permitted units will be closed are discussed in Section 9.3.6.

8.4 Closure Performance Treatment Standards for Hazardous Debris

The closure performance treatment standards for hazardous debris are technology-specific standards which apply to solid materials that are intended to be discarded, and they are not applicable to SSCs that will be reused or remain in place following closure of the Main Plant facility. The Project may utilize physical or chemical extraction technologies listed in 40 CFR 268.45, Table 1, Parts A.1 and A.2.a, to achieve the treatment standards for decontamination of hazardous debris. The extraction technologies that BGCAPP has selected for treating hazardous debris are summarized in Appendix B of this closure plan.

The physical extraction technologies include abrasive blasting, scarification, grinding, planing, spalling, vibratory finishing, and high-pressure steam/water sprays. For these technologies, the performance standards are based on removal of the contaminated layer of the debris. There are no restrictions on the type of contaminant being treated with these technologies because they are physically removed, and this separates the contaminated layer from the non-hazardous component of the debris. In addition, any debris type may be treated with these technologies provided that the contaminated layer is removed.

The chemical extraction technology selected by BGCAPP is water washing and spraying. The performance standards for this technology are based on dissolution of the contaminants into the cleaning solution and a clean debris surface. Complete removal of the outer debris layer is not intended with this technology, and it is most effective on non-porous debris. Water sprays or baths will effectively treat debris alone or when combined with caustic, surfactants, detergents, and/or other chemicals that enhance the effectiveness of the technique.

Hazardous debris that is successfully decontaminated with extraction technologies described in Appendix B of this closure plan may be excluded from Subtitle C regulation under the conditioned exclusion for treated debris at 40 CFR 268.45(c). Those items that are eligible for this exclusion may be recycled or disposed of in Subtitle D landfills provided that the treated debris also satisfies the applicable chemical agent and TSCA closure performance standards of Sections 8.2 and 8.3.

The specific application of the closure performance treatment standards for hazardous debris are described in the following sections.

8.4.1 Treatment Standards for Concrete Debris

The Project anticipates that a significant quantity of the waste produced from closure of the BGCAPP Main Plant facility will be rubblized concrete generated from demolition of the MDB and other obsolete structures associated with the management of hazardous waste. The MDB houses most of the HWMUs that will be addressed by this closure plan, and it is the only structure that is routinely exposed to liquid and vapor agent during operation of the facility. Concrete elements within the MDB that may be exposed to agent are covered with a protective coating that provides a barrier to prevent penetration of agent and other hazardous wastes into the concrete. Concrete elements of hazardous waste management areas that are outside the toxic areas of the MDB are not exposed to chemical agent and are rarely exposed to other hazardous wastes from spills or other unplanned releases. All spills are cleaned up immediately in accordance with Project procedures (24915-OPS-5PR-00-00028, *Environmental Inspections*; 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards*; and related documents), which prevents penetration of the concrete surfaces.

The hazardous debris treatment standards are technology-specific performance standards rather than numerical concentration performance standards. Thus, analysis of the treated debris for determining concentrations of hazardous constituents is generally not necessary. In the case of concrete that may have been exposed to liquid agent, the effectiveness of the extraction technologies will be verified with sampling and analysis as prescribed in the in-progress decommissioning sampling (IPDS) plan. Results of the sampling and analysis will be used to assist in determining how demolition debris will be managed when it is discarded. Liquid agent-contaminated concrete demolition debris that clears the non-hazardous waste control limits (NHWCL) for applicable chemical agent concentrations specified in U.S. Army Public Health Command (USAPHC) *Chemical Agent Health Based Standards and Guidelines* must also satisfy the closure performance standards of Section 8.3 and 8.4 and meet the agent screening criterion of < 1 VSL prior to disposal in a Subtitle D landfill. Eligible material from demolition of decontaminated SSCs that meet these closure performance standards may be sent offsite for concrete rubble recycling or scrap metal recovery.

The criteria for disposition of concrete debris as a recyclable material or disposal in a Subtitle D landfill is described in the following sections.

8.4.1.1 Concrete Exposed to Liquid Chemical Agent

The MDB floors are constructed from a steel-reinforced concrete mat foundation that is over three feet thick, and concrete curbing is provided to ensure that the containment systems within the building provide adequate volume for worst case scenarios of ruptured storage tanks. The walls and ceilings of the explosive containment rooms (ECRs) (Rooms 07-104/105) are also constructed from steel-reinforced concrete to contain potential detonations of energetic materials.

Small sections of the floors within the MDB are known to have been exposed to liquid chemical agent (e.g., MWS Room 07-135, ANS Room 07-123, ECR 07-104/105), and the exposed areas are recorded in the facility operating record documents. Procedure 24915-OPS-5PR-00-00040, *Chemical Agent Spill Tracking*, establishes the method of tracking areas and equipment in the Main Plant that become contaminated with liquid chemical agent during operations. Liquid agent contaminated SSCs are identified during performance of toxic entries or by closed-circuit television during inspections. The liquid agent contamination history is captured in the facility operating record (e.g., 24915-TEMPLATE-01841, *Contaminated Area/Equipment Identification Form*), along with decontamination activities that have taken place. 24915-CL-5PL-00-00003, *Main Plant Health-Based Risk Assessment*, captures information from spill tracking documentation, event reports, logs, and general operating knowledge to provide a clear picture of areas of known liquid and vapor contamination, and it will be provided to the Director for review and approval. The spill tracking forms (*Contaminated Area/Equipment Identification Form*) will be provided to the Director for review as they become available.

BGCAPP may decontaminate liquid agent contaminated coatings and concrete surfaces with any of the methods described in Appendix A followed by scabbling to eliminate potential agent hazards prior to demolition. Scabbling is the use of any of the physical extraction technologies that remove surfaces or layers of concrete which include abrasive blasting, scarification, grinding, planing, spalling or vibratory finishing. The performance standard for treatment of concrete debris exposed to liquid chemical agent requires (1) removal of at least ¼ inch of the surface layer and (2) treatment to a clean debris surface standard. Removal of a minimum ¼ inch of the surface layer is required because of the porous nature of concrete. To ensure removal of all contaminants that may be absorbed to depths beyond ¼ inch, the performance standard also requires removal of virtually all staining that could be indicative of the presence of agent contaminants. Because all contaminants are eliminated with the removal of the upper surface layer, the extraction technology will remove chemical agent, PCBs, and any other contaminants on the surface of the concrete. Treatment residuals from physical removal of the contaminated layer will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Confirmation sampling and analysis will be conducted as prescribed in the IPDS plan to verify that liquid-agent exposed concrete has been successfully decontaminated for disposal in a Subtitle D landfill. The In-Progress Decommissioning Sampling Plan (IPDSP) is a project-level document (24915-CL-5PL-00-00002, *In-Progress Decommissioning Sampling Plan for Main Plant*) that will be provided to the Director as supplemental information in support of the Closure Plan, as stated in Section 9.2.5. If the analytical results indicate that the NHWCL thresholds are exceeded, the affected area may be scabbled again until favorable results are attained, or the concrete may be disposed as hazardous waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). The Subtitle D landfill disposal criteria for treated concrete debris also requires that the debris satisfy the applicable closure performance standards of Sections 8.2 and 8.3.

8.4.1.2 Vapor Agent Contaminated Concrete Never Exposed to Liquid Agent

Nearly all of the concrete elements in category A, A/B, and B areas have been exposed to agent vapor and may undergo decontamination with methods described in Appendix A followed by treatment with one or more of the extraction technologies summarized in Appendix B to achieve the treatment standards for debris disposed in a Subtitle D landfill or resource recovery as recycled concrete. The hazardous debris performance standard for coated concrete that is vapor agent contaminated, but never exposed to liquid chemical agent is achieved when the upper surfaces are treated using any of the extraction technologies described in Appendix B, and the treatment results in a "clean debris surface." The concrete surfaces in the MDB are equipped with chemical resistant coatings that are designed to provide a protective barrier for the concrete. Therefore, the predominant debris type for coated concrete in toxic areas exposed to chemical agent vapor is the coating itself which can be treated to a clean debris surface standard with high-pressure steam and water sprays or other extraction technologies. Treatment residuals will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Confirmation that the treatment is effective for chemical agent decontamination will be performed with headspace monitoring or UMTs to verify that the concrete has been successfully decontaminated for disposal in a Subtitle D landfill or resource recovery as recycled concrete. If the monitoring results indicate that agent vapor thresholds are exceeded, the affected area may be decontaminated again until favorable results are attained, or the concrete may be disposed as hazardous waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The Subtitle D landfill disposal and resource recovery criteria for treated concrete debris also requires that the debris satisfy the applicable closure performance standards of Sections 8.2 and 8.3.

8.4.1.3 Concrete that is Not Agent Contaminated

Concrete elements in category C and D areas, and areas outside of the MDB that are used for waste management (e.g., containments, floors, curbs, pads) are not agent contaminated. These areas are typically sealed with protective coatings to prevent contamination from hazardous wastes and PCBs. Waste containers and permitted Subpart J tanks (i.e., agent hydrolysate tanks in HSA) in these areas are managed to prevent releases and the areas are routinely inspected for signs of leaks and spills. Spills and releases are cleaned up immediately in accordance with Project procedures (24915-OPS-5PR-00-00028, *Environmental Inspections*; 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards*; and related documents), and no process related hazardous wastes or PCBs are expected in these areas.

The concrete elements in these areas are not expected to be contaminated, but each area will be evaluated as closure progresses to identify potential contamination. If any of these concrete elements are determined to be contaminated with hazardous constituents, BGCAPP may decontaminate the areas with any of the methods described in Appendix A followed by treatment with appropriate extraction technologies in Appendix B to eliminate contamination prior to demolition. Treatment residuals will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

The Subtitle D landfill disposal and resource recovery criteria for treated concrete debris also requires that the treated debris satisfy the applicable closure performance standards of Sections 8.2 and 8.3 have been met. Eligible material from demolition of decontaminated SSCs may be shipped offsite as recycled concrete rubble or scrap metal.

8.4.2 Treatment Standards for Non-porous Debris

The hazardous debris treatment standard for non-porous materials is achieved when the upper surfaces are treated using any of the extraction technologies described in Appendix B and the treatment results in a "clean debris surface." An effective extraction technology used for decontamination of non-porous components (e.g., carbon steel SSCs) involves the use of high-pressure steam and water sprays which is fully described in 40 CFR 268.45, Table 1, Part A.1.e, as the "Application of water or steam sprays of sufficient temperature, pressure, residence time, agitation, surfactants and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers." Other physical extraction technologies or the chemical extraction technology described below may also be used in the event that the high-pressure spray is not sufficient for cleaning non-porous surfaces. Treatment residuals will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Process equipment and components will be disassembled as necessary to expose contaminated surfaces to high-pressure spray or other extraction technologies. Surfaces will be inspected to verify that the clean debris surface standard has been achieved. If the surfaces are determined to fail the clean debris surface standard, they may be subjected to additional high-pressure spray or other extraction technologies until compliance is achieved or, alternatively, the item may be shipped offsite to a properly permitted disposal facility in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents).

Appendix B also describes the only chemical extraction technology that has been considered for use during closure of the Main Plant facility. The technology is "water washing and spraying" which is described as the "Application of water sprays or water baths of sufficient temperature, pressure, residence time, agitation, surfactants, acids, bases, and detergents to remove hazardous contaminants from debris surfaces and surface pores or to remove contaminated debris surface layers" (40 CFR 268.45, Table 1, Part A.2.a). Treatment residuals generated from this extraction technology will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents).

Decontamination of SSCs using the "water washing and spraying" extraction technology will be accomplished in open vessels within engineering controls if they are potentially contaminated with chemical agent. Any material decontaminated using this treatment technology will be in contact with the solution not less than 15 minutes before it is visually inspected. If the inspection indicates the item does not achieve the clean debris surface standard, it may be treated again or shipped offsite for disposal in accordance with Project procedures. Items that cannot be reasonably disassembled for decontamination and for inspection of the inner and outer surfaces to ensure that the clean debris surface standard has been achieved may be shipped offsite for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents).

Confirmation that the treatment is effective for decontamination of chemical agent will be performed with headspace monitoring or UMTs to verify that the non-porous debris has been successfully decontaminated for disposal in a Subtitle D landfill or for resource recovery as a recyclable material. If the monitoring results indicate that agent vapor thresholds are exceeded, the affected area may be decontaminated again until favorable results are attained, or the non-porous debris may be disposed as a hazardous waste in accordance with project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). The Subtitle D landfill disposal and resource recovery criteria for treated debris also requires that the debris satisfy the applicable closure performance standards of Sections 8.2 and 8.3.

8.4.3 Treatment Standards for Porous Debris

Porous materials are typically identified during the decontamination and decommissioning process and may be removed from SSCs and disposed prior to performing treatment of hazardous debris. All porous materials exposed to liquid agent or vapor agent greater than IDLH levels will be evaluated in a risk assessment and removed (as necessary) during initial closure activities. If there are cases where porous material must be treated to meet the disposal criteria for hazardous debris, the following requirements apply. Porous materials may be size reduced into manageable pieces (no more than ½ inch in one dimension) and decontaminated using the "water washing and spraying" technology described in Appendix B (40 CFR 268.45, Table 1, Part A.2.a). The decontaminated portion of the porous material will then be visually inspected to verify that it is reasonably free of particles and contaminants characteristic of the material in contact with the debris. If the porous material does not meet that requirement, it may be subjected to further decontamination until it does comply with that requirement or, alternatively, it may be shipped offsite as hazardous waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Confirmation that the treatment is effective for decontamination of agent contaminated items will be performed with headspace monitoring or UMTs to verify that the porous debris has been successfully decontaminated for disposal in a Subtitle D landfill or for resource recovery. If the monitoring results indicate that agent vapor thresholds are exceeded, the affected area may be decontaminated again until favorable results are attained, or the debris may be disposed as a hazardous waste in accordance with project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). The Subtitle D landfill disposal and resource recovery criteria for porous debris also requires that the applicable closure performance standards of Sections 8.2 and 8.3 have been met.

8.5 Alternative Clean Closure Performance Standard

For any of the permitted units subject to closure, BGCAPP may choose to decommission the item and send all or part of it offsite for disposal as hazardous waste or hazardous debris or send eligible material offsite as recyclable resources in accordance with Section 9.6.8. Off-site disposition of permitted units or components may be selected as a clean closure performance standard instead of performing decontamination to satisfy the non-residential closure performance standards described above. Notwithstanding non-residential clean closure requirements applicable to any portion of the permitted unit that remains on site (e.g., containment systems), removal and proper offsite disposition (disposal or recycling) of all or part of the permitted unit constitutes clean closure of the item sent off site.

9.0 CLOSURE PLAN

401 KAR 39:090 Section 1; 40 CFR 264.112(a) and 761.65

This plan addresses the requirements for closure of RCRA- and TSCA-permitted units and supplemental equipment at the BGCAPP Main Plant with emphasis on units that have received and managed hazardous waste or PCB wastes during the active life of the facility. Permitted units that have never received or managed hazardous waste are outside the scope of RCRA and TSCA closure and will be administratively closed as described in Section 9.4.

9.1 Content of Plan

401 KAR 39:090 Section 1; 40 CFR 264.112(b) and 761.65

In accordance with the requirements of 40 CFR 264.112(b), this closure plan identifies the steps necessary to perform partial and final closure of the RCRA-permitted units at any point during the active life of the facility. The active life is the period beginning with the initial receipt of hazardous waste at the facility and ending when the Director receives certification of final closure. This plan also addresses the requirements of 40 CFR 761.65 for closure of PCB processing and storage areas associated with the Main Plant including the NCRM storage igloos.

9.2 Closure Planning and Execution

401 KAR 39:090 Section 1; 40 CFR 264.112(b) and 761.65

The BGCAPP closure process is a systematic approach to closure that combines planning, implementation, and reporting activities to ensure that closure performance standards are met in a safe and efficient manner, and adequate documentation is available to support closure certification. This process utilizes Project-level documents and recordkeeping practices that are available for inspection by the Director.

9.2.1 Decontamination and Decommissioning Packages

Decontamination and decommissioning packages (DDPs) define the boundaries and scope of closure work to be performed for decontamination and decommissioning of permitted units. The DDPs identify the activities and steps required for decontamination and decommissioning of HWMUs and associated ancillary equipment described in this closure plan.

Because of the interdependence of many of the systems and structures within the Main Plant, DDP boundaries may be defined by system, room, or area as deemed necessary to maintain control of plant systems and configuration management. For example, ancillary equipment such as piping or tray handling systems are spread throughout multiple areas of the facility and shared by multiple permitted units that require closure. These systems must remain operational until the last shared system is no longer needed to maintain safe configuration of the plant. One or more DDPs may be required to address complete closure of some permitted units.

Examples of DDPs that apply to areas and systems with permitted units in their boundaries are shown in Table 4. The complete list of DDPs is maintained in a Project-level document (24915-GEN-5PR-00-00046, *Development of Decontamination and Decommissioning Packages*), and it may be revised as planning proceeds.

Table 4 - Examples of Decontamination and Decommissioning Packages for Main Plant

Examples of Decontamination and Decommissioning Packages for Main Plant[1]			
Example DDP Systems, Rooms and Areas – Main Plant	Room/Location	Ventilation Category	Permitted Unit Type(s)
UPA1 / UPA1 Airlocks	07-101	C	Subpart I (UPA containment area), Subpart X (RNDE), TSCA (RMM)
Explosive Containment Room - 1 (ECR1)	07-104	A	Subpart I (ECR containment area), Subpart X (RSM)
Explosive Containment Room - 2 (ECR2)	07-105	A	Subpart I (ECR containment area), Subpart X (RSM)
Tray Container Transfer Room (TCTR)	07-124	B	Subpart I (TCTR containment area)
Toxic Maintenance Area	07-125	A/B	Subpart I (TMA containment area), Subpart X (Drum Compactor)
Metal Parts Treater System Room	07-146	B	Subpart X (MPT)
MPT Off-gas Treatment System Room	07-141	D	Subpart I (OTM containment area), Title V Pollution Control Equipment (OTM)
HVAC Ducts - Roof	MDB Roof	A, B, C	Ancillary Equipment (HVAC exhaust ductwork)
Example DDP Closure Areas	Area or Structure	Ventilation Category	Permitted Unit Type(s)
HVAC Carbon Filter Banks/Stacks	Filter Plenum, Ductwork, Stacks	N/A	Ancillary Equipment (Subpart CC), Title V Pollution Control Equipment (HVAC exhaust filtration system)
Hydrolysate Storage System (HSS)	HSA	N/A	Subpart J (HSA storage tanks)
Container Storage Facility (CSF)	Building 110FF	N/A	Subpart I (CSF containment system)

Notes:
1. The DDPs in this table are a partial list and provides examples only. The complete list of DDPs developed for BGCAPP Closure is maintained in a project-level document (24915-GEN-5PR-00-00046, *Development of Decontamination and Decommissioning Packages*) that may be updated as closure planning and execution proceed.

9.2.2 Closure Planning Risk Assessment

An assessment of chemical agent contamination in agent-related areas will be performed for systems, areas, or rooms to support the DDP planning activities. The risk assessment considers historical information regarding the exposure of equipment to chemical agents and will reference the contamination history (where applicable), determine a contamination potential (liquid, vapor, or none), and establish a decontamination regimen and clearance monitoring requirements. 24915-CL-5PL-00-00003, *Main Plant Health-Based Risk Assessment,* supports equipment- and area-specific decontamination and remediation decisions and will be prepared during the GB Rocket campaign. The *Main Plant Health-Based Risk Assessment* will be reviewed and updated (as required) upon completion of agent operations and during initial closure operations with regard to the contamination history of specific areas. This agent risk assessment will provide information that is required to finalize the DDP scope where required and will be provided to the Division for review and approval early in the Main Plant Closure period, once it has been finalized.

9.2.3 Engineering Design Change Documentation

Engineering will develop design change documents and other technical guidance to reflect the scope of work and required isolation/de-energization of equipment defined in the DDP. The design change documents will be the basis for developing work packages and work orders for executing closure work. As BGCAPP will remain an operating facility for much of closure, plant configuration management will be controlled as systems are incrementally removed from service during the decommissioning process. The BGCAPP configuration management process ensures that design changes to any portion of the facility are performed in a controlled manner to prevent disruption of systems that are required for continued safe operation of the plant. The design change packages associated with closure activities will be prepared and issued in accordance with the rigor described in Project configuration management protocols and procedures (24915-000-G01-GAM-00011, *Configuration Management Plan*; 24915-00-GPP-GAM-00006, *Configuration Management Process and Configuration Control Board; and related documents*). The design change process and the configuration management requirements are maintained at the Project document level (24915-SYS-5PR-00-00042, *System Change Request*).

Engineering design change documents for RCRA closure will be prepared under the System Change Request (SCR) process which throughout operations has generated numerous documents that became the basis for modifications to the RCRA and TSCA permits. During the facility closure period, the Director will be notified when a permitted HWMU is taken out of service and designated for closure in accordance with Section 18.0. At that time, the closure SCRs for that permitted HWMU can be implemented. The SCRs are Project-controlled documents (24915-SYS-5PR-00-00042) that will be distributed and archived by the Project Document Control Center (24915-000-2KP-A03-00001, *Records Management and Document Control*). Archived documents can be retrieved for closure certification purposes.

Once approved by BPBG Engineering, the closure SCRs are the authorizing documents for proceeding with changes to plant configuration to support decommissioning activities. It is anticipated that multiple SCRs will be issued for each DDP. All work performed under the SCRs will be recorded and archived in the operating record for future retrieval to support closure certification.

9.2.4 Work Orders

The DDPs and SCRs will be used as the planning documents that describe the field work to be performed on the various systems/rooms/areas/buildings undergoing closure. Work to be performed in the field will be executed under the direction of a work order. Work orders identify resources, work controls, tools, and equipment that is required for performing closure-related work. In addition to defining the steps associated with decontamination, disassembly, monitoring or sampling, closure work orders may include specific line items for collecting information to support closure certification.

Work controls specified within the work order address applicable workspace agent-vapor monitoring requirements in addition to other hazards, including hazardous energy control, hot work, confined space, scaffolding/work platforms, and hazardous materials control. Completed work orders contain a record of the work that was accomplished in the field as well as the as-left condition of the SSC that was being worked. Work orders and records of the work performed are Project-controlled documents (24915-WCG-5PR-00-00001, *Work Control, Work Order [WO] Process*) that are maintained in the operating record for future retrieval to support closure certification.

9.2.5 In-Progress Decommissioning Sampling

In-progress decommissioning sampling (IPDS) is designed to support decontamination and closure efforts. The analytical results are used as screening levels to assess the progress of PCB and agent decontamination efforts during the decommissioning phase. A combination of physical sampling and air monitoring may be used to evaluate cleanliness of equipment and the underlying protective barriers (concrete floors and joints) where PCBs and chemical agent were processed.

The IPDS Plan is a Project-level document (24915-CL-5PL-00-00002, *In-Progress Decommissioning Sampling Plan for Main Plant*) that is independent from this closure plan. It describes the methodology, requirements, and procedures that will be used to collect and analyze samples from hazardous waste and PCB management areas. Action levels will be designated in the IPDS Plan for use as a pass/fail criterion to support the closure waste management strategy and decontamination success for closure verification sampling. The main objective is to screen an area(s) for the presence or absence of contamination at predefined levels of concern. The IPDS Plan is a work plan to support consistent Project execution to the performance standards defined in Section 8.0, and it is not a component of the RCRA Permit. This allows for flexibility in the sampling procedures, and only limited data validation will be required to support pass/fail decisions. The IPDSP will be provided to the Director as supplemental information in support of the Closure Plan.

9.2.6 Closure Verification

401 KAR 39:090 Section 1, 40 CFR 264.112(b)(4) and 761.65

Final Closure verification sampling and analysis provides confirmation that the non-residential clean closure criteria defined in the CVQAPP have been satisfied, and the surrounding environment has not been contaminated as a result of BGCAPP operations. In addition to the non-residential clean closure criteria, the CVQAPP defines the field sampling design, the sample analyses that will be performed, and the Quality Assurance/Quality Control requirements which ensure that the data accurately reflect conditions of the site as configured for final RCRA and TSCA closure. If the non-residential clean closure criteria are confirmed, BGCAPP will proceed with closure certification in accordance with 40 CFR 264.115 and 761.65. If not, health risk assessments and ecological risk assessments may be conducted to determine whether additional actions are appropriate.

Closure verification sampling and analysis will take place after all potentially contaminated waste, debris, and soils have been removed and transported offsite for disposal. The non-residential clean closure criteria defined in the CVQAPP are applicable to the final physical configuration of the facility which includes permitted units that will be clean-closed and left in place for turnover to BGAD for future use and to the environmental media where HWMUs or structures that housed HWMUs are demolished. Additionally, hazardous wastes, closure wastes and demolition debris that will be sent offsite for disposal prior to final closure are not subject to the non-residential clean closure criteria.

Data obtained from closure verification sampling and analysis will be provided to KDEP for final closure certification, and they provide the basis for either accepting or rejecting the facility's claim that all contamination has been removed in accordance with the approved closure plan. Demonstration that the non-residential clean closure criteria have been met will allow BGCAPP to close without the need for further maintenance or controls (post-closure care).

9.3 Description of How Each Permitted Unit Will be Closed

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(1) and (b)(2), 270.23(a)(2), 761.65(e)

This section provides a description of activities that will be performed at each area/unit. This information is reflected in DDPs which also define the boundaries and scope of closure work to be performed for decontamination and decommissioning of permitted units.

Engineering will develop design change documents and other technical guidance to reflect the scope of work and the required isolation/de-energization of equipment defined in the DDP. The DDPs and the design change documents will be the basis for developing work orders for executing closure work in the field. Because closure of each HWMU must ultimately be certified by a registered Professional Engineer at the conclusion of final closure activities, records pertaining to the disassembly, decontamination, treatment, and disposition of the HWMU will be retained in the facility operating record for future retrieval.

9.3.1 Closure of Subpart I Container Storage Areas

This section describes how the technical performance standards identified in Section 8.1.2.1 for closure of container storage areas will be achieved, and it addresses the permitted units that are identified in Table 1 and Table 2. The permitted container storage areas that have never received hazardous waste will be administratively closed in accordance with Section 9.4.

The Subpart I container storage areas within BGCAPP have been designed, constructed, and managed in accordance with all applicable standards of 401 KAR 39:060, Section 5, and 401 KAR 39:090, Section 1. All of the containments for the permitted container storage areas are constructed with a concrete base that is sufficient to withstand the stress of material transport equipment and equipment used to move containers within these areas. Most of the concrete containments have a coating system, paint, or other surface material applied to make them sufficiently impervious to contain leaks, spills, and accumulated precipitation (e.g., outdoor units) until this moisture is detected and removed. In accordance with Project requirements, all spills or leaks are cleaned up in a timely manner to remove collected materials and prevent contamination of the containment.

When closure of an individual storage area commences, all containers of hazardous waste within the unit will be removed and shipped offsite for disposal at a properly permitted disposal facility. Once a container storage area is emptied of all containers, BGCAPP will remove or decontaminate all waste residues, contaminated subsoils, and structures and equipment contaminated with hazardous waste or PCBs for the area undergoing closure. Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination to meet the applicable closure performance standards.

The DDPs and the associated risk assessments identify the types of contamination associated with the container storage area and the type of decontamination that is required for the permitted storage unit(s) within that area. Permitted container storage areas will be decontaminated in accordance with the DDP and risk assessment requirements to achieve the designated physical end state of the facility (e.g., demolition or reuse).

9.3.1.1 Container Handling Building

The CHB is a permitted container storage area that receives and stores EONCs holding chemical agent munitions that are transferred from the BGCA storage igloos. It is a pre-engineered, steel-frame building with insulated metal roofing and insulated siding panels, and the floor of the CHB is constructed of reinforced concrete with a sealed floor surface.

The CHB is separate from the MDB, and it includes a transfer corridor (Room 06-002) and airlock (Room 06-003) that connect the two buildings. The transfer area structure is constructed with a steel frame, metal siding, and a reinforced concrete floor. The CHB and transfer area are ventilation category D areas, and they do not have a secondary containment system. The transfer area airlock is a ventilation category C area that has concrete walls and does not have secondary containment.

The EONCs have air-tight seals that provide secondary containment for the munitions and protect against agent vapor and liquid releases inside the CHB. No other wastes are received at the CHB, and the concrete floors are regularly inspected during operations for evidence of spills or releases of hazardous wastes or hazardous materials. The Project stores the EONCs in the CHB until they are moved through the transfer corridor and airlock to UPA-1 (Room 07-101) for processing.

Since M1A21 and 8-inch munitions (containing nerve agent), M55 rockets (containing nerve agent and energetics), and the SFTs (PCB bulk product waste) remain inside the sealed EONC while stored in the CHB, no process-related hazardous wastes or PCBs are expected in the CHB, transfer corridor, or airlock. When closure of the CHB storage area commences, all EONCs will be removed and the CHB transfer area and airlock will be inspected for wastes or residues and cleaned as necessary with any of the decontamination methods described in Appendix A. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure;* 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Successful closure of the CHB container storage area, transfer corridor, and airlock is decontamination and final disposition that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If the CHB container storage area, transfer corridor, and airlock are left in place for turnover to BGAD for future use, they will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis.

9.3.1.2 Munitions Demilitarization Building

The MDB receives EONCs containing nerve agent munitions from the CHB permitted storage area. In addition, secondary wastes that are generated within the MDB may be containerized and stored in various areas located throughout the MDB. The permitted container storage areas that are in use within the MDB, and the types of wastes that are expected to be stored in these areas are identified in Table 1 and Table 2.

The MDB is constructed with a steel reinforced concrete foundation, and the building enclosure consists of a pre-engineered outer shell with an inner, field-fabricated, reinforced concrete structure that comprises the Explosive Containment Rooms (ECRs). Floors, sumps, and curbs within the MDB also provide containments for Subpart I, Subpart J, Subpart X, and PCB storage areas, and they have been covered with a protective coating system that is sufficiently impervious to leaks and spills until these are detected and removed. The coating system also provides a protective barrier which prevents or minimizes contamination of the concrete.

The concrete containments are regularly inspected during operations for coating defects, evidence of spills/releases of hazardous wastes or hazardous materials, and corrective actions are implemented to correct any deficiencies. Any spills or leaks into the secondary containment are cleaned up in a timely manner in accordance with Project requirements and procedures (24915-OPS-5PR-00-00028, *Environmental Inspections*; 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards*; and related documents), and this prevents prolonged exposure of the containment to hazardous wastes or residue. The results of the inspections are documented in the facility operating record. Closure of the MDB secondary containment system (floors and sumps) is discussed in Section 9.3.4.

When a container storage area within the MDB is designated for closure, all containers of hazardous waste will be removed from the unit undergoing closure. Project personnel will then conduct a physical inspection of the containment to identify potential contamination, cracks, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Once a container storage area designated for closure is emptied of all containers, BGCAPP will remove or decontaminate all waste residues, contaminated subsoils, and structures and equipment contaminated with hazardous waste or PCBs for the area undergoing closure. Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination to meet the applicable closure performance standards. The closure DDPs and the associated risk assessments identify the types of contamination associated with the container storage area and the type of decontamination that is required for the permitted storage unit(s) within that area.

Successful closure of the MDB container storage areas will be verified by performing a final inspection to ensure that containers and residues have been removed and by documenting the results in the operating record. Final closure requirements necessary to achieve the closure performance standards for the container storage area containments are described Section 9.3.4.

9.3.1.3 Waste Transfer Station

The WTS storage facility consists of a field-fabricated container storage building (sprung structure) with a concrete foundation, three containment storage bays, storage pads for storage of containerized bulk liquids, rolloff boxes for bulk solid hazardous wastes, and PCB bulk product waste. The container storage building receives and stores <1 VSL containers of agent-contaminated waste and other secondary waste generated from the operations of the BGCAPP Main Plant, SDC 1200, and SDC 2000 facilities. The types and amounts of wastes that are expected to be stored in these areas are identified in Table 1 and Table 2.

The WTS container storage building facilitates management of containerized wastes for offsite shipment to a properly permitted facility. All containers holding hazardous waste stored at the WTS are DOT specification containers. Portable containment spill pallets and hazardous material storage lockers are utilized for storage of wastes in the WTS container storage building. The spill pallets and lockers are located on concrete pads and provide their own secondary containment. The three containment bays and bulk waste storage pads are located outdoors and are not enclosed or covered. The concrete containment bays have a protective sealant that prevents penetration of rainwater and other liquids until they can be removed.

The concrete containments are regularly inspected during operations for coating defects, evidence of spills/releases of hazardous wastes or hazardous materials, and corrective actions are implemented to correct any deficiencies. Any spills or leaks into the secondary containment are cleaned up in a timely manner in accordance with project requirements (24915-GEN-5PR-00-00018, *Emergency Response Procedure – Blue Grass Chemical Agent-Destruction Pilot Plant* and related documents), and this prevents prolonged exposure of the containment to hazardous wastes or residue. The results of the inspections are documented in the facility operating record.

At the time of WTS closure, all hazardous waste and hazardous waste residues will be removed from the WTS (i.e., removal of all spill containment pallets, containers, tankers and roll-offs). Concrete surfaces in the WTS sprung structure, bulk container storage bays and storage pads will be swept, dry-vacuumed or mopped as necessary to remove any residues and a physical inspection will be performed to identify potential contamination, cracks, or damage requiring further evaluation. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Next, BGCAPP personnel will conduct a physical inspection of the sprung structure, containment bays and storage pads to identify potential contamination, cracks, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils. The results of the inspection will be documented and placed in the facility operating record.

Following this inspection or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

There is a very low probability that any of the WTS storage area containments are contaminated due to the types of wastes stored at the WTS, due to the fact that containers are rarely opened at the WTS and also that containers are maintained in good condition. Any spills or releases that may have occurred at the facility are cleaned up immediately in accordance with waste management practices and procedures that are in place at the facility. Consequently, the closure performance standards of Sections 8.2 through 8.4 are not expected to apply for one-time spills.

Once the WTS storage areas are taken from service, BGCAPP will remove or decontaminate all waste residues, contaminated subsoils, and structures and equipment contaminated with hazardous waste or PCBs for the area undergoing closure. Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination to meet the applicable closure performance standards.

If the WTS storage facility is left in place for turnover to BGAD for future use, it will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis. The final non-residential closure performance criteria are presented in the CVQAPP.

If no future utilization of the storage facility is identified, the storage areas will be decontaminated and left in place for demolition or released for resource recovery (scrap metal and concrete rubble). The WTS storage facility will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the WTS storage facility may forgo decontamination as provided by Section 8.5 to meet those closure performance standards as provided by Section 8.5 and may be treated with any of the methods shown in Appendix A, demolished, and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Successful closure of the WTS storage facility is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Closure verification sampling and analysis is not required unless contamination of soil outside of any containment system at the WTS facility is suspected or confirmed.

9.3.1.4 Container Storage Facility

The CSF, Building 110FF, receives and stores agent-contaminated waste and other secondary hazardous waste generated from the operations of the BGCAPP Main Plant, SDC 1200 and SDC 2000 facilities. The types and amounts of wastes that are expected to be stored in these areas are identified in Table 1 and Table 2. The CSF facilitates management of these wastes for shipment to an offsite TSDF for final disposal. All containers of hazardous and secondary waste stored at the CSF are DOT specification containers; no containers are opened at the storage facility.

The CSF is designed as a fully enclosed structure which prevents runoff from the hazardous waste storage area to other areas of the facility or the environment. It consists of a pre-engineered metal building constructed on a concrete slab with a raised threshold to prevent run-on from reaching containers in the CSF permitted storage area.

The storage facility is equipped with both MINICAMS® and Depot Area Air Monitoring Systems (DAAMS) for monitoring of the interior of the facility when containers with >1 VSL agent-contaminated waste are present. The CSF is also equipped with an Exhaust Ventilation System (EVS) capable of filtering the interior atmosphere in case of any off-normal or emergency event that releases agent vapor. The EVS comprises an induced draft fan, filters, and activated carbon media.

No hazardous waste contamination is expected at the CSF as closure of the unit commences. Only containers that are in good condition are stored at the CSF, and weekly inspections of the containers are conducted to identify any deterioration or corrosion of containers, spills or evidence of leakage. Additionally, containers are placed on wooden pallets in the CSF to prevent contact with moisture or accumulated liquids on the floor, and any containers with free liquids are placed on portable spill pallets. Consequently, the closure performance standards of Sections 8.2 through 8.4 are not expected to apply for one-time spills.

For facility closure, all hazardous waste and hazardous waste residues will be removed from the CSF once it is emptied of containers, and portable spill containments. Pallets and portable containments may be reused at other BGCAPP locations or disposed of in accordance with Project waste management procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Agent monitoring for the CSF will be terminated once all of the containers of waste have been removed from the storage facility, and the permitted container storage area is designated for closure.

As closure proceeds, the concrete floor of the CSF will be swept, wet mopped, or vacuumed using an industrial wet/dry vacuum equipped with a high-efficiency particulate air (HEPA) filter to achieve a clean surface and minimize the spread of contamination. Sweepings, wet mop rinsates, or vacuumed materials will be managed in accordance with Project waste management procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents).

The CSF containment is inspected weekly to identify signs of spills and defects that require repair, and the documented results of the inspections are maintained in the operating record. A record review will be conducted along with a visual inspection to identify cracks or damage to the containment that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Agent monitoring records for the CSF will also be reviewed to verify that no detectable releases of chemical agent occurred during the operating life of the facility, and a chemical agent risk assessment will be performed to verify that the facility is uncontaminated for chemical agent and that the carbon media in the EVS was never exposed to agent vapor above the 1 VSL screening level. Carbon and other filter media will be removed from the EVS and disposed of in accordance with Project waste management procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). The ventilation duct and interior of the EVS filter housing will be visually inspected after removal of the filter media, and any residues will be removed and managed in accordance with Project waste management procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). Removal of loose residue may be accomplished by methods such as brushing, wiping, and vacuuming.

Successful closure of the CSF is decontamination and final disposition that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. The CSF will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis.

9.3.1.5 Non-Contaminated Rocket Motor Storage Igloos

Igloos previously constructed and used to support BGAD missions have been permitted by BGCAPP for the storage of NCRMs. The NCRM storage igloos provide an enclosure for the rocket motor storage boxes and prevents the accumulation of rainwater and migration of hazardous waste and hazardous constituents to the environment. No liquid wastes or chemical agent-contaminated wastes are stored in the igloos and leaks, or spills are unlikely to occur. The storage igloo containments are inspected weekly to identify signs of spills and defects that require repair, and the documented results of the inspections are maintained in the operating record. Deficiencies, when identified, are promptly corrected. The NCRM igloos may be closed independently during the course of chemical munitions destruction activities at BGCAPP as they are emptied of NCRM containers.

There is a very low probability that any of the NCRM igloos are contaminated due to the types of wastes stored (no liquids) and because containers are never opened within the igloos. Consequently, the closure performance standards of Sections 8.2 through 8.4 are not expected to apply. The containers that are stored within the NCRM igloos are closed boxes of SFTs with rocket motors. The SFTs and rocket motors are further contained within a sealed bag inside the storage boxes which prevents the release of PCB residues and other hazardous substances. The igloos will be inspected for evidence of PCB residues and decontaminated as necessary using any of the methods in Appendix A.

As closure of an individual NCRM igloo proceeds, all hazardous waste, residues and PCBs will be removed from the storage igloos once they are emptied of NCRM containers. The concrete floors of the NCRM igloos will be swept or vacuumed using an industrial wet/dry vacuum equipped with a HEPA filter to achieve a clean surface and minimize the spread of potential contamination. Sweepings or vacuumed materials will be managed in accordance with project waste management procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Next, an inspection team will conduct a physical inspection of the igloo. The floors will be visually inspected to identify potential contamination, cracks, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if liquids/rainwater had been present during the operating life of the facility.

The storage igloo containments are inspected weekly to identify signs of spills and defects that require repair, and the documented results of the inspections are maintained in the operating record. Any spills or releases that may have occurred will be cleaned up immediately in accordance with waste management practices and procedures that are in place at the facility, and this would prevent prolonged exposure of the igloo concrete containment to hazardous wastes, PCBs, or other residues. A record review will be conducted along with a visual inspection to identify cracks or damage to the containment that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Successful closure of the NCRM igloos is decontamination and final disposition that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. The NCRM igloos will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis.

9.3.2 Closure of Subpart J Tanks

This section describes how the technical performance standards identified in Section 8.1.2.2 for closure of tank systems will be achieved. The individual tank systems are located in the MDB, HSA, SPB, and STA and are identified in Table 1 and Table 3. The permitted tank systems in the SPB and the STA have never received hazardous waste and will be administratively closed in accordance with Section 9.4.

The Subpart J Tank Systems within the BGCAPP Main Plant have been designed, constructed, and managed in accordance with all applicable standards of 401 KAR 39:060, Section 5, and 401 KAR 39:090, Section 1. As defined in 40 CFR 260.10, a *tank system* comprises a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system. All of the Subpart J tanks that are inside the MDB share a single containment system that is fully enclosed by the MDB structure. The five Subpart J storage tanks in the HSA also share a single containment system that is located outdoors. The containment systems are constructed of reinforced concrete that is sealed with a chemical resistant coating system that is sufficiently impervious to the type of liquid wastes that are managed in the tanks and will contain any leak or spill until it can be removed.

After tank systems have been decontaminated and readied for disposition, BGCAPP personnel will conduct a physical inspection of the containment associated with the tanks system to identify potential contamination, cracks, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

All of the permitted storage tanks are interconnected by piping and ancillary equipment that transfers waste liquid from the MDB to the HSA and from the HSA to the tanker loadout station near the SPB. The tank system piping that is located outside of the containment systems is inspected daily while in operation to ensure that there are no leaks or piping failures. The results of the inspections are documented and placed in the facility operating record.

When closure commences and a tank system is removed from service, BGCAPP will remove or decontaminate all waste residues, contaminated subsoils, and structures and equipment contaminated with hazardous waste or PCBs from the tank system undergoing closure. Methods for removal of waste from permitted tank systems that were employed during operation of the facility are expected to be effective during the closure phase. However, there may be some need to modify components or install temporary additional items such as piping, hoses, or valves to facilitate complete removal of the final volume of waste from tank system components. Such modifications to permitted units that are undergoing closure are expected for decommissioning of the facility and do not require a modification to the RCRA operating permit to implement since the unit is no longer configured in accordance with the permit to manage hazardous waste under the conditions set forth in the RCRA hazardous waste operating permit.

Although not identified in the tables listed in Section 6, the ANS and SDS are supported by a sampling system that consists of sampling units, a sampling glove port, and a common sampler backwash heater. The Agent Hydrolysate and Spent Decon Sampler Module (MX-ANS-0111), Agent Hydrolysate and Spent Decon Glove Port Module (MX-ANS-0101) and Sampler Backwash Heater (ME-ANS-0114) equipment provide for sampling hydrolysate and SDS, and the equipment is located near or adjacent to Corridor 07-137. This equipment is considered to be ancillary equipment to these tank systems, and it will be addressed in the ANS Room DDP for decontamination and decommissioning. The same principles that apply to decontamination and decommissioning of the ANS and SDS tank systems apply to the sampling system.

Decontamination activities in the MDB where the SFTs were either processed or stored is likely to generate spent decontamination liquids that will carry non-liquid PCB residues suspended in the liquid. The liquids with PCB residues in suspension are collected in sumps and trenches which are pumped to the SDS storage tanks, and the contents of the SDS tanks are eventually processed through the ANS or transferred to the HSA tanks prior to offsite shipment and disposal. For the purposes of this closure plan, any non-liquid PCB solids in liquid suspension will continue to be managed as PCB bulk product waste derived from processing SFTs, and the requirements for decontamination of *liquid* PCBs do not apply to BGCAPP. Further discussion is provided in the ANS and SDS tank system sections.

The DDPs and the associated risk assessments identify the types of contamination associated with the container storage area and the type of decontamination that is required for the permitted storage unit(s) within that area. Permitted container storage areas will be decontaminated in accordance with the DDP and risk assessment requirements.

9.3.2.1 Munitions Demilitarization Building Storage Tanks

The MDB houses the Agent Collection System (ACS), ANS, and SDS active permitted storage tanks that are located in the ANS Room 07-123. There are other permitted storage tanks within the MDB (Energetics Neutralization Reactors and Energetics Hydrolysate Collection Tank) that were constructed for use but never placed in service and will be administratively closed.

The floor and curbing in the ANS room are part of the MDB secondary containment system that is shared by multiple HWMUs within the MDB. The secondary containment system is constructed from steel reinforced concrete that has been covered with a protective coating system that is sufficiently impervious to leaks and spills until these are detected and removed. The coating system also provides a protective barrier which prevents or minimizes contamination of the concrete. The floors in the ANS room slope toward sumps that discharge accumulated liquids to the spent decontamination tanks.

The concrete surfaces, trenches, and sumps are regularly inspected during operations for coating defects, evidence of spills/releases of hazardous wastes or hazardous materials, and corrective actions are implemented to correct any deficiencies. Any spills or leaks into the secondary containment are cleaned up in a timely manner in accordance with Project requirements and procedures (24915-OPS-5PR-00-00028, *Environmental Inspections*; 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards;* and related documents), and this prevents prolonged exposure of the containment to hazardous wastes or residue. The results of the inspections are documented in the facility operating record. Closure of the ANS room secondary containment system (floors and sumps) is discussed in Section 9.3.4.

Decontamination with caustic or other solutions in the MDB where the SFTs were either processed or stored is likely to generate spent decontamination liquids that will carry non-liquid PCB residues suspended in the liquid. The decontamination liquids with PCB residues in suspension are collected in trenches and sumps which are pumped to the SDS storage tanks, and the contents of the SDS tanks are eventually processed through the ANS and/or transferred to the HSA tanks prior to offsite shipment and disposal. For the purposes of this closure plan, any non-liquid PCB solids in liquid suspension will continue to be managed as PCB bulk product waste derived from processing SFTs, and the requirements for decontamination of *liquid PCBs* do not apply to BGCAPP.

The following sections discuss closure of the ACS, ANS, and SDS tank systems.

9.3.2.1.1 ACS Storage Tanks

The two agent storage tanks in the MDB are the agent holding tank, MT-ACS-0105, and the agent surge tank, MT-ACS-0106. The tanks are vertical vessels with semi-elliptical heads constructed from carbon steel lined with polyvinylidene fluoride (PVDF), and they are designed to receive chemical nerve agent from the draining of nerve agent munitions during operations.

The agent holding tank, MT-ACS-0105, stores agent that is drained from munitions. The agent surge tank, MT-ACS-0106, is a standby tank that is normally empty, and it can receive liquid from agent spills in category A and B sumps or overflow from the agent holding tank. The ACS tanks tie into agent feed pumps for transferring agent to the agent neutralization reactors (ANRs) in the ANS room.

For facility closure, the ACS tanks and ancillary equipment will be flushed and cleared of chemical agent after the tanks are taken out of service, and all hazardous waste and hazardous waste residues will be removed. The initial flush will be performed with caustic solution followed by rinsing with process water. All flush liquids will be transferred to the ANS for processing. After the tanks have been flushed, the manways will be opened to inspect the tanks for sludge and residue in the bottom. Any tank bottoms will be flushed and transferred to the ANS and followed by washdown with process water. Steam cleaning or high-pressure washing may be required to loosen and remove sludge and residuals that may be adhering to surfaces. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

The inner surfaces of the ACS tanks are coated with PVDF that is designed to provide a protective barrier for the carbon steel and to prevent corrosion. Therefore, the predominant type of debris for the coated interior of the tank that is in contact with chemical agent is the coating itself which can be treated to a clean-debris-surface standard and verified agent-decontaminated with headspace monitoring. If agent decontamination of the PVDF liner material is unsuccessful, the ACS tanks will be size-reduced and managed as hazardous waste for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

After flushing of the ACS tanks and ancillary piping is complete, the agent collection/transfer piping and pumps will be dismantled and managed as hazardous waste for off-site disposal, thermally decontaminated in the MPT, or decontaminated with methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Agent piping wall penetrations between MDB rooms will be assessed and may be decontaminated and left in place for demolition of the MDB if it is determined that they can be successfully cleared via the UMT. A more aggressive approach for piping penetration removal will occur if necessary, but BGCAPP does not anticipate this will be required.

Headspace emissions from the ACS storage tanks are vented through piping to the OTM thermal oxidizers (TOX) and downstream OTM elements with final off-gas discharge through the MDB HVAC system's filters. When emission control is no longer required, a compressed air blowdown will be performed to remove condensation from the lines. The vent pipes will be dismantled and managed as hazardous waste for off-site disposal, thermally decontaminated in the MPT, or decontaminated with any of the methods shown in and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

The internal and external surfaces of the ACS tanks will be agent vapor monitored to determine if the tanks can be left in place for demolition or released for scrap metal, and will be decontaminated to meet the applicable closure performance standards of Sections 8.1 through 8.4. Alternatively, the tanks may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Section 8.5 and Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the ACS tank system is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the ACS tanks will be dispositioned as either scrap metal, hazardous waste or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the ACS tanks is discussed in Section 9.3.4.

9.3.2.1.2 ANS Tanks

The ANS tanks include the two ANRs (MV-ANS-0101/0201) and the three AH sampling tanks (MT-ANS-0103/-0203/-0303). The ANRs are jacketed and insulated, vertical vessels with semi-elliptical heads constructed from Hastelloy®, and the AH sampling tanks are vertical vessels with semi-elliptical heads constructed from 316L stainless steel.

Agent feed pumps are used to transfer chemical agent from the agent holding/surge tanks to the ANRs. During the GB campaign, the chemical agent is hydrolyzed with caustic solution to yield AH which is subsequently transferred to the AH sampling tanks. Once verified clear for agent, the AH is pumped from the AH sampling tanks to the HSS tanks in the HSA. The SDS also transfers spent decontamination solution to the ANRs for processing, and the decontamination solutions may carry PCB bulk solid waste in solution.

For facility closure, the ANS tanks and ancillary equipment are flushed and cleared of hydrolysates and residues after the tanks are taken out of service. The initial flush will be performed with caustic solution followed by rinsing with process water. All flush liquids will be cleared for chemical agent prior to transferring the liquids to HSS tanks in the HSA. After the ANS tanks have been flushed, the manways will be opened to inspect the tanks for sludge and residue in the bottom. The tank bottoms will be removed and managed as hazardous waste or flushed and transferred to the HSS tanks and followed by a washdown with process water. Steam cleaning or high-pressure washing may be required to loosen and remove sludge and residuals that may be adhering to surfaces. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents) or this closure plan.

After flushing of the ANS tanks and ancillary piping is complete, the ANS pumps and piping system will be dismantled and size-reduced for treatment in the MPT or containerized and shipped offsite for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping,* and related documents). Hydrolysate collection/transfer piping and pumps in the ANS room will be dismantled and managed as hazardous waste for off-site disposal, thermally decontaminated in the MPT, or decontaminated with methods shown in Appendix A and managed for offsite disposal in accordance with Project (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The ANS piping wall penetrations between MDB rooms will be assessed and may be decontaminated and left in place for demolition of the MDB if it is determined that they can be successfully cleared via the UMT. A more aggressive approach for piping penetration removal will occur if necessary, but BGCAPP does not anticipate this will be required.

Headspace emissions from the ANRs and ANS tanks are vented to the OTM TOX, with final off-gas discharge through the MDB HVAC system. When emission control is no longer required, a compressed air blowdown will be performed to remove condensation from the lines. The emission control vent pipes will be dismantled and managed as hazardous waste for off-site disposal, thermally decontaminated in the MPT, or decontaminated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

The decontaminated ANS tanks will be agent vapor monitored to determine if the tanks can be left in place for demolition or released for scrap metal and will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the tanks may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and decontaminated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the ANS tank system is decontamination and final disposition (disposal or recycling) that satisfies the closure performance standards of Section 8.1 or 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the ANS tanks will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the ANS tanks is discussed in Section 9.3.4.

9.3.2.1.3 SDS Storage Tanks

The SDS Subpart J tank system comprises three SDS storage tanks (MV-SDS-0101/0201/0301) and ancillary equipment including the category A, B, and C floor sumps and pumps throughout the MDB, and the non-contaminated drainage (NCD) floor sumps in the OTM room (07-141). The SDS storage tanks are vertical vessels with semi-elliptical heads constructed from carbon steel lined with PVDF, and they are designed to receive spent decontamination solution that is generated from equipment and personnel washdown collected at various areas within the MDB, and the decontamination solutions may carry PCB bulk solid waste in the solution. The spent decontamination solution may be transferred to the ANS for processing or cleared for agent and sent to the HSS tanks in the HSA. The floor sumps are integral to the MDB secondary containment system and will be closed in accordance with Section 9.3.4.

For facility closure, the SDS tanks and ancillary equipment are flushed and cleared of spent decontamination solutions and residues after the tanks are taken out of service. The initial flush will be performed with caustic solution and followed by rinsing with process water. All flush liquids will be cleared for chemical agent prior to transferring the liquids to HSS tanks in the HSA.

After the SDS tanks have been flushed, the manways will be opened to inspect the tanks for sludge and residue in the bottom. The tank bottoms will be removed or flushed and transferred to the HSS tanks followed by washdown with process water. Steam cleaning or high-pressure washing may be required to loosen and remove sludge and residuals that may be adhering to surfaces. Any wastes or residues that are collected will be managed in accordance with Project procedures or this closure plan (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping,* and related documents).

The SDS tanks will be the last tanks in the MDB to be removed from service after the ACS and ANS tanks are flushed. After the SDS tanks are flushed and removed from service, the AH/OTMC transfer lines from the MDB to the HSA will be flushed and rinsed to remove any residual contamination. Plant water will be provided with a temporary connection at the SDS pumps to perform the flush. After the flush is complete, the remaining liquid will be evacuated from the lines with a compressed air blowdown. The liquid from the flushing and blowdown will be captured in the HSS tanks and shipped offsite for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

During the chemical agent campaigns, headspace emissions from the SDS storage tanks are vented to the OTM TOX and downstream OTM elements with final off-gas discharge through MDB HVAC system. When emission control is no longer required, a compressed air blowdown will be performed to remove condensation from the lines. The emission control vent pipes will be dismantled and managed as hazardous waste for off-site disposal or decontaminated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

After flushing of the SDS tanks and blowdown of exterior transfer piping is complete, the SDS pumps and piping will be dismantled, size-reduced, and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The SDS piping wall penetrations between MDB rooms will be assessed and may be decontaminated and left in place for demolition of the MDB if it is determined that they can be successfully cleared via the UMT. A more aggressive approach for piping penetration removal will occur if necessary, but BGCAPP does not anticipate this will be required. Transfer piping that is outside of the MDB, and between the MDB and HSA, will be dismantled, size-reduced, and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Eligible material may be sent offsite as scrap metal as described in Section 9.6.8.

The decontaminated SDS tanks will be agent-vapor-monitored to determine if the tanks can be left in place for demolition or released for scrap metal. If the tanks are left in place for demolition, the tanks will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the tanks may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the SDS tank system is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Section 8.1 or 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the SDS tanks will be dispositioned as scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the SDS tanks is discussed in Section 9.3.4.

9.3.2.2 Hydrolysate Storage Area Tanks

The HSA tanks include three HSS and two OTMC tanks. During operations, the HSS tanks receive hydrolysate from the ANS after ensuring that the agent destruction criteria have been met, and it may carry incidental amounts of PCB bulk solid waste in suspension. During operations, the OTMC tanks receive condensate discharged from the OTM.

The tanks are field fabricated, vertical tanks of a closed top design that are constructed of steel. The tanks and associated piping are insulated with metal cladding on the exterior and are heat traced to maintain temperature as necessary. The ancillary equipment for each tank includes items such as piping, pumps, and valves leading from the MDB to the tanks and from the tanks to the tanker loading area.

The HSA tanks are outdoors and do not have an enclosure to keep rainwater out. A single secondary containment is provided for the tanks, and it is constructed of steel reinforced concrete with perimeter dikes to prevent migration of spillage, leakage, or contaminated stormwater. The floor and dikes are sealed with a chemical resistant coating system, and the floor slopes toward a category D sump which discharges to either storm drains or containers if necessary.

For facility closure, the individual HSA tanks will be taken out of service when they are no longer needed, and BGCAPP does not anticipate that all tanks will be removed from service at the same time. When the tank is declared for closure, it will be emptied to the lowest practical level with existing pumps. The tank undergoing closure will be isolated and manways will be opened for residual liquid removal and mucking sludge from tank bottoms. Steam cleaning, or high-pressure washing may be required to loosen and remove sludge and residuals that may be adhering to surfaces. Care will be taken to prevent spillage into the secondary containment system, and any accidental spills will be immediately cleaned up. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping,* and related documents).

After the HSS tanks are removed from service, the AH/OTMC transfer lines from the HSA to the Truck Loading Station will be flushed and rinsed to remove any residual contamination. Plant water will be provided with a temporary connection at the HSS pumps to perform the flush. After the flush is complete, the liquid will be evacuated from the lines with a compressed air blowdown. The liquid from the flushing and blowdown will be captured in a container or tanker in the loading area and shipped offsite for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

The headspace in the tanks is vented to the MDB HVAC exhaust filtration system which serves as a Level 2 control required by 40 CFR 264 Subpart CC. When emission control is no longer required, a compressed air blowdown will be performed to remove condensation from the lines. The emission control vent pipes will be dismantled and decontaminated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Eligible material may be sent offsite as scrap metal as described in Section 9.6.8.

Following tank clean-out and verification, the concrete floor of the secondary containment will be swept or vacuumed using an industrial wet/dry vacuum equipped with a HEPA filter to achieve a clean surface and minimize the spread of contamination. Sweepings or vacuumed materials will be managed in accordance with Project waste management procedures. There is a very low probability the HSA containment is contaminated from spills or releases. Any spills or releases that may have occurred at the facility are cleaned up immediately in accordance with Project practices and procedures that are in place at the facility (24915-GEN-5PR-00-00018, *Emergency Response Procedure – Blue Grass Chemical Agent-Destruction Pilot Plant,* and related documents). Consequently, the closure performance standards of Sections 8.2 through 8.4 are not expected to apply for one-time spills.

The HSA containment system is inspected daily to identify signs of spills and defects that require repair, and the documented results of the inspections are maintained in the operating record. A record review will be conducted along with a visual inspection to identify cracks or damage to the containment that would have allowed hazardous waste or hazardous constituents to reach the underlying soils if contaminated liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

If the HSA is left in place for turnover to BGAD for future use, it will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis. The final non-residential closure performance criteria are presented in the CVQAPP.

If no future utilization of the system is identified, the HSA tank system (including the secondary containment system) will be decontaminated and left in place for demolition or released for resource recovery (scrap metal and concrete rubble). The HSA tank system will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the tank system may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Successful closure of the HSA tank system is decontamination and final disposition (reuse, disposal, or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Closure verification sampling and analysis is not required unless contamination of soil outside of secondary containment is suspected or confirmed.

9.3.2.3 RO Reject Truck Loading Station and Transfer Piping

The AH and OTMC are transferred from the HSA through piping that runs through the SPB to the Reverse Osmosis (RO) Reject Tanker Loading Station at the southwest corner of the STA. The transfer piping and tanker loading station including the tanker loading sump will be dispositioned as part of the SCWO end-state configuration.

The floor, curbing, and protective floor coating system inside the SPB provide secondary containment for the transfer piping. The secondary containment is inspected weekly to identify signs of spills or leaks from the transfer piping, and any defects in the secondary containment that would require repair to maintain the integrity of the containment system. The documented results of the inspections are maintained in the operating record.

Any spills or leaks into the secondary containment are cleaned up in a timely manner in accordance with Project requirements (24915-GEN-5PR-00-00018, *Emergency Response Procedure – Blue Grass Chemical Agent-Destruction Pilot Plant,* and related documents), and this prevents prolonged exposure of the floor coating system to standing liquids. The SCWO containment is not used for management of hazardous waste or PCBs other than the transfer piping, and it is not expected to be contaminated at closure. After the transfer piping is removed from service for closure, the floors of SPB secondary containment will be cleaned by sweeping, mopping, or wet/dry vacuuming to remove any residue, and the residue will be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents].

The transfer piping that is located outside of the containment system is Inspected daily while in operation to ensure that there are no leaks or piping failures. Any spills or leaks outside of a secondary containment area will be cleaned up in a timely manner in accordance with Project requirements (24915-GEN-5PR-00-00018) to prevent contamination of soils, surface water, and ground water. The results of the inspections are documented and placed in the facility operating record.

A record review will be conducted along with a visual inspection to identify transfer piping leaks or defects in the containment that would allow hazardous waste or hazardous constituents to reach the underlying soils if liquids had been present during the operating life of the facility. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

The RO Reject Truck Loading Station is located outdoors, and it is equipped with a reinforced concrete pad that slopes to a spill collection sump. The loading station is covered with a canopy and equipped with items such as piping, valves, or flow indicators that branch to two tanker truck loading stations. Each branch is equipped with flow indicators, quantifiers, and an on/off valve with double block and bleed for filling of the tanker trucks. Tanker filling is performed by an operator at the HSA tank area, an operator at the RO Reject Truck Loading Station, and the Control Room Operator. This equipment and method of filling is designed to prevent spills at the Truck Loading Station. Additionally, the transfer lines are inspected daily for signs of leaks, and the results of the inspections are maintained in the operating record.

Both branches of piping at the tanker loading stations are equipped with vent lines that direct tanker headspace to the atmosphere in the SPB Relief Tank Room (Room 10-103), and the atmosphere in Room 10-103 exhausts to the SPB filtration units (MK-HVAC-FILT1001 and MK-HVAC-FILT1002). The purpose of the vent lines is to control nuisance volatile organic compounds and odors that off-gas from the AH/OTMC tanker filling operation. The SPB filtration units consist of two medium density filter assemblies, two charcoal filter assemblies, an intake heater assembly, and a variable speed exhaust fan. The two units operate in a primary/standby capacity. The purpose of FILT1001/1002 is to filter exhaust, reactor effluent, and other process equipment emitted from the Relief Tank Room before it is expelled to the atmosphere.

After the HSS tanks are removed from service, the AH/OTMC transfer lines from the HSA to the Truck Loading Station will be flushed and rinsed to remove any residual contamination. Plant water will be provided with a temporary connection at the HSS pumps to perform the flush. After the flush is complete, the liquid will be evacuated from the lines with a compressed air blowdown. The liquid from the flushing and blowdown will be captured in a container or tanker in the loading area and shipped offsite for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents].

The tanker loading area does not routinely come in direct contact with hazardous wastes or other wastes. Spills are cleaned up at the time of the spill to leave no visible traces of spilled material or residue. Historical records will be reviewed and if there have been no releases, decontamination is not anticipated. However, if staining or discolorations on the apron suggest that contaminants could be present, the apron will be decontaminated with applicable methods in Appendix A.

Inspections of the vent lines from the RO Tanker fill stations have revealed that condensation periodically accumulates in the vent lines, and the condensation is drained and managed as hazardous waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). At closure, a compressed air blowdown will be performed. The vent piping will be triple rinsed with water to remove any residual contamination, and the floor within SPB's Relief Tank Room will be inspected for evidence of spills or releases from the vent line. Any residue will be cleaned up, and the floor will be decontaminated using any method in Appendix A. Additionally, the filter media will be removed from the SPB's filter units. Both waste streams will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents).

If the RO Reject Truck Loading Station and associated infrastructure is left in place for turnover to BGAD for future use, it will be considered clean closed when the non-residential clean closure criteria defined in the CVQAPP are verified through sampling and analysis. The final non-residential closure performance criteria are presented in the CVQAPP.

If no future utilization of the system is identified, then the RO Reject Truck Loading Station and associated infrastructure will be decontaminated and left in place for demolition or released for resource recovery (scrap metal and concrete rubble). The RO Reject Truck Loading Station and associated infrastructure will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, BGCAPP may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and components may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030*,* and related documents). Eligible material may be shipped offsite for resource recovery as described in Section 9.6.8.

Successful closure of the RO Reject Truck Loading Station and associated infrastructure is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Closure verification sampling and analysis is not required unless contamination of soil outside of secondary containment is suspected or confirmed.

9.3.3 Closure of Subpart X Miscellaneous Units

This section describes how the technical performance standards identified in Section 8.1.2.3 for closure of miscellaneous units and associated equipment (e.g., conveyors and THS equipment) will be achieved. With the exception of EONCs, the active Subpart X units are located in the MDB, and the individual Subpart X units are identified in Table 1 and Table 2. The EONCs are mobile pieces of equipment that are addressed in Section 9.3.3.5 along with the Subpart X Munitions Unpacking area.

The Subpart X miscellaneous units within BGCAPP have been designed, constructed, and managed in accordance with all applicable standards of 401 KAR 39:060 Section 5 and 401 KAR 39:090 Section 1. The units are operated and maintained to prevent releases to the environment and will be closed in a manner that will ensure protection of human health and the environment.

When closure commences, BGCAPP will remove or decontaminate all waste residues, contaminated subsoils, and structures and equipment contaminated with hazardous waste and PCBs. The DDPs and the associated risk assessments identify the types of contamination associated with the miscellaneous units and the type of decontamination that is required for the unit(s) within that area. Permitted miscellaneous units will be decontaminated in accordance with the DDP and risk assessment requirements to achieve the designated physical end state of the facility (i.e., demolition or reuse). Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination.

Methods for removal of waste from permitted miscellaneous units that were employed during operation of the facility are expected to be effective during the closure phase. However, there may be some need to modify components to facilitate complete removal of waste from miscellaneous unit components. Such modifications to permitted units that are undergoing closure are expected and do not require a modification to the RCRA operating permit to implement since the units are no longer configured to manage hazardous waste under the conditions set forth in the RCRA hazardous waste operating permit.

After the miscellaneous units have been decontaminated and readied for disposition, BGCAPP personnel will conduct a physical inspection of the containment associated with the units to identify potential contamination, cracks, or damage that would have allowed hazardous waste or hazardous constituents to reach the underlying soils. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP. Closure of the secondary containment system (floors and sumps) is discussed in Section 9.3.4.

9.3.3.1 Munitions Washout System

The MWS operations are complete, and concurrence was received from KDEP to decontaminate and decommission all associated equipment, via 24915-CL-5PL-MWS-00001, *Munitions Washout System (MWS) Decontamination Plan*. The MWS projectile processing equipment was located in the MWS Room (07-135), and the MWS Hydraulics Support System was located in the Tray/Container Transfer Room (TCTR), (07-124). The MWS was designed and operated to process agent-filled projectiles, and the process included:

- Removing the projectile nose closure at the NCRS
- Accessing the munitions agent cavity by collapsing its burster well using the cavity access machine (CAM)

- Removing agent from the projectile using the CAM
- Transferring the agent to the ACS storage tank
- Verifying sufficient agent was removed by weighing the projectile

Trays of projectiles were conveyed into the MWS room through an airlock on the west wall of the room. A projectile transfer robot (PTR) was used to move the projectiles between the various MWS stations to access and drain the chemical agent. The projectiles were individually removed from the tray on the infeed conveyor by the PTR for processing through the NCRS, the weigh station/burster probe, and the CAMs for agent draining before being returned to a munitions tray on the outfeed conveyor. The PTR used a vision control system above the infeed and outfeed conveyors to unload and load projectiles. Full trays of processed projectiles exited through the east side of the MWS room for treatment in the MPT.

The Tray Handling System (THS) supported movement of projectiles inside the MDB for processing at the MWS. The THS utilized conveyors to transport trays of undrained projectiles from UPA-2 to the MWS and transport trays of drained projectiles away from the MWS to the MPT. Tray conveyor MJ-THS-0108 is referred to as the infeed conveyor; whereas, 07 MJ THS-0109 is referred to as the outfeed conveyor.

The majority of the MWS projectile processing equipment has been disassembled and decontaminated to minimize or eliminate potential for worker exposure to chemical agent VX and support agent changeover in the Main Plant from VX to GB. Decontamination and disassembly of the MWS was performed in accordance with the *Munitions Washout System (MWS) Decontamination Plan*, and utilized Engineering Design Change documents SCR 2287, 2288, and 2334.

Tray conveyors MJ-THS-0108, 07-MJ-THS-0109, and MJ-THS-0139 and other THS equipment (e.g., turntable, buffer conveyors) in the MWS room will remain in place to support closure of the MDB along with the spent decontamination collection sump (SDS-0141) and secondary containment curbs. Any remaining tray conveyors and other THS equipment in the MWS room, TCTR, Toxic Maintenance Area (TMA), and Energetics Batch Hydrolyzer (EBH) are no longer needed to support closure, those items will be closed in accordance with the following paragraphs. The spent decontamination sump in the MWS room will be closed in accordance with Section 9.3.4.2.

Remaining equipment associated with the MWS and THS equipment in the MWS, TCTR, TMA, and EBH will be decontaminated and agent vapor monitored to determine if the equipment can be left in place for demolition or released for scrap metal recovery. Equipment will be decontaminated to meet the applicable closure performance standards of Sections 8.2 and 8.4. Alternatively, the remaining equipment may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents]. The MWS was not exposed to PCBs, and the performance standards of Section 8.3 do not apply.

Successful closure of the MWS is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the MWS will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the MWS is discussed in Section 9.3.4.

9.3.3.2 Metal Parts Treaters and MPT Cooling System

The Project is equipped with two MPTs to thermally decontaminate trays of munitions bodies, metal parts and secondary waste by inductive heating. The processed trays are discharged from the MPT to the MPT Cooling System (MCS). The MCS includes equipment and components used to cool the munition trays to a safe handling temperature prior to transfer to the Cooling Conveyor Room (07-150). The MPT effluent gases and the MPT airlock gases are vented to the OTM. The OTM is operated under the BGCAPP Title V air permit as an air pollution control system, and closure of this unit is discussed in Section 9.3.5.

Each of the two MPT processing lines comprises a series of four modules or chambers to facilitate the high-temperature, low-oxygen treatment of waste from the BGCAPP chemical demilitarization process. These modules include the inlet airlock, main chamber, outlet airlock, and cooling chamber. Each of these chambers is separated by a mechanically operated gate that when closed acts as a barrier to the transfer of heat and matter as well as acting as a pressure boundary by utilizing the sealing characteristics of the gate.

The majority of the MPT mechanical equipment is located in the MPT Room (07-146), a ventilation category B area, and the exterior components in this room may be exposed to low-level agent vapor during operations. The internal components of the MPT are almost entirely constructed from non-porous metal. Normal operations of the MPT ensure the main chamber, outlet airlock, and cooling chamber are clean for unrestricted use. The inlet airlock is exposed to IDLH vapor contamination and will require assessment at closure to determine if normal operating temperatures and flowrates are sufficient to ensure adequate agent decontamination. The main chamber of each MPT is a cylindrical shell constructed of UNS N06601 (nickel alloy 601) with two sections of induction coils on the exterior of the cylinder to allow for independent control of zone temperatures for Zone 1 and Zone 2. The off-gas piping that leads from the main chamber to the OTM is made of UNS N08810 (Incoloy® 800H or equivalent). The MPT inlet airlock/conveyor (MJ-THS-0114/-0115) and MPT outlet airlock/conveyor (MJ-THS-0116/-0117) housing and internals are both built of 316/316L stainless steel with carbon steel internals. The MPT cooling chamber (MJ-THS-0136/0137) is primarily built of carbon steel.

The MCS is located in the MPT Cooling Conveyor Room (07-150), and it accepts the processed trays that have been thermally treated in the MPT for cool down. The MCS blower induces a draft of air through the cooling chamber plenums to cool the trays below 490 °F prior to exiting the MCS. The exhaust from the plenums is routed to one of the two MCS filters (MK-MCS-101/0201) that are upstream from the blower. The filters are outside the MDB and are sized to capture 99.99% of solids >0.3 micron and 99.99% of droplets >0.5 micron. After sufficient cooling in the MCS, the tray is transferred to the MPT Cooling Conveyor Room to allow further cooling to a safe temperature prior to unloading the trays.

As closure commences, both of the MPTs and the TOXs will be verified to have operated at normal operating conditions for a minimum of 1 hour after all waste feed was terminated to thermally desorb and air wash any residual chemical agent on the interior of the system. The units will not be operated after the 1-hour desorption cycle is complete. After the MPTs are cooled down, each of the four modules described above will be inspected for residues from processing trays of waste. The residues will be removed using any of the decontamination methods described in Appendix A, and the decontamination methods may be used singly or in combination. Any residues that are collected will be managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). The MPT Main Chamber (MC) effluent piping (including the flame arrestors) and MPT airlock gas piping will be removed from the MPT main chambers to the TOX inlets and managed as hazardous waste for off-site disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

All of the processing trays and waste inductive-heating containers (WICs) associated with treatment in the MPT have been successfully agent decontaminated by heating to a minimum of 1000 °F for a minimum of 15 minutes prior to discharge from the unit and do not require any additional agent decontamination. All of the trays and WICs will be inspected for residue and cleaned as necessary. Any residues that are found on the tray or WICs will be removed using any of the decontamination methods described in Appendix A and the decontamination methods may be used singly or in combination. Any residues that are removed will be collected and managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). The trays or WICs may be sent offsite as scrap metal in accordance with Section 9.6.8 or managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents)..

There have not been any spills in the MPT room to date, and the operating records will be reviewed as closure commences to confirm that no contamination of the floors occurred during operations. The floors in the MPT room will be cleaned by sweeping, mopping or wet/dry vacuuming to remove any residue, and the residue will be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). No additional decontamination of the floors or exterior of the MPT is anticipated. The DDP associated with the MPT Room and the accompanying risk assessment will identify the types of contamination that need to be addressed to achieve the desired level of contamination that is consistent with the designated physical end state.

As closure proceeds, the conveyors and floor in the cooling conveyor room will be inspected for residues from processing trays in the MPT. The residues will be removed using any of the decontamination methods described in Appendix A, and the decontamination methods may be used singly or in combination. Any residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The sumps in the cooling conveyor room will be closed in accordance with Section 9.3.4.

The MCS plenums, plenum exhaust piping, filter housings, and filter cartridges were never exposed to chemical agent. The filters will be removed and managed as hazardous waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The MCS plenums, plenum exhaust piping, and filter housings will be inspected for residue, and any residues will be removed using any of the decontamination methods described in Appendix A. The decontamination methods may be used singly or in combination, and any residue will be collected and managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The MCS plenums, plenum exhaust piping and filter housings may be shipped off site for recycling under the scrap metal exemption at 40 CFR 261.6(a)(3)(ii).

The waste and scrap metal loading area at the termination of the MPT cooling conveyor, where waste is loaded into rolloff bins will be inspected for residue from handling wastes. The loading area does not routinely come in direct contact with hazardous wastes or other secondary wastes, and contamination is not expected in this area. In addition, any spills that may have occurred during operations will have been cleaned up at the time of the spill to leave no visible traces of spilled material or residue. Historical records will be reviewed, and if there have been no releases, further decontamination is not anticipated. However, if staining or discolorations in the loading area suggests that contaminants could be present, the area will be decontaminated with applicable methods in Appendix A

The MPT and MCS were not exposed to PCBs, and the performance standards of Section 8.5 do not apply. Successful closure of the MPT and MCS is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the MPT and MCS will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the MPT and MCS is discussed in Section 9.3.4

9.3.3.3 Rocket Handling System

The RHS contains various permitted miscellaneous Subpart X units designed for demilitarization of VX and GB M55 Rockets. The RHS includes the RNDE, VRCM, RSM, and Rocket Warhead Containerization System (RWCS), all located within the MDB.

The following sections describe how these units will be closed.

9.3.3.3.1 *Rocket Non-Destructive Examination System*

The RNDE (MJ-RNDE-0101) is located in UPA-1, Room 07-101. The UPA-1 is a ventilation category C area, and chemical agent contamination is not expected in this area under normal operations. The UPA-1 is also a permitted container storage area, and it will be closed in accordance with Section 9.3.1.

The RNDE uses a commercial X-ray unit to examine M55 rocket assemblies for evidence of liquid chemical agent within the interstitial space between the M441 SFT and the M55 rocket assembly and within the interspace of the M56 warhead and the M67 rocket motor prior to placing the munitions in the Rocket Input Assemblies (MJ-RHS-0101 and -0102) for processing in downstream equipment.

The RNDE equipment will be assessed for reuse or decontaminated and sent offsite for final disposition in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Equipment that is to be reused may be decontaminated for agent as required by the EDP, and PCB wipe sample results will be used to confirm that the unit is not regulated by TSCA for PCBs. If the equipment is left in place for demolition or released for resource recovery, it will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the RNDE equipment may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the RNDE equipment is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the RNDE equipment will be dispositioned as either scrap metal, hazardous waste or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the RNDE equipment is discussed in Section 9.3.4.

9.3.3.3.2 *Vertical Rocket Cutting Machines*

The M55 rocket assemblies are moved from UPA-1 by conveyors into one of the two ECVs for processing in downstream equipment. Once in the ECV, the VRCM input conveyor transports the rocket to the VRCM robot which places the M55 rocket assembly into the VRCM. The ECVs that house the VRCM equipment are ventilation category A/B areas, and chemical agent contamination is likely in these areas. The ECVs are also permitted container storage areas that will be closed in accordance with Section 9.3.1.

The VRCM separates the top segment of the SFT from the warhead end of the rocket assembly, and it is placed on the VRCM output conveyor and transferred to the MPR for packaging. With the rocket warhead exposed following removal of the upper SFT segment, the VRCM separates the warhead from the rocket motor, and it is placed on the VRCM output conveyor where it is conveyed to the ECR. Separated rocket motors (RMs) in the remaining section of the SFT are placed on the VRCM output conveyor and transferred to the MPR and placed in boxes that are fabricated for containerization prior to storage/shipping. The RM box is monitored out of the MPR for chemical agent at <1 VSL with an action level of 0.5 VSL. The MPR is a permitted container storage area, and it will be closed in accordance with Section 9.3.1.

The SFT cutting operations at the VRCMs generate fiberglass cuttings, particles, and dust (residue) which are non-liquid PCB bulk product wastes. When removed from service for closure, the VRCMs and associated equipment will be inspected for PCB residue, and any residues will be removed using any of the decontamination methods described in Appendix A. The decontamination methods may be used singly or in combination, and any PCB residues removed from the equipment will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

The VRCM will be decontaminated as necessary and sent offsite as a hazardous waste prior to demolition in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

9.3.3.3.3 *Rocket Shear Machine and Rocket Warhead Containerization System*

The separated M56 rocket warheads are received from the VRCM in the ECR for subsequent management in the RSM and RWCS. The ECRs are ventilation category A areas and chemical agent contamination is likely in these areas. The ECRs are also permitted container storage areas that will be closed in accordance with Section 9.3.1.

Each RSM consists of an input conveyor, warhead transfer assembly, and a punch and drain station (PDS) where agent is removed from the warhead. This is accomplished using a set of hydraulic punches that pierce through the skin of the warhead (WH) into the agent cavity. The bottom drain punches create liquid agent drain holes, and the top vent punch extends into the top of the warhead's agent reservoir to create a hole for venting as agent drains. The agent is drained from the warhead into the Agent Transfer Tank (ATT), where air and entrained vapor and gasses are removed from the process stream. The liquid agent in the ATT is transferred to the Agent Holding Tank (ACS-0105) in the ANS Room, and the ATT headspace volume is drawn through the RHS Entrainment Removal Drum.

The RWCS is used to containerize the warheads that have been separated from the RM assembly and drained of chemical agent. Following the punch and drain process, the warhead is transferred into a steel warhead canister. Once in the warhead canister, a plug is inserted into the opening and the canister is crimped around the plug to form a seal that prevents residual agent from escaping. The loaded canister passes from the ECR to the EBH Room (Room 07-111) through an airlock where the canister is weighed. The canisters are labeled and placed on a pallet for processing out of the MDB. Once a pallet is filled with containerized warheads, it is cleared for agent contamination and conveyed to UPA-2. The UPA-2 is also a permitted container storage area that will be closed in accordance with Section 9.3.1.

As closure commences, the RSM and RWCS equipment will be decontaminated as necessary and sent offsite as a hazardous waste prior to demolition, in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the RSM and RWCS equipment is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the RSM and RWCS equipment will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the RSM and RWCS equipment is discussed in Section 9.3.4.

9.3.3.4 Drum Compactor

The drum compactor is a Subpart X miscellaneous unit located in the TMA (Room 07-125). The drum compactor is used to compress demilitarization protective ensemble (DPE) suits and miscellaneous non-rigid wastes into containers to reduce void spaces. The unit is pneumatically powered and is connected to the plant air system in the TMA by a detachable air line. The drum compactor is inspected and maintained in accordance with the manufacturer's recommendations and the RCRA inspection plan.

At closure, the hydraulic fluid and filter will be removed and managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). The unit will be decontaminated using any of the decontamination methods described in Appendix A, and they may be used singly or in combination. Any residues removed from the equipment will be managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

The drum compactor will be assessed for reuse or decontaminated and sent offsite for final disposition in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Equipment that is to be reused may be decontaminated for agent as required by the EDP, and PCB wipe sample results will be used to confirm that the unit is not regulated under TSCA for PCBs. If the equipment is left in place for demolition or released for resource recovery, it will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the drum compactor may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the drum compactor equipment is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the drum compactor equipment will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the drum compactor equipment is discussed in Section 9.3.4.

9.3.3.5 Munitions Unpacking/Enhanced On-site Containers (EONCs)

During operations, EONCs are individually transported from the CHB to the UPA-1 for munitions unpacking. The UPA-1 munitions unpacking area is also a permitted container storage area that will be closed in accordance with Section 9.3.1 and UPA-1 contains the RNDE system that will be closed in accordance with Section 9.3.3.3.1.

The UPA-1 munitions unpacking area is continuously monitored for agent, and interiors of the EONCs are monitored prior to opening and at weekly intervals if stored in the CHB for longer than 7 days. The agent monitoring data gathered during operations will be used for assessment of contamination in UPA-1 and for the final disposition of the EONCs at closure. The UPA-1 and the interior and exterior of the EONCs are considered to be in a continuously controlled environment as defined in DA-PAM-385-61.

The EONCs are cylindrically shaped, horizontally-oriented containers with torispherically-shaped ends, and a hinged door provides access for loading and unloading munitions. The EONCs are primarily constructed of stainless steel with each containing hydraulic units used to actuate the door to open or closed positions. These hydraulic systems are composed of pumps, piping, and valves with hydraulic hoses on the exterior of the EONC. The hydraulic system is completely sealed and contained entirely on the exterior of the EONC. There is no pathway for agent to contaminate the hydraulic system via the EONC interior.

A current review of operations records reveals that none of the EONC exteriors have been exposed to agent, and the interiors have never been liquid-agent contaminated or exposed to vapor above the agent contamination threshold levels. After the EONCs have been emptied of all munitions at the end of the GB rocket campaign, another record review will be conducted as part of the risk assessment process to identify potential agent contamination that needs to be addressed for final disposition.

There is no credible release pathway for PCBs to the EONCs and a very low probability that the EONCs are contaminated with chemical agent, but BGCAPP will verify effectiveness of any required decontamination to meet the closure performance standard for chemical agent as described in Section 8.2 and for PCBs as described in Section 8.3. The EONCs may be decontaminated for agent as required by the EDP, and assessed for reuse or sent offsite for final disposition in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Successful closure of the EONCs is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the EONCs will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required.

The UPA-1 is regularly inspected during operations for evidence of spills or releases of hazardous wastes or hazardous materials, and results of the inspections are documented and placed in the operating record. There is a very low probability the UPA-1 is contaminated from spills or releases. Any spills or releases that may have occurred are cleaned up immediately in accordance with Project practices and procedures that are in place at the facility (24915-OPS-5PR-00-00028, *Environmental Inspections*; 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards*; and related documents). Consequently, the closure performance standards of Sections 8.2 through 8.4 are not expected to apply for one-time spills.

When closure of the UPA-1 munitions unpacking area commences, all EONCs will be removed, and the area will be inspected for wastes or residues and cleaned as necessary with any of the decontamination methods described in Appendix A. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Closure of UPA-1 container storage area will be addressed in Section 9.3.1.

9.3.4 Closure of MDB Secondary Containment Systems

The MDB has been designed and constructed to prevent migration of chemical agent and wastes into the environment. The design includes secondary containments which are supported by a reinforced concrete mat foundation that is over three feet thick. The floors in many of the MDB secondary containment areas are sloped to trenches, and the trenches are sloped to collection sumps. Where trenches are not provided, the floors slope to collection sumps in each of the rooms with permitted HWMUs. Concrete curbing is also included in the design of the containment system to ensure the containments provide adequate volume for worst case scenarios of ruptured storage tanks.

In May of 2016, KDEP approved an Equivalent Device Petition that allowed BGCAPP to utilize a chemical resistant coating system in the MDB as an impermeable liner for secondary containment, and it satisfies the requirements of 40 CFR 264.193(d)(4) for Subpart J storage tanks. Although the coating system in the MDB is designed to withstand direct and nearly continuous contact with liquids during facility operations, a combination of sloped floors and daily inspections prevents prolonged exposure of the floor coating system to standing liquids. Additionally, spills or leaks into the secondary containment are cleaned up in a timely manner.

At the end of agent operations, all chemical agent collection systems and chemical agent neutralization systems will be flushed and cleared of chemical agent and agent hydrolysate to reduce chemical agent concentrations in the MDB. Decontamination of agent systems coupled with successive flushing and rinsing of the SDS collection systems will significantly reduce chemical agent levels within the MDB.

After the tank systems are flushed, most of the liquids in the MDB will be either caustic decontamination solutions or rinse water that will be used for decontamination of equipment and personnel. These liquids will only contain minor concentrations of residual chemical agent, and as decontamination of the facility progresses, the concentration of chemical agent will continue to decline.

Diminishing concentrations of chemical agent in the MDB are requisite to performing the UMTs to verify that effective agent decontamination has occurred. In order to achieve the level of decontamination required for a successful UMT, floor coatings that have been exposed to liquid agent will be removed with the upper ¼ inch of concrete by scabbling affected areas.

9.3.4.1 MDB Floor Coating System and Concrete Containments

The permitted tank systems in the MDB all have secondary containments which are constructed with impervious coating systems that are compatible with the wastes that are managed in the MDB. The RCRA Permit condition A.III.J.(3)(c) requires the coating systems to be:

- Free of cracks and gaps
- Adhered to the structure beneath the coating
- Inspected in accordance with the inspection plan

Inspection of the coating systems during closure will continue in areas where permitted tank systems are still in operation to identify defects that would allow liquid to come in contact with the underlying concrete. As closure proceeds, decommissioning and dismantlement of the SSCs in the MDB will require personnel and equipment movement throughout the facility, and these activities are likely to cause minor damage to the coating system. As stated previously, the coating system in the MDB provides an equivalent impermeable liner for the secondary containment structure, but the concrete mat foundation provides a 3-foot-thick barrier to prevent releases into the environment. In areas with active tank systems where liquid waste is managed in volumes that drain to the sump collection system, a chemical resistant, adhesive tape (e.g., waterproof anti-slip tape) or other sealant may be applied to coatings that are cracked or damaged to minimize or prevent permeation of liquid into the concrete. Large areas of defective coatings may be isolated from liquid exposure with temporary spill containment berms (e.g., flexible polyurethane or similar material). Tape and temporary berms will be inspected daily to ensure integrity of the temporary liquid barriers, and the materials will be replaced if they are worn or damaged.

Smaller volumes of liquid waste from localized decontamination efforts that do not reach the collection sumps may be wiped up with absorbent material or mopped to prevent prolonged contact with the coated floor and minimize the spread of liquid and potential contamination. All liquids and absorbents will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents), and condensation will be pumped to the SDS tanks or temporary containers where it will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Condensation from recirculating cooling units (RCUs) will likely continue to accumulate in category C sumps at various locations in the MDB during closure, but the condensation will not have any significant quantities of contamination. Disposal of the RCU condensate will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

In areas of known liquid agent contamination, the coating systems will be scabbled and removed from the concrete floors to eliminate potential sources of agent prior to conducting the UMT and to meet the criteria for disposal of concrete debris as described in Section 8.4.1. Areas within the MDB that have liquid-agent contamination are identified in the 24915-CL-5PL-00-00003, *Main Plant Health-Based Risk Assessment*. Scabbling will occur after decontamination activities that generate aqueous liquid are complete, and in the unlikely event that liquids that are spilled or released after scabbling occurs, they will be immediately cleaned up. If the project anticipates that equipment in rooms where coatings are removed requires additional liquid decontamination, pop-up spill berms and polyethylene sheeting may be used to capture liquid and prevent contact with the bare concrete.

RCRA permit condition A.III.A.(9) states that sumps and secondary containments shall prevent any migration of wastes or accumulated liquid outside of secondary containment at any time during the use of the hazardous waste management unit. Sumps will be maintained as required for permitted systems that remain in operation, and closure of the various sumps is discussed in Section 9.3.

The primary consideration for closure is that the MDB containment system in its entirety remains capable of collecting and holding accumulated liquid wastes. Once liquids have been eliminated from a room or area, secondary containment is no longer essential. The concrete mat foundation of the MDB will continue to provide secondary containment during closure to capture any spillage of hazardous waste and/or industrial waste in the event of tank or container failure. Since all recoverable agent will be eliminated from the MDB prior to the commencement of closure, the concrete containment will be sufficiently impervious to the type and amount of aqueous liquid that will be managed in secondary containments, and precautions will be taken to prevent the removal of the coating system at or near the areas in the MDB where waterstops were omitted. The integrity of the coating system in these areas will be verified by visual inspections where liquid wastes are managed.

The MDB's containment system includes one large, non-curbed area, that includes key rooms such as the TMA, MWS room, TCTR, ENS room, DPE corridor, and ANS room. As hazardous waste liquids and HWMUs are closed in certain rooms, this large containment area will be reduced using temporary berms. The use of temporary berms to segregate active HWMU areas from non-active areas may be eliminated by reducing the containment requirement. The basis of the requirement is containment of 100% of the capacity of the largest tank within the boundary. By slightly reducing the working volume and associated alarm conditions in all three SDS tanks, which are the largest tanks in the MDB, the capacity of the trench and sloped floor system in the ANS room can contain the entire contents of any tank release in this room. Therefore, as long as the volume of the largest vessel cannot exceed the containment volume in the ANS room, the use of temporary berms in the remaining rooms of the containment system are not necessary.

As closure commences, BGCAPP will remove or decontaminate all waste residues from the containment systems. Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination. Agent-contaminated coatings and concrete components will be decontaminated as described in Section 9.5.1 and PCB-contaminated components will be decontaminated as described in Section 9.5.3. The closure DDP and the associated risk assessment identify the types of contamination associated with the containment system and the type of decontamination that is required for the units within that area, while the step-by-step details will be addressed within specific work orders for field execution.

The containments are inspected daily to identify signs of spills and defects that require repair, and the documented results of the inspections are maintained in the operating record. A record review will be conducted along with a visual inspection to identify cracks or damage to the containment that would have allowed hazardous waste or hazardous constituents to reach the underlying soils. Following this review or during progression of closure, it is possible that BGCAPP may discover an area having a probable release of a hazardous waste or hazardous constituent (i.e., an AOC) that needs to be investigated. In such an event, a remediation plan will be developed for KDEP approval which will address sampling and analysis for the investigation and remediation of the AOC. The remediation plan will draw upon the COPC lists, Closure Target Levels, and general sampling and analysis methodology contained in the Main Plant CVQAPP but will be prepared and submitted for approval independent of the CVQAPP.

Successful closure of the containments is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Closure verification sampling and analysis will be performed as described in the CVQAPP in addition to meeting the applicable closure performance standards of Section 8.0.

9.3.4.2 Closure of Sumps in the MDB

The floor sumps in the MDB are integral to the containment system that is shared by permitted HWMUs throughout the building. Category A and B sumps are double-wall primary containment sumps that are designed to collect and transport routine and systematic discharges of hazardous waste from periodic cleaning of process equipment.

Category C area sumps are normally free of liquids but may receive condensation generated from RCUs that provide supplemental cooling throughout the MDB. There are also several category D area sumps in the MDB that are normally free of liquids. The list of sumps in the MDB that will be closed is provided in Table 5.

Table 5 - MDB Sumps to be Closed

MDB Sumps to be Closed						
MDB Category A Sumps						
Sump No.	**Room No.**	**Location**	**Volume (gal)**	**Type of Containment**	**Type of Liquid Alarm(s)**	**Discharges to**
DB-SDS-0131	07-104	ECR 1	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0134	07-105	ECR 2	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0136	07-111	EBH	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0138	07-106	ECV 2	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0141	07-135	MWS	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0143	07-125	TMA	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0144	07-125	TMA	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0145	07-125	TMA	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0147	07-120	DPE Cor	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0148	07-123	ANS	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0149	07-123	ANS	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0151	07-109	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks

DB-SDS-0152	07-103	ECV 1	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0174	07-136	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0175	07-132	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
MDB Category B Sumps						
Sump No.	**Room No.**	**Location**	**Volume (gal)**	**Type of Containment**	**Type of Liquid Alarm(s)**	**Discharges to**
DB-SDS-0135	07-107	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0165	07-119	ENS	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0166	07-119	ENS	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0167	07-126	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0170	07-124	TCTR	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0171	07-124	TCTR	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0173	07-146	MPT	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0177	07-133	TMA Equip	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0178	07-124	TCTR	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0182	07-163	MPR	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0184	07-142	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0201	07-113	EBH Suppt	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0228	07-162	Airlock	85	Primary	Sump and Liner	Spent Decon Tanks
DB-SDS-0235	07-146	MPT	85	Primary	Sump and Liner	Spent Decon Tanks
MDB Category C Sumps						
Sump No.	**Room No.**	**Location**	**Volume (gal)**	**Type of Containment**	**Type of Liquid Alarm(s)**	**Discharges to**

DB-SDS-0154	07-137	OBS Cor	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0168	07-144	OBS Cor	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0169	07-118	SHT	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0176	07-129	Transfer	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0180	07-148	Washout	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0181	07-148	Washout	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0190	07-101	UPA 1	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0191	07-101	UPA 1	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0198	07-121	ANS Glove Box	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0200	07-117	OBS Cor	85	Secondary	Sump	Spent Decon Tanks
MDB Category C Sumps (continued)						
DB-SDS-0202	07-102	EONC Lkr	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0220	07-118	SHT	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0222	07-128	UPA 2	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0223	07-128	UPA 2	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0227	07-203	EBH Suppt	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0229	07-140	OTE	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0230	07-140	OTE	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0231	07-140	OTE	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0232	07-140	OTE	85	Secondary	Sump	Spent Decon Tanks
DB-SDS-0233	07-140	OTE	85	Secondary	Sump	Spent Decon Tanks

DB-SDS-0185	07-134	UPA Eq Rm	85	Secondary	Sump	Spent Decon Tanks
MDB Category D Sumps						
Sump No.	**Room No.**	**Location**	**Volume (gal)**	**Type of Containment**	**Type of Liquid Alarm(s)**	**Discharges to**
NCD-0230	07-141	OTM	82.9	Secondary	Sump	Containers, Storm Drains, or HSS
NCD-0231	07-141	OTM	82.9	Secondary	Sump	Containers, Storm Drains, or HSS
NCD-0232	07-141	OTM	82.9	Secondary	Sump	Containers, Storm Drains, or HSS
NCD-0235	07-150	MPT Discharge	82.9	Secondary	None	Containers
NCD-0236	07-150	MPT Discharge	82.9	Secondary	None	Containers
NCD-0233	07-164	MSR	82.9	Secondary	None?	Containers

Each sump in the category A, B and C areas is equipped with an air-driven sump pump to empty liquids from sumps, except sump SDS-0185 in the UPA Equipment Room (07-134). This sump requires a portable sump pump to empty if needed.

In normal operation, liquids are pumped from the category A, B, and C sumps to the permitted SDS holding tanks MV-SDS-0101, 0201, or 0301. Piping systems for each sump category are segregated to prevent cross-contamination between categories A, B, and C systems, and the piping connects to a common header that conveys liquid to the SDS holding tanks. If an agent spill occurs in category A or B areas and reaches the sumps, the liquid agent can be pumped directly to the agent surge tank MT-ACS-0106, bypassing the SDS Tanks. Use of the agent surge tank 07-MT-ACS-0106 requires supervisory control.

The category A and B sump systems are designed to contain accumulations of corrosive liquids and operated as intermittent collection units with primary and secondary containment. The sump systems are constructed with a steel embed placed in the concrete floor and a 3/16” steel sump liner. The steel embed provides secondary containment as required by 40 CFR 264.193, and the liner provides a primary containment barrier that collects liquid waste and protects the steel embed from exposure to corrosive decontamination solutions. The sump system assembly provides an interstitial space between the embed and sump liner that is approximately 2 to 3 inches wide on all sides and bottom. The sump system includes an ultrasonic level sensor that detects liquid levels in the primary containment sump liner, and a capacitance probe will detect liquid in the interstitial space if the liner is ever breached.

The category C sumps in the MDB are constructed with a steel embed placed in the concrete floor and are equipped with an ultrasonic level sensor to detect liquid. The category C sumps have a chemical resistant coating but do not have a sump liner. They are considered as secondary containments and are not designed for continuous management of liquid wastes.

The category D sumps in the MDB are constructed with a steel embed placed in the concrete floor and do not have a sump liner. They are considered to be secondary containment systems and are not designed for continuous management of liquid wastes. The sumps in Rooms 07-141 (NCD-0230, 0231 and 0232) are equipped with an ultrasonic level sensor to detect liquid and an air-driven sump pump. These sumps are designed to collect rainwater, cooling unit condensation, and OTM condensate, and the associated piping allows for transfer of OTM condensate liquids to the HSS tanks in the event of an upset condition. There are three other NCD sumps in the MDB (one in Room 07-164 and two in Room 07-150) that do not have pumps. These sumps are typically free of liquids and are not expected to be contaminated at closure. These sumps require a portable sump pump to empty if needed.

RCRA Permit Condition A.III.A.(9) states that spilled or leaked waste and accumulated precipitation shall be removed from the sump or collection area in as timely a manner is necessary to prevent overflow of the collection system. During the closure period, BGCAPP will continue to remove liquids accumulating in sumps and collection systems in as timely a manner is necessary to prevent overflow, but the liquids may remain for periods greater 24 hours after liquid is observed or detected. RCRA permit required sump inspections will continue as long as the sumps are in service to prevent overflow.

The initial decontamination and decommissioning activities performed during closure of the MDB are expected to generate large quantities of spent decontamination liquids in the category A and B areas. The sumps in these areas will be maintained to manage decontamination liquids during closure until they are designated for decommissioning by the room-designated DDP. As closure activities proceed, agent vapor concentrations will diminish in the MDB as a result of decontamination efforts, and the quantity of spent decontamination liquid that is generated will decline. Category A and B areas will transition to category C and eventually category D as closure progresses. The progress in hazard reduction and downgrades as HWMUs are closed will allow for the removal of sump liners if necessary to achieve decontamination goals, and sump level detectors and capacitance probes will be removed from service. Prior to these actions, the sumps will be triple rinsed with plant water, and the SDS piping from the sumps to the common manifold will be flushed with the sump rinse water. Caustic decontamination supply lines and plant water supply lines in that room will be isolated, and only incidental amounts of liquid will be allowed in the room to minimize or eliminate liquids from entering the sumps. Any incidental liquids accumulated in the sumps will be removed by appropriate methods (e.g., wipes, mops, wet-dry vacuums).

As closure commences, BGCAPP must remove or decontaminate all waste residues from the sumps. Any of the decontamination methods described in Appendix A may be used singly or in combination to achieve the desired level of decontamination. The closure DDP and the associated risk assessment identify the types of contamination associated with the sumps system and the type of decontamination that is required for the units within that area, while the step-by-step details will be addressed within specific work orders for field execution.

Successful closure of the sumps is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Final closure of the sumps will be verified by performing closure verification sampling and analysis as described in the CVQAPP.

9.3.5 Closure of the OTM and HVAC

The MDB is equipped with a Title V HVAC exhaust filtration system that provides agent vapor management within the structure, and the MPTs are equipped with an OTM, which vents to the HVAC. Both units are operated under the BGCAPP Title V air permit as air pollution control equipment, and they also provide compliance with the applicable requirements of 40 CFR 264 Subpart CC.

The following sections address closure of the OTM and HVAC exhaust filtration systems.

9.3.5.1 Closure of OTM

The OTM is operated under the BGCAPP Title V Air Permit, and it treats the effluent from the MPT and the vent gases from the ACS, ANS, and SDS tank systems. Each MPT is equipped with a TOX and cyclone separator. The effluent from each of the cyclones combines into a single common header that flows to a wet venturi, scrubber tower, particulate filter, and reheater before it is discharged to the MDB HVAC exhaust filtration system. The MPT blower provides the necessary induced draft for the MPT and the OTM.

The TOX units and cyclones are located in the EBH/ENS/MPT Off-Gas Treatment Room (07-140) of the MDB which is a category C area. All OTM equipment downstream of the cyclones is located in the OTM Room (07-141) of the MDB, which is a category D area.

The TOX units (MK-OTM-0106/-0206) are natural gas-fired thermal oxidation units that treat effluent from the MPT, purge gases from the MPT inlet and outlet airlocks, vent gases from the SDS, ANS, and ACS. The TOXs sole function is to oxidize combustible organic compounds in the gas stream, which is consistent with the description of air pollution control equipment as defined in 401 KAR 50:010 Section 1(5). The TOX is heated with a natural gas-fired burner with a maximum design temperature of 2250 °F, and the outer shell is made of carbon steel which is internally lined with Ruby® SR alumina-chrome refractory brick for insulation. Vent gas from the MPT is transferred to the TOX through 8-inch diameter piping that is routed through 3-inch or 8-inch flame arrestors prior to the TOX.

The OTM cyclones (MK-OTM-0107/0207) are single stage cyclonic particle separators designed to remove 90% of particles 14 µ in diameter and larger from the TOX effluent gases which may act as a catalyst in formation of dioxins and furans. Removal of particulate matter also minimizes carryover of heavy particulates to the scrubber to prevent fouling of the scrubber recirculation systems. The cyclone is constructed of Incoloy 800H to withstand the corrosive acid gases in the effluent gas. The cyclone has a motorized rotary valve at the bottom of the unit to transfer the captured particulate material to a collection drum. Vent gas from the TOX is carried to the cyclone through a 16-inch diameter duct.

The cyclone effluent from both MPT treatment trains is combined into a common header that discharges to the MPT venturi/scrubber tower (MK-OTM-0102) which is composed of two sections: the venturi and the scrubber tower. The venturi is an impaction scrubber that rapidly quenches the hot gases from the TOX and captures particulates in the gas stream. The scrubber tower is downstream from the venturi, and it neutralizes any acid gases that pass through the venturi. Vent gas from the cyclones is carried by 16-inch ducts to a 20-inch diameter common header that carries the vent gas to the venturi/scrubber tower.

The venturi is a wetted wall, variable throat design with a flooded elbow that removes approximately 99% of 3 µ particulates or larger and 90% of particulates between 1 and 3 µ in diameter. The venturi body is constructed of Incoloy 800H to resist corrosion. Alkaline brine (MPT condensate) is pumped from the bottom of the scrubber tower to the venturi inlet upstream of the variable throat damper to rapidly quench hot gases from the TOX and prevent formation of dioxins and furans. The wetted gas stream also captures entrained particulates that pass through the throat of the venturi to the flooded elbow and the entrainment separator at the bottom of the scrubber tower. The MPT condensate with the captured particulate is cyclonically separated from the gas stream in the scrubber tower entrainment separator, and the liquid accumulates in the scrubber tower reservoir. Dense condensate is bled from the reservoir and transferred to the HSA storage tanks. Caustic and makeup water is added as necessary to the scrubber bottom reservoir to maintain a pH of 8.0 with a range of 7.0-9.5 for neutralizing the acid gases in the venturi effluent. The venturi body is constructed of Incoloy 800H to resist corrosion.

The scrubber tower provides the second stage of acid gas scrubbing and additional cooling of the venturi exhaust. The scrubber tower incorporates a horizontal gas inlet above the scrubber reservoir, entrainment separator section, straightening vane, chimney tray, packed-bed scrubber section, a mist eliminator pad, and flanged vertical gas outlet at the top of the tower. The scrubber tower is primarily constructed from Incoloy 800H with packed-bed scrubber Raschig rings fabricated from Hastelloy. Vent gas from the scrubber tower is carried by an 18-inch duct to the MPT filters (MK-OTM-0104A/B).

The MPT condensate from the upper half of the scrubber tower is drawn from the chimney tray and gravity fed to the recirculation surge tank (MV-OTM-0101) which provides storage and surge capacity for the scrubber tower and scrubber recirculation system. The scrubber recirculation pumps (MP-OTM-0101A/B) draw the condensate from the surge tank and recirculate it through the scrubber cooling system (ME-OTM-0102 and ME-OTM-0104) and pump it back to the top of the packed bed in the scrubber chimney. The recirculated MPT condensate enters the scrubber tower at a temperature of approximately 70°F and the recirculation rate is controlled to maintain exit gas temperature from the scrubber at 100°F or less. The Raschig rings in the packed bed provide a large surface area in the scrubber for increased interaction between the OTM condensate and the gas effluent. Process water may also be added to the top of the scrubber tower chimney for makeup. The pH of the scrubber brine is maintained at approximately 8.0 with a range of 7.0-9.5 by adding caustic solution to the MPT scrubber recirculation surge tank (MV-OTM-0101) to ensure that the acid gases in the effluent are neutralized. Process water may also be added to the surge tank for makeup.

The MPT filters (MK-OTM-0104A/B) are downstream of the venturi/scrubber tower, and they operate with one online and the other as a spare. The filters reduce condensate mist and capture nearly 100% of the particulates of 3 microns or larger in the gas stream. The MPT filters have horizontally mounted cartridge-type particulate filters that are replaceable when plugging occurs, and the filter housing is primarily constructed from carbon steel.

Effluent from the MPT filters is reheated to approximately 95°F by the MPT air reheater (ME-OTM-0103). The reheater is an in-line resistance-type electric heater that heats the effluent to reduce relative humidity of the MPT blower exhaust to 55% or less. The MPT reheater shell and heater elements are primarily fabricated from carbon steel. The MPTs blowers (MA-OTM-0101A/B) provide induced draft for the MPT and OTM, and they exhaust to the HVAC exhaust filtration system. The blower casings are fabricated from cast iron, and the impellers are fabricated from aluminum.

As closure of this system commences, both of the MPTs and the TOXs will be operated at normal operating conditions for a minimum of 1 hour after all waste feed is terminated to thermally desorb and air wash any residual chemical agent on the interior of the system. The units will be permanently shut down after the 1-hour desorption cycle is complete, and decommissioning of the units may commence. The manways on the TOX units will be opened, and the refractory brick and internal debris will be removed for offsite disposal at a permitted TSDF because of the presence of chromium (D007) in the refractory. After the refractory and debris are removed, the TOX shell may be left for demolition. If the TOXs are left in place for demolition, they will be dismantled and decontaminated to meet the applicable closure performance standards of Section 8.0. Any of the decontamination methods described in Appendix A may be used, and they may be used singly or in combination. Any residues that are collected will be managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Alternatively, the TOXs may be size-reduced, containerized, and shipped offsite as scrap metal or for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

For closure of the MPT cyclones, the inspection port on each of the units will be opened to verify that all residue has been transferred to the collection drums and no bridging of solid material occurred. Any bridged material or solids remaining in the cyclone will be removed and disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Based on operating experience, BGCAPP does not expect a significant amount of solids or residue in the cyclones at closure. If inspection of the cyclone interior indicates that there are residues or solids that are not freely removed by gravity fall or hand tools, the interior may be pressure washed or steam cleaned, and liquids wastes will be collected for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). After residue has been removed from the cyclones, they may be left for demolition. If the cyclones are left in place for demolition, they will be dismantled and decontaminated to meet the applicable closure performance standards of Section 8.0. Any of the decontamination methods described in Appendix A may be used, and they may be used singly or in combination. Any decontamination residues that are collected will be managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Alternatively, the cyclones may be size-reduced, containerized, and shipped offsite as scrap metal or for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Following shutdown of the TOXs, OTM condensate in the venturi/scrubber tower and recirculation system will be flushed to the OTM condensate storage tanks in the HSA, and fresh plant or process water will be circulated through the system to clean out residual condensate. All rinsate will be transferred to the storage tanks in the HSA. After flushing and rinsing is complete, the venturi/scrubber system and ancillary equipment (e.g., pipes, pumps, valves) may be left in place for demolition. If the system is left in place for demolition, it will be dismantled and decontaminated to meet the applicable closure performance standards of Section 8.0. Any of the decontamination methods described in Appendix A may be used, and they may be used singly or in combination. Any residues that are collected from the decontamination effort will be managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). Alternatively, the units may be size reduced, containerized, and shipped offsite as scrap metal or for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Closure of the MPT Filters will consist of removal of the replaceable cartridges and disposal in

accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The horizontal housings will be pressure washed and rinsate will be collected and disposed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). The MPT reheater is downstream of the MPT filters and should be free of any visible residue. The MPT reheater and all vent gas ductwork associated with the OTM may be left in place for demolition. If the reheater and ductwork are left in place for demolition, the equipment will be dismantled and decontaminated to meet the applicable closure performance standards of Section 8.0. Any of the decontamination methods described in Appendix A may be used, and they may be used singly or in combination.

Any residues that are collected from the decontamination effort will be managed as waste in accordance with Project procedures. Alternatively, the reheater and ductwork may be size-reduced, containerized, and shipped offsite as scrap metal or for disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

There have been minor spills of OTM condensate and caustic in OTM Room 07-141 which were cleaned up immediately. The operating records will be reviewed as closure commences to confirm that no other contamination of the floors occurred during operations. The floors in Room 07-141 will be cleaned by sweeping, mopping, or wet/dry vacuuming to remove any residue, and the residue will be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). No additional decontamination of the floors in Room 07-141 or exterior of the OTM is anticipated.

There have not been any spills in the OTE Room 07-140, and the operating records will be reviewed as closure commences to confirm that no contamination of the floors occurred during operations. The floors in Room 07-140 will be cleaned by sweeping, mopping, or wet/dry vacuuming to remove any residue, and the residue will be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents). No additional decontamination of the floors or exterior of the equipment in Room 07-140 is anticipated.

Decontaminated OTM equipment may be left in place for demolition or released for scrap metal and will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the OTM equipment may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the OTM equipment is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the OTM equipment will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required. Closure of the secondary containment system (floors and sumps) associated with the OTM equipment is discussed in Section 9.3.4.

9.3.5.2 Closure of the MDB HVAC Exhaust Systems

The MDB HVAC system is designed to provide spatial heating and cooling and a cascading airflow through the building that maintains Category A, A/B, B, and C areas at negative pressure relative to atmosphere to prevent a release of agent to the environment. The MDB exhaust filtration system is regulated as air pollution control equipment that is operated under the BGCAPP Title V Air Permit, and it is also required for chemical agent operations in accordance with RCRA Permit Condition A.II.A.(7).

The cascade airflow design progressively moves air from the areas of least probable contamination to the areas of highest probable contamination in the MDB before it is exhausted through ductwork to the filter banks containing HEPA and carbon filter media to capture particulate and airborne contaminants entrained in the air streams. The exhaust air system also interfaces with off-gas from the OTM and other process equipment in the MDB. The OTM off-gas enters the exhaust air effluent through cross-connected exhaust air headers on top of the MDB which is directed to the filtration system.

The MDB exhaust filtration system that serves the MDB consists of airflow transfer and exhaust ducts and 14 filter units with a design airflow capacity of 16,000 actual cubic feet per minute (acfm) per unit. During agent operations, twelve units are operated in parallel for a combined design airflow of approximately 192,000 acfm, and two units are maintained on standby. Each of the filter housings is equipped with an adjustable speed, direct drive exhaust fan that pulls air through the filter housing to an exhaust header that connects to one of the common filter stacks. Monitoring houses are provided for the agent monitoring equipment that may be used as required to monitor effluent from agent sampling ports downstream of charcoal filter banks 1, 2, and 4 and at each of the common stacks.

The minimum transport velocity in the duct plenums that handle contaminated air is sufficient to entrain aerosols and particles ranging from 0.1 to 100 µ. For exhaust ducts, the ducts leaving category A areas and connecting the filtration system header have a minimum velocity of 1,800 ft/min. Air velocity through transfer ducts in category A and B rooms is 1,000 ft/min or higher, and the transfer air velocity may be as low as 700 ft/min (minimum) between category C to C and C to B rooms in order to optimize total system pressure. Established airflows meet or exceed the minimum ventilation criteria and hazard category pressure ranges in accordance with BGCAPP design criteria for agent operations.

Transfer and exhaust ductwork is fabricated from galvanized sheet metal. Ductwork exposed to agent-contaminated air, either internally or externally, is round and airtight, and duct seams and joints are fully welded. The filter housing and inside assemblies are constructed of stainless-steel type 304L. The first stage of the filter unit consists of a bank of prefilters that remove gross particulate matter. The second stage is a bank of HEPA filters that further remove particles down to 0.3 microns in size followed by six banks of activated charcoal adsorbers that remove agent contaminants. The final filtration stage is another bank of HEPA filters that provides for the removal of any fine charcoal particles that may emanate from the charcoal adsorbers. Exhaust air fans are controlled to maintain a constant negative air pressure in the two cross-connected exhaust air headers.

The MDB HVAC DDPs will provide the scope, boundaries, and technical approach to decommission the HVAC systems; the step-by-step details will be addressed within specific work orders. All exhaust ductwork and ancillary components (e.g., valves and dampers) in A, A/B, or B areas are assumed to have been agent vapor exposed.

Critical operating parameters for HVAC airflow in Attachment F of the RCRCA Permit were established for chemical agent operations and will not be applicable during closure after all recoverable agent has been removed from the agent collection systems, and gross decontamination of the toxic areas is completed. As decontamination and decommissioning activities progress within the MDB following operations, it may be necessary to modify or reduce the HVAC ventilation airflow to facilitate area closure activities and prevent adverse changes in pressure and airflow patterns. Airflow modifications may include a reduction of the number of online filter units while maintaining an overall negative pressure within the building. Ventilation airflow may be reduced by approximately 50% or more of the operational flow required during agent operations to allow for more stable control of pressure and air flows while isolating portions of the MDB for performing UMTs. When performing the UMT, the individual zone/area being tested will be isolated from the remainder of the building to prevent air flow into or out of the designated areas by closing all doors and dampers located around the zone boundary and blinding off HVAC ducts and wall penetrations, as appropriate. Unventilated monitoring

tests will be completed within the MDB prior to the final decontamination and decommissioning of the MDB HVAC system.

Specific guidelines for the sequential dismantlement of the system and its components will be outlined in the DDPs to ensure HVAC functionality as required during decommissioning and closure. Functionality includes ample heating and cooling of the MDB along with control of particulate and agent emissions. Temporary filter units may be used to supplement the fixed filters as closure proceeds depending on airflow requirements and modifications caused by dismantlement of systems and equipment in the MDB. As building ventilation requirements diminish and airflow is reduced, individual filter units may be taken out of service and decommissioned. Standby capacity will also be factored into the decision to take a filter unit out of service.

When UMTs are complete for rooms that were categorized as category A, A/B, and B during agent operations, the pre-filter, inlet HEPA filter, and charcoal banks 1 and 2 may be removed from all remaining filter units, and no new filter media will be installed in units remaining in service. All filter media that is removed from the filter housing will be managed in accordance with Project waste management procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

Decommissioning of the MDB HVAC system will be accomplished through internal duct/component decommissioning, external duct/component decommissioning, and filtration unit/component decommissioning. It is anticipated that the interior of the ductwork and filter housings will not exhibit agent contamination > 1 VSL because of the airflow velocity and continuous airwashing in the ducts. In the unlikely event that ductwork contamination levels exceed the 1 VSL criteria to leave in place for dismantlement by demolition personnel, the specific ductwork may be isolated with a tented enclosure, dismantled and decontaminated, or sized for disposition in accordance with Project waste management procedures.

As closure proceeds, exhaust ductwork inside the MDB will be addressed for decontamination and decommissioning in the individual room DDPs, and it will be evaluated for contamination and decontamination requirements. External ductwork that is not addressed by the Room DDPs will be evaluated for agent and PCB contamination in accordance with the associated DDP. The DDP(s) and closure planning risk assessment that addresses the internal and external ductwork will provide guidance to assist in the determination and extent of decontamination efforts for the ductwork and components. Ductwork decontamination methods that were used by former chemical demilitarization facilities may be used at BGCAPP if required. Borescopes, remote videography, and high-pressure air lances were used, along with other methods, to remove contamination from exhaust ductwork. It is assumed that headspace sampling performed on the upstream filter housings prior to facility closure will support plans to leave the units in place for removal by demolition personnel.

The upstream sections of filter housings will be evaluated for agent contamination after the pre-filters, HEPA filters, and contaminated carbon adsorber beds have been removed. Based on mid-bed agent monitoring performed during agent operations, no agent contamination occurred beyond the second charcoal bank, and only the upstream section of the filter housings will be headspace monitored to verify that the <1 VSL criteria has been met. Headspace monitoring will be performed after the second bank of carbon has been removed and the downstream section is isolated with plastic sheeting or equivalent material. It is assumed that ductwork headspace sampling performed prior to facility closure will support plans to leave the ductwork in place for removal by demolition personnel. After upstream portion of the filter plenum is cleared to <1 VSL, the remaining carbon banks may be removed and disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure;* 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Filter units may be placed on line without carbon adsorber beds to provide cooling ventilation for the MDB, and stack monitoring for chemical agent will continue while there exists a credible source of VSL-level agent in the flow of air exhausting the stacks.

The HVAC exhaust system components and associated ductwork may be left in place for demolition or released for scrap metal recovery and will be decontaminated to meet the applicable closure performance standards of Sections 8.2 through 8.4. Alternatively, the HVAC exhaust system components and associated ductwork may forgo decontamination as provided by Section 8.5 to meet those closure performance standards and may be size-reduced and treated with any of the methods shown in Appendix A and managed for offsite disposal in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Successful closure of the HVAC exhaust system components is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a “clean debris surface” will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Since the HVAC exhaust system components will be dispositioned as either scrap metal, hazardous waste, or debris, performing closure verification sampling and analysis is not required.

9.3.6 Closure of TSCA Permitted Units

Closure of permitted TSCA units will occur in conjunction with the RCRA closure activities described in this closure plan, and the same general principles and methods that are used for decontamination and disposition of RCRA-permitted units will apply to TSCA closure activities. This approach ensures that the closure performance standards of Section 8.3 will be achieved.

As closure commences, PCB bulk product waste and residues will be removed from units undergoing closure and shipped offsite for disposal at a TSCA- and RCRA-approved treatment, storage, and disposal facility. In accordance with 40 CFR 761.65(e)(1)(iii), a list of the subcontract treatment/disposal facilities that have agreed to accept TSCA PCB wastes from BGCAPP has been provided to US EPA Region IV as a TSCA Approval Condition. The list was included with the submittal of SDN 24915-00-GPE-GGPT-00388, *Request for Approval for Additional Treatment, Storage, and Disposal of Polychlorinated Biphenyl (PCB) Bulk Product Wastes*.

Agent decontamination activities in the MDB where the SFTs were processed are likely to generate spent decontamination solutions that will carry non-liquid PCB residues suspended in the liquid. The spent decontamination solutions are collected in sumps and routinely transferred to the SDS tanks. During operations, PCB-contaminated SDS waste will be processed through the ANS reactors and cleared for agent prior to being transferred to the AH storage tanks in the HSA. During closure, PCB-contaminated SDS wastes may bypass the ANS reactors and be sent directly to the HSA storage tanks after being cleared for agent. Closure of the Subpart J storage tank systems will address PCB contamination and is described in Section 9.3.2.

As required by the TSCA Approval, PCB markings that are posted immediately adjacent to all approved storage and processing areas must remain in place until the area is decontaminated in accordance with the approved facility closure plan. The criterion for removal of PCB markings for facility areas and/or equipment is PCB decontamination followed by wipe sample results < 10 µg per 100 cm^2 for facility or equipment surfaces. Standard wipe tests will be performed as outlined in 40 CFR 761.123 to demonstrate the decontamination criterion for removal of PCB markings, and the results will be placed in the facility operating record.

Since only non-liquid PCB bulk product wastes are managed at the BGCAPP facility, walls and ceilings of the PCB processing and storage areas will not be impacted by PCB contamination in processing and storage areas. Therefore, PCB decontamination efforts will focus on removal of PCB residues from floors in the permitted storage and processing areas, surfaces of SFT handling and processing equipment, and permitted tank systems that may have carried liquids with non-liquid PCB residues in suspension. Concrete surfaces in processing areas have been treated with sealants or protective floor-coating systems to prevent permeation of non-liquid PCBs into the immediate surface. Therefore, concrete coatings and surfaces will be treated as non-porous surfaces for the purposes of TSCA closure activities.

The CHB, BTR, and NCRM igloos are permitted storage areas that receive containerized PCB bulk solid wastes. No process-related hazardous wastes or PCBs are expected to remain in these areas at the start of closure because the primary waste containers are never opened in these areas. Therefore, these areas are not expected to require decontamination for PCB residue, and the non-residential clean closure performance standards of Sections 8.2 through 8.4 are not expected to be applicable. As closure commences, these areas will be inspected for wastes or residues and cleaned as necessary by sweeping, dry vacuuming, or mopping as appropriate. Any wastes or residues that are collected from these activities will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

The PCB-contaminated SSCs may undergo decontamination in accordance with any of the methods described in Appendix A of this closure plan or any of the 40 CFR 268.45 alternative treatment standards for hazardous debris described in Section 8.4 of this closure plan. Permitted units and PCB-contaminated SSCs may be dismantled and disposed of as PCB-contaminated hazardous waste or hazardous debris at an appropriately permitted TSDF instead of performing decontamination or if decontamination efforts are not sufficient to satisfy the applicable closure performance standards of this closure plan. Decommissioned components suitable for recycling may be sent offsite for resource recovery as scrap metal or recycled concrete as described in Section 9.6.8. Notwithstanding non-residential clean closure requirements applicable to any portion of the permitted unit that remains on site (e.g., containment systems), removal and proper offsite disposition (disposal or recycling) of all or part of the permitted unit constitutes clean closure of the item sent off site.

Successful closure of the TSCA permitted units is decontamination and final disposition (disposal or recycling) that satisfies the applicable closure performance standards of Sections 8.1 through 8.5. If applicable, the closure performance standard for attaining a "clean debris surface" will be verified by visual inspection of the decontaminated surface, and the results will be documented and placed in the operating record. Closure verification sampling and analysis is not required unless contamination of soil outside of secondary containment is suspected or confirmed.

9.4 Closure of Permitted Units Never Placed Into Service

There are RCRA-permitted units in the Main Plant facility that were constructed but never placed into hazardous waste operations. Since hazardous waste was never introduced to these units, they do not meet the definition of a HWMU and do not require RCRA closure. There are no units in this category that were permitted for processing PCBs under the TSCA Approval.

Permitted units that were never placed in service will be decontaminated as needed (e.g., industrial wastes) in accordance with the DDP and accompanying risk assessment requirements to achieve the designated physical end state of the facility (i.e., demolition or reuse). These units will be assessed for re-use or material salvage value and administratively closed following verification that the units are not regulated by the RCRA Permit. Any of the units that may have been in the proximity of chemical agent will be assessed for agent contamination, decontaminated as necessary, and decommissioned as required for future use or for removal and offsite disposition.

An administrative closure evaluation will be performed in which the operating record will be reviewed to confirm the status, and administrative closure documentation will be placed in the facility operating record stating that no further actions are required for completing closure in accordance with this plan.

9.5 Decontamination of Equipment and Structures – 401 KAR 39:090 Section 1, 40 CFR 264.112(b)(4)

This section describes the methodology to decontaminate SSCs for safer handling of materials during decommissioning or to achieve the closure performance standards identified in Section 8.0. The decision to decontaminate, and to what degree, will be evaluated throughout the closure process. As part of the closure strategy, contaminated SSCs and soil that do not meet the RCRA and TSCA closure performance standards without additional decontamination may be removed from the facility and disposed at properly permitted offsite disposal facilities.

The primary methods of decontamination for equipment and structures are chemical and mechanical. Chemical decontamination deactivates the contaminants by chemical reaction, and mechanical decontamination uses techniques to physically remove the contaminants. Appendix A describes the various methods that may be employed for decontamination of chemical agent, PCBs, and other types of contamination found on SSCs.

The selection of decontamination methods will be based on the conditions resulting in the contamination, the level of contamination, the type and configuration of the material to be decontaminated, and knowledge obtained from proven decontamination operations at former chemical demilitarization facilities.

Factors for determining the most appropriate decontamination approach include, but are not limited to:

- Reducing and/or eliminating the potential exposure to, and release of, hazardous constituents
- Evaluating the exposure risk to determine the appropriate level of PPE and the level of administrative and engineering controls for decommissioning, dismantlement, and demolition
- Salvaging equipment and materials for reuse, recycling, or alternative lower cost disposal options

Decontamination techniques selected by BGCAPP may be effective for either agent, non-agent, or both agent and non-agent contamination. Any non-agent hazardous waste or PCBs may be completely or partially removed using the same decontamination technique(s) used for agent. All hazardous waste or hazardous waste residues removed during decontamination activities will be characterized and managed as newly generated hazardous waste.

Specific details associated with decontamination of SSCs will be captured in work orders issued to the field for execution. These work orders are tracked to completion and closed out with the work order control process using the Project work order process (24915-WCG-5PR-00-00001, *Work Control, Work Order [WO] Process*). Work orders and records of the work performed are Project-controlled documents that are maintained in the operating record (24915-000-2KP-A03-00001, *Records Management and Document Control*) for future retrieval to support closure certification.

9.5.1 Agent Contaminated SSCs

Based on the operating record to date, agent-contaminated SSCs are located within the MDB (and its HVAC filtration system). Initial decontamination efforts will be focused on removal of all recoverable agent and agent hazard reduction. This includes blowdown and flushing of the ACS and portions of the ANS to remove liquid GB agent and GB agent hydrolysate in piping low points (drains) and tank heels.

Once the liquid agent hazard has been reduced, agent decontamination efforts will focus on the rest of toxic areas throughout the MDB to reduce exposure hazards to workers. Decontamination and decommissioning work generally progresses from the most highly contaminated areas and working towards the areas of lower contamination levels. Floor surfaces within the MDB that have been exposed to liquid chemical agent and have been decontaminated by other means will need to be scabbled if they demonstrate persistence of GB and VX contamination (via headspace monitoring that does not meet the <1 VSL screening criterion). Scabbling will remove the protective elastomeric coating system, and it will not be replaced during closure. To maintain the integrity of secondary containment within the MDB where liquids are present, a temporary dike system may be used to isolate the damaged/scabbled floor to prevent liquid from infiltrating and contaminating the exposed concrete.

9.5.1.1 Decontamination Requirements

Potentially agent-contaminated SSCs will be decontaminated for safer handling of materials during decommissioning or to achieve the closure performance standards identified in Section 8.0. Contaminated equipment and material may be dismantled and decontaminated using any of the methods described in Appendix A.

Alternatively, items may be decontaminated using mechanical means, such as wiping the surface to remove particulates, grease, and other surface debris, or by scarifying to remove surface coatings that may have been contaminated with agent. The SSCs may be chemically decontaminated or may be size reduced, packaged as appropriate, and sent to permitted storage awaiting further treatment.

The minimum decontamination requirements are as follows:

- The SSCs that have been potentially exposed to agent-contaminated liquids and aerosol agent may be decontaminated with caustic (generally a sodium hydroxide solution of varying strength depending on the application), water, or other approved decontamination solutions listed in Appendix A. Any occluded spaces must be identified and mitigated to ensure there are no opportunities for entrapping agent, and soft or porous materials must be addressed on a case-by-case basis to determine the affinity for chemical agent. The process for decontamination is to ensure contact with the decontamination solution on all agent-exposed surfaces. Alternatively, the item may be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure;* 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).
- The SSCs that have been contaminated by only agent vapor >1 VSL may be decontaminated with air (air washing). Headspace clearance monitoring will only be required for items removed from engineering controls prior to area clearance by unventilated monitoring. If the item does not clear headspace monitoring, then other approved decontamination methods in Appendix A can be applied, or the item may be disposed of as contaminated material in accordance with site waste management procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).
- Potentially contaminated sumps and trenches may be decontaminated with water or other approved decontamination solutions listed in Appendix A. The process for decontamination is to ensure contact with the decontamination solution on all exposed surfaces. Alternatively, the item may be disposed of in accordance with Project (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).
- Potentially contaminated fluids will be drained or flushed from systems and equipment and disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Agent-decontaminated equipment, process systems, and areas are specifically defined as not being able to entrap and then release hazardous amounts of agent vapor or pose a contact hazard. Items such as agent-exposed carbon media that can trap and release agent vapor upon increased temperature are excluded from this definition. Also excluded are items that contain cavities that have been exposed to liquid agent and do not have pathways for monitoring or cannot otherwise be characterized. These cavities are occluded spaces. Excluded items will be disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

9.5.1.1.1 *Occluded Spaces*

Occluded spaces are confined volumes that can (1) potentially trap liquid agent, (2) prevent contact with a decontamination solution, and/or (3) prevent agent vapors from trapped liquid agent from being detected during headspace/unventilated monitoring. The internal cavities of pumps and other equipment and the internal sections of closed pipes and other systems may contain occluded spaces. Other less obvious occluded spaces include flat, parallel surfaces near each other (e.g., areas beneath skid-mounted equipment and pipe and tank supports). If there is the potential these spaces were exposed to liquid agent, then the spaces will be opened, decontaminated with a proper decontamination solution, and wedged or supported to allow verification of decontamination by headspace monitoring. Caulking seals around equipment supports and concrete joints will be inspected to assess the potential for creating an occluded space. Questionable caulk seals will be removed, and any occluded spaces will be decontaminated and left open for headspace monitoring.

In order to complete agent decontamination of SSCs, any occluded spaces must be identified and mitigated to ensure there are no opportunities for entrapping agent that may otherwise go undetected during air monitoring test evolutions. This requires that all occluded spaces that may have been in contact with liquid or aerosol agent have been identified and opened to the atmosphere.

Occluded spaces can be identified by reviewing Project design drawings (24915-000-GPP-GEG-00007, *Engineering Drawings,* and related documents) and by performing a physical inspection of an area or item during an occluded space survey (OSS) walkdown. This survey is typically performed by a team that is specially trained and assigned this responsibility. The OSS will be used in order to identify confined areas within equipment, building surfaces, and structures that were exposed, or potentially exposed, to liquid or aerosol agent and that have (or have had) the potential to contain liquid agent. In accordance with the definitions of the ventilation categories applied to rooms in the MDB and barring a significant unanticipated agent spill event, only category A and A/B rooms (and the equipment within them) are eligible for exposure to liquid and/or aerosol agent; all other category rooms are not likely to be candidates for an occluded space survey. Each survey will consider operational knowledge as well as information gathered through site walkdowns and/or facility drawing reviews. If the survey reveals that occluded spaces exist, steps such as equipment disassembly will be taken to reveal these spaces for decontamination. Headspace monitoring will then be used to ensure adequate decontamination.

9.5.1.1.2 *Soft or Porous Materials*

Headspace monitoring for clearance of items relies on the principle that agent contamination will be available for monitoring. Soft or porous surfaces may absorb liquid agent, and monitoring may not be representative of potential internal agent contamination within those materials (e.g., drywall, insulation, rubber hose, and gaskets, wood and similar materials). When these materials are encountered during decommissioning, they must be specifically addressed on a case-by-case basis to determine the affinity for chemical agent and the effectiveness of decontamination methods applied. Porous materials exposed to liquid agent or agent vapors >1 IDLH levels will be removed or assessed during initial decontamination activities and therefore will not require consideration during the OSS.

9.5.1.2 Chemical Decontamination of Agent-contaminated Equipment and Structures

Decontamination of permitted units and supplemental equipment in agent-related areas that are under engineering controls will occur using a systematic approach to reduce and remove agent contamination from equipment and areas. The selection of decontamination methods will be based on the conditions resulting in the contamination, the level of contamination, the type and configuration of the material to be decontaminated, and knowledge obtained from proven decontamination operations at former chemical demilitarization facilities.

Chemical decontamination may be accomplished by using a variety of chemicals, either individually or in combination. Caustic solution and water are routinely used during agent operations to extract or destroy chemical agent from surfaces of contaminated equipment and structures. Water or a solution of water and commercial additives such as detergents and surfactants may be employed to aid in removing agent contamination. Any of the decontamination methods in Appendix A may be used singly or in combination to decontaminate items.

For tanks, vessels, and piping, recirculation of process water and/or sodium hydroxide decontamination solution may be all that is required to achieve adequate decontamination to permit offsite disposition of equipment.

Decontamination solutions may be sprayed on, poured on, pumped through equipment, or brushed or wiped onto surfaces where a potential for agent contamination exists; or components may be immersed in decontamination solution. Usually, after time is allowed for reaction between any agent contamination and the decontamination solution, the reaction products, spent decontamination solution, and residual decontamination solution are rinsed off using water. As a waste-minimization practice, the water rinse may not be performed for items that will receive follow-on treatment that does not demand the absence of either wet or dried caustic residue.

Effective decontamination of chemical agent will be verified with headspace monitoring to demonstrate that the closure performance standards for chemical agent have been met. If effective decontamination cannot be achieved, the equipment and/or structure may be removed and disposed as hazardous waste at an offsite TSDF in order to meet the clean closure performance standards.

9.5.1.3 Physical Decontamination of Agent-contaminated Equipment and Structures

Where chemical decontamination proves inadequate, physical decontamination techniques may be required to achieve successful decontamination. Removal of oils and grease or other organic compounds from equipment or floors by low- or high-pressure washing, or abrasive blasting may be necessary before effective decontamination of agent can be accomplished.

Additionally, mechanical surface removal, such as grinding, scraping, or scarifying, is a decontamination option to physically remove contaminated surfaces. Surface removal may also be used to reduce the volume of hazardous waste by removing only the contaminated fraction and allowing disposal of the uncontaminated substrate as nonhazardous waste or leaving the uncontaminated substrate in place. Grinding with grinding wheels or surfacing discs removes thin layers of surface contamination from concrete where contamination is limited to the coating or sealant finish. Scarifiers and scabblers physically abrade both coated and uncoated concrete and steel surfaces. The scarification process removes the top layers of contaminated surfaces down to the depth of sound, uncontaminated surfaces. Needle scaling is a scarification process for both concrete and steel surface removal. The removed surface material is then collected by sweeping or use of a vacuum system for treatment and/or disposal.

Certain areas of the MDB, such as the floors underlying the RSMs in the ECRs and the secondary containment system in the ANS room, may require scabbling in order to remove liquid agent contamination. Scabbling is a type of scarification process that was used at former chemical demilitarization sites to remove concrete coatings and surface layers. Scabbling removes surface layers from contaminated concrete surfaces with cutter blades or impact hammers that break up the material and is capable of removing about 1/4 inch (0.6 cm) of material in a single pass. Multiple passes may be necessary to remove all contamination in heavily contaminated areas. As an alternative to scabbling, removal of the coating system followed by monitoring and/or sampling of the underlying concrete may be performed.

Effective decontamination of chemical agent will be verified with headspace monitoring or UMT to demonstrate that the chemical agent closure performance standards have been met. If effective agent decontamination cannot be achieved, the equipment and/or structure may be removed and disposed of in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

9.5.2 SSCs Without Agent Contamination

Items outside of the MDB are not agent contaminated, and other types of contamination outside the MDB is predicted to be minimal. Key areas with permitted HWMUs outside of the MDB that may require decontamination are the HSA, WTS, CSF and NCRM igloos. Any of the decontamination methods in Appendix A may be used singly or in combination to achieve the desired level of decontamination.

Several techniques may be employed to decontaminate non-agent-contaminated equipment or structures prior to final disposition. The simplest approach is removal of loose dirt, dust, or residues using sweeping, washing with water, vacuuming, or a combination thereof. This approach is expected to be all that is required to decontaminate the Subpart I container storage areas outside the MDB or for decontamination of the HSA containment area. If more aggressive decontamination techniques (e.g., steam cleaning, pressure washing) are required for the container storage areas, existing or temporary containments, berms, or adsorbent materials will be used to capture liquids for characterization and disposal.

More aggressive techniques may be required for decontamination of permitted Subpart J tanks in the HSA and associated ancillary equipment. After the HSA storage tanks are emptied to the lowest practical level with existing pumps, manways will be opened for mucking out tank bottoms (liquid and sludge). Steam cleaning or high-pressure washing may be required to loosen and remove sludge and residuals that may be adhering to surfaces. Any wastes or residues that are collected will be managed in accordance with Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

9.5.2.1 Decontamination of Loading/Unloading Aprons

There are various loading and unloading aprons at the facility that will be evaluated during closure of the Main Plant facility. These aprons are located at the SPB Tanker Loading Station, MPT Cooldown Area, WTS Tanker and Bulk Storage Areas, CSF Loading Area, CHB EONC Canopy, and BCS Off-Load Area. The loading/unloading aprons do not routinely come in direct contact with containerized hazardous wastes or other wastes. In addition, any spills that may have occurred during operations will have been cleaned up at the time of the spill thus leaving no visible traces of spilled material or residue. Historical records will be reviewed and if there have been no releases, decontamination and sampling is not anticipated. However, if staining or discolorations on the apron suggests that contaminants could be present, the apron will be decontaminated with applicable methods listed in Appendix A.

9.5.3 SSCs With PCB Contamination

Following completion of the M55 GB rocket campaign in the Main Plant, processing equipment and storage areas that managed SFTs or PCB-contaminated residues will be cleaned and closed in accordance with the applicable requirements of 40 CFR 761.65(e) and this closure plan. The TSCA closure activities will utilize the same principles and methods that are used for decontamination and closure of chemical agent processing areas and will occur in conjunction with the RCRA closure.

As closure commences, all SFTs and M55 rocket components will be removed from the MDB, and PCB decontamination efforts will focus on areas where SFTs were processed and stored. Walls and ceilings of the PCB processing and storage areas are not likely to be contaminated by PCB residues, and decontamination efforts will focus on floors in the permitted storage and processing areas, surfaces of SFT handling and processing equipment, and storage tank systems that carried liquids with PCB residues in suspension. Concrete surfaces in storage and processing areas have been treated with sealants or protective floor-coating systems to prevent permeation of non-liquid PCBs into the immediate surface. Therefore, concrete coatings and surfaces will be treated as non-porous surfaces for the purposes of TSCA closure activities.

Due to the solid nature of the PCBs in the SFT residue, mechanical decontamination by wiping, pressure washing, water flushing, steam cleaning, or vacuuming with a high-efficiency particulate air filtration vacuum is appropriate. These methods of decontamination or other methods described in Appendix A will be used to meet the performance standards of Section 8.3.

All secondary containment areas, storage areas, loading areas and processing areas that were exposed to PCB bulk product waste will be inspected and decontaminated to remove any visible PCB residues, and the waste will be managed in accordance with the Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). The CHB receives EONCs that are sealed air-tight and provide secondary containment for M55 rockets while in storage at the CHB, but the EONCs are never opened until received at UPA-1. Therefore, the CHB does not require decontamination for PCB residue. The EONCs that were used to transport M55 rockets will be inspected for evidence of PCB residue and decontaminated as necessary using any methods described in Appendix A.

Caustic or water will be used to flush sumps, trenches, piping, and tanks inside the MDB that may have contained or transferred PCB residues suspended in liquids, and the liquids will be processed as required by the RCRA Permit and ultimately transferred to the HSA storage tanks. Additional decontamination may be performed as necessary using any of the methods described above or in Appendix A. The HSA storage tanks will be cleaned and closed as described in Section 9.3.2.

The NCRM igloos provide storage for boxes of SFTs with rocket motors. The SFTs and rocket motors are in a sealed bag within the storage boxes which prevents the release of PCB residues. Therefore, the NCRM igloos do not require decontamination for PCB residue. As individual NCRM igloos are closed, all boxes and residues will be removed from the igloo. The igloos will be inspected for evidence of PCB residues; in the event that PCBs are discovered, they will be decontaminated as necessary using any of the methods described above or in Appendix A.

9.6 Management of Closure Waste

401 KAR 39:090 Section 1, 40 CFR 264.114

This section describes the practices that will be utilized for managing closure-generated wastes transported offsite for disposal and management of demolition debris prior to non-residential clean closure certification.

9.6.1 Newly Generated Closure Waste

Throughout closure, BGCAPP will continue to be a generator of hazardous wastes subject to the applicable requirements of 40 CFR Sections 261 and 262 with respect to identification, accumulation, labeling, packaging, and manifesting of wastes for offsite treatment and/or disposal and the use and management of containers. Secondary wastes generated during the closure period will be characterized in accordance with the applicable requirements of 40 CFR 262.11, the RCRA Part B Permit Waste Analysis Plan (WAP), and site procedures that are currently in place (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*, and related documents) to support facility operations. These wastes may include agent-contaminated or agent-derived wastes as well as wastes that are not agent-related or that are considered hazardous due to either a hazardous waste characteristic or listing. Wastes that are produced from continued operations by permitted treatment and storage activities at BGCAPP are subject to the waste management provisions contained in the WAP.

Characterization of the waste determines the hazards, applicable waste codes, and whether further treatment is required before disposal in accordance with Land Disposal Restrictions (LDR) standards. Closure wastes that are not treated onsite to meet LDR standards may be sent offsite to a permitted TSDF and will be fully characterized by the receiving TSDF as necessary to support LDR disposal requirements.

9.6.2 Kentucky Listed Wastes

Agent-bearing or agent-contaminated wastes carry the applicable, agent-specific Kentucky listed waste codes N001, N002, and N003 in addition to other applicable waste codes. The treatment residues from the demilitarization of listed chemical agents N001, N002, and N003 are considered to be agent-derived wastes that are defined as listed hazardous wastes in accordance with 401 KAR 39:060 Section 3, and they include agent-specific wastes codes for RM and SFT parts, MPT residue, SDC residue, hydrolysates, lab wastes, condensate from the off-gas treatment system for the MPT (OTMC), and the SDS. A recent addition to this list includes codes for waste items that were contaminated with agent and have been decontaminated to a level such that they are no longer acutely hazardous:

> ***N1001**: GB contaminated waste equipment, tools, and construction materials that have been decontaminated in accordance with United States Army Guidelines and have been determined to be safe for storage or transport and approved by the Cabinet as no longer acutely hazardous*
>
> ***N1002**: VX contaminated waste equipment, tools, and construction materials that have been decontaminated in accordance with United States Army Guidelines and have been determined to be safe for storage or transport and approved by the Cabinet as no longer acutely hazardous*
>
> ***N1003**: H contaminated waste equipment, tools, and construction materials that have been decontaminated in accordance with United States Army Guidelines and have been determined to be safe for storage or transport and approved by the Cabinet as no longer acutely hazardous*

These newly adopted decontamination waste codes (N1001, N1002 and N1003) provide an important distinction from the agent waste codes N001, N002, N003, offering relief from the more stringent application of the federal RCRA "derived-from" rule (40 CFR 261.3, Definition of Hazardous Waste). The derived-from rule states that any waste derived from the treatment, storage, or disposal of a listed hazardous waste is itself a hazardous waste. Under this rule, a waste may still be classified as hazardous although it has little or no remaining amounts of hazardous constituents. Under federal rules, these derived-from wastes also carry the same hazardous waste code for which they were listed before treatment, storage, or disposal.

If the more stringent federal derived-from rule were applied to decontamination waste streams, those waste streams would continue to carry the applicable Kentucky agent waste codes N001, N002, and/or N003, designating them as agent-contaminated regardless of the amount of remaining residual agent. Since the Kentucky-specific listed hazardous waste codes are not recognized at the federal level, Kentucky has the statutory authority to reclassify any residues of agent demilitarization processes (secondary waste) in accordance with Subsection 7 of KRS 224.50-130. Under this authority, Kentucky has reclassified agent-contaminated waste streams that have been demilitarized (treatment or decontamination) with the non-agent waste codes N1001, N1002, and N1003 specified in 401 KAR 39:060 Section 3, Subsection 4.

9.6.3 PCB Wastes

The mean PCB concentration in the SFTs exceeds 50 parts per million (ppm), and the waste residues derived from processing M55 rocket assemblies are regulated for disposal as PCB bulk product waste. Prior to beginning closure, all SFTs and containerized PCB wastes will be removed from the Main Plant facilities. Any remaining bulk product waste residues are not debris and will be characterized and managed in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Any materials containing regulated concentrations of PCBs are subject to applicable TSCA disposal requirements at 40 CFR 761.62. In some cases, wastes containing PCB residues may be characterized with generator knowledge.

9.6.4 Demolition Debris

An intact, standing building, structure, or piece of equipment that continues to perform its essential function is not considered to be discarded until it is intentionally dismantled or destroyed for disposal. Such in-use material is not a solid waste because it has not been discarded, or intended for discard, as these terms are used in RCRA. Structures and equipment that are still in use or will continue to be used following closure are not wastes and are exempt from LDR treatment standards.

Hazardous waste management units that are designated for demolition or reuse are subject to the applicable closure performance standards in Section 8.0. The Project may use the conditioned exclusion of treated debris (40 CFR 268.45[c]) for decontaminated items that meet the hazardous debris treatment standards summarized in Appendix B (40 CFR 268.45, Table 1). Items that meet the closure performance standards and the debris treatment standards for the SSC undergoing closure are considered nonhazardous once the building and equipment components are demolished and become debris. This is a self-implementing "no-longer-contains" determination, and the Federal and Commonwealth of Kentucky derived-from listed waste codes no longer apply to the debris (40 CFR 261.3[f][2]). Residuals generated from the treatment of hazardous debris will be separated from the treated debris and managed in accordance with the applicable requirements of 40 CFR 262.11, the RCRA Part B Permit WAP, and Project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Demolition debris from HWMUs that has been treated using one or more of the specified extraction technologies specified in Appendix B and does not exhibit a characteristic of hazardous waste identified under Subpart C of 40 CFR Part 261 after treatment will not be regulated as a hazardous waste and need not be managed in a Subtitle C facility (e.g., BGCAPP may ship treated demolition debris to an offsite Subtitle D landfill or resource recovery facility).

9.6.4.1 Demolition Waste Management

Once all MDB areas and equipment have been decontaminated or treated to meet the closure performance standards of Section 8.0 and the UMT has been completed, the MDB will be demolished. The UMT is final verification that agent hazards have been mitigated, and agent vapor containment is no longer required. For the purposes of this closure plan, wastes generated from demolition of HWMUs will be containerized as soon as practicable after demolition has occurred and managed as either nonhazardous demolition debris or newly generated waste upon containerization. Nonhazardous demolition debris is the demolition waste stream that is not contaminated or that which has been treated to meet the applicable chemical agent and PCB closure performance standards in Sections 8.2 and 8.3 and the treatment standards for hazardous debris described in Section 8.4. Nonhazardous demolition debris will be containerized as soon as practicable to minimize the spread of wind- or water-borne dust and particles from the demolition site. Silt fences and similar control measures will also be in place during demolition.

Newly generated hazardous waste and hazardous debris resulting from demolition of SSCs will be containerized as soon as practicable and will be considered properly containerized when placed in waste hauling equipment, rolloffs, waste bins, or DOT containers. Intact portions of the equipment, building, or structures undergoing closure will not be declared waste or debris until the item is demolished, and the material has been containerized for transportation.

Demolition waste pre-shipment activities include segregation of waste to recover recyclable materials and size-reduction of large pieces of rubble and debris prior to containerization. Should segregation and size-reduction be unnecessary, demolition waste may be loaded directly into waste hauling equipment or containers without segregation. Relocation of waste and debris materials within the site boundaries for additional segregation to recover recyclable materials or additional size-reduction will be permissible provided that dust control and wind-driven material mitigation measures are employed as described in Section 9.6.9.

Building components and equipment requiring size-reduction (e.g., sized to fit into waste hauling equipment or rolloff containers) will be handled with the following considerations:

- Size-reduction items may be placed upon concrete slabs, asphalt, or soil that will be removed during demolition for offsite disposal under BGCAPP closure activities
- Soil, concrete slabs, and asphalt may remain in place provided that the location is recorded and subsequent additional closure verification sampling is performed in order to verify that the activity did not contaminate the concrete, asphalt, or soil.

9.6.5 Decontamination Liquids in the MDB

Bulk liquid wastes generated within the MDB during the closure period (e.g., system flushing fluids, spent decontamination solution) will generally be processed through the SDS and the agent treatment train (ACS, ANS) if required to meet the agent destruction standards specified in the RCRA permit. As decontamination and decommissioning of SSCs in the MDB proceeds, storage tank systems will be removed from service, and bulk liquids may be diverted from their normal flow path and transferred to intermediate bulk containers (totes), frac tanks, International Organization for Standardization tank containers (ISOtainers), or tanker trucks prior to shipment offsite for treatment and disposal.

All decontamination liquid wastes will be removed from SSCs prior to their release to demolition subcontractors or turnover to BGAD for future use. In accordance with RCRA Permit Condition A.III.A.(10), spent decontamination solution in the MDB will be tested and cleared for agent prior to being released from the MDB, and will not be released unless cleared to less than 52 µg/L for the GB campaigns and less than 80 µg/L for the VX campaigns.

9.6.6 Timely Containerization of Waste

Once demolition has commenced, newly generated hazardous waste or hazardous debris will be placed into approved DOT containers or transportation equipment (e.g., rolloffs, end-dumps) in as timely a manner as demolition and size reduction activities allow. Hazardous wastes or hazardous debris that are susceptible to wind-driven dispersion (in spite of any dampening applied) will be containerized prior to the end-of-shift each day.

Equipment and items that are dismantled during closure and demolition activities will be subject to the hazardous waste generator requirements of 40 CFR 262.17 when the equipment is removed from the building that it was housed in. Once generated, hazardous debris becomes subject to the applicable pre-transport requirements (e.g., packaging, labeling, marking, placarding, accumulation time) of 40 CFR 262. The basis of characterizing newly-generated hazardous waste or hazardous debris will generally be based on generator knowledge in accordance with 40 CFR 262.11(c)(2).

9.6.7 Size Reduction

Size-reduction techniques are used to make items easier and safer to handle and to facilitate packaging for transportation or to prepare items for subsequent treatment. Dismantling SSCs during closure involves operations typically used for construction or demolition with additional constraints for controlling spread of contamination. The Project may use a number of mechanical or high-temperature size-reduction methods and equipment during closure (e.g., circular saws, shears, power nibblers, orbital cutters, abrasive cutters, milling, shredding chipping hammers, paving breakers, abrasive water jets, expansive grout, plasma arc, torch, thermal lance, contact arc, arc saws).

The tool(s) or techniques that will be used for size-reduction will be specified in the individual work packages/work orders that are sent to the field for implementation prior to demolition. Demolition subcontractors are not subject to the BGCAPP work control/work order process, and they may use any size reduction techniques that are within the scope of their work.

9.6.8 Recycling/Reclamation of Metal Components and Concrete

Metal equipment and building pieces that are recyclable by reclamation (e.g., recovery of the metal content) are exempted from RCRA Subtitle C hazardous waste regulation per 40 CFR 261.6(a)(3)(ii), but any PCB-contaminated metal that is sent offsite as scrap metal must satisfy the applicable requirements of 40 CFR 761.62 unless the surfaces are cleaned to ≤ 10 µg/100 cm^2.

In order for the scrap metal to be recycled, all of the following requirements will be met:

1) The scrap metal shall have met the requirements of this closure plan
2) BGCAPP shall evaluate the potential for personnel exposure to any agent hazards in accordance with the EDP
3) The scrap metal must be properly characterized for PCB contamination and restrictions on recycling
4) BGCAPP will demonstrate a known market for the scrap metal
5) BGCAPP will possess a contract with a legitimate recycler for receipt of scrap metal including provisions for assurance of reclamation

Building components and equipment in need of size reduction (e.g., sized to fit into rolloff containers) may be placed upon the following:

- Concrete slabs that are themselves destined for demolition and disposal under BGCAPP closure
- Concrete slabs, asphalt, or soil, provided that the location is recorded and subsequent additional judgmental closure verification sampling is performed in order to verify that the activity did not contaminate the concrete, asphalt, or soil

Eligible material from demolition of decontaminated SSCs may also be sent offsite as recycled concrete rubble. Recycled concrete may be recovered from nonhazarous debris and converted to construction aggregate and raw material for new concrete or other uses as appropriate.

9.6.9 Dust Suppression and Mitigation of Wind-Driven Materials – 401 KAR 63:010

Dust suppression during demolition and size-reduction activities will be performed as necessary with the use of water sprays applied sparingly so as to avoid or minimize run-off from debris management areas. Run-off from dust suppression water will be controlled and contained with temporary berms to prevent it from entering site drainage features and bermed areas will be recorded in the facility operating record. Affected soils in the bermed areas will be removed with the demolition debris and judgmental closure verification samples may be collected in areas where dust suppression water or stormwater run-off may have accumulated in order to verify that the activity did not contaminate the soil.

The soft or friable materials in the debris piles will be dampened with water as necessary to prevent or minimize particulates from becoming wind-driven insofar as practicable. Efforts will be made during segregation and size-reduction of recyclable/recoverable materials to minimize dust generation with dampening performed as necessary.

The following control measures will be used as necessary during the closure period to minimize windblown dust from demolition areas:

- When dust is first seen rising and is easily observed, water is sprayed to maintain compliance with the conditions of KPDES Permit No. KY0020737.
- All unpaved roads and other disturbed-surface areas onsite are watered frequently to minimize off-property transport of visible fugitive particulates.
- Covering open bodied trucks at all times while in motion during transportation of materials likely to become airborne significantly reduces dust.
- Vehicle speed on all unpaved roads and disturbed areas is reduced. Speed limits will be posted and enforced.
- Maintenance of paved roadways in a clean condition limits demolition dust.

These measures will satisfy the requirements of 401 KAR 63:010 during demolitions of structures at the facility.

9.7 Reuse of Structures and Equipment

Due to the intrinsic value of some material, it is cost effective for certain items to be returned to usable service rather than discarded as waste. Items that are destined for reuse are not considered to be wastes, and any potential agent hazards will be evaluated through the EDP and other applicable Project procedures (e.g., 24915-SAF-5PR-00-00023, *Toxic Chemical Agent Safety,* and related procedures). The EDP describes agent decontamination criteria and action levels for release of contaminated items for reuse. Consequently, equipment and areas may be decontaminated, verified as decontaminated, and released for reuse based on selected health-based criteria for the anticipated use environment. The EDP identifies the allowable reuse environments in terms of the chemical agent unventilated monitoring thresholds:

- Facilities/items screened to less than the VSL are available for restricted release to agent workers only. Maintenance or disassembly of such items will only be performed by personnel knowledgeable in agent symptoms and characteristics and within facilities equipped with appropriate safeguards to control potential hazards.
- Facilities/items screened to less than the WPL concentration are available for restricted release to non-agent workers. Items or facilities screened to this level must remain under Government control and should not be modified or disassembled. If maintenance or disassembly of such items is necessary, it will be accomplished by personnel knowledgeable in agent symptomatology and characteristics and in facilities equipped with appropriate safeguards to control potential hazards.
- Facilities/items screened to less than the GPL concentration are available for unrestricted release to non-agent workers and the general public.

Systems, structures, and equipment that are still in use or will continue to be used are not subject to LDR treatment standards for final closure. Such in-use materials are not solid wastes because they are not discarded or intended for discard as defined in 40 CFR 261.2. However, permitted units, ancillary equipment and other appurtenances that will continue to be used after final closure of the facility will be decontaminated and closed in accordance with the closure standards identified in the EDP.

The closure standard for future use of SSCs that managed PCB bulk product wastes are equivalent to the bulk PCB remediation waste cleanup levels for high-occupancy areas in accordance with 40 CFR 761.61. However, wipe sample results for non-porous surfaces such as pipes, pumps, valves, and the inside of the Hydrolysate Storage Tanks may not be practical. Alternatively, samples from low volume rinses of decontaminated surfaces will be analyzed for Aroclor 1254. Results that are ≤ 1 ppm will satisfy the decontamination standards for reuse of these items.

10.0 DISPOSAL OR DECONTAMINATION OF EQUIPMENT, STRUCTURES AND SOILS

401 KAR 39:090 Section 1; 40 CFR 264.114 and 761.65

During partial and final closure activities, all contaminated equipment, structures, and soils will be decontaminated or removed in accordance with this closure plan, and all waste items will be disposed of properly.

Any remaining inventory of hazardous waste in the permitted units and associated ancillary equipment will be removed and shipped to a properly permitted TSDF that is approved to receive these wastes. Facilities and equipment that are closed in accordance with this closure plan may be turned over to BGAD or demolished for off-site disposition.

Due to the intrinsic value of some material, it may be cost effective for certain items to be returned to usable service rather than discarded as waste. Items that are destined for reuse are not considered to be wastes, and any potential health hazards will be evaluated through existing Project procedures (e.g., 24915-SAF-5PR-00-00023, *Toxic Chemical Agent Safety,* and related procedures).

11.0 CLOSURE MONITORING FOR AGENT

401 KAR 39:090 Section 1; 40 CFR 264.114

Following completion of chemical weapon destruction activities at the Main Plant, agent vapor concentrations in the MDB will decline as decontamination of systems, structures, and equipment proceeds. Chemical agent air monitoring will continue to be used during closure for safety and compliance purposes and also for clearing items for transfer from the MDB for reuse or disposal. The requirements for monitoring will be reduced as closure progresses through the completion of UMTs, and all agent monitoring will be suspended when engineering controls are no longer needed.

11.1 Point Source Monitoring

Point source monitoring uses near-real-time (NRT) agent monitors in ventilated areas to identify agent emission sources and is distinct from area monitoring and headspace monitoring. Point source monitoring is an adaptive method of monitoring that may be part of a graded approach to ensure successive decontamination efforts are effective, or it may be used to locate a known or suspected area of contamination on an item or within a room that is under engineering controls. This type of monitoring may also be used to support a targeted approach for verifying that a specific level of decontamination has been achieved (e.g., < 1 VSL) in preparation for follow-on work activities or monitoring tests. Point source monitoring may be either judgmental or systematic in nature.

11.2 Clearance Monitoring

There are two methods of air monitoring that will be used during closure to verify that equipment, areas, and structures meet designated agent screening criteria: 1) headspace monitoring and 2) unventilated monitoring. Headspace monitoring is generally used to verify agent levels for waste clearance, and unventilated monitoring is used to verify the effectiveness of the agent decontamination effort before releasing agent-contaminated structures for reuse or to the mass demolition contractor.

11.2.1 Headspace Monitoring

Headspace monitoring is used to determine operational constraints, PPE requirements, decontamination levels, and waste characterization. Either NRT monitoring or DAAMS methods may be used for headspace monitoring to clear items for removal from the MDB based on approved methods and the monitoring application. Headspace monitoring is performed at the required screening level on items that are bagged or contained in an enclosure of sufficient volume that allows for a representative vapor sample to be collected while minimizing dilution with incoming air.

For agent decontaminated items that will be reused, headspace monitoring will be conducted to demonstrate that agent vapor concentrations do not exceed the monitoring level for the reuse environments described in Section 9.7. Monitoring will be performed in accordance with 24915-00-9PL-00-00001, *Laboratory Analysis and Monitoring Plan*, and 24915-GEN-5PL-00-00006, *Equipment Decontamination Plan*.

Waste items will be screened to 1 VSL with an action level of 0.7 VSL. Items above the action level may be further decontaminated or packaged and shipped as >1 VSL waste in accordance with the Bounding Transportation Risk Assessment (BTRA). Waste items that are screened to less than the 0.7 VSL action level may be left in place for demolition or placed in containers, on pallets, or transferred out of the MDB and placed in rolloffs. Rolloffs will be managed onsite in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*) and shipped offsite for final disposition in accordance with Project procedures (24915-OPS-5PR-00-00023; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents).

11.2.2 Unventilated Monitoring

The final requirement to verify the effectiveness of the agent decontamination effort before releasing agent-contaminated structures for demolition is to conduct a UMT. Unventilated monitoring detects low-level agent vapor emissions that may be diluted to less-than-detectable concentrations by the ventilation airflow. A UMT is performed in all areas deemed to be potentially agent-contaminated as determined by a review of operational and monitoring history and completion of health-based risk assessment. The UMT is the final verification that agent hazards have been mitigated and the facility is ready for final disposition. The UMT results will be provided to the Division for review and approval before demolition of the MDB begins.

11.2.2.1 Unventilated Monitoring Test Plan

Agent-contaminated BGCAPP facilities will be decontaminated, decommissioned, and prepared for demolition and disposal after the completion of agent operations. 24915-CL-5PL-00-00004, *Unventilated Monitoring Test Plan,* is a project level document that identifies contaminated areas requiring decontamination and monitoring to 1 VSL with an action level of 0.7 VSL prior to demolition.

11.3 Agent Monitoring Reduction

Agent monitoring in Main Plant facilities may be suspended or terminated based on project needs and closure progression. The Main Plant configuration is such that all of the air in the MDB, to include the exhaust from the off-gas treatment units, is routed through the HVAC ducts to two main stacks, each with a series of seven IONEX carbon filter units. Cessation of near real time monitoring and historical monitoring of the MDB filter mid-beds and stacks/exhaust ducts for previously processed agents will not occur until all potentially contaminated carbon filter banks have been removed.

Agent monitoring reduction will be conducted in accordance with the applicable BPBG plans and procedures and the ACWA *Monitoring Concept Plan*. The criteria for reduction or discontinuation of routine agent monitoring associated with closure monitoring will be established in 24915-CL-5PL-00-00006, *Closure Progression Monitoring Plan,* and the MINICAMS/DAAMS Monitoring Table in Appendix E of the RCRA Part B Permit will be updated when changes in monitoring occur.

12.0 TERMINATION OF ENGINEERING CONTROLS

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5)

Engineering controls function to protect workers and the environment from agent exposure. The MDB HVAC system establishes and directs a cascading airflow throughout the MDB from areas with the least probability of agent contamination toward areas with the highest probability of agent contamination and exhausts to the atmosphere through a charcoal filter system.

Prior to removal of engineering controls, UMTs will be conducted in discreet areas as determined by risk assessment. In general, these areas are category A, A/B, and B areas of the MDB that have been exposed to liquid agent, agent aerosol, or agent vapors that exceeded the IDLH concentration with possible exceptions as described in DA PAM 385-61. Other potentially agent-contaminated structures or facilities with engineering controls that will be left for demolition may be cleared with appropriate headspace monitoring methods that demonstrate agent hazards have been mitigated.

Performance expectations for air monitoring before termination of engineering controls are included in the UMT plan. When the criteria for termination of engineering controls have been met, all ventilation systems and chemical agent monitoring may be suspended.

13.0 DEMOLITION OF THE MDB AND HVAC FILTRATION SYSTEM

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5)

The approach to decommissioning SSCs that are subject to demolition will focus on minimizing pre-demolition removal of equipment and items wherever possible and maximize the amount of material left in place for mass demolition. The goal is to assess and mitigate any contamination to levels that are protective of the demolition crew, the demolition debris transporter, the disposal facility workers and the environment, and will meet the regulatory requirements for disposal while minimizing labor intensive activities associated with dismantlement of the facility.

The MDB demolition project will prepare the MDB and the remaining portions of the HVAC filtration system for demolition. Demolition of agent-contaminated facilities occurs after successful completion of the UMTs. Prior to demolition, affected systems/facilities will be isolated from all utilities, and salvageable items will be removed for reutilization. Any remaining universal waste items that cannot be allowed to remain in the MDB for disposal with demolition debris will be removed and disposed at an approved TSDF.

After the MDB is decontaminated and verified to meet the minimum "action level criteria for disposal" (< 1 VSL generated off-gas rates determined through a successful UMT or completed decontamination for areas not subject to the UMT), the MDB will be demolished. Demolition will include the removal of the MDB concrete slabs to a predetermined depth and the removal of any remaining HWMUs and associated equipment in the MDB. Prior to demolition, hazardous materials and universal wastes will be removed from the MDB. Eligible materials may be sent offsite for scrap recovery as concrete rubble or scrap metal.

During the period between completion of the UMTs and demolition of the MDB, the majority of the HVAC exhaust system may remain intact and operational to maintain forced ventilation for temperature control throughout the MDB.

14.0 DETAILED DESCRIPTION OF OTHER NECESSARY ACTIVITIES

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5)

This section of the closure plan provides a description of activities necessary for closure of the Main Plant facility that are not addressed elsewhere in the plan.

14.1 Proper Operation and Maintenance

The RCRA Permit Condition A.II.D.(6) requires BGCAPP to properly operate and maintain all active permitted hazardous waste facilities and systems. When a permitted system or component is no longer required, it may be shut down or removed to reduce maintenance requirements and prevent accidental initiation of a system during the constantly changing closure environment. Systems that are removed from service will be maintained to prevent unplanned releases to the environment, but the maintenance activities that were required for an operational unit may be suspended, including the requirements for operational backup or auxiliary facilities, equipment, or similar systems.

14.2 Termination of Inspections, Testing, Monitoring, and Maintenance

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5), 264.31, 264.33, 264.15

Inspections, calibrations, monitoring, and required testing may be suspended for HWMUs and support systems identified in the BGCAPP RCRA Part B Permit when an item is removed from service for closure, and all hazardous waste has been removed (if present) from the permitted unit undergoing closure. Activities that will be suspended as closure proceeds include, but may not be limited to, the following:

- Inspections
- Logbooks and Recordkeeping
- Required training
- Floor coating systems
- Agent monitoring equipment and instrument calibrations
- Emergency equipment inventory, testing, and maintenance

- Security requirements
- Warning signs

As permitted units are taken out of service, specifically after hazardous wastes have been removed from the units as part of the closure process, the basis for conducting inspections and maintenance no longer exists. At that time, BGCAPP will place a final entry in the inspection and maintenance records for the unit stating that hazardous wastes have been removed from the unit, and the unit has been taken out of service as part of closure. The RCRA inspections and maintenance activities for permitted units cease with that entry into the operating record. Inspections required for large quantity generators will continue in accordance with 40 CFR 262.17, and BGCAPP will continue to comply with the applicable large quantity generator standards of 40 CFR 262 Subpart M until all hazardous waste has been removed from the site.

The Director will be notified in writing when any inspection, calibration, monitoring, testing or maintenance requirement listed in the RCRA Part B Permit or its Attachments F and G is suspended for closure. In addition, logbooks will no longer be required to be maintained or kept at locations identified in the Permit or its Attachments F and G once the item is removed from service for closure. A notation will be made in the associated inspection form or logbook that the item is undergoing closure when it is removed from service for closure, and a notice will be placed in the operating record.

14.3 Deviations from Container Management Practices in the MDB During Closure

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5)

As equipment inside the MDB and under engineering controls is dismantled and prepared for decontamination in the MPT, it will not be practical to containerize all of the dismantled, disassembled, and/or segmented components into containers prior to demolition of the MDB. In order to be processed through these units, contaminated items must be loaded into WICs to facilitate loading into the MPT. The WICs are designed to contain the waste materials and prevent spillage while conveying to, or treatment within, the MPT. The WICs, however, are not intended to be in a closed condition nor do they satisfy RCRA container management requirements. As large pieces of equipment (such as agent pumps, piping, or valves) are dismantled, it may be necessary to lay these segments on the floor or other working surface so that additional size-reduction can be performed or in order to transfer the components using hoists and overhead cranes. In such instances, BGCAPP may lay items down directly onto the building floors without being required to observe normal labeling and container management practices.

In the event that the MPT is not available for processing closure waste, SSCs will be dismantled and prepared for size-reduction and decontamination using any of the decontamination methods described in Appendix A prior to demolition of the MDB. The decontamination methods may be used singly or in combination. Any residues that are removed by decontamination will be collected and managed as waste in accordance with Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping*; and related documents). As pieces of equipment are dismantled, it may be necessary to place these items on the floor or other working surface so that additional decontamination, size-reduction, segregation, and headspace monitoring can be performed to segregate and characterize the items for containerization without being required to observe normal labeling and container management practices. The purpose of size-reduction, segregation and characterization of closure wastes is to comply with the waste container restrictions imposed by the authorized TSDF. Once the items are size-reduced, segregated and characterized, they will be containerized and managed in accordance with project procedures (24915-OPS-5PR-00-00023, 24915-OPS-5PR-00-00030, and related documents).

Care will be taken to avoid damaging floor coatings; when the risk to floor coatings is determined to be excessive, protective floor liners will be used to ensure free liquids remain contained. Any uncoated concrete floors used for placement of items that potentially contain liquids will be protected with temporary containments and protective floor liners, and any liquids emitted from a dismantled component will be transferred to a container or an in-service process tank from an operable sump.

Outside of the MDB, it is much more practical to bring a bulk collection container (e.g., hopper or rolloff) into the vicinity of any dismantling operation and transfer waste and decontaminated debris directly into the container. However, even in these areas it may be necessary to temporarily lay equipment on concrete pads or in secondary containment areas until transfers to bulk collection containers can be accomplished.

14.4 Run-on and Run-Off Control

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(5)

Run-on and run-off control practices will continue during closure through the maintenance of site grading, storm drains, and the use of containment structures. Grading and containments prevent run-on of uncontaminated stormwater and runoff of potentially contaminated stormwater. Secondary containment areas that are outdoors are designed to hold the volume of the largest tank or container within the area, rainfall from a 25-year/24-hour storm event, and sufficient freeboard to prevent topping if both of these events occur simultaneously. Stormwater that is collected in outdoor containment areas is managed in accordance with KPDES Permit No. KY0020737 and site procedures for stormwater management. The site procedures identify Best Management Practices (BMPs) that are implemented during operations and during closure activities at the facility. These methods, measures, and practices are implemented to prevent or reduce the contribution of pollutants to the surface waters of the Commonwealth of Kentucky. Effective preventive maintenance, good housekeeping, pollution prevention, waste minimization, and spill prevention and response are the cornerstones of the BGCAPP stormwater BMPs.

Waste handling activities in the CHB, MDB, and SPB take place in enclosed buildings which have secondary containment to collect liquid wastes. The floor sumps for hazardous waste management areas within the MDB have provisions for transferring sump contents to spent decontamination holding tanks or containers. There are NCD sumps located in the MDB and other secondary sumps in the SPB where personnel use manually operated pumps to remove accumulated liquids.

The NCRM storage igloos are designed and operated to prevent run-on and any entrance of precipitation into the igloo. The floors are non-seamed reinforced concrete that prevent the accumulation of liquids and migration of hazardous waste from the igloo to the environment.

During facility decommissioning activities, containment systems will remain intact until all hazardous wastes have been removed from the HWMU and containment system, and temporary berms may be used as the need arises during the decommissioning and demolition phases. Demolition equipment will be decontaminated with low or high-pressure water sprays, steam cleaning, or detergent solutions before leaving the site. This equipment will be decontaminated in the WTS containment bays or temporary containment berms to capture the cleaning liquids prior to disposal in compliance with applicable regulations and permits. Wastewaters and rinsates that are characterized as non-hazardous may be discharged to the sanitary sewer and BGAD wastewater treatment system.

These measures will prevent contamination from being inadvertently spread to the surrounding environment during closure.

14.5 Preparedness and Prevention

401 KAR 39:090 Section 1; 40 CFR 264.32(c) and (d), KRS 224.46-530

Emergency equipment and systems identified in Attachment F, *Procedures to Prevent Hazards*, and Attachment G, *Contingency Plan and Emergency Procedures*, of the RCRA Part B Permit may be removed or decommissioned as facility closure progresses. Emergency equipment and systems will be maintained during closure as long as they are required by building and safety codes.

The BGCAPP Engineering, Emergency Response, and Safety and Health personnel will evaluate fire protection systems and other safety systems for removal from service as part of the decommissioning and closure process. For example, fire extinguishers, fire suppression systems, and spill kits will be removed or isolated as closure proceeds, and the impact of equipment removal, system removal, or isolations will be evaluated through adherence to currently established engineering, safety, and emergency response Project procedures and plans in order to maintain the safety of personnel and the facility. Other systems and equipment identified as emergency or preparedness and prevention items, including warning signs, spill kits, and other emergency response equipment will be removed when it is safe to do so.

As part of the overall closure process, it will also become necessary to disable and remove alarm systems. As permitted units are taken out of service, specifically after hazardous wastes have been removed from the unit as part of the closure process, the alarm systems associated with those systems are no longer maintained and are dismantled and removed.

The Director will be notified when any emergency equipment or systems identified in Attachment F or Attachment G of the RCRA Part B Permit are anticipated to be removed or decommissioned as the result of facility closure, and a notice will be placed in the facility operating record that identifies the affected equipment or systems. Quarterly updates describing decommissioning and/or removal of emergency systems and equipment identified in Attachment F, *Procedures to Prevent Hazards*, and Attachment G, *Contingency Plan and Emergency Procedures*, of the RCRA Part B Permit will be provided to the Director no later than 45 days after the end of each calendar quarter. The Project will continue to comply with the applicable large quantity generator standards of 40 CFR 262 Subpart M until all hazardous waste has been removed from the BGCAPP site or control of the site is turned over to BGAD.

14.6 Removal of Communications Equipment

401 KAR 39:090 Section 1; 40 CFR 264.32(a) and (b)

Project subject matter experts in Engineering, Emergency Response, and Safety and Health will evaluate communication systems and other safety systems for shutdown as part of the decommissioning and closure process. Safety systems will be maintained in service as long as they are required by the RCRA Part B Permit and by building and safety codes. When a system or component is no longer required, it may be shut down or removed to reduce maintenance requirements and prevent accidental initiation of an alarm system during the constantly changing closure environment. Planning, notifications and execution of these activities will be completed in accordance with the RCRA Permit and applicable codes and regulations.

The Project maintains an internal communications system consisting of telephones, two-way handheld radios, cellular phones, a public address system, visual signals and audible signals. These devices provide a combination of voice and signal information throughout the facility to BGCAPP personnel and BGAD Security. The Project also maintains an external communications system consisting of telephones, two-way handheld radios, and cellular phones. These devices provide redundant communication channels to summon security, and emergency response from the BGAD emergency operations center (EOC). Additional emergency response resources are coordinated through the BGAD EOC as needed.

As part of the overall closure process, it will become necessary to disable and remove some communications and safety equipment. As permitted units are taken out of service, specifically after hazardous wastes have been removed from the unit as part of the closure process, the communications and safety equipment associated with those systems may be reduced, disabled, or removed.

The Director will be notified when any communications/safety equipment or systems identified in Attachment F, *Procedures to Prevent Hazards*, and Attachment G, *Contingency Plan and Emergency Procedures*, of the RCRA Permit are to be removed or decommissioned as the result of facility closure, and a notice will be placed in the facility operating record that identifies the affected equipment or systems. Quarterly updates describing decommissioning and/or removal of communications/safety equipment identified in Attachment F and Attachment G of the RCRA Permit will be provided to the Director no later than 45 days after the end of each calendar quarter. The Project will continue to comply with the applicable large quantity generator standards of 40 CFR 262 Subpart M until all hazardous waste has been removed from the site.

14.7 Revisions to the RCRA Contingency Plan

401 KAR 39:090 Section 1; 40 CFR 264.54

The Contingency Plan will remain in effect during closure of the facility, and it will be updated as closure proceeds to reflect the status of the facility through closure. Information contained within the facility's *RCRA Contingency Plan* covers several subjects (e.g., alarm systems, evacuation routes, communications equipment, spill response equipment) and changes to that plan are subject to the requirements of 40 CFR 264.54 and the RCRA Permit requirements of A.III.D.(4).

As part of the overall closure process, spill response equipment will be removed when it is no longer required. As permitted units are taken out of service and hazardous wastes have been removed, emergency equipment specified in the contingency plan for that area is no longer required to be present or maintained. Work plans for these areas will identify hazards and will include a list of emergency equipment required for the closure activities being performed.

During the closure period, BGCAPP will keep current copies of all agreements with local authorities for hazardous waste emergency response assistance at an onsite location. If, at any time, the Permittee terminates an agreement with an off-post responder listed in the *RCRA Contingency Plan* or does not renew an agreement with an off-post responder listed in the *RCRA Contingency Plan*, then the Permittee will notify the Director.

Administrative updates and/or changes made to the *RCRA Contingency Plan* during closure to keep the plan current with existing conditions may not warrant a permit modification. These updates shall be submitted to the Director for determination in accordance with 401 KAR 39:060, Section 5. The Project will continue to comply with the applicable large quantity generator standards of 40 CFR 262 Subpart M until all hazardous waste has been removed from the site.

14.8 Security

401 KAR 39:090 Section 1; 40 CFR 264.14

The BGAD restricted area is separated from the administrative area and the public by fences and security checkpoints. There are specific entry procedures established, and all entrants must obtain clearance to enter or be escorted by an individual with clearance authorization.

The CLA, which is fully contained within the BGAD restricted area, is a secure area, and access requires special procedures. Visitors requesting access to the CLA must first comply with health test, security, and safety procedure requirements. The CLA visitors are provided an escort while inside the CLA. Armed security personnel patrol and control/limit access to the area 24/7.

When all recoverable chemical agent has been removed from the CLA, security measures may be revised, but the area will be off limits to unauthorized individuals and armed security personnel will continue to patrol and control/limit access to the area. These measures will continue to prevent unknowing entry and minimize the possibility for unauthorized entry of persons or livestock onto the active portion of the facility.

14.9 Revisions to the Training Plan

401 KAR 39:090 Section 1; 40 CFR 264.16

As permitted HWMUs are taken out of service, the training requirements will be revised to reflect the job functions of affected personnel without the need to formally modify the RCRA Part B permit. Training requirements will be reduced and modified as closure proceeds, but BGCAPP will continue to comply with the applicable large quantity generator requirements of 40 CFR 262.17(a)(7) for personnel training until all hazardous waste has been removed from the site. These measures will ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems.

The Project will maintain training records in accordance with BPBG Training Procedures, 401 Kentucky Administrative Regulation (KAR) 34.020, *General Facility Standards*, Section 7, and 40 CFR 264.16(d) and (e). The Project will include documentation of training requirements, student performance, and course data as required by regulations and accepted operating practices.

14.10 Configuration Management and Permit Drawings

401 KAR 39:090 Section 1; 40 CFR 264.31, 264.601 and 270.30(l)

Maintaining configuration control during the closure period is necessary to ensure systems that are essential to safe operation of the facility continue to function in a reliable manner, and configuration management will be maintained for any system in operational standing during closure. Once a HWMU is designated for decommissioning, hazardous waste will be removed, and it will be permanently taken out of service and decommissioned in accordance with the associated DDP(s) and SCRs.

Once a RCRA-permitted unit, system, or piece of equipment has been permanently removed from service and designated for closure, configuration control with respect to the RCRA operating permit will no longer be required. A permit modification to update the RCRA Part A application indicating the HWMU is no longer operational will be submitted to KDEP to update the status of the permitted item.

Once a permitted unit or system is taken out of service for decommissioning, configuration control for that system and all applicable RCRA Part B Permit controlled documents (e.g., drawings, calculations, procedures) can be removed from the configuration management program. RCRA Part B Permit controlled items associated with the unit that is taken out of service will no longer updated or modified for the permit. Corresponding modifications to the Environmental permit drawing list will be initiated, and affected drawings/procedures will no longer be managed as RCRA Permit controlled items; all applicable procedural flags will be removed.

Since dismantlement and disassembly of an HWMU pursuant to closure does not constitute a modification of the HWMU with the intent to commence storage, treatment, or disposal of hazardous waste within the HWMU, FCCs will not be required. Therefore, RCRA Permit Condition A.II.D.(9) will not apply when modifying the configuration of any HWMU pursuant to closure unless the HWMU is intended for continued hazardous waste storage or treatment.

15.0 CORRECTIVE ACTION

401 KAR 39:090 Section 8; 40 CFR 264.100

Currently, there are no corrective action sites at BGCAPP. The RCRA closure applies to all permitted HWMUs and spills or releases to the environment that are reported per the RCRA Permit. One-time accidental spills are not considered to be SWMUs. However, BGCAPP's spill history must be reviewed to determine if there are areas of concern that warrant sampling during closure to ensure that there are no hazardous constituents that are above the defined closure screening levels.

Based upon the current operating history of the facility, there is no reason to expect that the surrounding environment (e.g., soil, groundwater, and surface water) has been contaminated as a result of BGCAPP operations, and the facility is expected to achieve non-residential clean closure after operations are complete. If operations result in contamination that cannot be effectively cleaned up during the closure phase, a post-closure plan may be necessary, but BGCAPP does not anticipate performing corrective action or post-closure care.

16.0 MAXIMUM WASTE INVENTORY

401 KAR 39:090 Section 1; 40 CFR 264.112(b)(3)

The inventory of hazardous wastes at BGCAPP will be managed in accordance with RCRA and TSCA requirements for facilities undergoing closure. At the time an HWMU is closed, there will be no remaining inventory of hazardous waste present. However, 40 CFR 264.112(b)(3) requires that a closure plan provide an "estimate of the maximum inventory of hazardous wastes ever onsite over the active life of the facility." A conservative estimate of the maximum waste inventory onsite at the start of closure would be the total volume of wastes stored in containers and tanks regardless of whether they were ever operated in that manner.

As a result of this conservative approach, the volumes of ancillary piping and equipment are not considered in the estimate of the total maximum inventory of waste. Additionally, newly-generated hazardous wastes were accumulated onsite in multiple CAAs (<90-day) under the provisions of 40 CFR 262.17 throughout the operating history of BGCAPP. As closure proceeds, additional <90-day areas may be established for waste collection. However, the volume of hazardous wastes contained in these <90-day accumulation areas is not included in the estimate.

Appendix C provides the maximum waste inventory based on permitted capacities of Subpart J Tanks and Subpart I container storage areas at the BGCAPP when closure begins. Permitted Subpart X treatment units are not included in the estimate.

Any RCRA and TSCA wastes that are removed from the site during closure are expected to be shipped offsite in accordance with existing Project procedures that are currently in place to support facility operations (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents). Much of the waste generated during the closure period will be treated onsite or stored in existing CAAs or permitted storage units and moved between units using the same equipment employed during operations. As decontamination and decommissioning of SSCs proceeds, systems will be removed from service and bulk liquids may be diverted from their normal flow path and transferred to intermediate bulk containers (totes), intermodal containers built to International Organization for Standardization specifications (ISOtainers) or tank trucks prior to shipment offsite for treatment and disposal. No liquid wastes will remain in SSCs upon release to demolition subcontractors or turnover to BGAD for future use.

Bulk solids may be placed in rolloff containers or commercial waste hauler equipment such as dump trucks or semi-tractor trailers provided by contracted waste disposal companies.

17.0 AMENDMENT OF PLAN

401 KAR 39:090 Section 1; 40 CFR 264.112(c)

A copy of the approved closure plan will be maintained at the facility. The Project will submit a written notification of, or request for, a permit modification whenever any of the following occur:

(i) Changes in operating plans or facility design affect the closure plan

(ii) There is a change in the expected year of closure, if applicable

(iii) In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan

(iv) BGCAPP requests the Director to apply alternative requirements to a regulated unit under 40 CFR 264.90(f), 264.110(c), and/or 264.140(d)

The Project will submit a written request for a permit modification including a copy of the amended closure plan for approval at least 60 days prior to the proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the Project will request a permit modification no later than 30 days after the unexpected event [40 CFR 264.112(c)(4)].

18.0 NOTIFICATION OF PARTIAL CLOSURE AND FINAL CLOSURE

401 KAR 39:090 Section 1; 40 CFR 264.112(d)

The Project will notify the Director in writing at least 45 days prior to the anticipated date on which partial or final closure is expected to begin. Final closure of the Main Plant must begin no later than 30 days after the date which the facility receives the known final volume of hazardous wastes.

19.0 SCHEDULE FOR CLOSURE

401 KAR 39:090 Sections 1 and 8(8); 40 CFR 264.112(b)(6)

Upon completion of its mission to destroy the stockpile of chemical weapons, BGCAPP will close according to the requirements of the approved closure plan. Final closure of the facility includes decontamination, decommissioning, and demolition or re-use of equipment and facilities to satisfy the physical end-state condition as directed by the U.S. Army. Successfully achieving final closure will include decontamination and/or removal of hazardous waste or hazardous constituents at concentrations that may be harmful to human health or the environment.

The closure sequence and schedule will continue to be refined as the closure planning strategy is negotiated and approved.

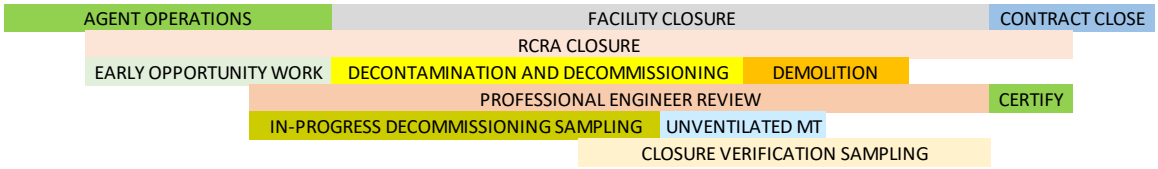
19.1 Closure Activities and Milestones

NOTE

Section 19.1 will be revised when a closure schedule is developed.

- End of chemical agent processing
- Termination of surety status
- Initial decontamination complete for reduced PPE
- Decontamination and decommissioning complete
- Unventilated monitoring testing complete
- Demolition and facility disposition complete
- Closure verification sampling and data validation complete
- PE certifies RCRA closure
- Administrative close-out of BGCAPP contract

The general milestone relationships are shown below:



19.2 Time Allowed for Closure

401 KAR 39:090 Section 1; 40 CFR 264.113(b)

The Project anticipates that it will take longer than 180 days specified in 40 CFR 264.113(b). It is estimated that approximately two years will be required for complete closure of the entire BGCAPP facility. The Project therefore requests KDEP approve a closure schedule of two years. The Project will request an extension of this schedule if the closure requires additional time.

During the closure of the facility, BGCAPP will continue to take all steps necessary to prevent threats to human health and the environment from non-operating hazardous waste management units that have not yet been closed. Approval and issuance of the permit and this closure plan will satisfy the requirements under 40 CFR 264.113(c) to formally request an extension to the 180-day deadline of 40 CFR 264.113(b). No further approval of the closure schedule will be required unless an extension to the current schedule is needed. 40 CFR 264.113(d) and 264.113(e) are not applicable to BGCAPP closure activities.

19.3 Extension for Closure Period

401 KAR 39:090 Section 1; 40 CFR 264.113(b)(1)(i)

If required, any request for an extension to the closure period will be made in accordance with the requirements of 401 KAR 39:090 Section 1 and 40 CFR 264.113.

20.0 PARTIAL CLOSURE

401 KAR 39:090 Section 1; 40 CFR 264.112

The Project expects to begin final closure after the chemical weapon stockpile has been destroyed and does not anticipate partial closure of individual units. If a permitted unit is designated for complete decommissioning and removal prior to final closure, partial closure will be performed in accordance with the approved closure plan. If deviations from the approved closure plan are required for partial closure of a permitted unit, a partial closure plan will be prepared in accordance with 401 KAR 39:090 Section 1, 40 CFR 264.112(c), and 40 CFR 270.42.

21.0 POST-CLOSURE PLAN

401 KAR 39:090 Section 1 and Section 8; 40 CFR 264.90, 264.112(b)(8) and 264.118

Based upon the operating history of the facility, there is no reason to expect that there will be any releases from Solid Waste Management Units or that the surrounding environment has been contaminated as a result of BGCAPP operations. Therefore, the facility is expected to achieve non-

residential clean closure after operations and closure activities are complete. If hazardous waste operations result in contamination of soil, surface water, or groundwater that cannot be effectively cleaned up during the closure phase, a post-closure plan may be necessary, but BGCAPP does not anticipate performing corrective action or post-closure care.

22.0 CLOSURE COST ESTIMATE

401 KAR 39:090 Section 1; 40 CFR 264.142

Not applicable. The owner of the BGCAPP is the U.S. Federal Government, which is not required to provide financial assurances or a closure cost estimate.

23.0 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

401 KAR 39:090 Section 7; 40 CFR 264.143

Not applicable. The owner of the BGCAPP is the U.S. Federal Government, which is exempted as a Federal facility from providing financial assurances or a closure cost estimate in accordance with 40 CFR 264.140(c) and as outlined in Kentucky Revised Statute (KRS) 224.40-110. Note that unclosed portions of the facility [40 CFR 264.112(b)(2)] will only be operated during the closure period to support closure activities as necessary (e.g., permitted container storage areas).

24.0 FINAL CLOSURE CERTIFICATION

401 KAR 39:090 Section 1; 40 CFR 264.115 and 761.65

Final closure means the closure of all permitted units at the facility in accordance with the approved closure plan so that hazardous waste management activities under parts 40 CFR 264 and 265 are no longer conducted. Completion of facility closure will be certified by the Permittee and a Professional Engineer (PE). Within 60 calendar days of completion of final closure, the BGCAPP will submit to KDEP, and EPA Region IV, by registered mail, a certification that the facility has been closed in accordance with the specifications in the approved closure plan.

The certification will be signed by the Permittee and by a PE.

Because closure of the permitted units must ultimately be certified by a PE at the conclusion of final closure activities, all records pertaining to the decontamination, disassembly, treatment and disposal of the HWMU, including ancillary equipment, will be retained in the facility Operating Record for future retrieval. Documentation supporting the PE's certification will be furnished to KDEP or EPA Region IV upon request.

Upon certification that the non-residential clean closure standards have been met, all Main Plant permitted units will be considered clean closed and deemed free of PCBs, hazardous wastes, and/or residues. Hazardous waste codes will not be attached to any of the clean-closed SSCs or environmental media within the contiguous BGCAPP Main Plant permitted area. The BGCAPP Main Plant RCRA Permit will be terminated following acceptance of the non-residential clean closure certification by KDEP, and the BGCAPP Main Plant TSCA Approval will be terminated following acceptance of the non-residential clean closure certification by EPA Region IV. Permitted items that are left in place for future use or those that will be reused, but not discarded, will exit the Main Plant permit and TSCA Approval when closed in accordance with this closure plan.

25.0 REFERENCES

- 24914-CL-5PL-00-00004, *Unventilated Monitoring Test Plan*
- 24915-000-2KP-A03-00001, *Records Management and Document Control*
- 24915-000-G01-GAM-00011, *Configuration Management Plan (CDRL B011)*
- 24915-000-GPP-GEG-00007, *Engineering Drawings*
- 24915-000-GPP-GPX-00101, *Disposal of Government Property*
- 24915-00-G01-GGPT-00005, *Attachment F – Procedures to Prevent Hazards (CDRL A019)*
- 24915-00-GPE-GGPT-00388, *Request for Approval for Additional Treatment, Storage, and Disposal of Polychlorinated Biphenyl (PCB) Bulk Product Wastes*
- 24915-00-GPE-GGPT-00394, *Part C – Waste Analysis Plan*, or current revision.
- 24915-00-GPP-GAM-00006, *Configuration Management Process and Configuration Control Board*
- 24915-00-LBG-GGPT-00022, *Demonstration Approval for Storage and Treatment of Polychlorinated Biphenyl (PCB) Bulk Product Waste, Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP)*, Blue Grass Army Depot (BGAD), Richmond, Kentucky, EPA ID No. KY8 213 820 105
- 24915-00-TKD-GGPT-10036, *Equivalent Device Petition*
- 24915-CL-5PL-00-00002, *In-Progress Decommissioning Sampling Plan for Main Plant*
- 24915-CL-5PL-00-00003, *Main Plant Health-Based Risk Assessment*
- 24915-CL-5PL-00-00006, *Closure Progression Monitoring Plan*
- 24915-CL-5PL-MWS-00001, *Munitions Washout System (MWS) Decontamination Plan*
- 24915-GEN-5PL-00-00006, *Equipment Decontamination Plan*
- 24915-GEN-5PL-00-00014, *Main Plant Closure Verification Sampling and Analysis Quality Assurance Project Plan*
- 24915-GEN-5PR-00-00018, *Emergency Response Procedure – Blue Grass Chemical Agent-Destruction Pilot Plant*
- 24915-GEN-5PR-00-00046, *Development of Decontamination and Decommissioning Packages*
- 24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure* (CDRL D012)
- 24915-OPS-5PR-00-00026, *Waste Characterization and Environmental Sampling*
- 24915-OPS-5PR-00-00028, *Environmental Inspections*
- 24915-OPS-5PR-00-00030, *Waste Shipping (CDRL D013)*
- 24915-OPS-5PR-00-00040, *Chemical Agent Spill Tracking*
- 24915-OPS-5PR-00-00043, *Decontamination Process*
- 24915-SAF-5PR-00-00023, *Toxic Chemical Agent Safety*
- 24915-SYS-5PR-00-00042, *System Change Request*
- 24915-TEMPLATE-01841, *Contaminated Area/Equipment Identification Form*
- 24915-WCG-5PR-00-00001, *Work Control, Work Order (WO) Process*
- 401 KAR, *Kentucky Administrative Regulations*

- 68 Federal Register, 58394 *Final Recommendations for Protecting Human Health from Potential Adverse Effects of Exposure to Agents GA (Tabun), GB (Sarin), and VX* (October 9, 2003).
- Code of Federal Regulations, Title 40, *Protection of Environment*
- DA Pamphlet (DA PAM) 385-61, *Toxic Chemical Agent Safety Standards*
- Department of the Army (DA). 2004. *Implementation guidance policy for revised airborne exposure limits for GB, GA, GD, GF, VX, H, HD, and HT.* Office of the Assistant Secretary (Installations and Environment), Department of the Army, Washington, D.C. (9 June).
- Kentucky Administrative Regulation, Title 401, *Energy and Environment Cabinet Department for Environmental Protection*
- *Land Disposal Restrictions for Newly Listed Wastes and Hazardous Debris*, 57 Federal Register, 37194 (August 18, 1992).
- Letter, Kentucky Department for Environmental Protection, Subject: *Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) Equivalent Device Petition Approval*, dated 9 May 2016; 24915-00-LKD-GGPT-10093.
- US Army. 2011. *Chemical Agent Health-Based Standards and Guidelines*, Summary Table 2: "Criteria for Water, Soil, Waste," as of July 2011, PHN No: 0711-03. Report, U.S. Army Public Health Command.
- USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine). 1999. *Derivation of Health-based Environmental Screening Levels for Chemical Warfare Agents, A Technical Evaluation*. U.S. Army CHPPM, Aberdeen Proving Ground, MD (March 1999)

Appendix A – Decontamination Methods

This section describes the various methods that may be employed for decontamination of chemical agent, PCBs, and other types of contamination found on SSCs. The methods may be employed, either singularly or in combination, to decontaminate the equipment or structure. Any wastes produced from decontamination activities (e.g., spent decontamination solution, rinsate, PPE) will be managed in accordance with applicable requirements of the RCRA WAP and Project procedures (24915-OPS-5PR-00-00023, *Hazardous Waste Management and Hazardous Material Reporting Procedure*; 24915-OPS-5PR-00-00030, *Waste Shipping;* and related documents].

All chemical-based decontamination solutions will be tested for potential agent monitoring interferences before first use, and high-foaming surfactants that could be directed toward sumps should be avoided to prevent potential foaming in the neutralization reactors.

Water or Steam Cleaning

Water and/or steam washing has both chemical and mechanical decontamination properties. This technique involves pressure washing or steam cleaning a surface with water (typically hot) or steam. The water or steam removes the contaminants, and the resulting wastewater is collected for treatment or disposal. Pressure washing includes low-pressure, high-pressure, or ultra-high-pressure (e.g., hydro blaster, water jet) equipment that may use specialized pumps to intensify water pressure. This technique may be used with detergents or other chemicals that enhance the effectiveness of the technique. Steam cleaning may be used to physically extract contamination from building and equipment surfaces. This technique combines the solvent action of water with the kinetic energy effect of blasting and elevated temperature. Effectiveness of steam cleaning as a decontamination method for agent is further increased by localized hydrolysis of the residual agent. The steam may be applied using hand-held wands or automated systems, and the condensate is collected in room trenches for disposal.

Chemical Decontamination Solutions

Sodium hydroxide (NaOH, caustic) solution is recognized as an effective decontamination solution for agent decontamination. An acidified trisodium phosphate formulation may be used for equipment and metal surfaces, while a non-acidified phosphate solution may be used for nonmetallic surfaces and surfaces covered in inorganic contaminants, such as toxic metals contained in salt compounds. Bleach or other commercial chemical products are candidates for effective agent decontamination, as well. The chemical decontamination technique involves the application of caustic or other similar solutions to the contaminated surface. The surface may be scrubbed with the solutions and/or allowed to stand for a specified minimum period of time and then flushed thoroughly with water. These solutions may also be used in combination with detergents and surfactants.

Detergents and Surfactants

Most commercial detergents are formulations of a detergent (sodium laurel sulfate, sodium oleate, alkyl aryl sulphonate) that also act as a wetting agent or surfactant, a phosphorous or carbonate salt (Na3PO4, Na2CO3), a thickening agent (carboxyl methyl cellulose), and other fillers. Unlike the decontamination solutions described above that effectively destroy the agent contamination, detergents are used in decontamination to physically remove surface contaminants (e.g., agent) and capture them in the resulting spent solution. Surfactants work by lowering liquid surface tension and providing better contact between the surface and the liquid.

Detergents are effective, mild, all-purpose cleaners for all facility surfaces and equipment. They can be used to increase the effect of water, steam, and solvents, and their effectiveness is increased by mechanical agitation. Detergents may not be effective on metal corrosion and long-standing contamination.

Foam Decontamination

Foam, such as that produced by detergents and wetting agents, can be used as a carrier mechanism for chemical decontamination agents. They can be applied in different depths and surface orientations. The foam decontamination method can effectively decontaminate metallic walls and parts of complex components. Surfactants in the foaming agent can enhance the effect by increasing contact with the surface. The primary mode of action of the decontaminant is based on oxidizing properties of hydrogen peroxide. A surfactant and an accelerant increase the rate of peroxide activity and allow the decontaminant to be applied as stable foam.

Physical and Mechanical Scrubbing

Physical/mechanical scrubbing with brushes or other devices was found to be extremely beneficial and most likely necessary in the decontamination of other demilitarization sites. Combining scrubbing of surfaces with the appropriate decontamination solution increases the efficiency of the decontamination solution in removing and destroying residual agent by enhancing contact between the solution and the residual agent.

Dry Ice Blasting

Dry ice and dry ice blasting may be used to physically remove contaminated surfaces. Blasting utilizes compressed air to accelerate frozen carbon dioxide (CO2) pellets, at supersonic speeds, towards a surface. The impact of the CO2 pellets results in the lifting/removal of the topmost layer of a substrate. Dry ice blasting is a non-abrasive, nonflammable, and nonconductive cleaning method which generates no secondary contaminants, such as solvents or grit media, because the CO2 quickly sublimes into a non-flammable gas. The method allows most items to be cleaned in place and can be used without damaging active electrical or mechanical parts or creating fire hazards. Additionally, CO2 blasting can be used to remove production residues, release agents, contaminants, paints, oils and biofilms from surfaces. Dry ice without blasting may also be used to remove substrate material, making use of the thermal contraction and cracking/lifting that occurs when the substrate encounters the cryogenic temperature of the dry ice.

Mechanical Surface Removal

Mechanical surface removal, such as grinding, scraping, planning, or scarifying is a decontamination option to physically remove contaminated surfaces. These techniques may be used to decontaminate areas intended for reuse or to achieve a prerequisite condition to support removal of protective containment boundaries. Surface removal may also be used to reduce the volume of hazardous waste by removing only the contaminated fraction and allowing disposal of the uncontaminated substrate as non-hazardous waste or leaving the uncontaminated substrate in place. Grinding with grinding wheels or surfacing discs removes thin layers of surface contamination from concrete where contamination is limited to the coating or sealant finish. Scarifiers (scabblers) physically abrade both coated and uncoated concrete and steel surfaces. The scarification process removes the top layers of contaminated surfaces down to the depth of sound, uncontaminated surfaces. Scabbling is a scarification process used to remove concrete surfaces. Needle scaling is a scarification process for both concrete and steel surface removal. The removed surface material is then collected by sweeping or use of a vacuum system for disposal.

Thermal Decontamination and Desorption

Non-PCB-contaminated equipment and material may be thermally decontaminated in the MPT permitted units in accordance with the RCRA Permit and WAP. Items processed through the MPT are heated to a minimum of 1,000°F for a minimum of 15 minutes to destroy chemical agent.

Items fed to the MPT will be classified as either metal or non-metal materials. Metal materials may include incidental amounts of non-metal materials—approximately 25% by weight—(e.g., washers, gaskets, seals, grommets, O-rings, tubing, sealant, grease, paint, coated wiring, hoses, patch cords, tubing, circuit boards, hydraulic fluid, concrete, PPE).

Metal items only or metal items with incidental amounts of non-metal materials will be loaded into WICs and thermally decontaminated in the MPT in accordance with RCRA Permit Condition A.III.X.(4)(e) and Project procedure 24915-OPS-5SO-MPT-00001, *Standing Operating Procedure for Metal Parts Treater (MPT)*. The quantity of non-metal material in the WIC will be estimated and will not exceed 25% by weight. Metal that is thermally decontaminated in the MPT may be managed as scrap metal under the scrap metal exemption at 40 CFR 261.6(a)(3)(ii) for scrap metal being recycled.

Thermal blankets, heat trace, forced hot air, or other heat sources may also be used for thermal desorption and decontamination of equipment and areas that are under engineering controls.

Air Wash Decontamination

Air washing extracts volatile hazardous contaminants (e.g., agent) from contaminated surfaces which are captured in the HVAC exhaust filtration system. Decontamination by air washing is the result of mass transfer by evaporation of agent from surfaces to the surrounding air and is not necessarily effective for materials such as bare concrete, wood, or materials possessing occluded spaces. Air washing is not an efficient means to decontaminate liquid- or aerosol-contaminated surfaces.

Commercially Available Products

Commercial formulations of surfactants, chelates, and wetting agents containing:

- Acetic acid ethenyl ester, polymer with ethanol
- Sodium dodecyl sulphate
- N-carboxymethyliminobis(ethylenenitrilo)tetra(acetic acid)N-methyl-2-pyrrolidone
- (R)-p-mentha-1,8-diene

Other products include

- Isopropyl alcohol wipes
- Oxone (potassium peroxomonosulfate)
- Commercially formulated decontamination solution (propylene glycol n-propyl ether and hydrogen peroxide mixture)

Appendix B – Treatment Standards for Hazardous Debris

This table provides a summary of the 40 CFR 268.45 Alternative Treatment Standards for Hazardous Debris that may be used at BGCAPP to achieve the closure performance standards for hazardous debris described in Section 8.4.

SUMMARY OF EXTRACTION TECHNOLGIES[1]		
Technology	**Performance Standard**	**Contaminant Restriction**
Physical Extraction: includes abrasive blasting; scarification, grinding, and planing; spalling; vibratory finishing; and high-pressure steam and water sprays.	***Glass, metal, plastic, rubber:*** Treat to clean debris surface.[2] ***Brick, cloth, concrete[3], paper, pavement, rock, wood:*** Remove at least 0.6 cm of the surface layer and treat to a clean debris surface.[2]	***All debris:*** None[3].
Chemical Extraction: Water washing and spraying. This technology may be used with detergents or other chemicals that enhance the effectiveness of the technique.	***All debris:*** Treat to a clean debris surface.[2] ***Brick, cloth, concrete, paper, pavement, rock, wood:*** Debris must be no more than 1.2 cm in one dimension, except that this thickness limit may be waived under an "Equivalent Technology" approval Debris surfaces must be in contact with the water solution for at least 15 minutes.	***Brick, cloth, concrete, paper, pavement, rock, wood:*** Contaminant must be soluble to at least 5% by weight in water solution or by 5% by weight in emulsion.

Notes:

1. Full descriptions of the extraction technologies may be found in 40 CFR 268.45 Table 1 – Alternative Treatment Standards for Hazardous Debris and *Land Disposal Restrictions for Newly Listed Wastes and Hazardous Debris*, 57 Federal Register, 37194 (August 18, 1992).
2. "Clean debris surface" means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area."
3. Any contaminant subject to hazardous debris treatment standards may be treated by these technologies because the contaminants are physically removed as residue. The residues are subject to the treatment standards for non-debris waste.

Appendix C – Maximum Inventory of Wastes at Beginning of Closure[1]

A.III.I.(9) – Subpart I Container Storage Areas		
Hazardous Waste Management Unit	**Location/ Room #**	**Maximum Inventory**
Waste Transfer Station	WTS	279,000 gallons
Container Handling Building	CHB	51,695 gallons
Box Transfer Area, Room 1 (240 rocket motors/SFTs)	07-165	
Box Transfer Area, Room 2 (240 rocket motors/SFTs)	07-166	
ANS Container Storage	07-123	
Tray/Container Transfer Room	07-124	
MPT Cooling Conveyor Storage Area	07-150	
TMA Storage Area	07-125	
TMA Equipment Room	07-133	
ECV Storage Areas ECV-1	07-103	
ECV Storage Area, ECV-2	07-106	
ECR Storage Area No. 1	07-104	
ECR Storage Area No. 2	07-105	
Munitions Washout System Room	07-135	
Unpack Area No. 1	07-101	
Unpack Area No. 2	07-128	
UPA Equipment Room	07-134	
EBH Room	07-111	
Off-gas Treatment System Energetics	07-140	
Off-gas Treatment System for the Metal Parts Treater	07-141	
Motor Packing Room	07-163	
Motor Shipping Room	07-164	
Container Storage Facility	CSF	49,280 gallons

A.III.I.(9) – Subpart I Container Storage Areas		
Hazardous Waste Management Unit	**Location/ Room #**	**Maximum Inventory**
Rocket Motor Storage	Igloo F1001 Igloo F1002 Igloo F1205 Igloo F1301 Igloo F1303 Igloo F1304 Igloo F1305 Igloo F1307 Igloo F1203 Igloo F1205 Igloo F1206 Igloo F1207 Igloo F1301 Igloo F1304 Igloo F1401 Igloo F1402 Igloo F1407 Igloo E301 Igloo E302 Igloo E303 Igloo E401 Igloo E402 Igloo E403 Igloo E404 Igloo E405 Igloo E406 Igloo E407 Igloo E501 Igloo E502 Igloo E503 Igloo E810 Igloo E907 Igloo E908	16,000 gallons, each Igloo (Only Igloos that received hazardous waste during the active life of the facility are included in the maximum inventory estimate)
Total Estimated Volume for Subpart I Containers	**--**	**476,675[2]**

A.III.J.(8) – Subpart J Tank Units		
Hazardous Waste Management Unit	**Location/ Room #**	**Maximum Inventory**
Agent Hydrolysate Storage Tanks MT-HSS-0105, MT-HSS-0205	HSA	336,943 gallons, each
Agent Hydrolysate Storage Tank MT-HSS-0104	HSA	103,195 gallons
OTM Condensate Storage Tanks MT-HSS-0604, MT-HSS-0704	HSA	316,192 gallons, each
Agent Holding/Surge Tanks MT-ACS-0105, MT-ACS-0106	07-123	1,856 gallons, each
Agent Neutralization Reactors MV-ANS-0101, MV-ANS-0201	07-123	2,251 gallons, each
Agent Hydrolysate Sampling Tanks, MT-ANS-0103, MT-ANS-0203, MT-ANS-0303	07-123	5,865 gallons, each
Spent Decontamination System Tanks, MV-SDS-0101, MV-SDS-0201, MV-SDS-0301	07-123	9,769 gallons each
Total Estimated Volume for Subpart J Tank Units	**--**	**1,464,581 gallons**

40 CFR 262 – Generator Standards		
Hazardous Waste Management Unit	**Location/ Room #**	**Maximum Inventory**
90-day Storage Areas	Various	TBD
Total Estimated Volume for Generator Storage Areas	**--**	**Not Included[2]**

Notes:

1. The estimated total maximum inventory of waste does not include volumes for permitted units that were never placed in service.
2. Newly-generated hazardous wastes were accumulated onsite in multiple container accumulation areas (<90-day) under the provisions of 40 CFR 262.17 throughout the operating history of BGCAPP. As closure proceeds, additional <90-day areas may be established for waste collection. However, the volume of hazardous wastes contained in these <90-day accumulation areas is not included in the estimate.

PCB Maximum Inventory Estimate		
Hazardous Waste Management Unit	**Location**	**Maximum Inventory**
Subpart I Container Storage Areas	In accordance with the RCRA Permit, the SFTs and PCB secondary wastes shall be stored in RCRA-permitted container storage areas. The RCRA storage areas that would also be used for PCB bulk product and secondary wastes include the Container Handling Building, two Box Transfer Area Rooms, the Motor Packing and Shipping Rooms, Waste Transfer Station, Metal Parts Treater Cooling Conveyor Storage Area, Container Storage Facility, and RCRA-permitted storage areas at BGAD (rocket motors within SFTs in up to 31 RCRA-Permitted container storage areas)[1].	The maximum quantity of PCB wastes that will be managed at BGCAPP is provided by the Approval as opposed to PCB quantity limits in each specific storage area. The PCB storage capacity within each area will be limited to the waste quantities and types specified in the RCRA Part B permit, and the PCB waste storage volume shall not exceed the RCRA-permitted container storage capacity in each permitted area. The maximum quantity of PCBs managed at BGCAPP shall be 69,449 rockets with 13.7 pounds/SFT containing an average PCB concentration of 1,247 mg/kg. The maximum quantity of PCB containing materials is 951,451 pounds for a maximum of 1,190 pounds of PCBs.
Maximum Estimated Quantity of PCBs	**--**	**1,190 pounds**

Note:

1. In accordance with the TSCA Approval, SFTs, rocket motors with SFT segments, and PCB secondary wastes may be stored in any RCRA-permitted storage areas. Additional RCRA-permitted storage areas not listed above may be placed into service for PCB Bulk Product Waste management during the active life of the facility. However, the maximum quantity of PCBs managed at BGCAPP will not change if additional storage units are utilized for PCB Bulk Product Waste.