ATTACHMENT II-7 CLOSURE PLAN

LIST OF APPENDICES AND TABLES

Appendix A: Closure/Post-Closure Inventory, Standards, and Reference Tables

Appendix B: Closure/Post-Closure Cost Summary Tables

Appendix C: Closure/Post-Closure Cost Worksheets

Appendix D: Cost Documentation Appendix (CDA)

A. CLOSURE PLAN

1.0 INTRODUCTION

Clean Harbors Grassy Mountain, LLC (CHGM), as the owner/operator of the Grassy Mountain Facility, is required to comply with the applicable requirements of the following regulations and test methods:

- Utah Administrative Code (UAC) R315-261-Identification and Listing of Hazardous Waste
  - Appendix VII – Basis for Listing Hazardous Waste
  - Appendix VIII – Hazardous Constituents
- UAC R315-262-Standards Applicable to Generators of Hazardous Waste
  - Subpart A (262.11) – Hazardous Waste Determination and Recordkeeping
- For RCRA Facilities Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
  - 40 CFR 264
  - UAC R315-264-110 through 120 – (Subpart G) Closure and Post-Closure
  - UAC R315-264-140 through 151 – (Subpart H) Financial Requirements
  - UAC R315-264-170 through 179 – (Subpart I) Use and Management of Containers
    - UAC R315-264-178 - Closure
  - UAC R315-264-190 through 200 – (Subpart J) Tank Systems;
    - UAC R315-264-197 – Closure and Post-Closure Care
  - UAC R315-264-220 through 231 – (Subpart K) Surface Impoundments;
    - UAC R315-264-228 – Closure and Post-Closure Care
  - UAC R315-264-300 through 317 – (Subpart N) Landfills
    - UAC R315-264-310 – Closure and Post-Closure Care
    - UAC R315-264-313 – Special Requirements for Incompatible Wastes
- UAC R315-268-Land Disposal Restrictions
  - Subpart D (268.45) – Treatment Standards for Hazardous Debris
- For TSCA Facilities:
  - 40 CFR 761-Polychlorinated Biphenyls (PCB) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
    - Subpart C (761.40-45) – Marking of PCBs and PCB Items
    - Subpart D (761.50-79) – Storage and Disposal
    - Subpart G (761.120-135) – PCB Spill Cleanup Policy
    - Subpart J (761.780-193) – General Records and Reports
    - Subpart K (761.202-219) – PCB Waste Disposal Records and Reports
    - Subpart N (761.260-274) – Cleanup Site Characterization Sampling for PCB Remediation Waste in Accordance with 761.61(a)(2)

        - Subpart O (761.280-298) – Sampling to Verify Completion of Self-Implementing Cleanup and On-Site Disposal of Bulk PCB Remediation Waste and Porous Surfaces in Accordance With §761.61(a)(6)
        - Subpart P (761.300-316) – Sampling Non-Porous Surfaces for Measurement-Based Use, Reuse, and On-Site or Off-Site Disposal Under §761.61(a)(6) and Decontamination Under §761.79(b)(3)
        - Subpart Q (761.320-326) – Self-Implementing Alternative Extraction and Chemical Analysis Procedures for Non-liquid PCB Remediation Waste Samples
        - Subpart R (761.340-359) – Sampling Non-Liquid, Non-Metal PCB Bulk Product Waste for Purposes of Characterization for PCB Disposal in Accordance With §761.62, and Sampling PCB Remediation Waste Destined for Off-Site Disposal, in Accordance With §761.61
        - Subpart S (761.360-378) – Double Wash/Rinse Method for Decontaminating Non-Porous Surfaces
            - Appendix IX – Ground-Water Monitoring List
- EPA Test Methods
    - EPA SW-846 – Test Methods for Evaluating Solid Waste

2.0 CLOSURE PERFORMANCE STANDARD

This closure plan describes the methods CHGM will use to meet the closure performance standard in R315-264-111 UAC. The closure performance standard requires that the owner or operator shall close the facility in a manner that (a) minimizes the need for further maintenance; (b) controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and (c) complies with the closure requirements of R315-264 UAC.

The plan presents a hypothetical closing sequence for the current waste management units to develop a closure cost estimate. The actual sequence may differ at the time of closure. The sequence will be based on minimizing exposure of personnel to contaminants and the release of contaminants to the environment. The plan assumes that each unit is at its maximum capacity. The cost estimate assumes the use of third parties to perform all closure work.

All tables referenced in this plan are presented in the attached appendices:

- Appendix A: Closure/post closure cost summary tables.
- Appendix B: Closure/post closure cost worksheets.
- Appendix C: The cost documentation appendix (CDA) includes tables of unit costs and other specific costs that were used for cost analysis.
- Appendix D: Closure/post-closure inventories, standards, and reference tables.

3.0 FACILITY UNIT DESCRIPTIONS

3.1 LOCATION

The Grassy Mountain Facility is located approximately 83 miles west of Salt Lake City, Utah in Section 16 of Township 1 North, Range 12 West in Tooele County. The portion of the property used for active and closed waste management units is located inside a fence and composes most of Section 16. CHGM also owns a ½ mile buffer around all of Section 16.

The waste management units are permitted for treatment, storage, and disposal of hazardous waste pursuant to the regulations administered by the State of Utah and/or the United States Environmental Protection Agency. Attachment II-1 contains a site plan that shows locations of the various waste management units and the fenced portion of the section.

3.2 GENERAL HYDROGEOLOGIC CONDITIONS

The facility is located upon exposed sediments of ancient Lake Bonneville. This geologic formation is a silty clay deposit believed to be approximately 300 feet thick. It contains no potable water and subsurface water movement is extremely slow. Hydraulic conductivity of the sediments underlying the site ranges from 1×10^{-4} to 1×10^{-6} cm/second. The sediments have extremely high sodium concentrations. Subsurface water contains total dissolved solids concentrations of 50,000 to 100,000 mg/l. The region receives approximately 5 inches of precipitation annually with evaporation rates of over 40 inches per year. There are no rivers or streams within 20 miles of the facility and the nearest body of water is Great Salt Lake (30 miles northeast).

3.3 HAZARDOUS WASTE STORAGE/TREATMENT/PROCESS UNITS

3.3.1 Container Management Facility (Module III)

The Container Management Facility (CMF) is an elevated slab, pre-engineered steel roof and side wall structure. It is designed to prevent the escape of contaminants should spills or leaks occur and to protect the unit from weather and precipitation while containerized waste is managed prior to disposal. The unit has separated drainage areas accessed by ramps. The drainage areas provide containment using concrete curbing and sumps. The slab and sump structures are constructed with waste-compatible joint materials and water stops to prevent waste leakage into the structural unit and underlying soils. (See Table D.1).

Dock 1 and Storage Pads 2 and 3 are utilized to store all wastes accepted at CHGM, including wastes not subject to regulation under Subtitle C of RCRA.

3.3.2 Drain and Flush Building Warehouse One (Module III)

The Drain and Flush Building Warehouse One (DFBWO) is an elevated slab, pre-engineered steel roof and side wall structure. It is designed to prevent the escape of contaminants should spills or leaks occur, and to protect the unit from weather and precipitation while containerized waste is managed prior to disposal. The unit has separated drainage areas accessed by ramps. The drainage areas provide

containment using concrete curbing and sumps. The slab and sump structures are constructed with waste-compatible joint materials and water stops to prevent waste leakage into the structural unit and underlying soils.

3.3.3 Facility Tanks (Module IV)

Facility tanks are used for stabilization, leachate storage, wheel wash water, and bulk storage (Tables D.1, D.9, D.10).

Some of the tanks have ancillary pipes, valves, and other equipment. All are located within secondary containment. Secondary containment areas are constructed of concrete slabs with curbing, sumps for collection/containment of run-off from selected portions of the units, and secondary containment with leak detection in tank areas. All floor slabs, containment, and sump structures are constructed with waste compatible joint materials and water stops to prevent both intrusion by waste into the structural unit and leakage through the unit to underlying soils.

3.3.3.1 Waste Stabilization Facility

The Waste Stabilization Facility consists of three square open-top tank treatment units with secondary containment, transport vehicle unloading areas, treated waste haul vehicle staging areas, and ramps for access. The tanks are used to mix reagents with waste using a backhoe or trackhoe. Since the tanks are not storage units, there is no inventory of wastes associated with these units. They are numbered 122-TN-001, 122-TN-002, and 122-TN-003.

3.3.3.2 Leachate Tanks

The Leachate Tank is in a secondary containment area and stores leachate prior to its disposal. It is numbered 119-TN-002.

3.3.4 Surface Impoundments (Module V)

Surface Impoundment A is above grade and can store 1,587,759-gallons. It has a surface area of approximately one acre and a maximum depth of approximately 15 feet. In October 1988, the impoundment was retrofitted with a double synthetic liner and leak detection system to meet the minimum technology requirements for hazardous waste surface impoundments.

Surface Impoundment B is permitted but not constructed. It will be above-grade, with a capacity of 5.0 million-gallons, a surface area of approximately three acres, and a depth of 13.4 feet.

No capacity is considered in computation of maximum inventory of waste for the surface impoundments because waste acceptance will be stopped and the stored liquid will be allowed to evaporate prior to closure. Decontamination and disposal of the liner system for Surface Impoundment A is included in the closure cost estimate. Since Surface Impoundment B is permitted but not yet constructed, it is not included in the closure cost estimate.

3.3.5 Landfill Disposal Cells (Module VI)

CHGM currently has three active hazardous waste landfill disposal cells approved for operation: Cells 7, 8, and B/6. Five additional hazardous waste cells, 9 through 13, have been permitted but not constructed. They will be constructed, operated, and closed at different times during the life of CHGM. In accordance with permit Module VI, final closure design engineering reports will be submitted for each cell either at the time of closure, or with the design engineering reports submitted with the permit application for the cell. Landfill closures will utilize an approved Geosynthetic Clay Liner (GCL) closure design in accordance with Module VI. All closure activities shall comply with the CQA Plan for Construction of Surface Impoundments, Landfills, and Landfill Closures (permit Attachment VI-3).

4.0 PARTIAL FACILITY CLOSURE ACTIVITIES

4.1 PARTIAL CLOSURE

Due to the size and complexity of CHGM, partial closure activities are common. CHGM shall implement partial closure to facilitate the upgrade of treatment, storage, and disposal facilities to more technically advanced units; to close out-of-date or uneconomic processes; to close landfill cells; or to dispose of expendable supplies.

Partial closure includes discontinuance of use; removal of wastes and residues from non-disposal areas; and cleaning the area or apparatus as applicable. Partial closure of any area may take place at any time.

After it is decontaminated, equipment may remain in place or be removed at the discretion of the owner or operator. Equipment will not be left in place after the end of the post-closure period. If an item cannot be decontaminated in place, it will be removed and either disposed of or decontaminated in a fixed or temporary containment area.

Facility areas or portions of facility areas listed below may be partially closed.

- Portions of the CMF and DFBWO
- Portions of the Vat Stabilization Tank System
- Some of the Leachate Storage Tanks
- Surface Impoundments
- Individual Hazardous Waste Landfill Cells

Each of the major facility process areas have been evaluated to determine the required steps for closure in accordance with the closure performance standards in UAC R315-264-111. This plan describes the steps for closing each process or storage area. The closure plan for each process area meets the regulatory requirements for final closure except for notification and certification requirements for tanks and container storage areas.

4.2 CERTIFICATION

Notification and certification of closure of non-disposal areas is not required until final closure in accordance with UAC R315-264-115. If an area is closed and certified under

partial closure, recertification at the time of facility closure is unnecessary. If the closed area is not certified at partial closure, certification will be required at final closure.

4.3 REQUIRED OPERATIONAL AREAS FOR FINAL CLOSURE

Several operational areas (or portions thereof) must remain functional to assist in the final closure of CHGM. These include:

- Hazardous Waste Landfill Cell
- Leachate Storage Tanks
- Stabilization Treatment Tank System
- CMF

Facility closure requires that a landfill cell with adequate capacity to contain the final inventory of wastes and contaminated materials remain available for final closure. CHGM will allocate at least one of the hazardous waste landfill cells for the final closure. This landfill will, at least, have the volume listed in Table D.2 available for compliance with Landfill Capacity Assurance requirements.

The Leachate Storage Tanks will be necessary to store the landfill leachate liquid prior to shipping it off-site for disposal during final closure and through post closure of CHGM.

The CMF and the waste stabilization treatment tank system will remain operational until just before final closure of the last open landfill cell. Both will remain open to ensure the proper handling of remaining wastes and waste residues in accordance with regulations at the time of closure.

Other final closure activities include site monitoring and routine site inspections; groundwater monitoring; decontamination of equipment, structures, and areas; verification sampling; and analytical efforts.

5.0 MAXIMUM EXTENT OF OPERATIONS

This closure plan is based on the cost of final closure when the extent and manner of operation would be most expensive in accordance with UAC R315-142(a)(1). Capacity calculations are based on an estimate of the maximum inventory of hazardous waste ever on site over the active life of CHGM in accordance with UAC R315-264-112(b)(3). As such, the plan represents a “worst case" scenario for unexpected closure at any time during the facility’s operation.

5.1 MANAGEMENT OF MAXIMUM INVENTORY

Remaining waste inventory and decontamination residuals are two categories of hazardous waste streams to be managed during facility closure. Permitted maximum capacities are used to estimate the inventory for removal, treatment, transport and/or disposal, as appropriate, at the time of closure (Table D.1). An estimate of residual waste generated during closure procedures (e.g., decontamination of areas and soils and residue clean-up from routine operations/treatment) is provided based on the decontamination portion of the closure plan.

5.1.1 Estimate of Maximum Remaining Waste Inventory

No waste inventory is attributed to the open landfill cells since such cells would be receiving waste for disposal, not generating wastes from closure. No costs are associated with surface impoundment inventory because liquids that may be in the surface impoundment will be evaporated prior to final closure.

Table D.1 describes the capacity of each container, tank, and storage area and assumes that the maximum inventory is in storage at the time of closure. This is based on the capacity of the CMF and capacities of the current, active, tank systems.

5.1.1.1 Maximum Inventory Management - Container Management Facility

Most containerized waste will be disposed in an on-site landfill after any required treatment or amendment activities are performed. Up to 50 55-gallon drums of flammable waste will be sent off-site for incineration. Any handling and processing of this containerized inventory will be performed in accordance with the current permit conditions and applicable regulations at the time of closure.

5.1.1.2 Maximum Inventory Management – Inactive and Active Tank Systems

The tank capacities used for inventory computations are listed in Module IV of this permit. The Stabilization Tanks are only listed for completeness since they are not used for storage and there is no associated waste inventory. No waste is considered in inventory for listed, inactive tanks that have been previously emptied and cleaned as described within this plan. The leachate tank will be needed through post-closure and will not be closed until the end of the post-closure period. However, disposal of the total permitted volume of the leachate tank is used to estimate closure costs.

5.1.1.3 Maximum Inventory Management – Drain & Flush Building Warehouse One

Mercury containerized waste will be handled according to 5.1.1.8 - Off-Site Management as outlined in this section.

5.1.1.4 Estimate of Closure - Generated Residual Waste inventory

Table D.2 summarizes the estimates of closure-generated residual waste to quantify closure management costs. Estimates are based on the decontamination methods and practices planned for the various units and are categorized according to the final management anticipated. The table provides a summary of the details presented in Appendix C, “Cost Documentation Appendix (CDA),” and the closure cost worksheets in Appendix B. The table outlines estimated landfill capacity assurance quantities.

5.1.1.5 Procedures for Handling Hazardous Waste Inventory and Decontamination Residues

Procedures for handling hazardous waste inventory and decontamination residues are detailed in Appendices B and C. Specific waste streams and any ancillary handling requirements such as removal, containerization, and

transportation, are included in the cost estimates as required for financial assurance.

5.1.1.6 RCRA/TSCA Waste Stream Inventory Management

Less than 5% of the total waste inventory of the CMF may be RCRA/TSCA combination wastes. This waste will not materially affect the cost of disposal of inventory as they will either be calculated into the landfillable volume or the incinerable volume.

5.1.1.7 On-Site Management

In general, hazardous waste inventory will be managed on-site during closure. Management activities during closure will be a continuation of routine operating practices such as: containerization and re-containerization of wastes, off-site shipment of non- landfillable wastes, stabilization of residues and waste streams, hazardous waste landfill disposal, providing and using container handling equipment and facilities, and mobilization of other equipment as necessary.

5.1.1.8 Off-Site Management

The off-site management practices will include manifesting, loading, and shipping wastes off-site for incineration or other treatment for organics. Wastes generated and shipped off-site will include leachate and decontamination liquids.

6.0 FACILITY DECONTAMINATION

General facility areas will be evaluated to determine whether decontamination is necessary. Roads, staging areas, scale areas, the laboratory, and truck/wheel washes will be decontaminated. Decontamination will meet performance-based standards.

The general decontamination procedures outlined here are commonly used in the hazardous waste industry and were used to develop the closure cost estimate. The Director must approve any modifications to the procedures described.

Implementation of a Corrective Action Plan (Module VIII) will, for any portion of CHGM at the time of partial closure of an area or total closure of CHGM, take precedence over the decontamination procedures described in this closure plan and will, when completed, meet closure requirements.

6.1 CONTAMINATED EQUIPMENT, STRUCTURES AND FACILITY AREAS

The Stabilization Tanks, Leachate Treatment Tanks, Leachate Building, CMF, and DFBWO will be decontaminated.

This plan assumes that the surfaces in the container management areas are contaminated. This plan assumes that storage tanks listed in Table D.1 are contaminated, even if they have been inactivated and cleaned. Surface impoundments must be cleaned as part of closure. Details for each process area are discussed below and on the closure cost estimate worksheets (CMF and CLO) in Appendix B and Cost Documentation (CDA) in Appendix

C. Final closure costs based on the listed criteria and assumptions are discussed in Section 14 and are presented in Appendix B.

6.2 TYPICAL DECONTAMINATION PROCEDURES

6.2.1 Removal of Waste Inventory

The waste inventory will be processed and/or treated in accordance with UAC R315-264-110 and the permit. Personnel will inspect process areas and equipment. They will:

1. Inspect slab areas, tanks, ancillary process equipment, liquid transfer lines, sump structures, and secondary containment areas for spills or evidence of spills, leaks, cracks, or other evidence of potential release of contaminants to the environment and document the findings.
2. Remove any accumulated material, such as dust and dirt, that would inhibit recognition of spills or releases during decontamination.
3. Inspect containment surfaces for cracks, holes, or evidence of potential leakage or loss of integrity.
4. Core the concrete and no less than one foot of the soil beneath cracks, holes, or evidence of potential leakage. Collect samples from 0-4 inches of depth, 5-8 inches of depth, and 9-12 inches of depth. Have the samples analyzed for the constituents found in UAC R315-261 Appendix VIII.
5. If the analytical results indicate a release, personnel will identify, record, and enter into the operating record the location of damage which could have caused the loss of integrity of the containment system. This information will be used in step 5.2.5.3 after decontamination of the containment surfaces.
6. Personnel will repair any cracks or other damage to containment surfaces that could release waste waters to the ground during decontamination efforts.

6.2.2 Decontamination of Areas/Equipment

Personnel will decontaminate process areas and equipment. They will:

1. Decontaminate tanks and/or piping in place or remove them to fixed or temporary containment for decontamination. Use decontamination methods for hard surfaces.
2. Decontaminate tanks and equipment inside and out.
3. Remove equipment from containment as necessary to ensure the containment surfaces are properly decontaminated.
4. Dispose of tanks and equipment instead of decontaminating them.

6.2.3 Decontamination of Structures

Personnel will decontaminate structures by removing all stains (chemical stains do not have to be removed) utilizing decontamination methods for hard surfaces (6.1).

6.2.4 Decontamination of Secondary Containment Surfaces

Personnel will decontaminate secondary containment surfaces utilizing decontamination methods for hard surfaces.

6.2.5 Re-Inspection

Personnel will re-inspect all sumps, secondary containment, and leak detection systems for cracks, holes, or evidence of potential leakage or loss of integrity that was not identified prior to initiation of closure. If they note evidence of potential leakage or loss of integrity, they will:

1. Collect core samples of the concrete and soil to identify the presence of contamination of the subsoils.
2. If contamination is confirmed, dig a trench to remove all concrete and soil within six inches of the crack and dispose of it as contaminated.
3. Sample the soil from the trench and have it analyzed for volatile, semi-volatile and pesticide/herbicide parameters listed in the Ground-Water Monitoring List in UAC R315-264-1107. Continue expanding the trench both laterally and vertically until the analyses of the samples come back less than or equal to the concentrations listed and dispose of the removed soil according to the Waste Analysis Plan.

6.2.6 Inspection and Removal of Contaminated Soil Adjacent to the Waste Management Units

Soils adjacent to waste management units must be inspected. This includes soils immediately adjacent to and within at least a six-foot perimeter of any unit (or within 10 feet of the CMF) and soils where trucks or other equipment have been staged for storing or transferring waste. Personnel will:

1. Inspect the area and map the location of stained or discolored soils.
2. Remove the top six inches of exposed soil.
3. Collect a grab sample of the excavated soil from each excavated area.
4. Analyze the soil for the volatile, semi-volatile, and pesticide/herbicide parameters listed in Attachment VII-3. Analyze for PCBs using the current SW-846 method and the decontamination standards in Section 6.0 of this Closure Plan. If the analysis shows levels at or below the decontamination standards, the unit may be declared closed, and the soil disposed of in the landfill.
5. If the analysis shows levels above the decontamination standards, dispose of the soil in the landfill according to the regulations.
6. Sample and analyze the soil from areas where the soil has been removed
    a. Collect grab samples approximately every 50 feet (0-to-6-inch depth).
    b. Collect additional surface (0-to-6 inches) grab samples from the locations of stained or discolored soils identified prior to removing the surface layer of soils.

c. Analyze soil samples for volatile, semi-volatile, and pesticide/herbicide parameters listed in the groundwater monitoring list in UAC R315-264-1107. Analyze soil samples for PCBs using the current SW-846 method and the standards set-forth in Section 6.3 of this Closure Plan.

d. If the analysis identifies contamination that exceeds the Regional Screening Level (RSL) risk assessment values for industrial soils, personnel will remove at least six inches of soil and repeat steps three through six above until the soil no longer exceeds the RSLs.

6.2.7 Assessment and Decontamination of Facility Roadways

CHGM is accessed by an asphalt road that is maintained by Tooele County. Inside CHGM's boundary, the scale pad, the sampling pad, the parking areas for the Administration Building, and the road from the gate to the north end of the sampling pad are all paved with asphalt. Stained areas on the asphalt, the sampling platforms, and the scales will be decontaminated according to the plan for hard surfaces.

The remainder of the roads at CHGM are dirt or gravel-covered dirt. The non-asphalt roadways within CHGM have been categorized as A, B, or C roads based on vehicle usage and vehicle payload type. The A, B, and C roadways will be sampled and decontaminated as follows:

6.2.7.1 Assessment Sampling Methodology

A sampling program will be initiated to determine the existence and extent of any contamination on the dirt and gravel roadways. The soil sampling program will utilize a grid system. The dimensions of the grid will vary depending on the classification of the roadway. An inventory of facility roads, with their dimensions and types, is presented in Table D.3.

Five sampling locations will be selected randomly in each grid, and samples will be collected from the 0 to 6-inch depth interval. Two samples will be composited to make one sample for analysis. If an area(s) of potential contamination is noted in the grid (i.e., soil discoloration and/or odor), one or more of the sampling locations must be from the area of suspected contamination. Samples from those locations will be discrete, not composited, and will be documented as such in the field logbook.

Personnel will clean the bucket-type hand auger and auxiliary sampling equipment with detergent, distilled water, and acetone. They will rinse the sampling equipment with distilled water between samples to avoid cross contamination. In each sampling grid, the five samples will be collected by advancing the bucket-type hand auger to a depth of 0 to 6 inches. Each sample will be visually characterized, noted in a field logbook, and placed in appropriate sampling containers with Teflon-lined caps. Personnel will label each sample container with the sample location, depth interval, time, date, and sampler, and initiate the chain of custody to ship the samples to an approved analytical laboratory.

Road Type A:

Type A roads are those that are used or have ever been used for large haul trucks driving from the stabilization tanks to the disposal cells and from the disposal cells to the wheel washes. The haul trucks are not covered when moving waste from the stabilization area to the disposal cells. Type A roads will be assessed with a 500 square foot sampling grid.

Road Type B:

Type B roads are those used by transport vehicles hauling hazardous waste to the stabilization tanks, the container storage buildings, and/or the bulk solid storage units. These vehicles are uncovered since tarps and other covering systems are removed at the sampling platform. Type B roads will be assessed with a 750 square foot sampling grid.

Road Type C:

Type C roads are other facility roads that have not had waste transported on them and are most likely not contaminated. Type C roads will be assessed with a 1,000 square foot sampling grid.

6.2.7.2 Sample Analysis

Samples collected in accordance with 5.2.7.1 will be analyzed for soil pH and the constituents listed in UAC R315-264-1107. If contamination is found that exceeds risk-based remedial action objectives based on current EPA RSLs for Industrial Settings in Soils, the extent of contamination must be determined in a horizontal and vertical direction.

6.2.7.3 Decontamination

Contaminated soils must be removed until a six-inch horizontal and vertical layer of soil meets the decontamination requirements in Section 6.0 as determined by representative soil samples collected within the contamination zone. Alternatively, a six-inch layer of soil will be removed from the entire grid, managed according to the permit, and placed in an active landfill. Sampling and analysis shall then be repeated in areas that were identified as contaminated during the initial sampling to demonstrate that the contamination has been completely removed.

Soils will be considered decontaminated when the analytical results indicate the criteria for soil pH and the parameters listed in UAC R315-261-1093 have been met. Test methods and procedures will be those specified in Attachment II, Waste Analysis Plan. Contaminated soils will be transferred to a RCRA or RCRA/TSCA cell at CHGM or to an off-site permitted hazardous waste disposal facility.

6.2.8 Personal Protective Equipment

The personnel involved in the decontamination process will be equipped with appropriate personal protective equipment as designated by the closure safety officer.

6.2.9 Decontaminate Equipment Used

Equipment used in the decontamination process will be decontaminated or disposed of according to the procedures in this plan.

6.3 SURFACE IMPOUNDMENT UNIT DECONTAMINATION

Surface Impoundment A is a triple-lined (two synthetic, one clay) with primary and secondary leak detection systems. The components include a clay liner and berms, 80 mil HDPE primary liner, 100 mil secondary liner, PVC and HDPE piping, synthetic drainage net, geotextile fabric, concrete pipe supports, gravel drainage media, and stone mulch/rock armor for exterior berm protection.

Surface Impoundment B will be double-lined with a 60-mil geomembrane top liner system, a 60-mil HDPE geomembrane, and 3-foot compacted clay bottom. A drainage layer consisting of geonet will provide for a leak detection system between the two synthetic liner systems (Module V).

The surface impoundments will be clean closed in accordance with the closure standards in UAC R315-264-111. Hard surfaces in the unit will be cleaned as indicated in Section 6.0, Criteria for Evaluating Decontamination. The hard surfaces may be disposed of instead of decontaminated at the discretion of the CHGM.

6.3.1 Remove Wastewater

Wastewater will be removed (may be allowed to evaporate) and solid residue will be managed in accordance with Attachment II – RCRA-TSCA WAP.

6.3.2 Clean the Surfaces

The liners and drainage nets will be cleaned to a hard surface standard. Rinse waters will be treated based on the waste codes managed in the surface impoundment. To estimate closure costs, CHGM assumed the rinse waters will be disposed of as leachate.

6.3.3 Remove the Primary and Secondary Surfaces

The liners and drainage nets will be cut into manageable sections for disposal. These may be reused at CHGM or other hazardous waste facilities. CHGM assumed that the liner would be disposed of to estimate closure costs.

6.3.4 Remove the Geotextile Surfaces

The geotextile under-layer will be removed and cut into manageable sections for disposal. These may be reused at CHGM or other hazardous waste facilities. CHGM assumed that the geotextile would be disposed of to estimate closure costs.

6.3.5 Remove the Leachate Collection System

The leachate collection system components will be removed for disposal. These may be reused at CHGM or other hazardous waste facilities. CHGM assumed that the geotextile would be disposed of to estimate closure costs.

6.3.6 Examine the Clay Liner

Personnel will:

1. Examine the clay liner for visual evidence of contamination.
2. Collect grab samples of the visually contaminated areas.
3. Analyze the samples for parameters appropriate for the waste managed in the surface impoundment.
4. Remove visually contaminated soil for disposal (assumed to be landfill disposal) if required, based on the analyses of the samples.
5. If no visual contamination is found, samples will be collected and analyzed from the sumps, which are the most likely to be contaminated. The results will determine whether the clay must be disposed of or may be reused.

6.3.7 Clay Liner Removal

Uncontaminated clay liner will be left in place or removed and stockpiled for future use.

6.3.8 Groundwater Monitoring Wells

Upon closure of the surface impoundment, personnel will:

1. Continue sampling groundwater monitoring wells utilized for monitoring of the surface impoundments.
2. Sample these wells and analyze the samples in accordance with Module VII of the Permit.
3. Continue routine groundwater monitoring for one year after closure.
4. Review the data collected for this final year, as well as the complete historic monitoring results.
5. Ensure that no statistically significant hazardous contamination has been detected.
6. If no contamination has been detected, abandon the monitoring wells in-place or remove them in accordance with regulatory or industry-established standards.
7. If contamination is detected in any of the three groundwater monitoring wells, follow the procedures specified in Modules VII & VIII for corrective action.

7.0 CRITERIA FOR EVALUATING DECONTAMINATION

7.1 CLOSURE OF "HARD SURFACE" WASTE TREATMENT OR CONTAINMENT ITEMS

Closure of "hard surface" items (steel tanks, concrete containment, equipment, HDPE liners, etc.) is performance-based and any cleaning method may be used to achieve the standard. The standards for successful decontamination vary with the disposition of the items being decontaminated as described in the following paragraphs.

7.1.1 Items Allowed Unrestricted Use

An item is considered decontaminated when decontamination rinse water meets the parameters and concentration limits listed in Section 6.3.

7.1.2 Left On-Site or Sold to an Equipment Broker, for which No End User Is Known

An item is considered decontaminated when the visual standard for a clean debris surface set forth in UAC R315-268-45 and Module I of this permit is met, at least 10% of like items from a given waste management unit have been rinsed, and the decontamination rinse water meets the parameters and concentration limits listed in Section 6.3.

7.1.3 Items To Be Used in Industrial Services that Are Not Related to Food, Feed, or Drinking Water, or Are To Be Scrapped for Remelt

An item is considered decontaminated when the visual standard for a clean debris surface is met.

7.1.4 Items Being Sold for Reuse in Used Oil Service, Low Level Radioactive Waste Service, or Other Industrial Services Approved by the Director

An item is considered decontaminated (without disassembly) after a single pass with a pressure washer, sandblaster, or equivalent means is used to remove residue from the interior of the equipment and the exterior is cleaned to either the rinsate standard in Section 6.3 or the visual standard for a clean debris surface.

7.1.5 Items Being Sold for Reuse in Hazardous Waste Service

An item is considered decontaminated (without disassembly) after a single pass with a pressure washer, sandblaster, or equivalent means is used to remove residue from the interior of the equipment and the exterior is cleaned to either the rinsate standard in Table D.4 or the visual standard for a clean debris surface. If the unit is not to be containerized during shipment, the exterior must be cleaned to either the rinsate standard or the visual standard for a clean debris surface.

7.1.6 Debris To Be Disposed of in a RCRA Landfill

For debris that will be disposed of in a RCRA landfill cell, it is considered decontaminated after a single pass with a pressure washer, sandblaster or equivalent means is used to remove residue.

7.1.7 Numerical Standards for PCB Decontamination

Target levels for PCBs will be consistent with the Regional Screening Level (RSL) Summary Table for industrial soils. The version of the RSL to be used will be the current version at the time of closure.

7.2 DECONTAMINATION RESIDUALS MANAGEMENT

7.2.1 Determine Disposal Method

CHGM will determine the appropriate disposal method of residual wastes generated during closure utilizing the regulatory standards.

7.2.2 Solids

CHGM will treat solids if required. The treated solids will be landfilled. Solids that meet the LDR standards will be landfilled without treatment.

7.2.3 Wash and Rinse Water

Wash and rinse water or other cleaning residues will be collected and handled as hazardous waste. The closure cost estimate assumes that 5% of these residues will need to be treated, stabilized, and landfilled and the liquids will be disposed of off-site. However, it is possible that the wastewater may also be stored in the leachate storage tanks and disposed of as leachate. Wash water may be stabilized on-site, treated at a facility with a National Pollutant Discharge Elimination System (NPDES) permit and discharged, deep well injected, or incinerated. The method used will be decided at the time of closure based upon site availability, regulatory approvals, and economics. The closure cost estimate assumes that liquids are sent to a facility with a NPDES permit and discharged.

If wash or rinse water is contaminated with PCBs, the wash or rinse water will be incinerated.

7.3 DECONTAMINATION STANDARDS

7.3.1 Hard Surfaces

Hard surfaces include concrete surfaces, metal building materials, metal equipment, and other non-porous materials. CHGM will perform all decontamination within secondary containment so that wash waters can be collected and sampled. Concrete surfaces will be hydroblasted with an appropriate industrial strength detergent solution. Wash water will be collected in sumps or within secondary containment. Representative rinsate samples will be collected from sumps or secondary containment areas from the final rinse water.

Decontamination will be considered acceptable when the rinsate analytical result produces a TOC level of less than 50 ppm or less than 1 ppm of UAC R315-261, Appendix VIII constituents at no greater than maximum contaminant levels for drinking water, and pH between 6 and 9. Test methods will be those specified in Attachment II - Waste Analysis Plan.

If test results fail to meet the decontamination standards, the area or piece of equipment must be decontaminated again. This must be repeated until the standard is achieved.

Contaminated rinse water will be collected for either on-site treatment or for disposal at a permitted hazardous waste disposal facility.

7.3.2 Soils

A soil is defined as all soil media and includes soils adjacent to permitted units, soils collected from beneath sumps and secondary containment, roadways, and any other soil that is excavated during the closure activities.

Metals, volatile, and semi-volatile compounds shall meet the industrial levels established in the most current version of the RSL Risk Assessment Summary Table. Soils will be determined to be clean if the constituents present in UAC R315-261 Appendix VIII are at or less than the RSL levels and the sum risk from multiple contaminants equal the following:

- For carcinogens, the total cancer risk must be $\leq 1 \times 10^{-6}$.
- For all other contaminants (the non-carcinogen) for which there is a detection, the Total Hazard Index must be ≤ 1.

7.3.3 Accumulated Risk (Based on the EPA RSL)

Using RSLs to Sum Risk from Multiple Contaminants

RSLs can be used to estimate the total risk from multiple contaminants at a site as part of a screening procedure. This methodology, which does not substitute for a baseline risk assessment, is often called the "sum of the ratios" approach. A stepwise approach follows:

1. Conduct sampling and perform analysis in accordance with the WAP.
2. Identify contaminants in the RSL Table. Record the screening level (SL) concentrations of the various contaminants and note whether the SL is based on cancer risk (indicated by 'c') or noncancer hazard (indicated by 'n'). Segregate cancer SLs from non-cancer SLs.
3. For sampling scenarios that have at least eight samples, a statistical approach to data evaluation can be used on a case-by-case basis when approved by the Director. Evaluations that use this approach can use a program developed by the EPA called ProUCL (or similar). For cancer risk estimates, the site-specific concentration (maximum or 95th percent of the upper confidence limit (UCL) on the mean) is divided by the SL concentrations that are designated for cancer evaluation 'c.' This is multiplied by a ratio by 10^{-6} to estimate chemical-specific risk for a reasonable maximum exposure. For multiple pollutants, the risk is added for each chemical. See equation below.

$$\mathrm{CR} = \left[\left(\frac{CC_1}{SV_1}\right) + \left(\frac{CC_2}{SV_2}\right) + \left(\frac{CC_3}{SV_3}\right) + \cdots + \left(\frac{CC_n}{SV_n}\right)\right] \text{ x } 10\text{-}6 \qquad \text{(Eq. 1)}$$

4. For non-cancer hazard estimates, the concentration term is divided by its respective non-cancer SL (indicated by 'n') and the ratios for multiple

contaminants are summed. The cumulative ratio represents a non-carcinogenic hazard index (HI). An HI of 1 or less is generally considered 'safe'. An HI greater than 1 suggests further evaluation is needed. Note that carcinogens may also have an associated non-cancer SL that is not listed in the RSL Table. To obtain these values, the user should view the Supporting Tables. See equation below:

$$HI = \left[\left(\frac{CC_1}{SV_1}\right) + \left(\frac{CC_2}{SV_2}\right) + \left(\frac{CC_3}{SV_3}\right) + \cdots + \left(\frac{CC_n}{SV_n}\right)\right] \text{ x } 1 \qquad \text{(Eq. 2)}$$

Where:

HI = Hazard Index

CR = Cancer Risk

CC = Contaminant Concentration

SV – Screening Values (RSLs)

n = Number of Contaminants

Soils that exceed either the Total Cancer Risk or the Total Hazard Index must be disposed of in a permitted landfill cell. Soils that meet or are less than the established value can be left in place.

8.0 CLOSURE CAPPING OF LANDFILL CELLS

8.1 FINAL COVER SYSTEM

Closure of CHGM will require the application of the designed final cover system to all open hazardous waste landfill cells at the facility. All such landfill cell closures shall meet federal and state regulatory requirements, conditions of the CHGM permit, and conditions of this closure plan.

8.2 INTENT TO BEGIN CLOSURE

Notification of intent to begin closure activities for an individual landfill cell or for partial/final closure of CHGM will include a unit-specific closure plan application for final cover. CHGM shall submit this plan for Director approval. Typical major components of a closure application for the final cover of any cell are listed below:

8.3 DESIGN ENGINEERING REPORT (DER)

A Design Engineering Report (DER) with commentary that may include such design considerations as:

- Preparation of waste mound materials and surface prior to placement of final cover;
- Design considerations to accommodate settlement and subsidence of the final cover considering initial settlement, primary and secondary consolidation, slope stability, and all historic experience concerning these issues at the site;

- Design modifications to reflect recent technological advancements of any portion of the design or Construction Quality Assurance Plan (Attachment VI-2). This will include design changes that result from site-specific (or other related) experience concerning a design or construction element.

8.3.1 Engineering Drawings

Engineering Drawings for the final cover of the specific cell, which demonstrate that the regulatory requirements have been met.

8.3.2 Construction Quality Assurance Plan (CQA)

The most recent CQA (Attachment VI-2) approved for landfill construction by the regulatory authority applicable to the cell(s) designated for closure.

8.3.3 Closure Plan Approval Application

The application for closure plan approval for CHGM includes an engineering report and any necessary engineering drawings and specifications for the disposal of all treated leachate from the closed units during closure activities and the post-closure period.

8.3.4 Closure Certification

Final cover closure activities shall meet the closure certification requirements outlined in Section 11.

9.0 GROUNDWATER MONITORING REQUIREMENTS

The groundwater monitoring requirements during partial or final closure are the same as they were during CHGM operation (permit Module VII). Module VII requires groundwater monitoring of all landfill disposal units at CHGM, including those subject to UAC R315, RCRA, and TSCA for the PCB Cells on site.

Module VII allows routine operational, closure and post-closure groundwater monitoring for the TSCA waste management units to be governed by EPA's Coordinated Approval for these units. These approvals are more stringent than or equivalent to the Module VII requirements.

The site will maintain the groundwater monitoring protection program, including all monitored wells active at the time of closure. Table D.5 provides a current list of all the existing CHGM land disposal units and their associated number of monitoring wells.

10.0 ANCILLARY CLOSURE ACTIVITIES

During either partial or final closure, several activities will be necessary to ensure that the closure activity will satisfy regulatory requirements. These will include leachate management, run-on/run-off control, and site security.

10.1 LEACHATE MANAGEMENT

10.1.1 Leachate & Landfill Cells

During the closure process, CHGM will continue to manage leachate within the landfill cells according to permitting requirements.

Management of Leachate and Leachate Collection Systems

CHGM will manage leachate and leachate collection and removal systems in accordance with permit Module VI and applicable regulations.

10.1.2 Monitor and Maintain Records

CHGM will monitor and maintain records for each leak detection/collection system in accordance with the requirements of Module VI of the permit.

10.1.3 Leachate Storage

CHGM will collect and store leachate in the leachate storage tanks prior to shipping the leachate off-site for disposal. To develop a closure cost estimate, CHGM assumed that off-site disposal will be used. However, any appropriate treatment or disposal method available at the time of closure may be utilized at the discretion of the CHGM.

10.1.4 Routine Maintenance

CHGM will perform all routine maintenance and repairs necessary for the proper operation of the leachate management system.

10.2 RUN-ON/RUN-OFF CONTROL

Run-On/Run-Off control refers to the non-contaminated precipitation at the site. CHGM shall manage the site-wide run-off control in the same predominantly passive manner as during normal operations, utilizing the site grading, collection system, and collection basins. This in-place system will be maintained during the closure period.

10.3SECURITY/INSPECTION

10.3.1 Security

CHGM will maintain security during final closure in accordance with the regulatory requirements, and in accordance with Module II and Attachment II-2 of the RCRA permit.

CHGM will provide additional security measures during partial closure activities as required by the Health and Safety Plan applicable to that closure activity.

10.3.2 Inspections

CHGM will conduct inspections in accordance with Module II and Attachment II-3 for waste management units still storing and/or managing waste except that:

1. CHGM may cease conducting inspections for a storage and/or treatment unit that has been certified by an independent, Utah-registered Professional Engineer

as being closed in accordance with this closure plan. The inspection form for that unit may be annotated until it is removed from the permit via a permit modification.

2. After waste is removed from a treatment and/or storage unit, CHGM is no longer required to have or maintain the emergency equipment specified in the contingency plan for that unit as long as: a) any closure work that is completed in that unit is assigned using a work permit, and b) workers are issued a list of emergency equipment necessary for the type of work being performed.
3. During the closure of a unit, CHGM may replace emergency equipment specified in the contingency plan with different but equivalent equipment.
4. CHGM will record on the appropriate inspection form when closure activities or the status of the unit being closed preempt or negate the need for the standard inspection requirements.
5. CHGM will continue performing standard inspections that require looking for spills, leaks, abnormal conditions, etc. Where inspections are not otherwise required, these inspections will be performed each day closure work is performed in an area.

10.4 FINAL/PARTIAL CLOSURE APPLICATION FOR PLAN APPROVAL

All closure activities require notification of the pending activity (and accompanying plan modifications) to reflect changed conditions, as appropriate. The application for plan approval of affected closure activity must address required changes to all the major components outlined by this site-wide closure plan or any unit-specific closure plan. This may include, for example, the closure schedule, engineering requirements, groundwater monitoring, and/or other ancillary closure activities.

11.0 SURVEY PLAT

CHGM will commission a survey plat indicating the location and dimensions of the closed landfill cells with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor.

- CHGM shall file the plat with Tooele County. The filing shall contain a note, prominently displayed, which states CHGM's obligation to restrict disturbance of the hazardous waste disposal unit in accordance with the applicable post-closure requirements.
- The survey plat must be submitted to the Director of the Division of Waste Management and Radiation Control (DWMRC).
- The plat must be filed with Tooele County and submitted to the Director no later than the submission of the certification of closure of each hazardous waste disposal unit or facility.

12.0 CLOSURE CERTIFICATION

Within 60 days of completion of closure of a waste management unit or the facility, CHGM must submit, by registered mail or other proof of delivery, certification that the facility has been closed in accordance with the specifications in this Closure Plan. An independent Utah-registered

professional engineer qualified by experience and education in the appropriate engineering field must sign the certification.

13.0 COMPLETE UNIT AND FINAL FACILITY CLOSURE SCHEDULE

CHGM will submit a disposal unit plan closure application for Director approval that will include:

- A schedule of closure activities.
- An estimate of the total time required to completely close each unit.
- An estimate of the time required for complete removal of any inventory to assure regulatory compliance.

Table D.6. presents an estimated 24-month schedule of activities for final facility closure. The activities described are based on existing facility conditions. Complete closure of a storage and/or treatment unit will be conducted in accordance with the schedule presented in Table D.6 unless an alternate schedule is approved by the Director.

The estimated time frame begins with the start of closure, assuming 60-day notification to begin closure and initiation of work within 30 days of receipt of the last waste. The 90-day requirement for complete waste inventory management is included. The submittal of final closure certification and filing the survey plat with the local land authority within 60 days of completion are included in the last two months.

The projected 24-month completion of final site wide facility closure will exceed the regulatory requirement of 180 days. However, this is necessary based on the size and complexity of the current overall operation. The maximum extent of operations predicts that two landfill cells will be operational prior to final site wide closure. However, this closure plan and respective closure cost estimate acknowledges that currently three RCRA landfill cells are operational. Since these units require extensive efforts for closure governed by construction quality assurance issues that require efforts and physical conditions that are restricted during 4-5 months of the winter season, the final facility closure will, of necessity, require more than the statutory 180 days to complete.

During this extended time frame, as well as throughout the closure period, the CHGM will continue to take all steps to prevent threats to human health and the environment from the unclosed non-operating portions of CHGM. This effort is supported by the requirements to continue all monitoring and maintenance of CHGM in accordance with the permit throughout the closure period.

14.0 CONTINGENT CLOSURE REQUIREMENTS

There are no units located at CHGM currently subject to state and federal contingent closure plan requirements. If, at the time surface impoundments are closed, unexpected conditions are found which prevent closure in accordance with the requirements of this closure plan, an amendment to the closure plan shall be prepared and submitted as provided for in state and federal regulations.

15.0 FINANCIAL REQUIREMENTS FOR CLOSURE

The cost estimates provided reflect the closure costs for the CMF and DFBWO as separate closure efforts. Since closure of the CMF will likely occur at the time of site wide closure, the certification

costs would be redundant and have been subtracted from the site wide closure. The closure cost worksheets are organized as follows:

- Individual unit-specific CMF Cost Worksheets (Tables B.1 through B.4).
- Sitewide closure (CLO) Worksheets (Tables B.6 through B.12).
- Appendix C - Cost Documentation Appendix (CDA) - discussion and analysis worksheets supporting the estimated costs (Tables C.1 through C.11).

15.1 Closure Cost Estimate Support Information

The Closure Cost Worksheets in Appendix B provide the information utilized to develop the cost estimates provided in Appendix A. Additional details of the estimates and references are provided in Appendix C (CDA). The CDA provides tables outlined to generally follow the order of the Worksheets in Appendix B.

15.2 Container Management Facility Closure Cost Worksheets

The closure cost worksheets for the CMF provided in Appendix B, Tables B.1 through B.4, provide the information utilized to develop the CMF Closure Cost Estimate provided in Table B.5. The CMF Closure Cost Estimate generally follows the order of the worksheets.

15.3 Drain & Flush Building Warehouse One Closure Cost Worksheets and Bulk Solids Storage Area Closure Cost

The Closure Cost Worksheets for the DFBWO and BSSA are provided in conjunction with the closure cost CMF Worksheets in Appendix B. Quantities and other information utilized to develop the Closure Cost Summary in Table B.5 are found in Tables B.1 through B.4 and Appendix D. The CMF, DFBWO, and BSSA Closure Cost Estimate generally follows the order of the Worksheets.

15.4 Site-Wide Closure Cost Estimate Support Information

The Site-Wide Closure Cost Worksheets provided in Appendix B, Tables B.6 through B.12, provide the information utilized to develop the site-wide Closure Cost Estimate provided in Appendix A. The site-wide Closure Cost Estimate generally follows the order of the Worksheets.

B. POST-CLOSURE PLAN

1.0 INTRODUCTION

This facility post-closure document is set forth to comply with the financial requirements of applicable state and federal regulations. The contents apply to CHGM, EPA ID UTD991301748. All portions of the permitted facility, which are interpreted to be affected by the post- closure requirements, are listed in Section 2.1 of this post-closure plan.

This plan sets forth the necessary actions and requirements, which could reasonably be expected, for post-closure care of CHGM. The post-closure monitoring and maintenance will, to the extent practicable, be developed to detect, in a timely manner, and prevent 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.

Post-closure care for all affected units will commence, in accordance with this plan, upon completion of closure requirements and issuance of any approved modifications of same.

2.0 FACILITY POST-CLOSURE REQUIREMENTS

2.1 AFFECTED HAZARDOUS WASTE MANAGEMENT UNITS

Post-Closure care is required for all hazardous waste management units (HWMUs) at which hazardous wastes will remain after closure. Based on the current permit for CHGM, the landfill units are the only HWMUs subject to post-closure care. CHGM has 13 existing landfill disposal units, 10 of which are approved under the RCRA permit.

- RCRA Cells 1, 2, 3, 4, and 5 (closed)
- RCRA/TSCA Cells B/6, 7, and 8 (active)
- Industrial Cells 1 and 2 (closed). These were closed as RCRA cells due to improper disposal of waste and are managed according to post-closure requirements.
- TSCA Cells X, Y, & Z are regulated by EPA Region 8 and are not subject to this permit. TSCA Cells X and Y are closed.

RCRA/TSCA Cells 9, 10, 11, 12, and 13 have been permitted but not constructed. See Attachment II-1 for the cell configuration.

RCRA Permit Module VII – Groundwater Monitoring Protection - covers that portion of the groundwater monitoring program for the TSCA cells that is not addressed by TSCA. The TSCA program covers Class 1 volatiles and semi-volatiles and Class 3 parameters.

2.2 MONITORING AND MAINTENANCE ACTIVITIES

After final closure of any landfill cell, the CHGM shall comply with the monitoring and maintenance requirements of the plan approval and UAC R315-264-310 that includes, at a minimum, the following:

- Groundwater monitoring and administrative reporting requirements;
- Required maintenance of the groundwater monitoring system;

- Operation of the leachate collection/detection and removal system until such time as leachate generation accumulates at a rate too small to pump. This shall include all administrative reporting requirements of the permit;
- Maintenance of the integrity and effectiveness of the final cover, including repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
- Prevention of erosion of the final cover of any unit or cell from run-on and run-off;
- Protection and maintenance of surveyed benchmarks.

The specific activities detailed below include all tasks that could reasonably be expected during the post-closure care period. Typical monitoring and maintenance inspection, maintenance and operational tasks, and the expected frequency are discussed below.

2.2.1 Groundwater Monitoring

In accordance with state and federal regulations, the CHGM shall conduct post-closure groundwater monitoring activities for the HWMUs consistent with the most current plan approval conditions for these units. These conditions are outlined and set forth in Module VII of the permit.

The current conditions delineated in Module VII and Module II have been utilized for the purpose of projecting post-closure activities and estimating post-closure costs. The groundwater monitoring program at CHGM includes all monitoring wells defined in Module VII for the RCRA Waste Management Units at the time of closure. Of the 108 wells currently on site, 81 are actively monitored under the permit. Maintenance costs for all 108 wells are considered in the closure and post-closure cost estimate. Monitoring and reporting costs in addition to maintenance costs are included in the closure and post-closure cost estimate for the 81 active wells under the permit. The current annual groundwater monitoring, reporting, and maintenance costs (tabulated in Table B.10: Worksheet CLO-5).

2.2.2 Leachate Management

In accordance with state and federal regulations, the CHGM shall continue to operate the leachate collection and leak detection systems associated with each of the RCRA HWMUs until leachate generation accumulates at a rate too small to pump with the existing pumps as defined in Table D.7. As presented in Table D.7, if pumping has been moved to a less frequent schedule and pumping produces more leachate than would have been produced at the previous frequency, then the pumping frequency will return to the previous frequency. This logic is repeated in the table. Any existing data may be used to determine the starting frequency during post-closure.

The management of these systems shall comply with the operational and reporting requirements in state and federal regulations of and applicable requirements contained in Module VI of the permit. The current permit conditions and operational procedures for leachate management have been utilized for the purpose of projecting post-closure activities and estimating post-closure costs as described in Table C.7 (CDA). Leachate Management Costs over a two-year period are discussed in the CDA and estimated in Table B.11 (Worksheet CLO-6) and in Section 9.1,

"Leachate Management". No solid residuals are expected to be generated from collecting leachate from closed cells over the post-closure period. The total post-closure annual costs for leachate collection and disposal efforts exclude solids disposal. This method of estimating leachate costs is believed to be conservative based on a reasonable expectation that reduced rates of leachate generation will result at the closed cells over time.

2.2.3 Maintenance Activities

In accordance with state and federal regulatory requirements and applicable plan approval conditions, the CHGM shall maintain the integrity and effectiveness of the final cover, including making repairs as necessary to correct the effects of settling, subsidence, erosion, or other events that could reasonably be expected to occur over the 30-year post-closure period. These maintenance activities include maintenance of the leachate management system and groundwater monitoring system as necessary. Groundwater monitoring system maintenance costs are included in the sampling and analysis cost estimates.

2.2.3.1 Routine Inspections

Routine inspections of pertinent facility systems are required by this plan and applicable regulations. Typical inspection items are listed below as a guide for the monitoring and inspection of CHGM at such time when no hazardous waste operations are taking place. During facility operations, the units in "post-closure status" will be inspected and monitored in accordance with the operations inspection schedule presented in Module II.

Typical inspection items will include monthly site perimeter & general facility checks for items listed in this Post Closure Plan, such as; well integrity, locks, leachate risers integrity, leachate pump function (during leachate management), site and perimeter security and signage, etc.

Typical landfill cell checks will be performed monthly and after severe weather events to include observation for erosion, standing liquids, subsidence, burrows, and any deterioration of final cover, runoff management systems.

2.2.3.2 Maintenance of Waste Containment Systems

Maintenance of the final cover of any disposal cell shall be performed to comply with the permit conditions stated within. It is expected that an annual maintenance operation will be required to meet the needs of CHGM. This annual operation will include replacement of soils lost to erosion which might threaten the integrity of the cover, maintenance of the drainage channels and culverts which direct any run-off away from the unit, controlling burrowing rodents as necessary to counter infestations, and control measures to prevent growth of woody or deep- rooted plants which might damage the integrity of the final cover.

2.2.3.3 Maintenance of the Leachate Management System

Maintenance of the leachate management system will include maintenance of the leachate evacuation pumping systems, temporary leachate storage units and other pertinent portions of the leachate collection/detection systems during such time as leachate is generated in quantities, which are able to be pumped. The leachate is expected to be managed at an appropriately permitted off-site treatment and disposal facility. The leachate collection/detection systems may be expected to occasionally require replacement of pumps and miscellaneous routine maintenance of equipment. These costs are estimated in Table C.6 (Appendix C, CDA).

2.2.3.4 Maintenance of the Groundwater Monitoring System

The groundwater monitoring system will require routine and non-routine maintenance throughout post-closure. It is expected that pump repair and replacement and other minor maintenance will be required, and these costs have been included in the semi-annual groundwater monitoring cost (Table C.4).

2.2.3.5 Maintenance of the Security System

The maintenance of the security system for this facility is expected to be minimal due to its remote location. Any security fencing and gates provided will be maintained and warning signs surrounding CHGM will be maintained and replaced as necessary to prevent the inadvertent entry of unauthorized personnel.

2.2.4 Post-Closure Care During Facility Operation

It should be noted that there will be numerous units in post-closure status and care while CHGM is still operating under the current and future permits. All maintenance and inspections of units in post-closure will be performed during the normal operation of CHGM while it is still operational. This cost estimate is, therefore, believed to be conservative.

2.2.5 Post-Closure Contact

The anticipated post-closure contact for CHGM is stated below. CHGM will make the necessary modifications to the designated contact below at the time of final closure.

Clean Harbors Environmental Services, Inc.
42 Longwater Drive
P.O. Box 9149
Norwell, Massachusetts 02161-9149
(781) 792-5000
Post-Closure Care Notices

The CHGM shall, no later than 60 days after certification of closure of each hazardous waste disposal unit, submit records to the local zoning authority and the DWMRC Director.

In addition, CHGM shall, within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, record, in accordance with state law, a notice on the deed which meets state and federal requirements. CHGM shall submit a certification that such notice has been executed to the Director of the DWMRC.

2.2.6 Post-Closure Certification

CHGM shall, no later than 60 days after the completion of the 30-year post-closure period for any hazardous waste disposal unit, submit a certification to the Director stating that all post-closure requirements have been completed in accordance with this plan and any required modifications of same.

3.0 FINANCIAL REQUIREMENTS FOR POST-CLOSURE

The post-closure cost estimates reflect the state and federal financial requirements.

3.1 POST-CLOSURE CARE COST ESTIMATES

Table A.3 provides post closure cost estimates. Additional information is found in Tables C.7 and C.8 (Appendix C, CDA).

C. FINANCIAL ASSURANCE MECHANISM

1.0 FINANCIAL ASSURANCES

1.1 FINANCIAL ASSURANCE FOR CLOSURE

This permit and UAC R315-264-143 require CHGM to provide assurances that there will be funds available to close the facility sometime in the future and to guarantee that closure can be performed by a third party, if for some reason CHGM is unable to do so itself. Table A.1 provides the minimum dollar amount CHGM shall guarantee for financial assurance in 2023 dollars. This figure will be updated at least annually in response to inflation and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee the Closure Costs:

- Closure Trust Fund
- Surety Bond Guaranteeing Payment into a Closure Trust Fund
- Surety Bond Guaranteeing Performance of Closure
- Closure Letter of Credit
- Closure Insurance
- Financial Test and/or Corporate Guarantee.

CHGM shall use one of these financial assurance mechanisms for the Grassy Mountain facility. CHGM shall submit the financial assurance documentation or certification of such documentation to DWMRC, where it will be kept on file. CHGM shall comply with the applicable rules for the selected financial assurance mechanism for closure.

1.2 FINANCIAL ASSURANCES FOR POST-CLOSURE

R315-264-145 UAC and this permit require CHGM to provide assurances that there will be funds available to maintain the facility throughout the post-closure period and to guarantee that a third party can perform post-closure care if for some reason CHGM is unable to do so itself. Table A.3 provides the minimum dollar amount to be guaranteed for financial assurance in 2023 dollars. This figure will be updated at least annually in response to inflation, and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee Post-Closure Care:

- Post-closure Trust Fund
- Surety Bond Guaranteeing Payment into a Post-Closure Trust Fund
- Surety Bond Guaranteeing Performance of Post-Closure Care
- Post-Closure Letter of Credit
- Post-Closure Insurance
- Financial Test and Corporate Guarantee for Post-closure Care.

CHGM shall use one of these financial assurance mechanisms for Grassy Mountain. CHGM will submit the financial assurance documentation or certification to DWMRC,

where it will be kept on file. CHGM shall comply with the applicable rules for the selected financial assurance mechanism for post-closure.

1.3 LIABILITY REQUIREMENTS

CHGM maintains liability insurance for sudden accidental occurrences, as required by R315-264-147 and Module II.Q.1. of the permit. CHGM submits the certificate of liability insurance to DWMRC, where it is maintained on file.

1.3.1 Variance Procedures and Adjustments by the Regional Administrator

CHGM has no plans to use variance procedures or adjustments, therefore this section is not applicable. No known adjustments have been made by either the Regional Administrator or the DWMRC Director.

1.3.2 Use of State Required Mechanisms

CHGM is not covered by any state financial mechanism, therefore this section is not applicable.

1.3.3 State Assumption of Responsibility

This section is not applicable to CHGM.

D. PCB COMMERCIAL STORAGE CLOSURE COST ESTIMATE

1.0 ANNUAL REVIEW OF INITIAL COST ESTIMATE

This section includes the estimated cost of closure activities including sampling, transportation, disposal, equipment costs, and labor. Disposal cost estimates are based on 2023 industry pricing. The cost of closure estimates shall be adjusted annually for inflation and may be adjusted for changes in market conditions.

2.0 CLOSURE COST ESTIMATE FOR PCBS

The PCB and used oil sample analysis costs for oil, water, soil, and wipe are based on quotations from one or more suitable laboratories, as defined in the WAP. CHGM shall sample uncoated concrete surfaces using destructive core sampling. CHGM shall wipe sample coated (impervious) concrete surfaces if in good condition.

2.1 TANK FARM

2.1.1 PCB Oil (TSCA) and Used Oil (RCRA) Disposal Charges

Disposal charges for used oil (RCRA) are presented in Table A.4.

3.0 REVIEW AND ADJUSTMENT OF COST ESTIMATE

Adjustments to the cost estimate are required in two situations: (1) after certain modifications to the closure plan, and (2) annually to account for inflation. These situations are described below.

The owner/operator will revise the cost estimates within 30 days of Regional Administrator approval of any closure plan modification that increases the costs of closure. The following changes in facility conditions or activities could increase the closure cost estimate:

- An increase in facility size and/or capacity;
- An increase in the estimate of maximum inventory;
- Changes in regulatory requirements that affect the costs of closure activities;
- Contingencies over the operating life of CHGM which affect the types of activities that will be required at closure (e.g., the occurrence of a spill necessitates additional closure activities); or
- Changes in surrounding land use (e.g., an increase in population density surrounding CHGM warrants increased security provisions).

The owner/operator may also request that a reduction in the cost estimate be allowed if costs decrease. The following changes in facility conditions may justify a decrease in the closure cost estimate.

- Reductions in the size of CHGM remaining to be closed over the remaining life of the facility;
- Changes in operating processes reduce the quantities of PCBs to be handled at the time of maximum estimated inventory;
- Reductions in costs of closure activities or disposal.

- Changes in regulations that allow for different disposal options than identified in the plan.

4.0 PCB CLOSURE PLAN

4.1 FACILITY DESCRIPTION

4.1.1 General description

The PCB storage and transfer facility is near the PCB permitted landfill cells, and all are within the fenced perimeter of Grassy Mountain. The storage and transfer unit consists of a warehouse (DFBWO) and an unenclosed tank farm.

4.1.2 Jurisdiction In Which Facility Is Located

CHGM is located at the eastern edge of the Great Salt Lake Desert of Tooele County, Utah. It is approximately three miles east and seven miles north of the Knolls, Exit Number 41, off Interstate 80.

Latitude 40° 49’ 00" North, Longitude 113° 12’ 30” West
Township 1 North; Range 12 West; Section 16, plus a ½-mile perimeter buffer around the section.

The site address and contact telephone number is:

Clean Harbors Grassy Mountain, LLC Exit 41, Off I-80
3 Miles East, 7 Miles North of Knolls Grassy Mountain, Utah 84029
435-884-8900

4.1.3 Written Description and Topography

4.1.3.1 PCB Storage Facilities/Buildings and Structures

The PCB transfer and storage unit consists of DFBWO and the PCB Tank Farm. DFBWO is an enclosed building with bermed storage areas inside used for PCB item storage, PCB transformer drain and flush operations, and storage of PCB liquids in two 3,000-gallon storage tanks. Items stored in DFBWO include PCB oil, Askarel (pure PCB), other PCB contaminated liquids, transformers, capacitors, and debris. The concentrations of PCBs managed range from 0 to 1,000,000 ppm PCB. DFBWO is also permitted to store mercury containing materials and to consolidate elemental mercury.

The unenclosed, bermed tank farm contains six total tanks. Four of the tanks may be used to store PCB liquids, one tank can store clean diesel fuel / used oil and one can store clean oil. Tank number 5 is designated to store PCB contaminated water and Tanks 1, 2, and 4 are designated to store any type of bulk PCB liquids.

4.1.3.2 PCB Treatment and Disposal Facility

This section is not applicable.

4.1.3.3 Hazardous Waste Management Units

DFBWO has permitted hazardous waste storage in Areas 1 – 4. These are described in Module III of the permit and A.6.1 of this attachment.

4.1.3.4 100-Year Flood Plain

This facility is above any 100-year floodplain. The lowest point of elevation is 4,220 feet.

4.1.3.5 Adjacent Surface Waters or Wetlands

There is a constructed storm water run-off pond for the PCB landfills that EPA has identified as surface water. There are no surface waters within 1,400 feet of DFBWO. CHGM shall contain all storm water on CHGM property.

4.1.3.6 Surrounding Land Uses

CHGM is in the Great Salt Lake desert. The only other company in proximity is the Amax Magnesium Company, which is intermittently active. The Utah Test and Training Range is approximately 7 miles north of CHGM, and most of the surrounding land is managed by the Bureau of Land Management.

4.1.3.7 Other Key Topographic Features

CHGM is in the Salt Lake Basin.

4.1.3.8 Traffic Patterns

From the east, trucks may approach DFBWO on the road that is bounded by PCB Landfill Cells X and Z on the north and Landfill Cell B/6 on the south. From the north, trucks may approach on the same road bounded by Cells X and Y on the east and operations units on the west. All road surfaces are clay and lime fines mixtures. Brine water from a well located in the adjacent Grassy Mountains is spread on the road surface for dust control. There are no special weight restrictions.

4.1.3.9 Location and Status of Underground Storage Tanks

There are no underground tanks for waste storage.

4.1.3.10 Location and Nature of Security Systems

Barriers and Means to Control: A 6-foot-high security fence with locked gates encloses the entire CHGM facility. CHGM shall keep all gates shut and locked except when being used and/or monitored by security and/or operations personnel.

24-Hour Surveillance System: The front gate is monitored with a camera during operating hours.

Safety Signs: Safety signs such as “No Smoking", “Fire Extinguisher”, “Exit” and “Safety Shower” are posted in accordance with OSHA in the active areas of the PCB storage facility.

4.1.3.11 Closed PCB Units

The PCB Oil Dechlorination Unit that was originally part of this facility was closed.

4.1.4 Description of Environmental Conditions On-Site

4.1.4.1 Proximity to Surface Waters Including Ponds, Lagoons, Wetlands and Storage Reservoirs

There are no surface waters in proximity to the CHGM facility. There is a storm water run-off pond for the PCB landfills that EPA has identified as surface water. This pond is about 1,400 feet from DFBWO with a PCB landfill in between the pond and DFBWO. There are no surface waters adjacent to DFBWO.

4.1.4.2 Proximity to Public or Private Drinking Water Sources

Due to the high groundwater salinity, no groundwater in the vicinity can be used as drinking water. Bottled drinking water is brought to the site.

4.1.4.3 Sewer Location and Design Which Could Result in Contamination of Sewers or Sewage Treatment Systems from PCB Spills

There are no surface sewer collection areas on CHGM. DFBWO has an office with a bathroom that is served by a septic tank. The human waste is periodically pumped, solidified, and placed in one of CHGM's RCRA permitted landfill cells.

4.1.4.4 Location of Nearby Grazing Lands, Farms and Vegetable Gardens

The nearest grazing areas are 20 miles from CHGM.

4.1.4.5 Presence of a Shallow Well, Groundwater Near the Surface, or Which Poses a High Potential for Groundwater Contamination

There are no known injection or withdrawal wells either on-site or off-site within 1,000 feet of CHGM. There are no known intermittent streams within 1,000 feet of CHGM. There are no other known sources of groundwater that would be affected by possible PCB contamination.

4.1.5 Detailed Description of DFBWO

4.1.5.1 Engineering Drawings

Engineering drawings for DFBWO are in Attachment III-1.

4.1.5.2 Certification Statement

Under the civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate, and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

_____

Mr. Shane Whitney, General Manager
Clean Harbors Grassy Mountain, LLC

4.1.5.3 Roof and Walls

The storage units for containers and other PCB items are in DFBWO. The building has a roof and walls that are in good repair and prevent rainwater from reaching stored PCBs and PCB items. CHGM may also store PCBs in bulk tanks in the Tank Farm, which is not enclosed by a roof and walls. Instead, these tanks meet the state and federal requirements for PCB storage tanks.

4.1.5.4 Flooring

DFBWO has a coated and sealed concrete floor without expansion joints. The floor is inspected weekly for cracks or damage to sealed joints and repaired accordingly.

4.1.5.5 Curbing and Containment Volume

Curbing and Material of Construction

At the time the floor was constructed, reinforcement bar was placed to provide support for the curbing that was poured a few days later. The new concrete floor was freshly cured and required no surface preparation. Additional reinforcement bar was wired to the vertical studs of bar embedded in the floor. This additional bar consisted of two strands, one above the other running parallel and horizontally around the area that was to form the berm. Wooden forms were constructed around the reinforcement bar and the curbing was poured using medium strength concrete.

Containment Volume

Containment capacities for DFBWO are calculated and summarized in Table D.8. The secondary containment was constructed to meet the requirements of CFR761.65(b)(1)(ii), which states, "the floor and curbing must provide a containment volume equal to at least two times the internal volume of the largest PCB article or PCB container or 25 percent of the total internal volume of all PCB articles or PCB containers stored there, whichever is greater."

Area B, which has a containment capacity of 13,227 gallons, could store 10,670 gallons or 194 55-gallon drum equivalents, which is well within the maximum allowed for either unit even if the two 3,012-gallon tanks (the equivalent of about 110 55-gallon drums) are included. There are two tanks that may be used to store PCB liquids in DFBWO Area B. Each tank is constructed entirely of steel. The tanks are described in Table D.9.

4.1.5.6 Drain Valves, Floor Drains, Expansion Joints, etc.

The existing floor has no expansion joints, no floor drains, and no openings of any other type.

4.1.5.7 Storage Pallets Outside of Storage Buildings (Including Locations and Numbers)

CHGM shall not store pallets of large high voltage capacitors or PCB-contaminated electrical equipment that has not been drained of free-flowing dielectric fluid outside of the PCB storage units in the building.

4.1.6 Tank Farm

4.1.6.1 Description of Tanks

Table D.10 describes each tank the material that it may store. Note that Tank 7 is used for RCRA used oil storage only. Tank 6 is used for clean oil only.

There is one four-inch steel waste underground pipeline with welded connections that joins the Tank Farm to DFBWO. The underground portion is approximately 200 yards long and is in a plastic sleeve so it can be inspected for leaks. When full it would contain approximately 392 gallons.

Thus, the total of the Tank Farm tank capacities for TSCA regulated PCB fluids and RCRA- regulated used oil is 84,728 gallons. Each tank described in Table D.10 is constructed entirely of steel. The tanks were designed and constructed according to the American Petroleum Institute standard 650 (API 650), "Welded Steel Tanks for Oil Storage, Edition 7." The API 650 standard encompasses all the parameters necessary for the design and construction of the tanks, including:

- Materials of construction
- Design of bottoms, roofs, shells, joints, connections, and appurtenances
- Anchoring
- Fabrication and construction

- Testing, repairs, and inspection
- Welding
- Marking

All tanks have the following spill prevention controls.

- Float Type Level Gauges: Before pumping into the tanks, the level is checked to determine the amount of material that may be pumped without possibility of spill. Use of these gauge readings is the normal procedure for determining the free board space.
- Internal Emergency Valve with Fusible Link: Each of the above tanks has internal emergency valves with fusible links on the bottom valve openings. These valves are designed to automatically close if the temperature at that valve is above a predetermined set point. This safety factor is designed to seal the tank in case of fire.
- Emergency Vent: This vent is designed to remain closed until a predetermined internal tank pressure is exceeded. The vent is meant to open if the tank requires additional venting capabilities, and to provide additional protection against tank rupture.
- Normal breathing vent: This vent provides for the normal venting of the tank during operation. This vent is normally closed but opens at predetermined set points for pressure or vacuum.
- Manual Valving: Each tank has an internal emergency valve and a manual ball valve that can be visually checked to determine open or closed status.
- Physical Binding of Quick Connect Couplings: All quick connect couplings are wired or otherwise physically bound together to prevent accidental line decoupling during PCB transfer.
- Contingency Plan: The contingency plan is Attachment II-6 of the permit. The tank farm unit also has a written protocol (*see* 4.1.6.2 Tank Management Practices), for the prevention of spills.
- Spill Kit: The tank farm unit has a spill kit that contains supplies for spill containment and clean up.

4.1.6.2 Tank Management Practices

The following practices are employed as a means of spill prevention:

- Typical inlets and tank outlets and quick connect couplings are preceded by a ball valve that enables operators to shut off the flow of liquids before connecting or disconnecting any hoses or other parts of the tank system for repairs, maintenance, or regular operations. Most lines in the system are designed to allow them to be pumped dry by the pumps in operation before being opened or closed. When appropriate, connections and breaks in lines are done with an appropriately sized spill pan or absorbent pad underneath the connection to reduce the possibility of

spills or spatters. Heavy-duty flexible oil transfer hoses, or their equivalent, are used.

- Coupling connections are typically tied off with wire or an equivalent fastener to reduce the possibility of their coming undone during a transfer operation.
- To minimize the potential for leaks from tanks during loading or unloading, the inlet and outlet lines of the large tanks are equipped with a locking ball valve that is locked in the closed position with a padlock when CHGM is not in operation.
- To prevent *de minimus* releases from lines, couplings are typically covered with fitted covers (if male) or plugged (if female) when not in use. Prior to initiating transfer operations, the operator checks all lines for obvious leaks and correct valve position.
- The following equipment and procedures are typical of those used to prevent the overfilling of the bulk storage tanks during transfer operations.
- All tanks are equipped with level sensing devices that enable operators to determine the level of the liquid in the tank to the nearest half-inch.
- Operators record tank levels in the daily tank farm log at the beginning and end of the working day.
- When operators transfer material from one tank to the other, they verify the liquid levels in the relevant tanks. The operators recheck these figures to ensure that no mistakes have occurred and that all material is accounted for.
- Prior to a transfer material transfer, the operators check the level-sensing device on both tanks to make sure that it is the same as recorded on the operations log.
- The operators calculate the amount to be transferred from a chart that converts the level in the tank to gallons of material and vice-versa. Operators calculate the final levels for both tanks, check the transfer lines for valve position and leaks, and begin the transfer process.
- An operator is directly overseeing the PCB transfer throughout the process.
- An operator checks the level sensing devices at appropriate intervals to ensure that the predetermined amount is transferred and that overfill does not occur.
- At the end of the transfer process, the operator records the transfer in the daily tank farm log, recalculates the final levels in the tank, and checks the level-sensing device to ensure that all calculations were correct. The new levels of the tanks are then recorded in the log.

4.1.6.3 Secondary Containment Requirements

Materials Managed in the Tanks

Table D.10 describes materials that are managed in the tank farm. No incompatibilities exist between the materials described and the steel tank construction.

Containment System Design

The tank farm containment is constructed of concrete reinforced with rebar and the expansion joints are equipped with water stops. The joints were sealed with epoxy and the entire containment surface coated with an epoxy grout to form an impervious surface free of cracks and gaps. Any precipitation in the form of run-on is removed from the containment sumps for disposal at an EPA approved facility.

The following is a list of the materials used in the construction of the secondary containment system and their specifications:

- Concrete: The concrete used was normal weight concrete with a compressive strength of 3,500 psi at 28 days curing time. Air entrained concrete shall be used for all concrete exposed to weather.
- Reinforcing Steel: All reinforcing steel conformed to ASTM Standard Specification A185 and A82.

The secondary containment system was built in three separate parts: the tank foundations, the berm wall, and the floor. The secondary containment system is designed and maintained to be free of cracks or gaps. The containment unit is inspected at least weekly according to the inspection schedule. Cracks or gaps in the floor, berm walls, or internal ramps are noted and repaired using appropriate sealants. Cracks and/or gaps must be repaired in a timely manner. Interim measures should be employed to minimize the potential for escape of spilled material.

The repair procedure for cracks typically includes applying a sealant. Cracks are thoroughly cleaned, any loose chips are removed, then an appropriate sealant is applied.

The repair procedure for gaps includes roughening the surfaces of the gap and applying an epoxy-bonding agent to the surfaces. This agent seals the surface and improves the adhesion of the filler material (concrete) that is then poured and set inside the gap if necessary. After the filler material has set, the edges of the repaired area are sealed again on all exposed surfaces using an appropriate sealant.

Containment System Capacity

The containment system in the Tank Farm consists of three separate bermed areas. The capacity of the berms and the containment capacity calculations are described in Table D.11.

Each of the Tank Farm storage units has a minimum capacity of 100% of the contents of the largest container, including freeboard.

Control of Run-off

The secondary containment system was designed and built to prevent the migration of liquids to the environment. Any precipitation, leaks or spills that enter the Tank Farm secondary containment system will be collected at a sump.

Removal of Spills or Leaks from the Containment System

CHGM shall inspect the secondary containment system daily for any liquids in the sump or any spilled or leaked material on the floor. CHGM shall pump liquids in the sump into an appropriate container. The material will be managed as PCB waste unless the liquid is tested and found to be below the standards defined in 40 CFR 761. It will be stored, treated, and disposed of in accordance with all applicable regulations.

Leaked or spilled material outside of the sumps will be cleaned up using the appropriate procedures. All recovered material from the cleanup, and all liquid material that enters the containment system will be stored, treated, and disposed of as PCB wastes, if appropriate.

4.1.7 PCB Materials Volatility

The PCB materials typically handled with contaminated mineral oils have a vapor pressure well below 78 mm Hg @ 25°C. The mineral oil itself has a vapor pressure that varies depending on the source but is approximately 0.01 mm Hg @ 20°C. The vapor pressure of PCBs varies depending on the amounts of the various Aroclors in the mixture. The vapor pressures of Aroclors vary from non-detectable to 0.001 mm Hg @ 100°F. As both materials are substantially below the limit of 78 mm Hg @ 25°C, the PCB contaminated mineral oils can be exposed to atmospheric conditions without migrating to the environment.

4.2 DISPOSAL OF PCB WASTE INVENTORY

4.2.1 Maximum Inventory

4.2.1.1 Provide Design Capacity

Table D.8 provides the maximum capacities for the two storage units in DFBWO. The total combined capacity of the two units is 25,912 gallons or 471 55-gallon drum equivalents. The sum of the Tank Farm PCB storage tank capacities is 64,142 gallons (Table D.11).

4.2.1.2 Estimate of Maximum Types and Quantities

Based on historical levels, the approximate percentages of each waste type that may be stored in DFBWO are described in Table D.12. The percentages are reflected in the waste capacities shown in Table D.13.

4.2.2 Disposal of Inventory

4.2.2.1 Details to Ensure Compliance as a PCB Waste Generator

CHGM will adhere to PCB waste generator requirements when managing PCB wastes created during the closure process. Some of these requirements are listed below:

Containers

Containers used to store PCB liquids or solids generated during closure will meet the container specifications and requirements in 40 C.F.R. Part 761.

Marking and Labeling

CHGM shall mark containers with formats specified in state and federal regulations, and CHGM shall write the date of storage for disposal on the container when it is placed in storage.

Manifesting

When shipped to a commercial storage or disposal facility, PCB wastes will be listed on a shipping manifest (such as EPA Form 8700-22 or a similar state manifest) that specifies the shipper/generator, the transporter, and the destination facility. PCB wastes will be listed on the manifest with additional unique descriptive information, as appropriate. Shipment dates will be compared with receipt dates, and storage for disposal dates with dates on Certificates of Disposal to help ensure timely disposal of PCB wastes created during closure. CHGM shall send exception reports to EPA as required.

Recordkeeping

CHGM shall maintain records to show the PCB wastes generated during closure and their disposition. This information will be recorded in CHGM's annual document log and included in the annual report as required. These records will be maintained at the owner/operator offices or will be sent as originals or copies to EPA.

4.2.2.2 Estimate of Maximum Inventory to be Sent for Disposal

Refer to Tables D.10, D.11, and D.13 for the Tank Farm and DFBWO maximum capacities of wastes in storage.

4.2.2.3 Description of Any Treatment Prior to Transport, if Applicable

Tanks used to store oil with greater than 50 mg/kg (ppm) PCBs will either be landfilled or decontaminated, then scrapped, stored for reuse, or reused. The closure cost estimate includes the cost of landfilling in a PCB landfill at Grassy Mountain using market prices for disposal.

4.2.2.4 Methods and Arrangements Used for PCB Waste Removal and Transportation to Approved Storage and Disposal Facilities

PCB Storage Tank Waste Removal

In the event of closure, CHGM will empty each PCB storage tank in the commercial storage facility and the oil from the pipeline to the warehouse. Oil will be transferred into a bulk oil tanker or drums for shipment to a PCB disposal facility.

PCB Container Removal

Forklifts or other mechanical devices will be used to remove the waste containers. CHGM shall send all PCB wastes to EPA approved facilities with appropriate disposal technology and capability. Liquids will either be transferred from drums into a tank truck or shipped in their original containers. Approximate loading time per tanker, flatbed, or van trailer is 2 hours. A tanker can hold approximately 54 drums or about 40,000 pounds of Askarel. Solids such as capacitors, debris drums, and transformers will be loaded onto flatbed trucks and transported to an appropriate facility. Approximate loading time is 2 hours to load 80 drums per truck. Drums are assumed to weigh approximately 500 pounds. A 1,000-pound transformer would be considered as two 55-gallon drums. It takes about 35 gallons of diesel fuel to flush a 55-gallon equivalent PCB transformer.

4.2.2.5 Description of Treatment/Disposal Methods at the Final Treatment/Disposal Facilities

To estimate closure costs, CHGM assumed that disposal would take place at the facilities listed in Table D.14. Any EPA approved treatment and/or disposal facility may be used during actual closure, even if not identified in this closure plan.

The disposal methods listed below were used as an example to estimate closure costs.

Disposal of Treatable Mineral Oils/Storage Container Disposal

To estimate closure costs, disposition of each category will be as follows:

- Askarel / Untreatable Oil — Incineration
- Transformer Flush — Incineration
- Water — Incineration
- Transformers (Drained/Flushed) — Landfill
- Capacitors — Incineration
- Debris — Landfill

4.2.2.6 Bulk Tank Removal, Transport, and Disposal of Tank Capacity

CHGM shall remove contaminated tanks using rigging and a crane. Tanks that will be landfilled (rather than scrapped or reused) will be loaded onto transport vehicles and transported to CHGM's PCB landfill cells.

4.2.2.7 Proposed Schedule to Complete Disposal within 90 Days from Commencement of Closure

CHGM shall notify the Regional Administrator at least 90 days prior to the intended start date of closure activities. Closure activities may begin before the end of that 90-day period. The schedule provided in Table D.16 indicates the activities and actions to take place after closure is initiated. Day one is considered the day closure activities are initiated.

4.3 CLOSURE PLAN SAMPLING, DECONTAMINATION

4.3.1 Equipment and Area Classification

4.3.1.1 Tank Farm

The Tank Farm will be closed to the standards identified in Table D.17. The Tank Farm units have concrete floors and sidewalls, which are coated with an epoxy grout that extends up the berm wall and over the sealed expansion joints. However, this coating was applied to cap a spill that could not be cleaned to spill cleanup standards. In previous correspondence with EPA R8, CHGM agreed to remove the concrete containment and dispose of it as bulk PCB remediation waste. Thus, the tank farm containment unit will not be sampled, but will be removed and disposed of in the adjacent RCRA/TSCA landfill cell.

Any spills occurring outside of the containment units during closure will be cleaned to the PCB Spill Cleanup Policy Standards in 40 CFR 761 Subpart G and according to 40 CFR 761.65. Any spills occurring inside the containment units will be cleaned and double wash/rinsed, but no confirmatory sampling will be done as the concrete will be disposed of in a PCB landfill.

4.3.1.2 DFBWO - Container Storage Unit

Warehouse One will be closed to the standards identified in Table D.17. To estimate closure costs, CHGM assumed that the uncoated concrete containment units will be removed and disposed of as Bulk PCB Remediation Waste. Any spills occurring outside of the containment units during closure will be cleaned to the PCB Spill Cleanup Policy Standards in accordance with federal requirements. Any spills occurring inside the containment units will be cleaned and double wash/rinsed, but no confirmatory sampling will be done as the containment will be disposed of in a PCB landfill.

4.3.2 Numerical Standards

Target levels for this classification are described in Table D.17.

4.3.3 Statistical Sampling Program

4.3.3.1 Safety Plan

The safety plan details precautions required to minimize the risk to personnel performing the on- site inspection and sampling in addition to CHGM's or contractor's standard safety plan.

Personal Protective Equipment (PPE)

Anyone working in or inspecting the Tank Farm or DFBWO must wear a hard hat, safety glasses, and steel-toed boots. Appropriate additional PPE (such as Tyvek suits, face shields, leather gloves, chemical resistant gloves, chemical resistant boots, etc.) must be worn while sampling, working with liquids, or transferring wastes. If dust will be generated by an activity, operators must wear either a half-face respirator with high efficiency filter and goggles or a full-face respirator with a high efficiency filter.

Confined Space Entry

No confined space entries will be performed except by those trained in accordance with OSHA standards.

Work Permits

Hot work permits will be issued prior any use of open flames or metal cutting.

4.3.3.2 Initial Inspection of the PCB Management Units

CHGM or an approved contractor will perform the initial visual inspection. Visually contaminated areas, along with areas suspected of contamination based on operator knowledge, will be assumed to be contaminated with PCBs and will require confirmatory sampling. The inspection will cover the entire PCB transfer and storage area, including tanks, valves, equipment, containment areas, and 100 feet from the perimeter of the containment areas. Because CHGM will perform the initial visual inspection, historical insight can be considered when investigating areas that may need remediation. This will include evaluating the historical use of buildings, types of exposure to PCBs (i.e., liquids or solids contact, high- level or low-level PCBs), protection of surfaces such as epoxy floor coatings, traffic through buildings and throughout the plant, and containment and/or migration protection.

All PCB storage takes place within bermed concrete containment areas. PCBs may have contacted the concrete surfaces over the history of the use of the buildings and tank farm. All containment areas will either be tested for contamination using grid or random sampling or removed and disposed as PCB bulk remediation waste without sampling. The closure cost estimate assumes the latter.

Prior to removing the concrete containment, CHGM shall remove the underground PCB waste pipe, drain any residual liquid into a waste container, and wash the structures over the containment to remove any buildup of dust. Any visually stained areas remaining after this washing will be sampled to determine if they are contaminated with PCBs.

Random wipes will be used for solid surfaces when contamination is either likely or suspected; the equipment will be decontaminated per 40 C.F.R. § 761.79; or the equipment will be disposed of.

To estimate closure costs, CHGM assumed that the equipment is disposed of. Liquid transfer and storage equipment such as pipes, hose and tanks will be assumed to be contaminated. The disposition of equipment will be determined based on the practicality of decontamination versus disposal in a chemical waste landfill.

CHGM shall keep records of PCB concentration and/or type of PCB waste with each unit's unique identification number in the case of drums, transformers, capacitors, and associated materials. These records shall be compared against the actual physical inventory of PCB material in the container storage and Tank Farm units. In the event of obvious discrepancies, the material shall be sampled to determine the proper method of disposal.

4.3.3.3 Sampling Plan

After the concrete containment in DFBWO and the Tank Farm has been removed, the soils that were under the containment and the surrounding soils will be sampled to identify any presence of PCB contamination above standards. Appropriate sampling methods for the items and surfaces to be tested will be in accordance with regulatory requirements for sampling impervious and non-impervious surfaces.

DFBWO Sampling Plan

The DFBWO container storage unit is composed of five berms (A through E). However, only the A & B berms are used to manage PCBs. During the operational life of CHGM, PCB transformers, crushed PCB drums, PCB capacitors, PCB article containers, and PCB containers will have been stored in berms A and B. The berms have concrete floors and sidewalls. The closure cost estimate assumes that no sampling will be conducted in these areas. Containment berms A and B will be removed and disposed of as PCB wastes in the adjacent CHGM RCRA/TSCA landfill cell.

It is unlikely that the walls or roof (inside or out) of DFBWO would be contaminated with PCBs. It is also unlikely that the soil under the containment or the soils surrounding DFBWO are contaminated with PCBs since all PCB spills throughout the life of the facility will have been cleaned up to the PCB spill cleanup standards. However, the walls and roof will be inspected for staining, and any stained areas or areas suspected of being PCB contaminated based on operator knowledge will be sampled to determine if

PCB contamination exists. As stated previously, CHGM shall sample the soil under the removed concrete in accordance with required procedures.

To estimate closure costs, CHGM assumed that 285 such samples will be taken– 275 soils and 10 wipes from impervious surfaces. A total of 56 analyses are included in the closure cost estimate to account for compositing the soil samples into 36 samples to analyze and 10% method blanks and 10% trip blanks.

The analytical method used to determine PCB concentration in samples will be the current SW-846 method for analyzing PCBs.

Tank Farm Sampling Plan

The Tank Farm is composed of three separate areas (Area I, Area II, and Area III). Each berm has sump chambers and ramps. Area I has three tank pads for tanks 4, 5, and 6. Area III has three tank pads for tanks 1, 2, and 7 and is joined to Area II via a weir. During the operational life of the treatment facility that has already been closed, PCB oils and water were stored and treated/decontaminated, and clean fuel oil and used oil was stored in the Tank Farm. After closure of the treatment unit, these same materials, except for treated oils, would be stored in the tank farm. The tank used to store treated oils no longer stores any materials but could be used to store clean, non-volatile liquids in the future.

There is no reason to suspect that the soil under the containment is contaminated with PCBs as all PCB spills throughout the life of CHGM (except as noted above) are cleaned to the PCB Spill Cleanup Standards. However, the area under the containment will be sampled according to required procedures to determine if PCB contamination exists. To estimate closure costs, CHGM assumed that 360 soil samples will be taken and composited into 45 samples to analyze. A total of 55 analyses are included in the closure cost estimate to account for 10% method blanks and 10% trip blanks.

The analytical method used to determine PCB concentration in the samples will be the current SW-846 method for analyzing PCBs.

4.3.3.4 Quality Assurance and Quality Control

Sampling Procedures

A comprehensive program is essential to ensure that all samples taken are appropriate for the analysis being performed, that the analysis is complete and accurate, and that the final reports contain sufficient information to achieve their intended purpose.

PCB wipe and solid samples will include 10% trip blanks and field blanks.

Sample Collection

PCB Wipe and solid samples will be taken in accordance with the standards in 40 CFR 761.79.

Traceability

Traceability is achieved when the documentation surrounding a sample and its analysis is such that a set of data can be traced back through the analyst, to the person performing the sampling, and then to the material sampled. All samples receive a unique sample identification number to facilitate this process.

Chain-of-Custody procedures will be used when shipping samples off-site. To trace sample possession from the time of collection, sample collectors will complete a traceability record and keep it with the sample. The record will contain the following information:

- Sample ID
- Signature of the collector
- Date/time collected
- Waste type
- Signature of persons involved
- Inclusive date of possession
- Cross-reference to manifest (if applicable)

Sample Labels

Sample labels are necessary to prevent misidentification of samples. The labels are affixed to the containers prior to or at the time of sampling. Samplers complete the labels at the time of collection.

Sample Seals

Sample seals are used to detect any tampering during shipment for samples sent off-site. The seals are initialed, dated, and then affixed to the sample containers or shipping containers before the samples leave the custody of the lab. Sample seals are not necessary for samples taken on-site at CHGM and sent to the on-site laboratory or if being transported by facility or project personnel or the personnel from the laboratory that is going to perform the analysis.

Sampling Record

All information pertinent to field surveys or sampling is documented in a sampling record. Since sampling situations vary widely, no set of rules can be given as to the extent of information that must be entered in the record. However, sufficient information must be recorded to allow someone to reconstruct the sampling without reliance on the collector's memory. This record will include, at a minimum the-following information:

- Location of sampling point
- Volume of samples collected
- Date of collection
- Sample identification number

- Person sampling
- Comments or observations
- Sampling methodology

Chain-of-Custody

CHGM shall maintain sample chain-of-custody as required by the regulatory agency. A chain-of-custody is used to ensure the data from sample collection to data reporting is legally defensible. This includes the ability to trace the possession and handling of samples from the time of collection through analysis and final disposition.

The components of the chain-of-custody include sample seals, a log, and a chain-of-custody record. The procedures for their use are described in further detail.

A sample is under a person's custody if it is any of the following:

- In a person's physical possession
- In view of the person after possession has taken place
- Secured by that person so that undetected tampering with the sample cannot occur
- Secured by that person in an area that is restricted to authorized personnel

Upon receipt of the sample(s) in the laboratory they are entered into the sample receipt log. All chain-of-custody samples are directed to the sample custodian. The shipping containers and sample bottles are inspected for proper seals and labels. The contents of the containers are then checked against the chain-of-custody record. The chain-of-custody record may include but is not limited to the following:

- Sampler Signature
- Date/Time Sampled
- Sample ID
- Type of sample (i.e., composite or grab)
- Number of Containers
- A place for comments
- Blocks for the person relinquishing the sample to sign, print their name, and write the date and time the sample was relinquished.
- Blocks for the person receiving the sample to sign, print their name, and write the date and time the sample was received.

If the chain-of-custody information is complete and the integrity of the samples has not been broken, each sample is assigned a unique identification number. If the information on the chain-of-custody record is not complete, the sample custodian shall contact the appropriate facility personnel to obtain the missing information, and a unique identification number is

assigned. All problem resolutions will be documented in the sample receipt log. The samples are then put into storage to await analysis.

4.3.4 Tank Farm Decontamination Procedure

4.3.4.1 PCB Storage Tank Inventory Removal

See Section D.4.2.2.4 of this attachment for PCB Storage Tank Waste Removal.

4.3.4.2 Tank Decontamination/Removal/Disposal

CHGM shall designate tanks that contained oil with greater than 50 ppm PCB for disposal at the on-site PCB permitted chemical landfill cell. Alternatively, such tanks may be decontaminated in accordance with federal requirements prior to scrapping or reuse. CHGM assumed that the tanks will be disposed of to estimate closure costs.

4.3.4.3 Tank Farm Containment Unit

CHGM shall remove the tank farm containment and dispose of it in a chemical waste landfill approved by TSCA regulations for bulk PCB remediation waste disposal. The closure cost estimate provides for disposal in one of the adjacent PCB landfills.

The amount of material to be removed from the Tank Farm storage units including the ramps, sumps, and tank pads are 1.5 feet times the total area of the internal containment area surfaces. This results in 337 cubic yards of material with an estimated weight (based on 3,000 pounds per cubic yard) of 505.5 tons. This assumes two feet of concrete for each pad and ramp and one foot of concrete for the remaining tank farm containment area. It also assumes the berms are three feet deep, six inches wide at the perimeter of the combined areas plus the two dividing berms yielding 25 yards of concrete and 17 yards for the one-foot-thick unload pad.

4.3.5 DFBWO Storage Areas

4.3.5.1 Container Removal

See Section D.4.2.2.4 of this attachment for PCB Container Removal.

4.3.5.2 Container Storage Area Decontamination/Disposal

After all containers of waste have been removed from bermed areas and sent out for disposal, CHGM shall inspect the walls and roof areas for staining and take samples to determine if these areas need to be decontaminated. The containment area floor will be removed and disposed of as bulk PCB remediation waste. The closure cost estimate provides for disposal in one of the adjacent RCRA/TSCA landfill cells.

To calculate closure costs, the volume of concrete removed was determined by multiplying the area of the internal surfaces of the DFBWO PCB containment areas (including the truck drive through areas) by the estimated average thickness of the concrete of 1.3 feet (110 x 44 x 1.3 = 6,292 ft^3) plus the berm walls. The berm walls were calculated based on being three

feet deep, six inches wide and 292 feet long or 438 cubic feet. The total volume then is 6,730 cubic feet.

The two 3,000-gallon storage tanks in the drain and flush area will be decontaminated if they are to be reused or scrapped, otherwise they will not be decontaminated. The drained PCB oils will be manifested to an EPA approved incineration facility for treatment. To estimate closure costs, CHGM assumed that the tanks will be disposed of without prior decontamination at one of the landfill cells permitted to accept solid PCB waste for disposal.

4.3.6 Auxiliary Equipment

CHGM shall manage auxiliary equipment in accordance with 40 C.F.R. § 761.65 and this permit. All movable equipment will be evaluated on its intrinsic value versus the decontamination cost. If the decontamination cost of the equipment is estimated to exceed the item's intrinsic value, that item will be disposed of in accordance with this closure plan. If the equipment is of sufficient value to warrant decontamination, it will be decontaminated to regulatory standards (Table D.17). Equipment identified for decontamination includes forklifts, barrel grabbers, hand trucks, pallet grabbers, and spill pans and other items used to collect PCB liquids.

Any auxiliary equipment not suitable for decontamination will be landfilled in an approved chemical waste landfill. CHGM expects that these materials will include items such as pipe, hose fittings, buckets, drip pans, tools and other material used in PCB operations. CHGM anticipates that the equivalent of 50 drums of equipment will be designated for landfilling. A list of typical auxiliary equipment is provided in Table D.15, along with its anticipated treatment. Equipment to be landfilled will be dismantled as much as practical and placed in a rolloff box or similar container for bulk shipment to an approved chemical waste landfill. This material will constitute less than 15 cubic yards and will take only one rolloff box or similar container.

4.3.7 Post-Cleanup Verification Procedures

Sample location selection criteria, sampling methods (e.g., wipe tests, soil/concrete cores), analytical methods, QA/QC, sampling, equipment decontamination, and chain of custody for post cleanup verification shall be consistent with that of the Sampling Plan in Section D.4.3.3.3 of this attachment.

Additionally, all PCB contaminated articles, debris, equipment, and associated material shall be managed according to 40 CFR 761.65 and this permit. Where practical, sampling equipment will be double washed/rinsed with an approved solvent. All contaminated solvent rags, debris, and associated material will be containerized and disposed of as required. Volumes and disposal methods of material generated in the cleanup are provided in Table D.13.

Disposal facilities for PCB materials generated during clean up are anticipated to include, but not limited to, those shown in Table D.14.

4.4 OTHER CLOSURE ACTIVITIES

4.4.1 Leachate Management

CHGM will manage leachate during closure. They will:

1. Apply leachate management during closure activities only to the landfill disposal units.
2. Manage leachate and leachate collection and removal systems according to Module VI of the CHGM permit and applicable regulations.
3. Monitor and maintain records for each leak detection/collection system in accordance with the requirements of Module VI of the permit.
4. Collect and store leachate in the leachate storage tanks prior to shipping the leachate off-site for disposal. This disposal method is assumed to estimate closure costs. However, any appropriate treatment or disposal method available at the time of closure may be utilized at the discretion of the CHGM.
5. Perform all routine maintenance and repairs necessary for the proper operation of the leachate management system.

4.4.2 Groundwater Monitoring

Because the disposal activities at this site are limited to PCB transfer and storage and associated activities and do not entail surface impoundment, fill, or any other surface applications of waste, it is not necessary to provide for ground water monitoring or run-on and run off controls.

4.4.3 Security Devices

During the closure and post-closure periods, the CHGM shall maintain security devices as described by Permit Condition II.F.

4.5 SCHEDULE FOR CLOSURE

After the start date of closure activities has been determined, CHGM shall follow the closure schedule shown in Table D.16. CHGM shall notify the Regional Administrator and the DWMRC Director at least 60 days prior to the start of closure activities. Closure activities may commence before the end of that sixty days. An anticipated closure schedule is in Table D.16. The day closure activities are initiated is assumed to be day one.

4.6 MODIFICATION TO CLOSURE PLANS

Closure plans will be amended and then submitted to the agency for approval if a change in operating plans or facility design affects the closure plan, for example:

- Increases in facility size and/or capacity;
- Increases in the estimate of maximum inventory;
- Changes in regulatory requirements that affect closure activities;

- Changes in surrounding land use (e.g., drinking water wells are installed near CHGM or sewer extensions increase the possibility of contaminating sewage treatment plant operations in the event of a spill);
- An unexpected event occurs while conducting final closure activities that affects the closure plan; there is a change in the expected year of closure; or financial status changes that may result in an inability to adequately pay for closure.

E. CLOSURE AND POST-CLOSURE PLAN FOR RCRA/TSCA CELLS

1.0 CLOSURE CAP LAYOUT AND GENERAL DESCRIPTION

The final covers for the cells are designed to provide long-term minimization of migration of liquid through the closed landfill; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; accommodate settling and subsidence so that the cover's integrity is maintained; and are provided with a cap liner system that has a permeability less than or equal to the permeability of any bottom liner system. The closure caps for RCRA/TSCA Landfill Cells have been designed considering these requirements.

Design Engineering Reports (DERs) for each of the RCRA/TSCA landfills are incorporated in the permit. The Construction Quality Assurance (CQA) Plan for Construction of Surface Impoundments, Landfills, and Landfill Closures is Attachment VI-3 of the permit. The DER and the CQA Plan present material specifications, including clay, GCL and synthetic liners, drainage net, filter fabric, geocomposites, soil cover, and rock armor. The CQA Plan establishes procedures for installation, visual inspection, monitoring, and testing of the different elements of the closure cap. The DER and the CQA Plan work together to provide closure caps that meet the regulatory requirements for both TSCA and RCRA landfill cells.

The closure caps will consist of two feet of compacted clay or a GCL, an HDPE geomembrane liner with an overlying drainage system, a protective cover over the liner and drainage system, and rock armor plating (stone mulch) over the protective cover for erosion protection. The closure caps are designed in the general shape of a hipped roof or elongated pyramid, with the cap surface sloping toward the outer edges of the cap at minimum slope of approximately five percent. Grading the closure cap as proposed will assist in accommodating settlement and subsidence so that the cover's integrity and positive drainage of storm water are maintained. At the proposed slopes of five percent, the cap could settle or subside an additional three feet over a horizontal distance of 100 feet and still maintain a slope of approximately two percent, thus, promoting drainage off the surface of the cap. Downspout pipes will be located at each of the four comers and at intermediate locations around the perimeter of the closure caps, as needed, to convey precipitation runoff from the closure caps to drainage conveyance ditches located at the bottom of the exterior slopes of the landfill cells. The drainage conveyance ditches then convey storm water to retention ponds and containment areas within CHGM’s storm water containment system.

2.0 DESIGN

Cross-sections of the closure caps are illustrated in the closure drawings for each of the RCRA/TSCA Landfill Cells (Attachment VI-4). The closure cap must consist of the following:

- A final waste surface that has been graded, compacted and prepared to receive compacted clay cap material or a final waste surface that has been graded and cleared of all objects that

may damage the overlying GCL and synthetic liners, that has received a six-inch-thick protective sand layer, and that is smooth and has been brought to its final grade.

- A two-foot-thick compacted clay cap with a maximum in-place saturated hydraulic conductivity (permeability) of 1 x 10^{-7} cm/second or a GCL, which has equivalent or improved permeability characteristics to the two feet of compacted clay.
- A 60-mil HDPE geomembrane liner. Since the cap will consist of a geomembrane liner, it will have a permeability that is less than or equal to the permeability of the bottom liner system in the cells.
- A lateral drainage layer consisting of drainage net with overlying geotextile filter fabric, or a drainage geocomposite. The drainage layer will convey water that percolates through overlying closure cap materials off the underlying geomembrane liner. The edge of the drainage net will extend into the more permeable erosion protective cover material on the 2H:1V or flatter exterior slopes around the perimeter of the cap. This will allow water that enters the drainage layer to discharge freely from the closure cap.
- A two-foot protective soil cover that will provide protection from frost, construction, and other operations that will occur above the lining materials. The compatibility of protective soil cover materials with GCL materials will be determined prior to use. The regional depth of frost penetration is about 21-inches at facility. The protective cover and rock armor plating (stone mulch) thickness should, therefore, provide adequate frost protection.
- The erosion protection cover will consist of six inches of rock armor plating (stone mulch) material over the entire closure cap surface. Rock will be used instead of vegetation due to the sparse nature of local vegetation. Annual rainfall is quite low and will not support vegetation thick enough to prevent erosion of the caps. Native vegetation will begin to grow by itself in the rock layer as verified by the growth of native vegetation in the rock armor plating that has previously been placed as erosion protection on the slopes and closure caps of landfill cells at CHGM. Due to the climatic and soil conditions of the region, no deep-rooted vegetation that might penetrate the HDPE liner is expected to grow.
- Berms, ditches, downspout pipes, storm drainage pipes, and other drainage facilities will be provided to control and convey runoff from the closure caps. Berms will be constructed at the top of the 2H:1V (or flatter) slopes around the perimeter of the caps. The berms will form ditches around the top perimeter of the caps with a bottom slope of about 0.7 percent sloping toward the downspout pipes that will be located at the four corners and intermediate locations (if needed) around the closure caps. The ditches will collect precipitation runoff from closure cap surfaces and convey the runoff toward the downspout pipes. The downspout pipes will then convey the storm water to utility access holes, other storm drainage pipes, and storm drainage ditches that will convey the storm water to retention ponds and other containment areas of CHGM.
- The cover system shall be sloped at least five percent from the center of the landfill toward the crest of the landfill.

3.0 CLOSURE ACTIONS

3.1 PREPARATION OF THE WASTE MOUND

Proper selection, compaction, slope and grading of the waste materials and surfaces are necessary to ensure the integrity of the cap designs. If a GCL is used as an alternate to two feet of compacted clay cap material, waste free of sharp objects and debris will make up the final lift prior to placing the six-inch thick sand layer the overlying GCL and HDPE geomembrane materials. The waste will be shaped and contoured to conform to the final grading plan after adjustments are made to account for settlement of the cells. The caps will be graded at a minimum slope of approximately five percent. The contouring of the waste will reduce the subsequent need for additional fill material, facilitate grading of the cap, and reduce the possible formation of depressions that could pond water if the GCL is used as an alternate to compacted clay.

3.2 COMPACTED CLAY OR GEOSYNTHETIC CLAY LINER (GCL)

If a compacted clay cap is used, CHGM shall determine the method of placement by the methods outlined in the CQA Plan. The procedures used will result in a maximum in-place saturated hydraulic conductivity of 1×10^{-7} cm/second If a GCL is used in place of a compacted clay cap, placement will be sequenced from the high areas of the closure caps toward the low areas to direct precipitation runoff away from the GCL. Note that the upper edge of the lower panel will be placed under the lower edge of the upper panel, which will function like a shingle. HDPE geomembrane will immediately be placed above the GCL to prevent precipitation from contacting the GCL.

3.3 HDPE LINER

CHGM shall install a 60-mil HDPE geomembrane liner above the compacted clay or GCL. The HDPE geomembrane in conjunction with the underlying compacted clay or GCL will provide for the long-term minimization of liquid migration through the closed cell.

3.4 DRAINAGE NET AND GEOTEXTILE FILTER FABRIC (OR GEOCOMPOSITE)

CHGM shall place a drainage net with an overlying geotextile filter fabric (or a geocomposite) above the HDPE geomembrane to function as a drainage media for water that infiltrates the surface of the protective soil cover. The geotextile filter fabric installed directly above the drainage net is to prevent clogging of the drainage net by the overlying soil. The drainage net and the filter fabric (or geocomposite) will be installed at the same time as the protective cover.

3.5 PROTECTIVE COVER

A two-foot-thick protective cover layer will be placed over the drainage layer. The protective soil cover will consist of soils that meet design and CQA plan requirements and may be obtained from sources near CHGM. The installer must demonstrate that the soil is compatible with salinity prior to its use with GCL materials.

3.6 EROSION PROTECTIVE COVER

The erosion protective cover across the entire cap, including the berms and exterior 2H:1V or flatter slopes around the perimeter of the cap, will consist of a six-inch layer of rock armor plating (stone mulch) material.

3.7 SCHEDULE OF EVENTS

CHGM will notify the Regional Administrator and the DWMRC Director sixty days prior to the expected start date of closure of a RCRA/TSCA cell. Closure activities will follow the schedule presented in Table D.18.

This schedule assumes that weather conditions will not interfere with closure activities. If adverse weather conditions disrupt closure operations, a revised closure schedule will be prepared and provided to U.S. EPA and DWMRC.

3.8 CLOSURE COST ESTIMATES

Table B.9 provides a summary of the closure costs for RCRA and RCRA/TSCA Cells B/6, 7 and 8. In the closure cost estimate, it should be noted that the closure costs for only Cells B/6, 7, and 8, and for Surface Impoundment A are addressed. Surface Impoundment B is a proposed facility not yet scheduled for construction, so it was not included in the closure cost estimate. To estimate closure costs, CHGM assumed that the cells to be closed will be filled to the operating capacity and then mounded.

Tables C.9, C.10, and C.11 present an estimate of the closure costs based on bids received for the closure of Cell Z in 2021. Inflation factors for each year were used to adjust the closure cost to current dollars. Tables C.9, C.10, and C.11 (CDA) present an estimate of the required quantity of closure materials and itemized costs based on the estimated quantities. The total estimated cost for closing the cells is provided in Table B.9.

4.0 POST-CLOSURE CARE PLAN

CHGM will provide post-closure care and leachate monitoring of the cell for thirty years, beginning when the DWMRC Director approves the certification that the cell has been closed in accordance with this closure plan. CHGM will provide post-Closure groundwater monitoring of each Waste Management Area (WMA), as defined in the RCRA Closure Plan Module VII, for thirty years beginning when the DWMRC Director approves the certification that the last cell in the WMA has been closed in accordance with this plan.

Post-closure care for the closed cells will be incorporated into the inspections and maintenance performed on the active cells until CHGM undergoes final closure. After final closure, post-closure care and monitoring will consist of monthly inspections of grading, security fencing, signs on the fence, surface water drainage and containment dikes, and leachate collection systems. Groundwater monitoring well and leachate sampling and analysis events will take place annually. Except for frequency and the identification of wells to monitor, CHGM will follow the groundwater monitoring program as described in the most recent revision of Module VII of the permit.

Groundwater monitoring wells were located so that the migration of hazardous constituents beyond the point of compliance will be detected. If hazardous constituents are detected, CHGM will follow

the notification and corrective actions outlined in the most recent state-issued Part B Permit.

Either on-going operations or the person selected to oversee post-closure will provide for the continued integrity of the clay cap and final rock cover, runoff containment dike, and ground-water monitoring wells. There will be no post-closure use of the RCRA/TSCA Cells that will disturb the integrity of the final covers, containment systems, or groundwater monitoring wells.

CHGM will maintain a copy of this RCRA/TSCA Cell Closure and Post-Closure Plan. The plan will be available for review at any time during the closure period.

The anticipated post-closure contact for CHGM is stated below. During the post-closure care period, correspondence should be directed to:

Clean Harbors Environmental Services, Inc.
42 Longwater Drive
P.O. Box 9149
Norwell, Massachusetts 02161-9149
(781) 792-5000

CHGM shall visually inspect the leachate collection system riser pipes monthly for defects and wear or damage. CHGM shall perform Repairs or replacement as necessary. Warning signs will be inspected monthly and maintained or replaced as necessary to prevent the unknowing entry of unauthorized personnel.

The rock cover over the closed cell will be inspected monthly for any signs of erosion, burrowing rodent activity, or depressions caused by secondary consolidation. Any damaged or eroded areas will be repaired as necessary.

CHGM will implement appropriate control measures if they discover that any burrowing animals disturbed the cell cover, including trapping and/or using rodenticides. CHGM will implement appropriate control measures to prevent the growth of woody or deep-rooted plants whose roots may penetrate and damage the synthetic or clay liners. These include using soil sterilant or physically removing the plants. At closure, the cap will provide sufficient weight to prevent liner deformation.

During closure, CHGM will pump, quantify, sample, and analyze leachate at the same frequency and for the same parameters as in the most recent state-issued Part B Permit. During post-closure, CHGM shall pump and quantify leachate according to the schedule provided in Table D.19.

CHGM may petition U.S. EPA and the Division for a different pumping schedule like the schedule provided in Table D.20 based on the history and quantity of leachate produced.

CHGM shall sample and analyze leachate from the upper collection systems and from the leak detection sumps for PCBs and chlorinated organics based on the schedule provided in Table D.20.

All leachate will be transferred to a tank or tanker for disposal or treatment per the TSCA and RCRA regulations effective at that time. If off-site disposal/treatment is required, sufficient volume will be collected for transportation to a permitted off-site disposal facility.

All sampling and testing procedures will be performed in accordance with the appropriate regulations and standards required at the time. CHGM shall retain records of the analysis and ground-water surface elevations throughout the post-closure care period. CHGM shall provide copies to the U.S. EPA and the Division upon request. Post-closure care will continue for thirty

years from cell closure unless specified otherwise in this document or a petition to the contrary is approved by the Regional Administrator or the Division. The person designated to supervise post-closure care will be required to follow the post-closure plan and maintain appropriate records.

The post-closure plan will be amended when there are changes in operating procedures or facility design that render the current plan incomplete or incapable of meeting the post-closure plan standard. The plan will be reviewed as appropriate and amended within sixty days after changes or events occur that warrant an amendment.

4.1 NOTICE TO LOCAL LAND AUTHORITY

Within ninety days after final closure is complete, CHGM will submit a survey plat indicating the location and dimensions of the closed cell with respect to the surveyed benchmarks to the U.S. EPA, the Division, and the Tooele County recorder. A professional land surveyor will prepare and certify the plat. CHGM shall file the plat with the land office and include a prominently displayed attachment which states that CHGM has an obligation to prevent disturbance of the site. CHGM shall submit a record of the type, location, and quantity of wastes disposed in the cell to the above agencies.

5.0 POST-CLOSURE COST ESTIMATE

Table C.7 and Table C.8 explain how the post closure cost estimates were developed for the RCRA and RCRA/TSCA Cells and include leachate pumping and treatment costs. After closure, the results of inspections, leachate sampling, and groundwater sampling will be reported annually. This estimate of post- closure cost is based upon estimates received from independent contractors. The total estimated cost of post-closure over 30 years for the RCRA and RCRA/TSCA Cells is provided in Table A.3.

5.1 ANNUAL UPDATE OF THE CLOSURE/POST-CLOSURE COST ESTIMATE

The closure and post-closure cost estimates will be adjusted for inflation by May 15th of each year. The estimate is adjusted by multiplying the previous estimate by a ratio of the latest published Gross National Product (GNP) Implicit Price Deflator divided by the Deflator used the previous year. The annual GNP Implicit Price Deflator is published by the U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis.

6.0 FINANCIAL ASSURANCE MECHANISM

6.1 FINANCIAL ASSURANCE FOR CLOSURE

R315-264-143 UAC and this permit require CHGM to provide assurances that there will be funds available to close the facility sometime in the future and to guarantee that closure can be performed by a third party, if for some reason CHGM is unable to do so itself. This figure will be updated at least annually in response to inflation, and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee the closure costs:

- Closure Trust Fund
- Surety Bond Guaranteeing Payment into a Closure Trust Fund
- Surety Bond Guaranteeing Performance of Closure
- Closure Letter of Credit
- Closure Insurance
- Financial Test and/or Corporate Guarantee.

CHGM shall use one of these financial assurance mechanisms for the Grassy Mountain facility. CHGM shall submit the financial assurance documentation or certification of such documentation to DWMRC, where it will be kept on file. CHGM shall comply with the applicable rules for the selected financial assurance mechanism for closure.

6.2 FINANCIAL ASSURANCES FOR POST-CLOSURE

This permit and UAC R315-264-145 require CHGM to provide assurances that there will be funds available to maintain the facility throughout the post-closure period and to guarantee that post-closure care can be performed by a third party, if for some reason CHGM is unable to do so itself. This figure will be updated at least annually in response to inflation, and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee Post-Closure Care:

- Post-closure Trust Fund
- Surety Bond Guaranteeing Payment into a Post-Closure Trust Fund
- Surety Bond Guaranteeing Performance of Post-Closure Care
- Post-Closure Letter of Credit
- Post-Closure Insurance
- Financial Test and Corporate Guarantee for Post-closure Care.

CHGM shall use one of these financial assurance mechanisms for the Grassy Mountain facility. CHGM shall submit the financial assurance documentation or certification of such documentation to DWMRC, where it will be kept on file. CHGM shall comply with the applicable rules for the selected financial assurance mechanism for post-closure.

6.3 LIABILITY REQUIREMENTS

CHGM shall maintain liability insurance for sudden accidental occurrences, as required by UAC R315-264-147 and Module II.Q.1. of the permit. CHGM shall submit the certificate of liability insurance to DWMRC, where it will be kept on file.

7.0 SOIL SAMPLING PLAN FOR RCRA/TSCA WMAS

At closure of each RCRA/TSCA Cell, CHGM will sample the berm road surrounding the cell to detect soils contaminated with PCBs exceeding 25 mg/kg (ppm) dry weight basis (DWB). Composite samples will be used due to the large number of samples required. A

detection of 5 ppm DWB PCB in a composite sample will be assumed to indicate that one of the areas sampled was contaminated with 25 ppm DWB PCB.

Since PCBs are not readily dissolved in a water matrix, excavation to a six-inch depth from the berm surface is recommended for soils showing contamination. As such, if sampling reveals that soils have PCBs exceeding 25 ppm DWB, CHGM shall remove the top six inches of soil in the contaminated area and placed in the landfill. After excavation, CHGM shall repeat sampling to ensure that contamination from PCBs exceeding 25 ppm DWB has been removed.

Clean materials will then be backfilled into the excavated area once the area has been determined to be clean. The new material shall meet and be compacted to the specifications found in the Construction Quality Assurance Plan (Attachment VI-3) of this permit.

CHGM may elect to excavate the top six inches of berm material prior to any sampling because of the rocky nature of the berm road construction material.

7.1 DETAILED SAMPLING STRATEGY

The berm road will be sampled every 40 feet along the length of the road (modified from the approach described in EPA-560/5-86-017). Due to the large number of required samples, samples will be composited from 5 sample locations (A through E) to represent a 200-foot lineal section of road (e.g., Road Section #1). Composite samples will be prepared using the following method:

- A sample will be collected from the first sample location, Sample A, to a depth of one inch and mixed in a clean stainless-steel bowl.
- One hundred grams of soil will be collected from the bowl and placed in the composite sample jar Road Section #1.
- The remainder of Sample A will be placed in a clean glass bottle, which will be capped and labeled. The sample collection data will be entered into a field logbook and on the chain-of-custody form.
- The process will be repeated for sample locations B through E.
- After all five 100 gram samples from Road Section #1 have been placed in the composite sample jar, the soil in the composite sample jar will be emptied into a clean stainless-steel bowl and mixed again. The soil will then be returned to the composite sample jar.
- The composite sample for Road Sample #1 will be analyzed for PCB contamination.
- The composite sample may be considered representative of the entire width along the 200-foot length of Road Section #1unless analysis detects soils with PCBs exceeding 5 ppm DWB. In that case, sampling of the road section suspected of PCB contamination will follow the hexagonal grid system outlined in the U.S. EPA-560/5-86-017 "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup" or applicable updates. Alternatively, the entire road section suspected of PCB contamination may be excavated prior to re-sampling.
- All samples will be retained until the results of the analyses reveal that PCBs are not present in concentrations greater than 5 ppm PCBs in the composite samples.

Collecting and compositing grid samples in this manner will define the extent and degree of PCB contamination, and this process will continue until all the PCB contamination is identified for excavation, excavated, and resampled for clean-up verification analysis.

QUALITY ASSURANCE AND QUALITY CONTROL - SOIL SAMPLING

If individual disposable sampling devices are not used for each composite sample, then the sampling device will be wiped with a disposable cloth to remove any visible particles before taking the next sample. After each sample, decontamination debris will be disposed in a bag intended for disposal of PCB-contaminated materials.

Each sample will be logged into a field logbook with a description of the area, coordinates of the sample location, time and date of sampling, type of sample taken, (i.e. soil), and initials of the sampler. Each sample will then be entered onto a chain of custody form. The chain of custody record will have the following elements: unique sample identification number; date of sampling; time of sampling; sampling method (i.e., composite, grab); matrix type; and initials of sampler.

7.2 ANALYTICAL PROCEDURES

CHGM shall analyze, extract, and clean samples taken at each TSCA Cell according to standard U.S. EPA protocols using a laboratory approved per the Disposal Cell Operating Approval. These may include SW846 methods for analyzing PCBs or the US EPA Contract Lab Protocols (CLP). Specific Cleanup Procedures cannot be foreseen until the time of analysis.

7.3 REPLICATE SAMPLES

Replicate samples help evaluate the precision of a method by quantifying the uncertainty of an analytical value. Replicates can be either replicate sample analysis or replicate spiked sample analysis. If no constituents of concern are expected in an analysis, it is better to use replicate spiked samples.

Replicates samples, usually a duplicate (i.e., two samples rather than three or more samples), must be analyzed at a minimum frequency of 20% or according to the analytical method requirements, whichever is more frequent. For tests which are run infrequently (once a month), duplicates will be analyzed with each batch.

After enough replicates for a given sample matrix have been accumulated, control limits will be established. Replicates which exceed the control limits indicate the need to reanalyze the associated sample batch.

Exceptions may be documented by re-spiking/re-analysis and providing a comment on the laboratory bench sheet.

7.4 BLANKS

Blanks demonstrate that the method is free from interference and allow the analyst to monitor the background and keep it from reaching levels that would interfere with detection and quantification of the target analytes.

Blanks also serve to inspect the reagents used for contamination. If a reagent is found to be injecting unacceptable quantities of interference into the measurement system, it needs to be replaced with a higher grade/interferant-free material.

Blanks are to be run with each sample batch or one for every 20 samples, whichever is more frequent. Analyte concentration in the blank should not exceed 2 x the method detection limit.

If the level of blank contamination is constant and can be controlled, appropriate control limits can be established. Blank values must be recorded on an ongoing basis in this case.

7.5 FIELD BLANKS

Field contamination evaluation will be accomplished by preparing field blanks. For every 20 composites collected, CHGM will collect one field blank. The blank will be prepared in the field by pouring a commercially available sand over the entire sampling train. The sand will then be placed into a prepared bottle and shipped to the laboratory for analysis. By obtaining these samples, CHGM can be assured that the sampling technique has not introduced contaminants to the samples.

Sample bottles will be purchased pre-cleaned from an appropriate vendor. The bottle will be purchased for the intended use (i.e., amber glass bottles suitable for semi-volatile analysis). Bottles will not be reused, thereby eliminating the possibility of cross-contamination.

7.6 CHAIN-OF-CUSTODY

CHGM will use the approved the chain-of-custody form in use at the time they begin closure.

APPENDIX A

CLOSURE/POST-CLOSURE INVENTORY, STANDARDS, AND REFERENCE TABLES

APPENDIX B

CLOSURE/POST-CLOSURE COST SUMMARY TABLES

APPENDIX C

CLOSURE/POST-CLOSURE COST WORKSHEETS

APPENDIX D

COST DOCUMENTATION APPENDIX