8.0 CLOSURE PLAN

The closure plan described in this section of the permit identifies how Bacchus will close the regulated unit located on Plant 1 which is HS-1.

8.1 CLOSURE PLANS AND CLOSURE COSTS ESTIMATES

In developing the closure plan for HS-1, Bacchus used the requirements of R315-264-110 through 120 and R315-264-17 of the Utah Admin. Code. The closure cost estimates are to be submitted to the Director for review and approval as required by the Permit and shall be made in accordance with R315-264-140 through 151 of the Utah Admin. Code. The closure cost estimates shall be maintained in the operating record.

Bacchus assumed, for the purposes of estimating the closure costs, that HS-1is filled to its respective maximum waste storage capacity as identified in the RCRA Part A Permit Application for Plant 1. If storage capacity changes, the Permit will be modified and a revised cost estimate will be sent for review and approval.

8.2 CLEAN-UP APPROACH

The Part A and Permit for Plant 1 only authorized Bacchus to store hazardous waste. HS-1 has not been used for treatment or disposal of hazardous waste. The source of any contamination occurring in HS-1 should be limited to spills onto concrete or asphalt surfaces during the operational life of these units. HS-1 will be cleaned using steam and/or high-pressure water until surfaces are decontaminated. This method has been routinely used at Bacchus to clean various areas as a part of normal plant maintenance. Wash water will be collected using permanent berms and sumps, or if necessary temporary berms to prevent contaminating the area surrounding the units. Past experience indicates that contaminant levels in the cleanup wash water will be minimal, and after characterization the water can meet discharge limits for a POTW or UPDES discharge permit. Therefore, it is not anticipated that the wastewater generated during closure will require special handling. The wastewater will be collected according to Bacchus practices, it will then be stored, tested, and disposed. If it is determined that the wastewater cannot meet discharge limits, it will be characterized and disposed of in accordance with applicable rules and regulations.

Once HS-1 has been decontaminated and verified clean, Bacchus will submit a written report to the Director requesting concurrence on the closure certification. Before any unit is determined to be clean closed, Bacchus must have concurrence from the Director of the Utah Division of Waste Management and Radiation Control. The final disposition of any unit that has been clean closed will be the prerogative of Bacchus or the current proprietor of the facility. If a unit cannot be clean closed Bacchus will develop an appropriate and applicable post-closure care mechanism.

8.3 CLEAN CLOSURE CRITERIA

For the purposes of estimating closure costs, it is assumed that HS-1 will be clean closed. Clean closure can be achieved by meeting the clean closure equivalency as defined in R315-101-6(c)(1) of the Utah Admin. Code. Closure will assess real and potential impacts to human and ecological exposures.

Three types of samples will be necessary to determine if HS-1 can be clean closed including soil samples, wipe samples and final rinse samples.

Soil samples will be evaluated using Regional Screening Levels for Contaminants of Concern at Superfund Sites (RSLs). RSLs are now used by USEPA Regions and will be used to screen the data under a residential land-use scenario and a protection of ground water soil screening scenario. RSLs will be divided by a factor of 10 to account for cumulative risk. RSL goals will be established prior to implementing any of the closure plans in this section. Bacchus will use the most current screening levels published by USEPA, or they can establish site-specific risk-based clean closure goals in accordance with R315-101-5.2 of the Utah Admin. Code.

Wipe samples will be evaluated using the Health Risk Assessment Methods and Screening Levels for Evaluating Office Worker Exposures to Contaminants on Indoor Surfaces Using Surface Wipe Data as prepared by the U.S. Army Center for Health Promotion and Preventative Medicine. This document develops surface wipe screening levels (SWSL) for numerous chemicals based on standard risk assessment techniques. To account for cumulative risk, the SWSL screening levels developed by the U.S. army will be divided by a factor of 10.

Note that wipe samples are not suitable for evaluation of volatile chemicals. Final rinse samples will be taken for this purpose at HS-1. Such samples will be taken at the completion of cleaning activities from the final rinse of the applicable building. These will be aqueous samples with results compared to RSLs for residential tapwater. To account for cumulative risk, the residential tapwater RSLs will be divided by a factor of 10.

8.4 VERIFICATION SAMPLING APPROACH

To determine whether HS-1 has been successfully decontaminated and cleaned up, Bacchus will use the following techniques:

- Core samples or subsurface soil samples will be collected from the floors in buildings where liquid hazardous wastes were stored, and from locations where porous flooring materials are present. Sample locations will be biased toward visible staining or other indication of potential contamination, such as the source of the material, coloration, or floor integrity. Cores obtained from the floors will penetrate the floor to a soil depth of at least 6 inches. The top 6 inches of soil will be used for taking soil samples. If additional material is needed for analysis, additional cores will be collected by co-locating additional cores near the original sample point. In situ samples will always be discrete samples and not composited. If the buildings are to be demolished at closure, the soil samples beneath the buildings shall be proposed in a revised closure plan after the building demolition in lieu of the core samples. Visual inspections of subfloor soil may be used to determine appropriate sample number and locations.

- Wipe samples will be collected from the wall and floor surfaces in the buildings when applicable. The sample will be collected by wiping the surface of a designated area using a 10 cm x 10 cm template with a piece of solvent moistened gauze to remove any remaining contaminants. The wipe will be placed in to a glass vial for storage and transport. Samples will be handled according to applicable sample preservation and chain-of-custody requirements.

- Final rinse water samples will be collected in buildings when analysis for volatile constituents is required. The rinse water samples will be analyzed and evaluated to determine whether the exposed surfaces of the buildings have been adequately decontaminated.

- Soil samples will be collected where the potential existed for hazardous waste materials to be transported to soil areas surrounding the designated building area. Samples will be collected in areas with the greatest potential to have received waste materials, visible staining of soil, or other indication of contamination. Each sample collected for volatile organic compound analysis will be a discrete sample. However, the samples collected for non-volatile compounds may be composited within the sample interval. Analytical results will be compared with closure performance standard presented for the specific hazardous waste management unit.

- Prior to implementing the closure plans described in this section of the application, Bacchus will develop Data Quality Objectives (DQOs) for all verification samples. The DQOs will be submitted to the Director for approval prior to implementing any of the closure plans.

- The unit will be considered clean if the verification samples show that all contaminant concentration levels are less than the risk-based clean closure equivalency as defined in R315-101-6(c)(1) of the Utah Admin. Code. If the risk values cannot be attained after initial closure activities, additional work will be required which could include more cleaning, development of a site specific risk assessment or development of a post closure plan.
- Sampling and handling will be conducted according to the requirement and protocols established by the USEPA and the UDEQ.
- All samples will be processed and analyzed by a Utah Certified Laboratory in accordance with R444-14-3(2) of the Utah Admin. Code. Analytical and extraction methods to be used are shown in Table 8-1.

TABLE 8-1
ANALYTICAL AND EXTRACTION METHODS

Parameter	Analytical Procedure	Extraction Procedure
Volatiles	SW-846; 8260B	SW-846; 5030B(W), 5035S
Semi-Volatiles	SW-846; 8270C	SW-846; 3510C(W), 3550B(S)
RCRA Metals	SW-846; 6010B	SW-846; 3005A(W), 3050B(S)
Mercury	SW-846; 7470A/7471A	SW-846; 7470A(W), 7471A(S)
Explosives	SW-846; 8330 Modified	SW-846; 8330 Modified
Perchlorate	EPA 314.0	EPA 314.0

8.5 HS-1

HS-1 is a waste storage unit where non-explosive solid (non-liquid), semi-solid, and liquid hazardous and non-hazardous wastes are stored. This unit is used to store and consolidate waste prior to off-site shipment to an authorized TSDF. HS-1 (Figure 2-2.2) consists of Buildings 8562, 8567, 8568, and Sheds A-D located south of the main structure. HS-1 has a combined storage capacity of 15,900 gallons. Capacity for each area is listed in Table 8-2 below.

TABLE 8-2
BUILDING STORAGE CAPACITIES

Building	Capacity (gallons)
8562	4900
8567	1200
8568	9350
Sheds A-D	450

8.5.1 Site Description

Indoor concrete floor surfaces are sealed with a commercial sealant, and the concrete joints are caulked with silicone. The sealant provides ease of cleanup and mitigates leaks or spills from migrating into the concrete pad.

Building 8562 (Figure 2-2.4) is an enclosed structure, built on a monolithic cement pad surrounded by a minimum 6-inch curb on all sides. The inside dimensions of this building are 21 ft x 52 ft. The floor slopes to the north and east. Any liquids released during the operational life of this building will be contained and collected along the north and east side of the building. The average depth along the north wall is 0.30 ft. The average depth along the east wall is 0.25 ft. To conservatively determine the containment capacity the size of the containment was estimated based on a depth of 0.25 ft along both the north and east wall. A width of 21 ft along the north wall and 35 ft along the east wall and will cover approximately one-half the room, using a line that bisects the room running from the northwest corner to a point about 35 ft along the east wall. The 35 ft distance along the east wall is based on the floor elevation where liquids could start to flow through the door into the work area of Building 8657. The containment volume for this area is calculated to hold about 700 gallons.

Building 8567 (Figure 2-2.4) is divided by a wall into two separate rooms. The west half of the building is office space, and the east half is a work area. Wastes are only stored in the eastern half, work area, of this building. The entire building is equipped with heat and lighting.

The floor in the work area of Building 8567 was constructed using a monolithic cast concrete slab with a 6-inch curb on the south and north walls. The inside dimensions of the work area is 24 ft x 20 ft. The main concern is to ensure that liquids will be contained and not released through the north personnel door**.** The area adjacent to the personnel door is approximately 0.12 ft higher than the surrounding floor area. The floor forms the secondary containment in the area west of the personnel door with a liquid collection trench forming the low point of the containment. The dimensions of the containment area are approximately 12 ft x 24 ft x 0.12 ft. The volume of this area can be approximated by calculating one-half the volume of the rectangle or 17 ft^3. The room also has a floor trench that is an architectural feature from the previous occupancy of the building. The average dimensions of the trench are 0.4 ft deep, 0.5 ft wide, and 24 ft long for a volume of about 5 ft^3. The total volume contained in the trench and area west of the personnel door is about 22 ft^3, or 165 gallons

Building 8568 (Figures 2-2.7 and 2-2.8) is an enclosed wood-framed structure fitted with two large overhead doors. It measures 30 ft wide x 60 ft long. This building has a concrete floor with no secondary containment and is primarily used for the storage of non-liquid wastes. Liquid wastes stored in this building will be stored on pallets that provide secondary-containment.

The four wood-framed sheds each have approximate dimensions of 10 ft x 10 ft, and are located south of Building 8562 (Figure 2-2.2). Actual dimensions vary slightly for each shed. The sheds are designated A, B, C, and D. Shed A and B are used to store hazardous waste. Shed C is used to store supplies. Shed D is a mechanical room for the facility. The sheds have a concrete floor with no secondary containment.

Shed A is used to store unique wastes such as gas cylinders and containers that may off-gas, such as water wet aluminum powder. Waste materials are stored on shelves, in a cabinet, or on a containment pallet. Shed B contains cabinets for storing small containers. The cabinets are constructed of steel with dimensions 40 in. x 40 in. x 74 in. The storage cabinets are self-contained, with a 13-gallon capacity liquid sump. No secondary containment is required in this shed. These small container cabinets are identical to cabinets in Building 8562. Sheds C and D have not been used to store hazardous wastes or materials.

8.5.2 HS-1 Closure Plan

The closure plan detailed in this section was developed with the assumption that HS-1 can and will be clean closed. The plan describes the procedures that will be used to clean, decontaminate, and verify closure of all applicable structures and equipment at HS-1, and how closure standards will be

established. Any change or amendment to this plan will be done in accordance with R315-264-112(c) of the Utah Admin. Code.

8.5.3 Closure Performance Standard

This unit will be clean closed by cleaning the unit until it meets the clean closure equivalency as defined in R315-101-6(c)(1) of the Utah Admin. Code. After closure, HS-1 may be used for other purposes, or may be demolished. Post-closure care for HS-1 is not anticipated.

Numerical closure performance standards will be developed at the time of closure. It is anticipated that the closure standards will be developed from the latest version of the following sources:

Soil samples - EPA Regional Screening Levels for Resident Soil

Soil samples - EPA Regional Screening Levels for Resident Soil to Groundwater. Initial screening will be conducted assuming a dilution attenuation factor of 20.

Aqueous rinse samples - EPA Regional Screening Levels for Resident Tapwater (volatiles only).

Wipe Samples - Health Risk Assessment Methods and Screening Levels for Evaluating Office Worker Exposures to Contaminants on Indoor Surfaces Using Surface Wipe Data as developed by the U.S. Army. Note that as per the listed guidance document, wipe samples are not appropriate for volatiles analysis. Aqueous rinse samples will be used for volatiles analysis.

8.5.4 Operational History of Spills or Releases at HS-1

At the time this plan was written there was no history of any major spills occurring at HS-1. There is a record of minor spills, less than one gallon, of waste material. Whenever a spill occurs, the waste material was absorbed immediately and disposed according to the applicable regulations. Prior to closure the operational history of HS-1 will be reviewed to determine when and where spills have occurred. It is anticipated that all spills or releases will have been contained within the secondary containment, however, prior to closure Bacchus will examine the condition of the floor and secondary containment and identify any cracks or gaps and determine whether the closure plan needs to be amended.

8.5.5 Maximum Waste Inventory at HS-1 Wastes stored in HS-1 include: acids, bases, lab waste, organic compounds, paints, solvents, resins, used oils, and other miscellaneous materials. Based on the operating history for this unit and the Part A permit, the maximum inventory of hazardous waste documented on-site is the maximum capacity shown in Table 8-3.

TABLE 8-3
SUMMARY OF STORAGE CAPACITIES

Storage Unit	Part A Capacity
HS-1 (8562)	4900 gal
HS-1 (8567)	1200 gal
HS-1 (8568)	9350 gal
HS-1 (Sheds A-D)	450 gal

8.5.6 Inventory Removal, Disposal, and Decontamination of Structure/Equipment
All hazardous wastes stored at the time of closure will be shipped to an approved TSDF. Only authorized transporters and approved TSDFs facilities will be used. This activity will be completed within 90 days after receiving the final volume of hazardous waste. Container storage areas, equipment, structure, etc., will be decontaminated by steam cleaning and/or washing with high pressure water and scrub brushes. An environmentally safe detergent or degreaser may be used. Decontamination water will be squeegeed into the concrete sumps at the edge of the building. The decontamination process is expected to generate approximately 500 gallons of wastewater and residue. Structures and equipment requiring decontamination include but are not limited to the following:

- Building floors;
- Walls where splashing may have caused contamination;
- Miscellaneous equipment permanently attached to the facility; and,
- Building drains and sumps.

Decontamination water will be collected from the sumps or bermed areas of the floors using a wet/dry vacuum, mop buckets, or transfer pumps into drums or containers, or will be removed by a vacuum truck. The sumps will be cleaned using the above-described techniques and the additional decontamination water will be collected.

8.5.7 Verification and QA/QC Samples
Verification samples will be collected separately from each storage and waste handling building at HS-1. The storage and waste handling areas are: the chemical handling room in Building 8567, storage areas in Building 8562 and Building 8568, and Sheds A and B.

From previous experience, contaminants in the decontamination wastewater are expected to be very low. Wash water will be collected and, if possible, sent to a local POTW following approval or verification that discharge limits can be met.

To demonstrate adequate decontamination, verification samples will be collected from each of the storage and handling areas. Soil samples will be collected underneath the concrete at two locations in both Buildings 8562 and 8567. Sample locations for the cores will be decided based on the discussion in Section 8.4.

Final rinse samples of the floors will be collected from the floor and/or sumps of all HS-1 buildings. If the area does not have a sump, then samples will be collected from bermed areas of the floor designed to catch wash and rinse waters. Wipe samples will be collected from two walls and the floor in Buildings 8562 and 8567. Wipe samples will be collected from the floor of Building 8568, Shed 'A" and Shed 'B'. Samples will be collected according to the procedure described in Section 8.4.

In addition to the verification samples identified in Table 8-4 (found in the *Tables* section following this chapter), QA/QC samples will be collected as necessary. During closure activities, QA/QC samples will be collected according to the bullets below:

- A field blank filled with de-ionized water will be exposed during sampling and analyzed for accidental or incidental contamination.
- A trip blank sample will be collected by filling the bottle with de-ionized water and carried with the decontamination/sampling crew to HS-1 on days where a sample-of-record will be collected for volatile organic compound analyses. The trip blank bottles shall be handled identically to the handling methods used for sample-of-record collection, transported within the same cooler, and subjected to the same analyses.
- One (1) blind duplicate sample will be collected for each ten (10) verification samples collected (rounded up to the next greatest multiple of 10).

Table 8-4 identifies the number of verification and QA/QC samples that will be collected from each storage and handling building at HS-1. Samples will be properly labeled, sealed, and sent to a certified analytical laboratory for testing. Samples will be handled under USEPA chain-of-custody and sample preservation protocols. No residue or contamination is expected to remain on or in the structures and equipment following the decontamination process. Structures and permanent fixtures may be kept for future use. There is no intention to break up and dispose of the concrete pads or catch basins. Prior to re-use of the HS-1 facility, Bacchus will have the structural integrity of HS-1 examined by a competent structural engineer to determine whether it has been compromised. The engineer will document the results of the examination.

8.5.8 Closure Report and Certification

Upon completion of the closure a written report will be provided to the Director certifying that the closure was completed in accordance with the plan. The report will include a summary of the operational history of HS-1, copies of all analytical results generated during closure operations, copies of the QA/QC data, data validation reports, copies of manifests that accompanied off-site shipments, characterization of decontamination water/residue, documentation that the closure of HS-1 met the performance standard identified in Section 8.5.3, a closure certification, and a copy of the structural integrity examination report. A certification of closure according to 40 CFR 264.115 will be submitted by registered mail to the Director within 60 days of the completion of the final closure.

8.5.9 Schedule for Closure

Final closure is expected to be initiated within 30 days of receipt of the final volume of hazardous wastes. If more time is required, Bacchus will submit a request to the Director. All hazardous wastes will be removed or treated within 90 days of (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever comes latest. Final closure activities will be completed within 180 days of (1) plan approval, or (2) after receiving the final volume of hazardous waste, whichever is later.

8.5.10 Post-Closure Care

The closure plan described above anticipates that HS-1 will be clean closed and will not require post-closure care. If at the conclusion of the closure activities it is determined that any part of HS-1 cannot be clean closed, Bacchus will develop an appropriate and applicable post-closure care plan for all areas of this unit that cannot be clean closed. Any proposal for post-closure care will be developed in accordance with R315-264 110 through 151 of the Utah Admin. Code, and submitted to the Director for approval.

8.5.11 Closure Cost Estimate

The cost estimate for the closure of HS-1 will be maintained in the operating record.

8.6 Changes in Closure Plans

If it becomes necessary to change, amend or modify the closure plan for HS-1, a written request submitted to the Director for a permit modification in accordance with R315-264-112(c) of the Utah Admin. Code.

8.7 Closure Cost Updates

Closure costs will be updated annually by July 30th. The cost estimate shall be adjusted for inflation using the Implicit Price Deflator for the Gross Domestic Product typically found on the Utah Division of Waste Management and Radiation Control website.

Other necessary adjustments to the closure costs resulting from changes in storage capacity, early closure of certain units, or other factors, will be made through a new engineering cost estimate for the applicable items and inflation updates for other items and explained in the annual cost update.

TABLES

SAMPLE VERIFICATION

TABLE 8-4
HS-1 SAMPLE VERIFICATION

Area	Analytical Procedure			
	Volatiles	**Semi-Volatiles**	**Metals/Hg**	**Explosives/ Perchlorate**
Bldg. 8562				
Floor (Core)	2	2	2	2
Floor (Final Rinse)	1	0	0	0
Floor (Wipe)	0	1	1	1
Walls (Wipe)	0	2	2	2
Bldg. 8567				
Floor (Core)	2	2	2	2
Floor (Final Rinse)	1	0	0	0
Floor (Wipe)	0	1	1	1
Walls (Wipe)	0	2	2	2
Bldg. 8568				
Floor (Final Rinse)	1	0	0	0
Floor (Wipe)	0	1	1	1
Shed 'A'				
Floor (Final Rinse)	1	0	0	0
Floor (Wipe)	0	1	1	1
Shed ‘B’				
Floor (Final Rinse)	1	0	0	0
Floor (Wipe)	0	1	1	1
Field Blank	2	2	2	2
Trip Blank	2	--	--	--
Blind Duplicate	2	2	2	2