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Low-Level Burial Ground Trenches 31-34-94

Facility Description and General Provisions

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1. Facility Description and General Provisions

This attachment briefly describes the general provisions and information identified in Ecology Publication 95-402, *Dangerous Waste Permit Application Requirements*, Section B, Facility Description and General Provisions, for the Low-Level Burial Ground (LLBG) Trenches 31-34-94 Operating Unit Group (OUG), hereinafter referred to as LLBG Trenches 31-34-94. Topics discussed include the following:

- General Facility Description
- Location, Ownership, and Management
- Dangerous Waste Categories Managed
- Traffic Information
- Seismic Consideration
- Topography

1.1. General Facility Description

This section provides a general description of the layout, history and function of the Hanford Site, the Hanford Facility, and LLBG Trenches 31-34-94.

1.1.1. Hanford Site

The Hanford Site covers approximately 1,450 km^2 (900 mi^2) of semiarid land that is owned by the U.S. Government, and is managed and operated by the U.S. Department of Energy, Richland Operations Office (DOE-RL). The city of Richland adjoins the southeastern most portion of the Hanford Site boundary and is the nearest population center.

In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for plutonium production for national defense. For over 20 years, activities were primarily dedicated to the continuation of plutonium production and managing the waste generated. In later years, activities became increasingly diverse, involving research and development for advanced reactors and renewable energy technologies. The end of the Cold War brought the shutdown of most of the Hanford Site's plutonium production and management facilities. Current missions are to safely clean up and manage the legacy waste on the Hanford Site, and to develop and deploy science and technology.

The Hanford Site is divided into numerically designated areas as shown in LLBG Trenches 31-34-94 Addendum C, “Process Information” (Appendix C-A, “Topographic Map, Overall Facility Map of the Hanford Site”), located in DOE/RL-2015-74, *Hanford Facility Dangerous Waste Part B Permit Application; Low-Level Burial Grounds Trenches 31-34-94, T Plant Complex, and Central Waste Complex-Waste Receiving and Processing Facility.* These areas served as the location for reactor, chemical separation, and related activities for the production and purification of special nuclear materials and other nuclear activities. The reactors are located along the Columbia River in the l00 Areas. The reactor fuel reprocessing units are in the 200 Areas, which are on a plateau approximately 11 km (6.8 mi) from the Columbia River. The 300 Area, located adjacent to and north of Richland, contains the reactor fuel manufacturing plants, the research and development laboratories, and the Environmental and Molecular Sciences Laboratory. The 400 Area, 8 km (5 mi) northwest of the 300 Area, contains the Fast Flux Test Facility designed for testing liquid metal reactor systems. The 600 Area covers all locations not specifically given an area designation. Adjacent to and north of Richland, the 1100 Area contains offices associated with administration, maintenance, transportation, and materials procurement and distribution. Offices also are located in the 700 Area, which is in down town Richland.

1.1.2. Hanford Facility

The Hanford Facility consists of the contiguous portion of the Hanford Site that contains treatment, storage and disposal (TSD) units and for the purposes of RCRA, excludes lands north and east of the Columbia River, river islands, lands under the exclusive jurisdiction or control by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and lands owned by or leased to Washington State. The Hanford Facility RCRA permit operating boundary is shown in the overall facility map (DOE/RL-2015-74).

1.1.3. LLBG Trenches 31-34-94 Operating Unit Group Description

The LLBG Trenches 31-34-94 is located in the 200 West and East Areas of the Hanford Facility and is comprised of the dangerous waste management units (DWMU) listed below. Detailed information describing storage operations, waste management activities, treatment processes and land disposal operations are described in the process information located in Addendum C (DOE/RL-2015-74).

List of Dangerous Waste Management Units

- LLBG Trench 31 Waste Storage and Treatment Pad DWMU
- LLBG Trench 34 Waste Storage and Treatment Pad DWMU
- LLBG Trench 31 DWMU
- LLBG Trench 34 DWMU
- LLBG Trench 94 DWMU

1.2. Location, Ownership, and Management

The Hanford Facility is owned by the U.S. Government, and is managed and operated by DOE-RL and its contractor CH2M HILL Plateau Remediation Company. Contact information is as follows:

U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, WA 99352
(509) 372-2400

CH2M HILL Plateau Remediation Company
P.O. Box 1600
Richland, WA 99352
(509) 376-0556

1.3. Dangerous Waste Categories Managed

LLBG Trenches 31-34-94 manages LDR-compliant waste consisting of, mixed waste and/or listed hazardous waste, characteristic hazardous waste, state only dangerous waste in accordance with the *Resource Conservation and Recovery Act of 1976* (RCRA) or WAC 173-303, "Dangerous Waste Regulations," as well as, nondangerous low-level radioactive waste managed in accordance with the *Atomic Energy Act of 1954* (AEA). For a comprehensive list of RCRA waste managed, including classification and estimated annual quantities, refer to LLBG Trenches 31-34-94 Addendum A, "Part A" located in DOE/RL-2015-74.

Other Hanford Site processes or activities regulated under Ecology's Dangerous Waste Regulations include recycling (e.g., WAC 173-303-017, "Recycling processes involving solid waste," WAC 173-303-120, "Recycled, reclaimed, and recovered wastes," and WAC 173-303-500, "Recycling requirements for state-only dangerous waste"), generator activities [e.g., WAC 173-303-170, "Requirements for generators of dangerous waste"), treatment-by-generator (WAC 173-303-170(3)(b))], transport (e.g., WAC 173-303-240, "Requirements for transporters of dangerous waste"), permits by rule

(e.g., WAC 173-303-802, “Permits by rule”), and research, development, and demonstration permits (WAC 173-303-809, “Research, development and demonstration permits”).

1.4. Traffic information

The regional public highway network traversing the Hanford Site (Washington State Highways 24 and 240), nonrestricted access roadways (Route 10, and portions of Route 4S located south of the Wye Barricade), and restricted access roadways are shown in the overall facility map (DOE/RL-2015-74). Roadways east of the Yakima Barricade and north of the Wye Barricade, and within the 300 and 400 Areas, are restricted to authorized personnel only. Other U.S. Department of Energy roadways are subject to such restrictions or closure as the U.S. Department of Energy might require.

1.4.1. Hanford Site Roadways

Major roads located within the Hanford Site are classified as either primary or secondary routes. Primary routes include Routes 4S, 10, 2S, 3, 6, and 11A, as well as various avenues within each area. Primary routes are constructed of bituminous asphalt with an underlying aggregate base in accordance with U.S. Department of Transportation requirements. The bituminous asphalt measures approximately 5 cm (2 in.) thick, however, the asphalt layer thickness will vary with each road.

Secondary routes are constructed of layers of an oil and rock mixture, with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found onsite. The present load-bearing capacities of these roads are unknown; however, loads as large as 9.8 kg/cm^2 (140 lb/in.^{2}) have been transported without observable damage to road surfaces. All roads were originally constructed to meet the requirements for the American Association of State Highway and Transportation Officials HS-20-44 load rating (AASHTO 1983). An HS-20-44 loading represents a two-axle tractor [front axle loading of approximately 3,630 kg (8,000 lbs) and rear axle loading of 14,500 kg (31,900 lbs)], plus a single-axle trailer with a 14,500 kg (31,900 lbs)- axle loading.

1.4.2. Traffic Control Signs, Signals, and Procedures

Standard traffic control signs are used throughout the Hanford Site (e.g., octagonal stop signs, triangular yield signs). Speed limits are posted throughout the Hanford Site, and the maximum posted speed is 97 kph (60 mph) on major thoroughfares. For minor thoroughfares areas, posted speeds are reduced to a maximum of 56 kph (35 mph) and held to speeds as low as 24 kph (15 mph).

1.5. Seismic Consideration

The Hanford Facility is located in Zone 2B as identified in the Uniform Building Code (ICBO 1991). No active faults, or evidence of a fault that has had displacement during Holocene times have been found on the Hanford Facility (DOE/RW-0164). The youngest faults recognized on the Hanford Facility occur on Gable Mountain, approximately 1.6 km (1.0 mi) north of the 200 East Area, and 7.2 km (4.5 mi) northeast of the 200 West Area. These faults are of Quatemary age and are considered 'capable' by the U.S. Nuclear Regulatory Commission (NUREG-0892).

1.6. Topographic Map

This section addresses the general topographic map requirements for the Hanford Facility and LLBG Trenches 31-34-94 including information on prevailing wind directions and floodplain area.

1.6.1. Hanford Facility

The overall facility map (DOE/RL-2015-74) illustrates the Hanford Site and includes the following:

- Hanford Site legal boundary (for area shown)
- Hanford Facility operating boundary
- Sufficient contours to show surface water flow
- Major access roads (i.e., state highways, regional and Hanford Site roads)
- Longitudes and latitudes
- DOE operating areas
- Rivers, lakes, perennial streams, intermittent streams, ditches
- FEMA 100 year and 500 year flood zones (probable maximum flood for Colombia and Yakima Rivers, and Cold Creek)
- Hanford Site waste management units and water supplies
- Surrounding land use.

1.6.2. Operating Unit Group

LLBG Trenches 31-34-94 general topographic maps are located in Addendum A (DOE/RL-2015-74). The maps show a distance of at least 305 m (1000 ft) around each DWMU, and are drawn at a scale of 1 in. equaling no more than 200 ft (1:200). In addition, the following information is included:

- Map scale
- Date
- Prevailing wind direction
- A north arrow
- Surrounding land use
- Locations of DWMUs
- TSD operating unit group boundary
- DOE operating areas
- DWMU (operating, closing, buildings)
- Structures, concrete, major and service roads
- Access control (e.g., railroads and fences)
- Injection and withdrawal wells (if applicable)
- Other buildings.

1.6.3. Prevailing Wind Directions

Prevailing wind directions in the 200 East and 200 West Areas (located approximately in the center of the Hanford Site) are from the northwest in all months of the year. Secondary maxima occur for southwesterly winds.

Monthly average wind speeds are lowest during the winter months, averaging 9.7 to 11.3 kph (6 to7 mph), and highest during the summer, averaging 14.5 to 16.1 kph (9 to 10 mph). Wind speeds that are well above average usually are associated with southwesterly winds. However, the summertime drainage winds generally are northwesterly and frequently reach 50 kph (31 mph). Estimates of wind extremes have been summarized (PNL-4622). Information on the likelihood and frequency of strong winds and tornados in the region have been summarized in a final environmental impact statement (DOE/EIS-0113), the Hanford Meteorological Station climatological summary (PNL-4622), and reports from the National Severe Storms Forecast Center.

1.6.4. Floodplain Area

Three sources of potential flooding of the Hanford Facility are considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Facility. No perennial streams occur in the central part of the Hanford Facility. The only other potential source of flooding of the Hanford Facility is run-off from a large precipitation event in the Cold Creek watershed. This event could result in flooding of the ephemeral Cold Creek.

References

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DOE/RL-2015-74, *Hanford Facility Dangerous Waste Part B Permit Application; Low-Level Burial Grounds Trenches 31-34-94, T Plant Complex, and Central Waste Complex-Waste Receiving and Processing Facility* 2015, (Revision 0), U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RW-0164, *Site Characterization Plan, Reference Repository Location, Hanford Site, Washington Consultation Draft*, Vol. 1-9, Office of Civilian Radioactive Waste Management, U.S. Department of Entergy, Washington, D.C.

ICBO, 1991, "Earthquake Regulations," *Uniform Building Code*, UBC Section 2312, International Conference of Building Officials, Whittier, California.

NUREG-0892, *Safety Evaluation Report (Related to the Operations of WPPSS Nuclear Project No. 2)*, Supplement No. 1, U.S. Nuclear Regulatory Commission, Washington, D.C.

PNL-4622, 1983, *Climatological Summary for the Hanford Area*, Pacific Northwest Laboratory, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D195059530.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq. Available at: http://www.epa.gov/epawaste/inforesources/online/index.htm.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303.

303-017, "Recycling Processes Involving Solid Waste."

303-120, "Recycled, Reclaimed, and Recovered Wastes."

303-170, "Requirements for Generators of Dangerous Waste."

303-240, "Requirements for Transporters of Dangerous Waste."

303-500, "Recycling Requirements for State-Only Dangerous Waste."

303-802, "Permits by Rule."

303-809, “Research, Development and Demonstration Permits.”

Low-Level Burial Ground Trenches 31-34-94

Regulatory Crosswalk

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Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-803(3) Contents of Part A of the permit application		
(3) Part A of the final facility permit application must include the following information:		
(a) The activities conducted by the applicant that require it to obtain a permit under the Hazardous Waste Management Act;	Section A1. Complete and Submit the Part A Form	Part A Form Section XI., Attachment A, Nature of Business.
(b) Name, mailing address, and location, including latitude and longitude of the facility for which the application is submitted;		Part A Form Section IV. (Per Part A CAP) Part A Form Section XV., Attachment C (Topo Map for Long/Lat.)
(c) Up to four NAICS codes that best reflect the principal products or services provided by the facility;		Part A Form Section IX.
(d) The operator's name, address, telephone number, ownership status, and status as federal, state, private, public, or other entity;		Part A Form Section VII.
(e) The name, address, and phone number of the owner of the facility;		Part A Form Section VIII.
(f) Whether the facility is located on tribal lands;		NA
(g) An indication of whether the facility is new or existing and whether it is a first or revised application;		Part A Form Section IV (D.) Part A Form Section XI., Attachment A, Nature of Business
(h) For existing facilities:		
(i) A scale drawing of the facility showing the location of all past, present, and future treatment, storage, and disposal areas; and	Section A1. Complete and Submit the Part A Form	Part A Form Section XV., Attachment C (Topo Map) Addendum C, Process Information (Drawings)
(ii) Photographs of the facility clearly delineating all existing structures, existing treatment, storage, and disposal areas, and sites of future treatment, storage, and disposal areas;		Part A Form Section XVII., Attachment C
(i) A description of the processes to be used for treating, storing, and disposing of dangerous waste, and the design capacity of these items;		Part A Form Section XI., Attachment A, Nature of Business Part A Form Section XII., Attachment A, Nature of Business

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(j) A specification of the dangerous wastes listed or designated under WAC 173-303-070 to be treated, stored, or disposed of at the facility, an estimate of the quantity of those wastes to be treated, stored, or disposed annually, and a general description of the processes to be used for the wastes;		Part A Form Section XIV., Attachment B, Waste Codes
(k) A listing of all permits or construction approvals received or applied for under any of the following programs:		
(i) Hazardous waste management program;	Section A1. Complete and Submit the Part A Form	Part A Form Section X.
(ii) UIC program under the SWDA;		
(iii) NPDES program under the CWA;		
(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;		
(v) Nonattainment program under the Clean Air Act;		
(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;		
(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act;		
(viii) Dredge or fill permits under section 404 of the CWA;		
(ix) Other relevant environmental permits, including state permits;		
(l) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its dangerous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundary;		Part A Form Section XV., Attachment C, Photos
(m) A brief description of the nature of the business;		Part A Form Section XI., Attachment A, Nature of Business

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(n) For hazardous debris, a description of the debris category(ies) and contaminant category(ies) to be treated, stored, or disposed of at the facility.		Part A Form Section XII and XIII, Attachment A, Nature of Business

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WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-110 Sampling, testing methods, and analytes		
(2) Representative samples.		
(a) The methods and equipment used for obtaining representative samples of a waste will vary with the type and form of the waste. The department will consider samples collected using the sampling methods below or the most recent version of such methods for wastes with properties similar to the indicated materials, to be representative samples of the wastes:	C4.6. Sampling and analysis methodologies	Section B2.1 – Identification and Classification of Waste. Section B3.1 – Confirmation Section B4 – LLBG Trenches 31-34-94 Generated Waste Table B-2. Waste Requiring Verification or Characterization Analysis. Section B5.1 – Sampling Methods and Equipment Table B-3. LLBG Trenches 31-34-94 Sampling Equipment
(i) Crushed or powdered material - ASTM Standard D346-04e1;		
(ii) Extremely viscous liquid - ASTM Standard D140-01 (2007);		
(iii) Fly ash-like material - ASTM Standard D2234/D2234M-03e1;		
(iv) Soil-like material - ASTM Standard D1452-80 (2000);		
(v) Soil or rock-like material - ASTM Standard D420-98 (2003);		
(vi) Containerized liquid wastes - "COLIWASA" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a), or the equivalent representative sampling method described in ASTM D5743-97 (2003). Per this method, the selection of an appropriate device must be best suited for the characteristics of the waste being sampled; and		
(vii) Liquid waste in pits, ponds, lagoons, and similar reservoirs - "Pond Sampler" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a).		

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(5) Equivalent testing methods. Any person may request department approval for the use of an equivalent testing method by submitting a petition, prepared in accordance with WAC 173-303-910(2), to the department.	NA – LLBG Trenches 31-34-94 is utilizing SW-846 or ASTM methods.	
(6) Reporting analytical results. Ecology requires that all test methods report their analytical results for solid and soil samples on a dry weight basis. Reporting on a dry weight basis compensates for variability in water content and provides a consistent procedure for all analytical results provided to ecology for designation purposes.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Table B-2 Waste Requiring Verification or Characterization Analysis
WAC 173-303-140 Land disposal restrictions		
Subpart A - General	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1.1 Verification of Waste from Non-SWOC Onsite or Offsite Generators Section B3.1.1.2 Verification of Waste from Other Hanford SWOC TSD Units Section B3.1.2 Preshipment Review Section B3.2.1 Container Receipt Inspection Section B4 LLBG Trenches 31-34-94 Generated Waste
Subpart D – Treatment standards		
WAC 173-303-300 General waste analysis		
(1) Purpose. This section requires the facility owner or operator to confirm his knowledge about a dangerous waste before he stores, treats, or disposes of it. The purpose for the analysis is to insure that a dangerous waste is managed properly.	C4.1.1 Confirming/reconfirming waste stream profiles C4.4 Process analyses C4.5 Waste generated on site	Section B2 Waste Pre-acceptance Processes Section B3 Waste Acceptance Process Section B4 LLBG Trenches 31-34-94 Generated Waste Section B5 Waste Analysis Parameters

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(2) The owner or operator must obtain a detailed chemical, physical, and/or biological analysis of a dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), before they store, treat, or dispose of it. This analysis must contain the information necessary to manage the waste in accordance with the requirements of this chapter. The analysis must include or consist of existing published or documented data on the dangerous waste, or on waste generated from similar processes, or data obtained by testing, or a combination of these.		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 LLBG Trenches 31-34-94 Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(a) When an owner or operator relies on knowledge from the generator for waste designation or for this detailed analysis (commonly known as a waste profile) instead of analytical testing of a sample, that information must be documented and must meet the definition of "knowledge" as defined in WAC 173-303-040. To confirm the sufficiency and reliability of the "knowledge" used for the waste profile, the facility must do one or more of the following:		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval
(i) Be familiar with the generator's processes by conducting site visits, and reviewing sampling data and other information provided by the generator to ensure they are adequate for safe management of the waste;		
(ii) Ensure waste analysis contained in documented studies on the generator's waste is based on representative and appropriate sampling and test methods;		
(iii) Compare the generator's waste generating process to documented studies of similar waste generating processes to ensure the waste profile is accurate and current;		
(iv) Obtain other information as predetermined by the department on a case-by-case basis to be equivalent.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) As required in WAC 173-303-380 (1)(c), records must be retained containing specific information that show compliance with this subsection for sufficient and reliable information on the waste whether the owner or operator relies on analytical testing of the waste or knowledge from the generator, or a combination of these.	C4.9 Recordkeeping	Section B7 Recordkeeping
(3) The owner or operator of an off-site facility must confirm, by analysis if necessary, that each dangerous waste received at the facility matches the identity of the waste specified on the accompanying manifest or shipping paper.	C4.2 Incoming waste procedures C4.2.2 Waste stream verification analyses	Section B3.1.1 Verification
(4) Analysis must be repeated as necessary to ensure that it is accurate and current. At a minimum, analysis must be repeated:	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Appendix B-A, Section B-A1 Initial Waste Profile Review
(a) When the owner or operator has been notified, or has reason to believe, that the process or operation generating the dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), has significantly changed; and		Section B2.2.2 Standing Waste Profile Review
(b) When a dangerous waste received at an off-site facility does not match the identity of the waste specified on the manifest or the shipping paper.		Section B2.2.2 Standing Waste Profile Review
(5) Waste analysis plan. The owner or operator must develop and follow a written waste analysis plan which describes the procedures he will use to comply with the waste analysis requirements of subsections (1), (2), (3), and (4) of this section. He must keep this plan at the facility, and the plan must contain at least:	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B4. LLBG Trenches 31-34-94 Generated Waste Table B-2 Section B5 Waste Analysis Parameters
(a) The parameters for which each dangerous waste, or nondangerous waste if applicable under WAC 173-303-610 (4)(d), will be analyzed, and the rationale for selecting these parameters (i.e., how analysis for these parameters will provide sufficient information on the waste's properties to comply with subsections (1) through (4) of this section);		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) The methods of obtaining or testing for these parameters;		
(c) The methods for obtaining representative samples of wastes for analysis (representative sampling methods are discussed in WAC 173-303-110(2));		
(d) The frequency with which analysis of a waste will be reviewed or repeated to ensure that the analysis is accurate and current;	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Section B6.1 Waste Receipt Quality Assurance
(e) The waste analyses which generators have agreed to supply;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval
(f) Where applicable, the methods for meeting the additional waste analysis requirements for specific waste management methods as specified in WAC 173-303-400(3) which incorporates by reference the regulations in 40 C.F.R. Part 265 Subparts F through R, 265.1034, 265.1063(d), 265.1084, 268.4(a) and 268.7 for interim status facilities and in WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, and 40 C.F.R. 264.1034, 264.1063(d), 264.1083, 268.4(a) and 268.7 for final status facilities. Note that data provided from laboratory analyses for WAC 173-303-400(3) which incorporates by reference 40 C.F.R. Part 265 Subparts F through R, WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, 40 C.F.R. 268.4(a) and 268.7 must meet the requirements of WAC 173-303-110;	C4.6 Sampling and analyses methodologies	WAC 173-303-140(4)(b) – Disposal of liquid waste – NA Do not dispose of liquid wastes. WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible waste – NA Not accepted. WAC 173-303-630 – Use and management of containers (Process Information) WAC 173-303-640 – Tank systems – NA No tank systems. WAC 173-303-645 – Releases from regulated units - NA WAC 173-303-646 – Corrective action WAC 173-303-650 – Surface Impoundments – NA No surface impoundments WAC 173-303-655 – Land treatment – NA No land treatment WAC 173-303-670 – Incinerators – NA No incinerators

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
		40 C.F.R. 264.1034 – Subpart AA – Air emission standards for process vents, Test methods and procedures – NA No process vents 40 C.F.R. 264.1063(d) – Air emission standards for equipment leaks, Test methods and procedures – NA No equipment 40 C.F.R. 264.1083 – Air emission standards for tanks, surface impoundments, and containers, Waste determination procedures (Only containers are applicable) NA – waste is placed in a waste storage and/or treatment areas that employ air emission controls that are in compliance with the Subpart CC standards. (Process Information) 40 C.F.R. 268.4(a) Treatment surface impoundment exemption. NA No surface impoundment 40 C.F.R. 268.7 – Testing, tracking, and recordkeeping requirements for generators, treaters, and disposal facilities. – Section B7 Recordkeeping
(g) For off-site facilities, the waste analysis that dangerous waste generators have agreed to supply;	C4.2.2 Waste stream verification analyses	Section B2.2.1 New Waste Profile Review and Approval
(h) For surface impoundments exempted from land disposal restrictions under 40 C.F.R. 268.4(a), incorporated by reference in WAC 173-303-140(2), the procedures and schedules for:	NA – LLBG Trenches 31-34-94 does not have surface impoundments	

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) For owners and operators seeking an exemption to the air emission standards of subpart CC in accordance with Sec. 264.1082, incorporated by reference at WAC 173-303-692, or with 265.1083, incorporated by reference at WAC 173-303-400 (3)(a):	NA – LLBG Trenches 31-34-94 is not seeking an exemption from Subpart CC.	
(6) For off-site facilities, the waste analysis plan required in subsection (5) of this section must also specify the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan must describe:	C4.2.2 Waste stream verification analyses C4.8 Waste tracking	Section B3 Waste Acceptance Process
(a) The procedures which will be used to determine the identity of each movement of waste managed at the facility;		Section 3.1.2 Preshipment Review Section 3.2.1 Container Receipt Inspection
(b) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling; and		Section 3.1.1 Verification Table B-2 Waste Requiring Verification or Characterization Analysis Table B-3 LLBG Trenches 31-34-94 Sampling Equipment
(c) The procedures that the owner or operator of an off-site landfill receiving containerized hazardous waste will use to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container.		Section 3.1.1 Verification
WAC 173-303-350 Contingency plan and emergency procedures - (3)(b)		
(3) The contingency plan must contain the following:		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4. Addressing Conformance Issues
WAC 173-303-370 Manifest System		
(1) Applicability. The requirements of this section apply to owners and operators of permitted treatment, storage, and disposal facilities and of dangerous waste recycling facilities operating under the requirements of this chapter who receive dangerous waste from off-site sources. If a facility receives dangerous waste accompanied by a manifest, the owner, operator, or his/her agent must sign and date the manifest as indicated in subsection (2) of this section to certify that the dangerous waste covered by the manifest was received, that the dangerous waste was received except as noted in the discrepancy space of the manifest, or that the dangerous waste was rejected as noted in the manifest discrepancy space.		
(2) If a facility receives dangerous waste shipment accompanied by a manifest, the owner, operator, or their agent, must:	C4.2 Incoming waste procedures C4.2.1 Manifest reviews and procedures C4.3 Discrepancy resolution	Section B3.2.1 Container Receipt Inspection
(a) Sign and date, by hand, each copy of the manifest;		
(b) Note any discrepancies (as defined in subsection (5)(a) of this section) on each copy of the manifest;		
(c) Immediately give the transporter at least one copy of the manifest;		
(d) Within thirty days of delivery, send a copy of the manifest to the generator; and		
(e) Retain at the facility a copy of each manifest for at least three years from the date of delivery.		
(3) If a facility receives hazardous waste imported from a foreign source, the receiving facility must mail a copy of the manifest and documentation confirming EPA's consent to the import of hazardous waste to the following address within thirty days of delivery: Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460.	NA – LLBG Trenches 31-34-94 does not receive waste from foreign sources.	

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(4) If a facility receives, from a rail or water (bulk shipment) transporter, dangerous waste which is accompanied by a manifest or shipping paper containing all the information required on the manifest (excluding the EPA/state identification numbers, generator's certification, and signatures), the owner or operator, or his or her agent, must:	C4.2.2. Waste stream verification analyses	Section B3.2.1 Container Receipt Inspection
(a) Sign and date each copy of the manifest or shipping paper to certify that the dangerous waste covered by the manifest or shipping paper was received;		
(b) Note any significant discrepancies in the manifest or shipping paper, as described in subsection (5) of this section, on each copy of the manifest or shipping paper;		
(c) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper;		
(d) Within thirty days after the delivery, send a copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within thirty days after delivery) to the generator; and		
(e) Retain at the facility a copy of each shipping paper and manifest for at least three years from the date of delivery.		
(5) Manifest discrepancies.		
(a) Manifest discrepancies are:		
(i) Significant differences (as defined in (b) of this subsection) between the quantity or type of dangerous waste designated on the manifest or shipping paper, and the quantity and type of dangerous waste a facility actually receives;	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(ii) Rejected wastes, which may be a full or partial shipment of dangerous waste that the TSDF cannot accept; or		
(iii) Container residues, which are residues that exceed the quantity limits for "empty" containers set forth in WAC 173-303-160(2).		NA – LLBG Trenches 31-34-94 does not receive shipments of empty containers.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) Significant differences in quantity are: For bulk waste, variations greater than ten percent in weight (for example, tanker trucks, railroad tank cars, etc.); for batch waste, any variations in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies
(c) Upon discovering a significant difference in quantity or type, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter. If the discrepancy is not resolved within fifteen days after receiving the waste, the owner or operator must immediately submit to the department a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.	C4.3 Discrepancy resolution	
(d)(i) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2), the facility must consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the facility may return the rejected waste or residue to the generator. The facility must send the waste to the alternative facility or to the generator within sixty days of the rejection or the container residue identification.	NA – LLBG Trenches 31-34-94 does not ship waste to an alternate facility, waste is returned to generator.	

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) While the facility is making arrangements for forwarding rejected wastes or residues to another facility under this section, it must ensure that either the delivering transporter retains custody of the waste, or the facility must provide for secure, temporary custody of the waste, pending delivery of the waste to the first transporter designated on the manifest prepared under (e) or (f) of this subsection.		
(e) Except as provided in (e)(vii) of this section, for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	NA – LLBG Trenches 31-34-94 does not ship waste to an alternate facility, waste is returned to generator.	
(f) Except as provided in (f)(vii) of this subsection, for rejected wastes and residues that must be sent back to the generator, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	C4.3. Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(i) Write the facility's U.S. EPA ID number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.		
(ii) Write the name of the initial generator and the generator's U.S. EPA ID number in the designated facility block (Item 8) of the new manifest.		
(iii) Copy the manifest tracking number found in Item 4 of the old manifest to the special handling and additional information block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iv) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the discrepancy block of the old manifest (Item 18a).		
(v) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.		
(vi) Sign the generator's/offeror's certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation.		
(vii) For full load rejections that are made while the transporter remains at the facility, the facility may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the alternate facility space. The facility must retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with (f)(i), (ii), (iii), (iv), (v), (vi), and (viii) of this subsection.		
(viii) For full or partial load rejections and container residues contained in nonempty containers that are returned to the generator, the facility must also comply with the exception reporting requirements in WAC 173-303-220(2).		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(g) If a facility rejects a waste or identifies a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2) after it has signed, dated, and returned a copy of the manifest to the delivering transporter or to the generator, the facility must amend its copy of the manifest to indicate the rejected wastes or residues in the discrepancy space of the amended manifest. The facility must also copy the manifest tracking number from Item 4 of the new manifest to the discrepancy space of the amended manifest, and must re-sign and date the manifest to certify to the information as amended. The facility must retain the amended manifest for at least three years from the date of amendment, and must within thirty days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(6) Reasons for not accepting dangerous waste shipments. The owner or operator may decide that a dangerous shipment should not be accepted by his facility.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(a) The following are acceptable reasons for denying receipt of a dangerous waste shipment:		
(i) The facility is not capable of properly managing the type(s) of dangerous waste in the shipment;		
(ii) There is a significant discrepancy (as described in subsection (5) of this section) between the shipment and the wastes listed on the manifest or shipping paper; or		
(iii) The shipment has arrived in a condition which the owner or operator believes would present an unreasonable hazard to facility operations, or to facility personnel handling the dangerous waste(s) (including, but not limited to, leaking or damaged containers, and improperly labeled containers).		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) The owner or operator may send the shipment on to the alternate facility designated on the manifest or shipping paper, or contact the generator to identify another facility capable of handling the waste and provide for its delivery to that other facility, unless, the containers are damaged to such an extent, or the dangerous waste is in such a condition as to present a hazard to the public health or the environment in the process of further transportation.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(c) If the dangerous waste shipment cannot leave the facility for the reasons described in (b) of this subsection, then the owner or operator must take those actions described in the contingency plan, WAC 173-303-350 (3)(b).	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Addendum J, Contingency Plan
(7) Within three working days of the receipt of a shipment subject to 40 C.F.R. Part 262, subpart H (which is incorporated by reference at WAC 173-303-230(1)), the owner or operator of the facility must provide a copy of the movement document bearing all required signatures to the exporter, to the Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, D.C. 20460, and to competent authorities of all other concerned countries. The original copy of the movement document must be maintained at the facility for at least three years from the date of signature.	NA – LLBG Trenches 31-34-94 does not import or export dangerous wastes destined for recovery operations in other countries.	
(8) A facility must determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated federally) as hazardous wastes under its state hazardous waste program. Facilities must also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.		NA
WAC 173-303-395 Other general requirements		

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(1) Precautions for ignitable, reactive, or incompatible wastes.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	NA – LLBG Trenches 31-34-94 does not accept ignitable, reactive, or incompatible wastes.
(2) Compliance with other environmental protection laws and regulations. In receiving, storing, handling, treating, processing, or disposing of dangerous wastes, the owner/operator must design, maintain and operate his dangerous waste facility in compliance with all applicable federal, state and local laws and regulations (e.g., control of stormwater or sanitary water discharge, control of volatile air emissions, etc.).		Process Information
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:		NA – LLBG Trenches 31-34-94 do not accept liquid wastes.
(5) Storage time limit for impoundments and piles.	NA – LLBG Trenches 31-34-94 does not have impoundments or piles.	
(6) Labeling for containers and tanks.	No guidance section identified.	Process Information, Inspections
WAC 173-303-630 Use and management of containers - (7)(c) and (9)		
(7) Containment.		
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	No guidance section identified.	Process Information
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or	No guidance section identified.	
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.	No guidance section identified.	
(9) Special requirements for incompatible wastes.	NA – LLBG Trenches 31-34-94 does not accept incompatible waste.	

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-640 Tank systems - (1)(b), 2(c), (3)(a), and (10)		
NA		
WAC 173-303-690 Air emission standards for process vents		
NA		
WAC 173-303-691 Air emission standards for equipment leaks		
NA		
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
NA		
WAC 173-303-806 Final facility permits - (4)(a)(ii) and (iii), 4(b)(ii) and (v), and 4(c)(x)		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		
(a) General requirements. (ii) Chemical, biological, and physical analyses of the dangerous waste and hazardous debris to be handled at the facility. At a minimum, these analyses must contain all the information which must be known to treat, store, or dispose of the wastes properly in accordance with WAC 173-303-600.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 LLBG Trenches 31-34-94 Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(iii) A copy of the waste analysis plan required by WAC 173-303-300(5) and, if applicable WAC 173-303-300 (5)(g).	C. Waste Analyses	WAP will be included in the Part B Application and is currently available electronically.
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including: **(A)** Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and **(B)** A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling C4.1.1 Confirming/reconfirming waste stream profiles	(A) Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1 Verification B4 LLBG Trenches 31-34-94 Generated Waste Tables B-1 and B-2 (B) Waste storage description is covered under in Process Information.
(v) Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with WAC 173-303-630 (9)(a) and (b), and 173-303-395 (1)(b) and (c); and	NA – LLBG Trenches 31-34-94 does not accept incompatible wastes.	
(c) Specific Part B information requirements for tanks. Except as otherwise provided in WAC 173-303-600(3), owners and operators of facilities that use tanks to store or treat dangerous waste must provide the following information:	NA – LLBG Trenches 31-34-94 does not have any tanks.	

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WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-160 Containers		
(2) A container or inner liner is "empty" when:		
(a) All wastes in it have been taken out that can be removed using practices commonly employed to remove materials from that type of container or inner liner (for example, pouring, pumping, aspirating, etc.) and:	D2.1. Description of Containers	C2.2.1 Procedure for Handling
(i) No more than one inch of waste remains at the bottom of the container or inner liner; or		
(ii) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 119 gallons in size; or		
(iii) No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size. A container that held compressed gas is empty when the pressure inside the container equals or nearly equals atmospheric pressure; and		
(b) If the container or inner liner held acutely hazardous waste, as defined in WAC 173-303-040, toxic EHW as defined in WAC 173-303-100 or pesticides bearing the danger or warning label, the container or inner liner has been rinsed at least three times with an appropriate cleaner or solvent. The volume of cleaner or solvent used for each rinsing must be ten percent or more of the container's or inner liner's capacity or of sufficient quantity to thoroughly decontaminate the container. In lieu of rinsing for containers that might be damaged or made unusable by rinsing with liquids (for example, fiber or cardboard containers without inner liners), an empty container may be vacuum cleaned, struck, with the open end of the container up, three times (for example, on the ground, with a hammer or hand) to remove or loosen particles from the inner walls and corners, and vacuum cleaned again. Equipment used for the vacuum cleaning of residues from containers or inner liners		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
must be decontaminated before discarding, in accordance with procedures approved by the department. A container or inner liner is also considered "empty" if the container or inner liner has been cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generator, to achieve equivalent removal. Any rinsate or vacuumed residue that results from the cleaning of containers or inner liners must, whenever possible, be reused in a manner consistent with the original intended purpose of the substance in the container or inner liner. In the case of a farmer, if the rinsate is a pesticide residue then the rinsate must be managed or reused in a manner consistent with the application instructions on the pesticide label. On-site disposal or burial of pesticide residues is prohibited. Otherwise, the rinsate must be checked against the designation requirements (WAC 173-303-070 through 173-303-100) and, if designated, managed according to the requirements of this chapter.		
(c) In the case of a container, the inner liner, that prevented the container from contact with the commercial chemical product or manufacturing chemical, has been removed.		
WAC 173-303-190 Preparing dangerous waste for transport		
The generator must fulfill the following requirements before transporting off-site or offering for off-site transport any dangerous waste.	D2.3. Container Labeling	C2.1 Description of Containers
(1) Packaging. The generator must package all dangerous waste for transport in accordance with United States DOT regulations on packaging, 49 C.F.R. Parts 173, 178, and 179.		
(2) Labeling. The generator must label each package in accordance with United States DOT regulations, 49 C.F.R. Part 172.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(3) Marking. The generator must:		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) Mark each package of dangerous waste in accordance with the applicable United States DOT regulations on hazardous materials under 49 C.F.R. Part 172; and		
(b) Mark each container of one hundred nineteen gallons or less of dangerous waste used in such transportation with the following, or equivalent words and information in accordance with 49 C.F.R. 172.304. HAZARDOUS WASTE - State and federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, and the Washington State Department of Ecology or the United States Environmental Protection Agency. Generator's Name and Address Generator's EPA Identification Number Manifest Tracking Number		
WAC 173-303-340 Preparedness and prevention		
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Addendum F, *Preparedness and Prevention* Enclosure 5, Supporting Documentation
WAC 173-303-395 Other general requirements		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container Management Practices	Addendum F, *Preparedness and Prevention*
(a) Contain spills and leaks that might occur during loading or unloading;		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;		
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and		
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.		
(6) Labeling for containers and tanks. The owner or operator must label containers and tanks in a manner which adequately identifies the major risk(s) associated with the contents for employees, emergency response personnel and the public (Note—If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320. For tanks, the label or sign must be legible at a distance of at least fifty feet. For containers, the owner or operator must affix labels upon transfer of dangerous waste from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
WAC 173-303-630 Use and management of containers		
(2) Condition of containers. If a container holding dangerous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the dangerous waste from the container to a container that is in good condition or manage the waste in some other way that complies with the requirements of chapter 173-303 WAC. In addition, the owner or operator must address leaks and spills in accordance with the applicable provisions of WAC 173-303-145 and 173-303-360.	D2.1. Description of Containers	C2.1 Description of Containers C2.1.1 Condition

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(3) Identification of containers. The owner or operator must label containers in a manner which adequately identifies the major risk(s) associated with the contents of the containers for employees, emergency response personnel and the public (note: If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must affix labels upon transfer of dangerous wastes from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(4) Compatibility of waste with containers. The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the dangerous waste to be stored, so that the ability of the container to contain the waste is not impaired.	D2.1. Description of Containers	C2.1.3 Waste Compatibility
(5) Management of Containers	D2.2. Container Management Practices	C2.2 Managing Containers
(a) A container holding dangerous waste must always be closed, except when it is necessary to add or remove waste.	D2.2. Container Management Practices	C2.2.1 Procedure for Handling
(b) A container holding dangerous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.	D2.2. Container Management Practices	C2.2 Managing Containers C2.2.1 Procedure for Handling C2.2.2 Container Handling Equipment
(c) A minimum thirty-inch separation is required between aisles of containers holding dangerous waste(s). A row of drums must be no more than two drums wide.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Enclosure 5, Supporting Documentation

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.	D2.2. Container Management Practices	C2.2.4 Inspections Addendum I, *Inspections*
(7) Containment. **(a)** Container storage areas must have a containment system that is capable of collecting and holding spills and leaks. In addition to the necessary leak containment capacity, uncovered storage areas must be capable of holding the additional volume that would result from the precipitation of a maximum twenty-five year storm of twenty-four hours duration. The containment system must:	D2.4.1. Secondary Containment System Design for Containers D2.4.2. System Design	C2.3 Secondary Containment
(i) Have a base underlying the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated rainfall until the collected material is detected and removed. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;	D2.4.3. Structural Integrity of Base	C2.3.1 Base

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) Be designed for positive drainage control (such as a locked drainage valve) to prevent release of contaminated liquids and so that uncontaminated precipitation can be drained promptly for convenience of operation. Spilled or leaked waste and accumulated precipitation must be removed from the containment system in as timely a manner as is necessary to prevent overflow; and	D2.4.3. Structural Integrity of Base D2.4.6. Removal of Liquids from Containment System	C2.3.2 Drainage Control C2.4 Removal Of Liquids from Containment System
(iii) Have sufficient capacity to contain ten percent of the volume of all containers or the volume of the largest container, whichever is greater. Only containers holding free liquids, or holding wastes designated as F020, F021, F022, F023, F026, or F027 need to be considered in this determination.	D2.4.4. Containment System Capacity	Not Applicable <u>Note:</u> LLBG Trenches 31and 34 Waste Storage and Treatment Pads do not accept containers with free liquids or containers holding wastes designated as F020, F021, F022, F023, F026.
(b) Run-on into the containment system must be prevented, unless the department waives this requirement in the permit after determining that the collection system has sufficient excess capacity in addition to that required in (a)(iii) of this subsection to accommodate any run-on which might enter the system.	D2.4.5. Control of Run-on	C2.3.4 Controlling Run-on and Runoff
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	D2.4.7. Demonstration that containment is not required because containers do not contain free liquids, wastes that exhibit ignitability or reactivity, or wastes designated F020 – 023, F026, or F027	C2.3 Secondary Containment
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or		
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(d) The department may require owners and operators to protect their containers from the elements by means of a building or other protective covering if the department determines that such protection is necessary to prevent a release of waste or waste constituents due to the nature of the waste or design of the container. The building or other protective covering must allow adequate inspection under subsection (6) of this section.	D2.4.2. System Design	Not Applicable
(8) Special requirements for ignitable or reactive waste.		
(a) Containers holding reactive waste exhibiting a characteristic specified in WAC 173-303-090 (7)(a)(vi), (vii) or (viii) must be stored in a manner equivalent to the International Fire Code's "*American Table of Distances for Storage of Explosives*" Table 3304.5.2(2) or "*Table of Separation Distances for Low Explosives*" Table 3304.5.2(3), 2003 edition, or the version adopted by the local fire district.	D2.5.1. Management of Certain Reactive Wastes in Containers	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) The owner or operator must design, operate, and maintain ignitable waste and reactive waste (other than a reactive waste which must meet (a) of this subsection) container storage in a manner equivalent with the International Fire Code. Where no specific standard or requirements are specified in the International Fire Code, or in existing state or local fire codes, applicable sections of the NFPA Pamphlet #30, "*Flammable and Combustible Liquids Code*," must be used. The owner/operator must also comply with the requirements of WAC 173-303-395 (1)(d).	D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(9) Special Requirements for Incompatible Wastes		
(a) Incompatible wastes, or incompatible wastes and materials must not be placed in the same container, unless WAC 173-303-395 (1)(b) is complied with.	D2.5.3. Design of Areas to Manage Incompatible Wastes	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) Dangerous waste must not be placed in an unwashed container that previously held an incompatible waste or material.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(c) A storage container holding a dangerous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device. Containment systems for incompatible wastes must be separate.		
(11) Air emission standards. The owner or operator must manage all hazardous waste placed in a container in accordance with the applicable requirements of 40 C.F.R. Subparts AA, BB, and CC, which are incorporated by reference at WAC 173-303-690 through 173-303-692.	D2.2. Container Management Practices	Refer to WAC 173-303-690, *Air emission standards*, of this checklist.
WAC 173-303-690 Air emission standards for process vents		
(1)(a) The regulations in this section apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes.	D4.1. Process Vents	C2.7 Air Emissions <u>Note</u> LLBG Trenches 31-34-94 does not have any process vents subject to 40 CFR 264, Subpart AA requirements.
(b) Except for 40 C.F.R. 264.1034 (d) and (e), this section applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 ppmw, if these operations are conducted in one of the following:		
(i) A unit that is subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		
(ii) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of WAC 173-303-200(1) (i.e., a hazardous waste recycling unit that is not a ninety-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iii) A unit that is exempt from permitting under the provisions of WAC 173-303-200(1) (that is, a "ninety-day" tank or container) and is not a recycling unit under the provisions of WAC 173-303-120.		
WAC 173-303-691 Air emission standards for equipment leaks		
(1)(f) Equipment that contains or contacts hazardous waste with an organic concentration of at least ten percent by weight for less than three hundred hours per calendar year is excluded from the requirements of 40 C.F.R. Parts 264.1052 through 264.1060 if it is identified, as required in 40 C.F.R. Part 264.1064 (g)(6).	D4.2. Equipment Leaks	C2.7 Air Emissions Note LLBG Trenches 31-34-94 does not have any equipment subject to 40 CFR 264 Subpart BB requirements.
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
(1)(a) The requirements of 40 C.F.R. Part 264 Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either WAC 173-303-630, 173-303-640, or 173-303-650 except as WAC 173-303-600 and (b) of this subsection provide otherwise.	D4.3. Tanks and Containers	C2.7 Air Emissions Note LLBG Trenches 31 and 34 Waste Storage and Treatment Pads only store and treat MW in containers, do not have tank systems or surface impoundments therefore, 40 CFR 264, Subpart CC, standards for MW containers, tanks, and surface impoundments do not apply.
(b) The requirements of 40 C.F.R. Part 264 Subpart CC do not apply to the following waste management units at the facility:		
(vi) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(2) 40 C.F.R. Parts 264.1081 through 264.1091 (Subpart CC) is incorporated by reference.	D2.2. Container Management Practices	C2.7 Air Emissions <u>Note</u> LLBG Trenches 31 and 34 Waste Storage and Treatment Pads only store and treat MW in containers, only store LDR-compliant containers, and do not have tank systems or surface impoundments; therefore, 40 CFR 264, Subpart CC, standards for MW containers, tanks, and surface impoundments do not apply.
WAC 173-303-806(4) Contents of Part B		
(a) General requirements.		
(i) A general description of the facility	B1. General Facility Description	Enclosure 5, Supporting Documentation
(viii) A description of procedures, structures, or equipment used at the facility to:	D2.2. Container Management Practices	C2.7 Air Emissions <u>Note</u> LLBG Trenches 31 and 34 Waste Storage and Treatment Pads only store and treat MW in containers, only store LDR-compliant containers, and do not have tank systems or surface impoundments; therefore, 40 CFR 264, Subpart CC, standards for MW containers, tanks, and surface impoundments do not apply.
(F) Prevent releases to the atmosphere.		
(x) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).	B3. Traffic Information	Enclosure 5, Supporting Documentation
(xi) Seismic risk consideration. The owner/operator of a proposed facility or expansion of an existing facility must	B2. Seismic Consideration	Enclosure 5, Supporting Documentation

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
identify the seismic risk zone in which the facility is intended to be located. Where state or local maps are not available, United States Geological Survey Open File Report number 82-1033 may be used to identify seismic risk zones. The owner/operator must demonstrate that the facility can and will be designed to resist seismic ground motion and that the design is sufficient to withstand the maximum horizontal acceleration of a design earthquake specified in the demonstration.		
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following: **(A)** Map scale and date; **(B)** One hundred-year flood plain area; **(C)** Surface waters including intermittent streams; **(D)** Surrounding land uses (residential, commercial, agricultural, recreational); **(E)** A wind rose (i.e., prevailing windspeed and direction); **(F)** Orientation of the map (north arrow); **(G)** Legal boundaries of the TSD facility site;	B4. Topographic Map	Appendix C-A, Topographic Map Overall Facility Map of the Hanford Site

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(H) Access control (fences, gates); **(I)** Injection and withdrawal wells both on-site and off-site; **(J)** Buildings; treatment, storage, or disposal operations; or other structure (recreation areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems, loading and unloading areas, fire control facilities, etc.); **(K)** Barriers for drainage or flood control; and **(L)** Location of operational units within the TSD facility site, where dangerous waste is (or will be) treated, stored, or disposed (include equipment clean-up areas). (Note - For large TSD facilities the department will allow the use of other scales on a case-by-case basis.) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).		
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		
(i) A description of the containment system to demonstrate compliance with WAC 173-303-630(7). Show at least the following: **(E)** How accumulated liquids can be analyzed and removed to prevent overflow; and	D2.4.6. Removal of Liquids from Containment System	C2.4 Removal Of Liquids from Containment System
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including:	D2.4.7. Demonstration that containment is not required because containers do not	C2.3 Secondary Containment

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(A) Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and	contain free liquids, wastes that exhibit ignitability or reactivity, or wastes designated F020 – 023, F026, or F027	Addendum B, *Waste Analysis Plan*
(B) A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;		C2.3 Secondary Containment C2.3.1 Base C2.3.2 Drainage Control C2.4 Removal of Liquids from Containment System
(iii) A description of the procedures for labeling containers;	D2.3. Container Labeling	C2.1.2 Identification and Labeling
(iv) Sketches, drawings, or data demonstrating compliance with WAC 173-303-630(8) (location of buffer zone and containers holding ignitable or reactive wastes) and WAC 173-303-630 (9)(c) (location of incompatible wastes), where applicable;	D2.5.1. Management of Certain Reactive Wastes in Containers D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers D2.5.3. Design of Areas to Manage Incompatible Wastes	Not Applicable <u>Note</u> LLBG Trenches 31and 34 Waste Storage and Treatment Pads do not accept ignitable and/or reactive waste.
(vi) Information on air emission control equipment as required in (m) of this subsection.	D2.2. Container Management Practices	C2.7 Air Emissions <u>Note</u> LLBG Trenches 31 and 34 Waste Storage and Treatment Pads only store and treat MW in containers, only store LDR-compliant containers, and do not have tank systems or surface impoundments; therefore, 40 CFR 264, Subpart CC, standards for MW containers, tanks, and surface impoundments do not apply.
40 CFR 264.1086 Standards: Containers		
(a) The provisions of this section apply to the control of air pollutant emissions from containers for which §264.1082(b) of this subpart references the use of this section for such air emission control.	D4.3. Tanks and Containers	C2.7 Air Emissions <u>Note</u> LLBG Trenches 31 and 34 Waste Storage

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) *General requirements.* **(1)** The owner or operator shall control air pollutant emissions from each container subject to this section in accordance with the following requirements, as applicable to the container, except when the special provisions for waste stabilization processes specified in paragraph (b)(2) of this section apply to the container. **(i)** For a container having a design capacity greater than 0.1 m^3 and less than or equal to 0.46 m^3, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(ii)** For a container having a design capacity greater than 0.46 m^3 that is not in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(iii)** For a container having a design capacity greater than 0.46 m^3 that is in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 2 standards specified in paragraph (d) of this section. **(2)** When a container having a design capacity greater than 0.1 m^3 is used for treatment of a hazardous waste by a waste stabilization process, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 3 standards specified in paragraph (e) of this section at those times during the waste stabilization process when the hazardous waste in the container is exposed to the atmosphere.		and Treatment Pads only store and treat MW in containers, only store LDR-compliant containers, and do not have tank systems or surface impoundments; therefore, 40 CFR 264, Subpart CC, standards for MW containers, tanks, and surface impoundments do not apply.

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Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum C, Process Information Regulatory Crosswalk – Landfills

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6 Landfills	806(4)(h) 665(1) through (13)	Regulations listed apply to owners and operators of facilities that dispose of dangerous waste in landfills.	C4 Process Information for Landfills
D-6a List of Wastes	806(4)(h)(i)	Provide a list of all hazardous wastes placed or to be placed in landfills.	C1.1.2.1 List of Wastes C1.1.3.1 List of Waste
D-6b Liner Exemption Requests			
D-6b(1) Exemption Based on Existing Portion	806(4)(h)(ii)(A) 665(2)(a)	Existing portions of landfills that have waste in place on November 8, 1984, and will have only vertical expansion are exempted from liner system requirements. Provide plan showing limits of existing portion.	Not Applicable
D-6b(2) Exemption Based on Alternative Design and Location	806(4)(h)(ii)(A) 665(2)(i)	If an exemption from the double liner and leachate collection and removal system is requested based on an alternative design, document that the alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituent into the ground or surface water at least as effectively as a double liner with leachate collection/detection system, and will allow detection of hazardous constituents through the top liner as least as effectively.	C4.1.1.2 LLBG Trench 94 <u>Note</u> Not applicable for LLBG Trenches 31 and 34
D-6b(3) Exemption for Replacement Landfill Unit	806(4)(h)(ii)(A) 665(2)(k)	If the owner/operator of a replacement landfill unit seeks an exemption from the required liner system (top liner, composite lower liner, and leachate collection and removal system), demonstrate (1) that the existing unit was constructed in compliance with the design standards of Sections 3004(o)(1)(A)(i) and 3004(o)(5) of RCRA; and (2) there is no reason to believe that the liner is not functioning as designed.	Not Applicable

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6b(4) Exemption for Monofills	806(4)(h)(ii)(A) 665(2)(j)	Demonstrate that the landfill will consist of a monofill receiving only wastes from foundry furnace emission controls or metal casting molding sand that are not hazardous wastes for reasons other than toxicity characteristics.	Not Applicable
D-6b(5) Groundwater Monitoring Exemption	806(4)(h)(iv) 645(b)(ii)	If exemption from groundwater monitoring requirements is sought, provide data demonstrating that the following conditions are met.	Not Applicable
D-6b(5)(a) Engineered Structure	806(4)(h)(iv) 645(b)(ii)(A)	Provide design data showing that unit for which exemption is sought is an engineered structure.	Not Applicable
D-6b(5)(b) No Liquid Waste	806(4)(h)(iv) 645(b)(ii)(B)	Describe procedures for ensuring that no liquid waste or waste containing free liquids will be received by, or contained, in the unit.	Not Applicable
D-6b(5)(c) Exclusion of Liquids	806(4)(h)(iv) 645(b)(ii)(C)	Provide design and operating data demonstrating how liquids, precipitation, and other run on and run-off will be excluded from the unit.	Not Applicable
D-6b(5)(d) Containment System	806(4)(h)(iv) 645(b)(ii)(D)	Describe containment system (both inner and outer layers) that will enclose waste.	Not Applicable
D-6b(5)(e) Leak Detection System	806(4)(h)(iv) 645(b)(ii)(E)	Describe design and operating data demonstrating leak detection system built into each containment layer.	Not Applicable
D-6b(5)(f) Operation of Leak Detection System	806(4)(h)(iv) 645(b)(ii)(F)	Demonstrate means for ensuring continuing operation and maintenance of leak detection systems during active life of unit and closure and post-closure care periods.	Not Applicable

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6b(5)(g) No Migration	806(4)(h)(iv) 645(b)(ii)(G)	Demonstrate that unit will not allow hazardous constituents to migrate beyond outer layer of containment system prior to end of post-closure care period.	Not Applicable
D-6c Liner System, General Items	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Discuss the items that apply to liner system as a whole.	C4.1 Liner System – General Items and Description
D-6c(1) Liner System Description	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Provide a detailed description of the liner system, demonstrating (by description and drawings) that any flow of liquids into and through the liners will be prevented. For each liner within the system (minimum one upper synthetic liner and one bottom composite synthetic/soil liner), describe the type of liner, its material and its material and its thickness. The liner system includes the liner foundation, bottom composite liner, leachate detection system, top synthetic liner, leachate collection system, and any protective layer placed to protect the leachate collection system from damage.	C4.1 Liner System – General Items and Description Appendix C-B, Engineering Drawings
D-6c(2) Liner System Location Relative to High Water Table	806(4)(h)(ii)(A)(III) 665(2)(a)(i)(A)	Provide data showing seasonal fluctuations in the depth to the water table and the location of the seasonal high water table in relation to the base of the liner system (i.e., groundwater levels and liner foundation elevations should be shown on geological cross sections).	C4.1.2 Liner Location Relative to High Water Table

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6c(3) Loads on Liner System	806(4)(h)(ii)(A) 665(2)(a)(i)(A)	Provide results of calculations defining maximum loads or stresses that will be placed on liner system considering both static and dynamic loads, stresses due to installation or construction stresses resulting from operating equipment stresses due to maximum quantity of waste, cover, *and* proposed post-closure land use stresses resulting from settlement, subsidence, or uplift internal and external pressure gradients.	C4.1.3 Loads on Liner System
D-6c(4) Liner System Coverage	806(4)(h)(ii)(A) 665(2)(a)(i)(C)	Demonstrate that the liner system will be installed to cover all surrounding earth likely to be in contact with the waste or leachate (i.e., construction, as built, or detailed drawings).	C4.1.4 Liner System Coverage
D-6c(5) Liner System Exposure Prevention	806(4)(h)(ii)(A) 665(2)(a)(i)(A)	Demonstrate that the liner system will not be exposed to wind or sunlight or, if exposure to any part of the system is to be permitted, that such exposure will not result in unacceptable degradation of that portion of the system.	C4.1.5 Liner System Exposure Prevention
D-6d Liner System, Foundation			
D-6d(1) Foundation Description	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Describe foundation for liner system, including foundation materials and indicate bearing elevations on geological and construction drawings. Indicate any load-bearing embankments placed to support liner system.	C4.2.1 Foundation Description C4.2.3 Laboratory Testing

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6d(2) Subsurface Exploration Data	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Verify engineering characteristics of liner system foundation materials through subsurface explorations. Provide information to fully describe these efforts.	C4.2.2 Subsurface Exploration Data C4.2.3 Laboratory Testing
D-6d(3) Laboratory Testing Data	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide index testing results to classify site materials and lab test data to evaluate engineering properties of foundation materials. Provide references to standard test procedures.	C4.2.3 Laboratory Testing Data
D-6d(4) Engineering Analyses	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide engineering analyses based on subsurface exploration and laboratory testing data. Include discussion of methods used, assumptions, copies of calculations, and appropriate references.	C4.2.4 Engineering Analyses
D-6d(4)(a) Settlement Potential	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide estimates of total and differential settlement of liner system foundation. Consider stresses imposed by liner system and applicable stresses computed in item D-6c(3).	C4.2.4.1 Stability
D-6d(4)(b) Bearing Capacity	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide analysis of allowable bearing capacity of liner system foundation.	C4.2.4.1 Stability

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum C, Process Information Regulatory Crosswalk – Landfills

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6d(4)(c) Stability of Landfill Slopes	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide, as appropriate, analyses of stability of: • Excavated slopes for units constructed below grade embankment slopes for units constructed with earthen dikes or berms, • Landfill slopes consisting of liner system or cover system placed on waste.	C4.2.4.1 Stability
D-6d(4)(d) Potential for Excess Hydrostatic or Gas Pressure	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Provide estimates of potential for bottom heave or blow-out of liner system due to unequal hydrostatic or gas pressures.	C4.2.4.1 Stability
D-6e Liner System, Liners			
D-6e(1) Synthetic Liners	806(4)(h)(ii)(A) 665(2)(a)(i) 665(2)(h)	For each synthetic liner in system or under consideration, provide following general information: thickness; type; material; brand name; and manufacturer.	C4.1.1.1 LLBG Trenches 31 and 34 C4.6 Liner System – Construction and Maintenance

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6e(1)(a) Synthetic Liner Compatibility Data	806(4)(h)(ii)(A) 665(2)(a)(i)(A)	Provide summary and discuss test results and conclusions as to suitability of synthetic liner based on liner/waste compatibility testing.	C4.1.1.1 LLBG Trenches 31 and 34 C4.3.1 Synthetic Liners C4.6 Liner System – Construction and Maintenance
D-6e(1)(b) Synthetic Liner Strength	806(4)(h)(ii)(A) 665(2)(a)(i)(A)	Provide data showing that synthetic liners, including seams, have sufficient strength after exposure to waste and waste leachate.	C4.3.1 Synthetic Liners C4.3.1.1 Compatibility Data C4.6 Liner System – Construction and Maintenance

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6e(1)(c) Synthetic Liner Bedding	806(4)(h)(ii)(A) 665(2)(a)(i)(B)	Demonstrate that sufficient bedding will be provided above and below synthetic liners to prevent rupture during installation and operation. Synthetic membrane of bottom composite liner should be placed directly on soil portion.	C4.3.1.2 Liner Bedding C4.6 Liner System – Construction and Maintenance C4.5 Working Surfaces
D-6e(2) Soil Liners	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Provide description of soil portion of bottom composite liner, including its classification, thickness, hydraulic conductivity, and material specifications.	C4.1.1.1 LLBG Trenches 31 and 34 C4.3.2 Soil Liners C4.5 Working Surfaces
D-6e(2)(a) Material Testing Data	806(4)(h)(ii)(A) 665(2)(h)	Provide complete results for index tests, laboratory and/or in situ permeability tests, strength tests, consolidation tests, and shrinks well properties of soil liner material. Discuss potential for dispersion and piping of soil due to flow of liquid through soil liner layer.	C4.2.3 Laboratory Testing Data C4.3.2 Soil Liners C4.6 Liner System – Construction and Maintenance

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum C, Process Information Regulatory Crosswalk – Landfills

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6e(2)(b) Soil Liner Compatibility Data	806(4)(h)(ii)(A) 665(2)(a)(i)(A) 665(2)(h)(iii)(C)	Provide complete test results of permeability testing of soil liner material using representative of leachate from surface impoundment.	C4.2.3 Laboratory Testing Data C4.3.2 Soil Liners C4.6 Liner System – Construction and Maintenance
D-6e(2)(c) Soil Liner Strength	806(4)(h)(ii)(A) 665(2)(a)(i)(A) 665(2)(h)(iii)(C)	Demonstrate that soil liner has sufficient strength to support loads/stresses computed in item D-4c(3).	C4.2.4 Engineering Analyses C4.3.2 Soil Liners C4.6 Liner System – Construction and Maintenance
D-6f Liner System, Leachate Collection/Detection Systems			

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum C, Process Information Regulatory Crosswalk – Landfills

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6f(1) System Operation and Design	806(4)(h)(ii)(A) 665(2)(a)(ii) 665(2)(h)(ii) 665(2)(h)(iii)	Describe design features of leachate detection system and how system will function to detect any leakage through either liner in timely manner.	C4.4.1 Systems Operation and Design C4.6 Liner System – Construction and Maintenance
D-6f(2) Drainage Material	806(4)(h)(ii)(A) 665(2)(a)(ii) 665(2)(h)(iii)(B)	Describe leachate detection system drainage material.	C4.1.1.1 LLBG Trenches 31 and 34 C4.4.1 Systems Operation and Design C4.4.2 Grading and Drainage C4.6 Liner System – Construction and Maintenance

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6f(3) Grading and Drainage	806(4)(h)(ii)(A) 665(2)(a)(ii) 665(2)(h)(ii) 665(2)(h)(iii)	Indicate slopes of leachate detection system and provide contour plan for system along with plan showing layout and spacing of piping system and any sumps, pumps, etc. Demonstrate that leak detection system is appropriately graded to assure that leakage at any point in liner system is detected in timely manner.	C4.4.1 Systems Operation and Design C4.4.2 Grading and Drainage C4.6 Liner System – Construction and Maintenance
D-6f(4) Maximum Leachate Head	806(4)(h)(ii)(A) 665(2)(a)(ii) 665(2)(h)(ii)	Describe and demonstrate that the design and operating features will prevent the leachate depth over the top of the primary liner from exceeding one foot (i.e., one foot above the uppermost liner). Provide copies of calculations along with a justification of the assumed parameters and of the numerical technique used.	C4.4.1 Systems Operation and Design C4.4.3 Maximum Leachate Head C4.6 Liner System – Construction and Maintenance
D-6f(5) Systems Compatibility	806(4)(h)(ii)(A) 665(2)(a)(ii)(A)(I) 665(2)(h)(iii)	Demonstrate that all components of the leachate collection/detection systems are chemically resistant to the waste managed in the landfill and the leachate expected to be generated.	C4.4.4 Systems Compatibility C4.6 Liner System – Construction and Maintenance

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6f(6) Systems Strength			
D-6f(6)(a) Stability of Drainage Layers	806(4)(h)(ii)(A) 665(2)(a)(ii)(A)(II) 665(2)(h)(iii)	Demonstrate that the drainage layers of the leachate collection/detection system have sufficient strength to support the loads and stresses computed in item D-6c(3) (i.e., sufficient soil bearing capacity to support loads). Demonstrate (by providing calculations) that the drainage layers placed on sloped surfaces of the landfill or foundation will be stable during construction.	C4.4.5 Systems Strength C4.6 Liner System – Construction and Maintenance
D-6f(6)(b) Strength of Piping	806(4)(h)(ii)(A) 665(2)(a)(ii)(A)(II) 665(2)(h)(iii)	Demonstrate that pipe used in piping systems have sufficient strength to support loads as computed in item D-6c(3).	C4.4.5 Systems Strength C4.6 Liner System – Construction and Maintenance
D-6f(7) Prevention of Clogging	806(4)(h)(ii)(A) 665(2)(a)(ii)(B) 665(2)(h)(iii)(D)	Demonstrate that the leachate collection/detection systems are designed and operated to prevent clogging (due to piping) of the drainage layer material of the pipes throughout the active life of the landfill. Consideration must also be given to physical, chemical and/or biological clogging. As an alternative, describe how clogging would be detected and what cleanout procedures would be used to restore the capacity of the system. Include calculations demonstrating the effectiveness of the protection material or system.	C4.4.6 Prevention of Clogging C4.6 Liner System – Construction and Maintenance

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6f(8) Liquid Removal	806(4)(h)(ii)(A) 665(2)(h)(iii)(E) 665(2)(h)(iv)	Describe the sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump. Each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed. Indicate that the owner/operator will collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner. Indicate the fate of the collected leachate, which is considered a hazardous waste.	C4.4.1 Systems Operation and Design C4.4.1.1 Primary System C4.4.1.2 Secondary System C4.6 Liner System – Construction and Maintenance
D-6f(9) Location Relative to Water Table	806(4)(h)(ii)(A)(III) 665(2)(h)(v)	The owner/operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of groundwater.	Not Applicable
D-6g Liner System, Construction and Maintenance			
D-6g(1) Material Specifications			

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6g(1)(a) Synthetic Liners	806(4)(h)(ii)(A) 665(2)(a)(i)	Provide detailed material specifications for specific synthetic liner or liners to be used.	C4.1.1.1 LLBG Trenches 31 and 34 C4.6 Liner System – Construction and Maintenance
D-6g(1)(b) Soil Liners	806(4)(h)(ii)(A) 665(2)(a)(i)	For soil liners constructed of borrowed material, provide specifications. For soil liners using in-place soil, provide specifications to be used to assure that all existing materials meet requirements of liner design.	C4.1.1.1 LLBG Trenches 31 and 34 C4.2.3 Laboratory Testing Data C4.6 Liner System – Construction and Maintenance
D-6g(1)(c) Leachate Collection/Detection Systems	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Provide material specifications for drainage layer material, filter fabric or filter layer, piping, and sumps.	C4.1.1.1 LLBG Trenches 31 and 34 C4.6 Liner System – Construction and Maintenance
D-6g(2) Construction Specifications			

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EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6g(2)(a) Liner System Foundation	806(4)(h)(ii)(A) 665(2)(a)(i) 665(4)(a)	Provide construction specifications of foundation installation procedures. For units that use in-place material for liner system foundation, provide construction specifications for preparation of foundation.	C4.6 Liner System – Construction and Maintenance
D-6g(2)(b) Soil Liner	806(4)(h)(ii)(A) 665(2)(a)(i) 665(4)(b)(ii)	Describe procedures for installing soil liner.	C4.6 Liner System – Construction and Maintenance
D-6g(2)(c) Synthetic Liners	806(4)(h)(ii)(A) 665(2)(a)(i) 665(4)(a)(i)	Provide construction specifications for placement of synthetic liners.	C4.6 Liner System – Construction and Maintenance
D-6g(2)(d) Leachate Collection/Detection Systems	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Provide construction specifications for placement of all components of leachate collection/detection systems.	C4.6 Liner System – Construction and Maintenance
D-6g(3) Construction Quality Assurance (CQA) Program	806(4)(h)(ii)(A) 806(h)(ii)(iv) 810(14)(b) 665(4)(a) 335	Provide complete details of CQA program to be used during construction of liner system to assure that it is built as designed.	C4.6.1 Construction Quality Assurance Program
D-6g(4) Maintenance Procedures for Leachate Collection/Detection Systems	806(4)(h)(ii)(A) 665(2)(a) 665(2)(h)	Describe anticipated maintenance activities that will be used to assure proper operation of leachate collection/detection systems throughout landfill's expected life.	C4.6.2 Maintenance Procedures for Leachate Collection and Removal Systems

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6g(5) Liner Repairs During Operations	806(4)(h)(ii)(A) 665(2)(a)	Describe methods that will be used to repair any damage to liner that occurs while landfill is in operation during placement of waste (such as a dozer ripping the liner).	C4.6.3 Liner Repairs during Operations
D-6h Action Leakage Rate			
D-6h(1) Determination of the Action Leakage Rate	806(4)(h)(ii)(A)(V) 665(8)(a)	Identify the action leakage rate for landfill units subject to the liner system provisions of 665(2)(h) and 665(2)(i). The action leakage rate shall be defined as the maximum design flow rate that the leak detection system (i.e., the leachate collection and removal system) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include and adequate safety margin to allow for uncertainties in the design, construction, operation, and location of the leak detection system, waste and leachate characteristics, sources of other liquids in the system, and proposed response actions.	C4.13 Action Leakage Rate and Response Actions
D-6h(2) Monitoring the Leakage	806(4)(h)(ii)(A)(V) 665(8)(b)	To determine if action leakage rate has been exceeded, owner/operator must convert required leachate flow rate monitoring data to average daily flow rate for each sump. This average daily flow rate must be calculated weekly during active life of facility and closure period, and monthly during post-closure care period.	C4.13 Action Leakage Rate and Response Actions
D-6i Leakage Response Action Plan			

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6i(1) Response Actions	806(4)(h)(ii)(A)(V) 665(9)(a)	Provide a response action plan for landfills subject to the liner system provisions of 665(2)(h) and 665(2)(i). The response action plan must describe the actions to be taken if flow rate into the leak detection system exceeds the action leakage rate.	C4.13 Action Leakage Rate and Response Actions
D-6i(2) Leak and/or Remedial Determinations	806(4)(h)(ii)(A)(V) 665(9)(b) 665(9)(c)	The response action plan must outline procedures to determine, to the extent practicable: (1) the location, size, and cause of any leak; (2) whether waste receipt should cease or be curtailed; (3) whether waste should be removed from the unit for inspection, repairs, or controls; (4) whether the unit should be closed; and (5) other short-term or long-term actions to be taken to mitigate or stop leaks. To make leak and/or remediation determinations, the owner/operator must: (1) assess the source of the liquids and amounts of liquids by source, (2) conduct a fingerprint, hazardous constituent, or other analyses of the liquids to identify the source and possible location of any leaks and the hazard and mobility of the liquid, and (3) assess the seriousness of any leaks in terms of potential for escaping into the environment. Alternatively, the owner/operator may document why such assessments are not needed.	C4.13 Action Leakage Rate and Response Actions
D-6i(3) Notifications	806(4)(h)(ii)(A)(V) 665(9)(b)	The response action plan must indicate that the Regional Administrator will: (1) be notified in writing within seven (7) days of determining that the action leakage rate has been exceeded; (2) be provided with a preliminary assessment and action plan within 14 days of the initial determination that the action leakage rate has been exceeded; and (3) receive a status report within 30 days after the original notification that the action leakage rate has been exceeded. The Regional Administrator must receive monthly status reports for as long as the flow rate exceeds the action leakage rate.	C4.13 Action Leakage Rate and Response Actions

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6j Run-on and Run-off Control Systems			
D-6j(1) Run-on Control System	806(4)(h)(ii)(B) 665(2)(c)	Describe system that will be used to prevent run-on onto active portions of landfills.	C4.7.1 Run-On Control System
D-6j(1)(a) Design and Performance	806(4)(h)(ii)(B) 665(2)(c)	Describe the run-on control system design and how the design prevents run-on from reaching the active portions of the site. Provide a plan view showing the locations of the run-on control system components, along with sufficient drawing details, profiles and cross sections along with the calculations used to size the system.	C4.7.2 Design and Performance
D-6j(1)(b) Calculation of Peak Flow	806(4)(h)(ii)(A) 665(2)(c)	Identify peak surface water flow expected to result from 25-year design storm. Provide copies of calculations and data.	C4.7.3 Calculation of Peak Flow
D-6j(2) Run-off Control System	806(4)(h)(ii)(C) 665(2)(d)	Describe run-off control system to be used to collect and control run-off from active portions.	C4.7.4 Runoff Control System
D-6j(2)(a) Design and Performance	806(4)(h)(ii)(C) 665(2)(d)	Describe the run-off collection and control system design. Provide calculations demonstrating that the system has sufficient capacity to collect and hold the total run-off volume. Provide a plan view showing the locations of the run-off control system components, along with sufficient drawing details and cross sections. Indicate the fate of the collected run-off that is considered hazardous waste until tested and/or treated.	C4.7.4 Runoff Control System
D-6j(2)(b) Calculation of Peak Flow	806(4)(h)(ii)(C) 665(2)(d)	Identify the total run-off volume expected to result from at least a 24-hour, 25-year storm. Describe data sources and methods used to make the peak flow calculation. Provide copies of the calculations and data, including appropriate references.	C4.7.4 Runoff Control System

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6j(3) Management of Collection and Holding Units	806(4)(h)(ii)(D) 665(2)(e)	Describe how collection and holding facilities associated with run-on and run-off control systems will be emptied or otherwise managed expeditiously after storms to maintain system design capacity. Describe fate of liquids discharged from these systems.	Not Applicable <u>Note</u> LLBG Trenches 31 and 34 operate under 90-day storage for removal of liquids.
D-6j(4) Construction	806(4)(h)(ii)(B) 806(4)(h)(ii)(C) 665(2)(c) 665(2)(d)	Provide detailed construction and material specifications for run-on and run-off control systems.	C4.7.1 Run-On Control System C4.7.4 Runoff Control System
D-6j(5) Maintenance	806(4)(h)(ii)(B) 806(4)(h)(ii)(C) 665(2)(c) 665(2)(d)	Describe any maintenance activities required to assure continued proper operations of run-on and run-off control systems throughout active life of unit.	C4.12 Monitoring and Inspection
D-6k Control of Wind Dispersal	806(4)(h)(ii)(E) 665(2)(f)	If the landfill contains any particulate matter that may be subject to wind dispersal, describe how the landfill is covered or otherwise managed to control wind dispersal.	C4.8 Control of Wind Dispersal
D-6L Liquids in Landfills			
D-6L(1) Bulk or Noncontainerized Free Liquids	806(4)(h)(vii) 140(4)(a) 140(4)(b)	Describe procedures that will be used to ensure that no bulk or noncontainerized liquid hazardous waste or waste with free liquids will be placed in landfill. Demonstrate, by paint filter test, Method 9095, that no free liquids will be placed in landfill.	C4.9 Liquids in Landfills Addendum B, *Waste Analysis Plan (WAP)*

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EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6L(2) Containers Holding Free Liquids	806(4)(h)(vii) 140(4)(b)(ii)	For facilities that intend to dispose of containers holding free liquids, describe how free liquids will be removed from containers or stabilized within container before container is placed in landfill. If liquid is removed, container must be backfilled or crushed.	C4.9 Liquids in Landfills Addendum B, *WAP*
D-6L(3) Restriction to Small Containers	806(4)(h)(vii) 140(4)(b)(ii)(B)	If small containers are to be disposed of in landfill, demonstrate by indicating container volume, that containers will be very small (such as ampules).	C4.10 Containerized Wastes Addendum B, *WAP*
D-6L(4) Nonstorage Containers	806(4)(h)(vii) 140(4)(b)(ii)(C)	If nonstorage containers are to be disposed of in landfill, demonstrate by describing the containers designed to hold free liquids for use other than storage (e.g., batteries, capacitors).	C4.4.6 Prevention of Clogging C4.9 Liquids in Landfills Addendum B, *WAP*
D-6L(5) Lab Packs	806(4)(h)(vii) 140(4)(b)(ii)(D)	Describe how it will be assured that lab packs to be landfilled containing free liquids meet requirements for lab packs.	C4.9 Liquids in Landfills Addendum B, *WAP*

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EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6L(5)(a) Inside Containers	806(4)(h)(vii) 140(4)(b)(ii)(D) 161(1)	Demonstrate how it will be assured that inside containers: • Are securely sealed and not leaking; • Will not react with, be decomposed by, or ignited by the waste; and • Meet DOT specifications.	C4.9 Liquids in Landfills C4.16 Special Requirements for Ignitable or Reactive Waste Addendum B, *WAP*
D-6L(5)(b) Overpack	806(4)(h)(vii) 140(4)(b)(ii)(D) 161(2)	Demonstrate that overpacking consists of metal, Department of Transportation (DOT) containers, metal DOT containers, with open heads no larger than 110 gallons; and sufficient sorbent material determined to be nonbiodegradable to completely sorb all liquid contents of inside container.	C4.9 Liquids in Landfills Addendum B, *WAP*
D-6L(5)(c) Sorbent Material	806(4)(h)(vii) 140(4)(b)(iv) 161	Demonstrate that sorbent materials used are not capable of reacting dangerously with, being decomposed by, or being ignited by contents of inside containers.	C4.4.6 Prevention of Clogging Addendum B, *WAP*
D-6L(5)(d) Incompatible Wastes	806(4)(h)(iv) 665(7) 161(4)	Demonstrate that incompatible wastes, or incompatible wastes and materials must not be placed in the same landfill cell, unless WAC 173-303-395 (1)(b) is complied with. Demonstrate that incompatible wastes, as defined in WAC 173-303-040, must not be placed in the same outside container.	C4.17 Special Requirements for Incompatible Wastes Addendum B, *WAP*

EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6L(5)(e) Reactive Wastes	806(4)(h)(iv) 665(7) 665(10) 161(5)	Demonstrate that incompatible wastes, or incompatible wastes and materials must not be placed in the same landfill cell, unless WAC 173-303-395 (1)(b) is complied with. Demonstrate that ignitable or reactive waste must not be placed in the same landfill cell, unless WAC 173-303-665(10) is complied with. Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in WAC 173-303-090 (7)(a)(v), must be treated or rendered nonreactive prior to packaging in accordance WAC 173-303-161(5).	C4.16 Special Requirements for Ignitable or Reactive Waste Addendum B, *WAP*
D-6m Containerized Wastes	806(4)(h)(vii) 665(12)	If containerized solid wastes are to be landfilled, describe how either it will be assured that all containers are at least 90% full when placed in the landfill, or containers will be crushed, shredded or similarly reduced in volume to the maximum practical extent before burial.	C4.10 Containerized Wastes
D-6n Special Waste Management Plan for Landfills Containing Wastes F020, F021, F022, F023, F026, and F027			C4.11 Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027 Note Hazardous wastes designated as F020, F021, F022, F023, F026, and F027 will not be
D-6n(1) Waste Descriptions	806(4)(h)(iv) 665(11)	Identify volume, physical, and chemical characteristics of waste, including potential to migrate through soil or volatilize or escape into atmosphere.	

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EPA 530-R-11-006[a] Section and Requirement	State Regulation WAC 173-303	Review Consideration	LLBG Trench 31-34-94 Section
D-6n(2) Soil Description	806(4)(h)(iv) 665(11)	Describe attenuative properties of underlying and surrounding soils or other materials.	placed in any landfill. Confirmation and verification processes to ensure that hazardous wastes F020, F021, F022, F023, F026, and F027 are not disposed of in LLBG Trenches 31-34-94 are described in the WAP (Addendum B).
D-6n(3) Mobilizing Properties	806(4)(h)(iv) 665(11)	Describe mobilizing properties of other materials co-disposed of with this waste.	

[a]EPA guidance document, *Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) Regulations* [EPA 530-R-11-006, Version 4 dated 12/1/2014]. Example RCRA Subtitle C Permit Application Checklist for Review of Federal RCRA Permit Applications, Section D. Process Information – Landfills.

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WAC Regulation	Ecology Guidance Document Publication 95-402	DOE/RL-2009-76, Rev. 1 *Groundwater Monitoring Plan for the LLWMA-2* (Trench 94)	DOE/RL-2015-64, *Groundwater Monitoring Plan for the LLWMA-3* (Trench 31-34)
WAC 173-303-806 Final facility permits			
(xx) Additional information requirements. The following additional information regarding protection of groundwater is required from owners or operators of dangerous waste facilities containing a regulated unit except as otherwise provided in WAC 173-303-645 (1)(b):	No Ecology guidance for groundwater monitoring		
(A) A summary of the groundwater monitoring data obtained during the interim status period under 40 C.F.R. 265.90 through 265.94, where applicable;		Section 2.5 Summary of Previous Groundwater Monitoring	Section 2.5 Summary of Previous Groundwater Monitoring
(B) Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, and the basis for such identification (that is, the information obtained from hydrogeologic investigations of the facility area);		Section 2.4.2 Hydrogeology Section2.4.3 Groundwater Flow Interpretation	Section 2.4.2 Hydrogeology Section 2.4.3 Groundwater Flow Interpretation Section 2.6.3 Hydrogeologic Considerations
(C) On the topographic map required under (a)(xviii) of this subsection, a delineation of the waste management area, the property boundary, the proposed "point of compliance" as defined under WAC 173-303-645(6), the proposed location of groundwater monitoring wells as required under WAC 173-303-645(8), and, to the extent possible, the information required in (a)(xx)(B) of this subsection;		Figure 1-2. 218-E-12B Burial Ground at LLWMA-2 Figure 2-7. Low Gradient Water Level Map for 200 East Area, 2013 Figure 2-8. Low Gradient Water Level Map for 200 East Area, 2014	Figure 1-2. LLWMA-3 Burial Grounds 218-W3A, 218-W-3AE, and 218-W-5 Figure 2-5. Water Table Map for LLWMA-3
(D) A description of any plume of contamination that has entered the		2.2 Regulatory Basis	2.2 Regulatory Basis

WAC Regulation	Ecology Guidance Document Publication 95-402	DOE/RL-2009-76, Rev. 1 *Groundwater Monitoring Plan for the LLWMA-2* (Trench 94)	DOE/RL-2015-64, *Groundwater Monitoring Plan for the LLWMA-3* (Trench 31-34)
groundwater from a regulated unit at the time that the application was submitted that:		2.5 Summary of Previous Groundwater Monitoring	2.5 Summary of Previous Groundwater Monitoring
(I) Delineates the extent of the plume on the topographic map required under (a)(xviii) of this subsection;		N/A	N/A
(II) Identifies the concentration of each constituent throughout the plume or identifies the maximum concentrations of each constituent in the plume. (Constituents are those listed in Appendix "Ground-Water Monitoring List" in *Chemical Testing Methods for Designating Dangerous Waste* which is incorporated at WAC 173-303-110 (3)(c) and (7), and any other constituents not listed there which have caused a managed waste to be regulated under this chapter.);		N/A	N/A
(E) Detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of WAC 173-303-645(8);		Section 3 Groundwater Monitoring Program Section 4.2 Statistical Evaluation Section 4.4 Annual Determination of Monitoring Network Section 4.5 Reporting and Evaluation Appendix A Quality Assurance Project Plan	Section 3 Groundwater Monitoring Program Section 4.2 Statistical Evaluation Section 4.4 Groundwater Monitoring Section 4.5 Reporting and Notification Appendix A Quality Assurance Project Plan

WAC Regulation	Ecology Guidance Document Publication 95-402	DOE/RL-2009-76, Rev. 1 *Groundwater Monitoring Plan for the LLWMA-2* (Trench 94)	DOE/RL-2015-64, *Groundwater Monitoring Plan for the LLWMA-3* (Trench 31-34)
		Appendix B Section B2 Sampling Methods Appendix C Well Construction	Appendix B Section B2 Sampling Methods Appendix C Well Construction
(F) If the presence of dangerous constituents has not been detected in the groundwater at the time of permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a detection monitoring program which meets the requirements of WAC 173-303-645(9). This submission must address the following items specified under WAC 173-303-645(9):		Section 3 Groundwater Monitoring Program Section 4 Data Evaluation and Reporting Section 5 Outline for Groundwater Quality Assessment Plan	Section 3 Groundwater Monitoring Program Section 4 Data Evaluation and Reporting
(I) A proposed list of indicator parameters, waste constituents, or reaction products that can provide a reliable indication of the presence of dangerous constituents in the groundwater;		Section 3.1 Constituents List and Sampling Frequency Table 3-1. Monitoring Well for the LLWMA-3	Section 3.1 Constituents List and Sampling Frequency Table 3-1. Monitoring Well for the LLWMA-3
(II) A proposed groundwater monitoring system;		Section 3.2 Monitoring Well Network	Section 3.3 Monitoring Well Network
(III) Background values for each proposed monitoring parameter or constituent, or procedures to calculate such values; and		Section 4.2 Statistical Evaluation	Section 4.2 Statistical Evaluation
(IV) A description of proposed sampling, analysis and statistical comparison procedures to be utilized in		Section 4.2 Statistical Evaluation	Section 4.2 Statistical Evaluation

WAC Regulation	Ecology Guidance Document Publication 95-402	DOE/RL-2009-76, Rev. 1 *Groundwater Monitoring Plan for the LLWMA-2* (Trench 94)	DOE/RL-2015-64, *Groundwater Monitoring Plan for the LLWMA-3* (Trench 31-34)
evaluating groundwater monitoring data;			

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum E, Security Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-310 Security		
(1) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his or her facility, unless he can demonstrate to the department that:	Section F1. Security	E1.1 Security Provisions; E1.1.1 Access control
(a) Physical contact with waste, structures or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and	NA	NA – Meeting requirement of WAC 173-303-310(1)
(b) Disturbance of the waste or equipment by the unknowing or unauthorized entry of persons or livestock onto the active portion of the facility will not cause a violation of this chapter 173-303 WAC.	NA	NA – Meeting requirement of WAC 173-303-310(1)
(2) A facility must have:		
(a) Signs posted at each entrance to the active portion, and at other locations, in sufficient numbers to be seen from any approach to the active portion. Signs must bear the legend "Danger - unauthorized personnel keep out," or an equivalent legend, written in English, and must be legible from a distance of twenty-five feet or more; and either	Section F1.1.1.	E1.1.2 Warning Signs
(b) A 24-hour surveillance system which continuously monitors and controls entry onto the active portion of the facility; or	Section F1.1.2, Bullet 1	E1.1 Security Provisions: E1.1.1 Access Control
(c) An artificial or natural barrier, or a combination of both, which completely surrounds the active portion of the facility, with a means to control access through gates or other entrances to the active portion of the facility at all times.	Section F1.1.2, Bullet 2	NA – Rely on WAC 173-303-310(2)(b)

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(3) In lieu of WAC 173-303 310(2), above, the owner or operator of a totally enclosed treatment facility or an elementary neutralization or wastewater treatment unit (as defined in WAC 173-303-040) must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock into or onto the totally enclosed treatment facility or the elementary neutralization or wastewater treatment unit.	NA	NA – Rely on WAC 173-303-310(2)(b)

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-806(4)(a)(vi) Contents of Part B		
(vi) A justification of any request for a waiver(s) of the preparedness and prevention requirements of WAC 173-303-340, or a description of the procedures used to comply with these requirements.	F3. Preparedness and Prevention Requirements	No waiver of WAC 173-303-340 is requested.
WAC 173-303-806(4)(a)(viii) Contents of Part B		
(viii) A description of procedures, structures, or equipment used at the facility to:	F4. Preventative Procedures, Structures, and Equipment	
(A) Prevent hazards and contain spills in unloading/loading operations (for example, ramps, berms, pavement, special forklifts);	F4. Preventative Procedures, Structures, and Equipment	F1.2.1 Container Loading, Unloading, and Handling Preventive Measures
(B) Prevent runoff from dangerous waste handling areas to other areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches);	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(C) Prevent contamination of water supplies;	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(D) Mitigate effects of equipment failure and power outages;	F4. Preventative Procedures, Structures, and Equipment	F1.2.3 Equipment and Power Failure
(E) Prevent undue exposure of personnel to dangerous waste (for example, protective clothing); and	F4. Preventative Procedures, Structures, and Equipment	F1.2.4 Personal Protective Equipment
(F) Prevent releases to the atmosphere.	No equivalent	NA. Prevention of releases to the atmosphere are covered in the AOP.
WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible wastes		

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including, but not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. "No smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3 Prevention of Reaction of Ignitable, Reactive, and/or Incompatible Waste LLBG Trenches 31-34-94 does not accept ignitable, reactive, and/or incompatible waste.
(b) Where specifically required by other sections of this chapter 173-303 WAC, the treatment, storage, or disposal of ignitable or reactive waste, and the mixture or commingling of incompatible wastes, or incompatible wastes and materials, must be conducted so that it does not:	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	NA, LLBG Trenches 31-34-94 does not accept ignitable, reactive, and/or incompatible wastes.
(i) Generate extreme heat or pressure, fire or explosion, or violent reaction;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iv) Damage the structural integrity of the facility or device containing the waste; or	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(v) Through other like means, threaten human health or the environment.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(c) When required to comply with (a) and (b) of this subsection, the owner or operator must document that compliance in the operating record required under WAC 173-303-380(1). This documentation may be based on references to published scientific or engineering literature, data from trial tests, waste analyses, or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	NA
WAC 173-303-395(4) Loading and unloading areas		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures
(a) Contain spills and leaks that might occur during loading or unloading;	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures F1.1.3 Emergency Equipment
(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;	No equivalent	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and	No equivalent	NA Cleaning of transport vehicles is not allowed on the LLBG Trenches 31 and 34 Waste Storage and Treatment Pads
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.	No equivalent	F1.2.1. Container Loading, Unloading, and Handling Preventative Measures
WAC 173-303-340 Preparedness and prevention		
(1) Required equipment: All facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below:	F3.1. Equipment requirements	No equipment exceptions requested

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel;	F3.1.1. Internal Communications	F1.1.1 Internal Communications
(b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams;	F3.1.2. External Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(c) Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment, and	F3.1.3. Emergency Equipment	F1.1.3 Emergency Equipment
(d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	F3.1.4. Water for Fire Control	F1.1.4 Water for Fire Control; F1.1.3 Emergency Equipment
(2) Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situation below:		
(a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (1) of this section;	F3.1.1. Internal Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (1) of this section.	F3.1.2. External Communications	F1.1.2 External Communications

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	F3.2 Aisle space requirement	F1.1.5 Aisle Spacing
(4) Arrangement with local authorities. The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements:	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(a) Arrangements to familiarize police, fire departments, and emergency response with the layout of the facility, associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers; and Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements, with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(5) Where state or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum G, Personnel Training Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-806(4)(a)(xii) Final facility permit		
An outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330. A brief description of how training will be designed to meet actual job tasks in accordance with requirements in WAC 173-303-330 (1)(d).		
WAC 173-303-303 Personnel training		
(1) Training program. The facility owner or operator must provide a program of classroom instruction or on-the-job training for facility personnel. This program must teach personnel to perform their duties in a way that ensures the facility's compliance with this chapter 173-303 WAC, must teach facility personnel dangerous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed, must ensure that facility personnel are able to respond effectively to emergencies, and must include those elements set forth in the training plan required in subsection (2) of this section. In addition:	H. Personnel Training	Attachment 5 *Hanford Facility Personnel Training Program*
(a) The training program must be directed by a person knowledgeable in dangerous waste management procedures, and must include training relevant to the positions in which the facility personnel are employed;	H5. Training Program Administration	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.4 Training Program Direction)
(b) Facility personnel must participate in an annual review of the training provided in the training program;	H4. Continuing Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.2 Continuing Training)
(c) This program must be successfully completed by the facility personnel:	H2. Initial Training	
(i) Within six months after these regulations become effective; or	No equivalent	Refer to (c)(ii)
(ii) Within six months after their employment at or assignment to the facility, or to a new position at the facility, whichever is later.	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)
(d) Employees hired after the effective date of these regulations must be supervised until they complete the training program; and	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum G, Personnel Training Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(e) At a minimum, the training program must familiarize facility personnel with emergency equipment and systems, and emergency procedures. The program must include other parameters as set forth by the department, but at a minimum must include, where applicable:	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1 Introductory and Continuing Training) PRC-STD-TQ-40227, *Low Level Burial Grounds Dangerous Waste Training Plans* (Section 2.1 Emergency Response Training), referenced in Addendum G, Personnel Training
(i) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;	H2. Initial Training	PRC-STD-TQ-40227 *Low Level Burial Grounds Dangerous Waste Training Plans* (Table 2-1, Applicability of WAC 173-303-330(1)(e)), referenced in Addendum G, Personnel Training
(ii) Key parameters for automatic waste feed cut-off systems;		
(iii) Communications or alarm systems;		
(iv) Response to fires or explosions;		
(v) Response to ground-water contamination incidents; and		
(vi) Shutdown of operations.		
(2) Written training plan. The owner or operator must develop a written training plan which must be kept at the facility and which must include the following documents and records:	H. Overview of Requirements	Addendum G, Personnel Training PRC-STD-TQ-40227 *Low Level Burial Grounds Dangerous Waste Training Plans*
(a) For each position related to dangerous waste management at the facility, the job title, the job description, and the name of the employee filling each job. The job description must include the requisite skills, education, other qualifications, and duties for each position;	H6. Job Title/Job Description	PRC-STD-TQ-40227, *Low Level Burial Grounds Dangerous Waste Training Plans* (Section 3.0 Names, Job Descriptions, and Job Title/Positions)
(b) A written description of the type and amount of both introductory and continuing training required for each position; and	H3. Task Specific Training	Addendum G, Personnel Training (Table G-1 Training Matrix) PRC-STD-TQ-40227 *Low Level Burial Grounds Dangerous Waste Training*

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
		Plans (Section 2.0, Training Program; Table 3-2, Training Course Matrix)
(c) Records documenting that facility personnel have received and completed the training required by this section. The department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received.	H7. Documentation and Record Retention	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.3 Training Records)
(3) Training records. Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.	H7. Documentation and Record Retention	Permit Condition II.I.1: The Permittees will maintain a written Facility Operating Record until ten (10) years after post-closure, or corrective action is complete and certified for the Facility, whichever is later.

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WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-610 Closure and post-closure		
(2) Closure performance standard. The owner or operator must close the facility in a manner that:		
(a)(i) Minimizes the need for further maintenance;	95-402 I1.2 Closure Performance Standards 94-111 2.0 Closure Performance Standards	H-A2 Closure Performance Standards
(ii) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and		
(iii) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.		
(b) Where the closure requirements of this section, or of WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680 (2) through (4), or 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695) call for the removal or decontamination of dangerous wastes, waste residues, or equipment, bases, liners, soils or other materials containing or contaminated with dangerous wastes or waste residue, then such removal or decontamination must assure that the levels of dangerous waste or dangerous waste constituents or residues do not exceed:		NA – Landfill closure. Waste will not be removed.
(i) For soils, groundwater, surface water, and air, the numeric cleanup levels calculated using unrestricted use exposure assumptions according to the Model Toxics Control Act Regulations, chapter 173-340 WAC as of the effective date or hereafter amended. Primarily, these will be numeric cleanup levels calculated according to MTCA Method B, although MTCA Method A may be used as appropriate, see WAC 173-340-700 through 173-340-760, excluding WAC 173-340-745; and		NA – Landfill closure. Waste will not be removed.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) For all structures, equipment, bases, liners, etc., clean closure standards will be set by the department on a case-by-case basis in accordance with the closure performance standards of WAC 173-303-610 (2)(a)(ii) and in a manner that minimizes or eliminates post-closure escape of dangerous waste constituents.		NA – Landfill closure. Waste will not be removed.
(3) Closure plan; amendment of plan.		
(a) The owner or operator of a dangerous waste management facility must have a written closure plan. In addition, certain surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the dangerous waste at partial or final closure are required by WAC 173-303-650(6) and 173-303-660(9) to have contingent closure plans. The plan must be submitted with the permit application, in accordance with WAC 173-303-806(4), and approved by the department as part of the permit issuance procedures under WAC 173-303-840. The approved closure plan will become a condition of any permit. The department's decision must assure that the approved closure plan is consistent with subsections (2), (3), (4), (5), and (6) of this section, and the applicable requirements of WAC 173-303-630(10), 173-303-640(8), 173-303-645, 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680(2), and 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695). A copy of the approved plan and all revisions to the plan must be furnished to the department upon request, including request by mail until final closure is completed and certified in accordance with subsection (6) of this section. The plan must identify steps necessary to perform partial and/or final closure of the facility at any point during its active life. The closure plan must include at least:	94-111 8.2 The Closure Plan	H-A1 Introduction

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum H, Closure Plans Regulatory Crosswalk (Trenches 31 and 34)

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) A description of how each dangerous waste management unit at the facility will be closed in accordance with subsection (2) of this section;	95-402 I1.3.1 Removing Dangerous Wastes (For Maximum Waste Inventory Elimination) 94-111 8.2.1 Contents of the Closure Plan	H-A3 Closure Activities
(ii) A description of how final closure of the facility will be conducted in accordance with subsection (2) of this section. The description must identify the maximum extent of the operation which will be unclosed during the active life of the facility;	94-111 8.2.1 Contents of the Closure Plan	H-A1.1.1 Maximum Waste Inventory H-A2 Closure Performance Standards H-A3 Closure Activities
(iii) An estimate of the maximum inventory of dangerous wastes ever on-site over the active life of the facility. (Any change in this estimate is a Class 1 modification with prior approval under WAC 173-303-830(4));	95-402 I1.3.1 Removing Dangerous Wastes (For Maximum Waste Inventory Elimination) 94-111 8.2.1 Contents of the Closure Plan	H-A1.1.1 Maximum Waste Inventory
(iv) A detailed description of the methods to be used during partial closures and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the type(s) of the off-site dangerous waste management units to be used, if applicable;	95-402 I1.3.1 Removing Dangerous Wastes (For Maximum Waste Inventory Elimination) 94-111 8.2.1 Contents of the Closure Plan	H-A1.1 Unit Description H-A1.1.1 Maximum Waste Inventory H-A3.5 Final Landfill Cover
(v) A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard;		NA – Landfill closure. Waste will not be removed.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(vi) A detailed description of other activities necessary during the closure period to ensure that all partial closures and final closure satisfy the closure performance standards, including, but not limited to, groundwater monitoring, leachate collection, and run-on and runoff control;	95-402 I1.3.4 Other Activities	H-A3 Closure Activities
(vii) A schedule for closure of each dangerous waste management unit and for final closure of the facility. The schedule must include, at a minimum, the total time required to close each dangerous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all dangerous waste inventory and of the time required to place a final cover must be included.); and	95-402 I1.4 Schedule for Closure	H-A4 Closure Schedule and Time Frame
(viii) For facilities that use trust funds to establish financial assurance under WAC 173-303-620 (4) or (6) and that are expected to close prior to the expiration of the permit, an estimate of the expected year of final closure.		NA – No trust fund used.
(ix) For facilities where the director has applied alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d), the closure plan must include either the alternative requirements or a reference to the enforceable document that contains the alternative requirements.		NA – No alternative requirements.
(b) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan in accordance with the applicable procedures in WAC 173-303-800 through 173-303-840. The written notification or request must include a copy of the amended closure plan for review or approval by the department.	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum H, Closure Plans Regulatory Crosswalk (Trenches 31 and 34)

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) The owner or operator may submit a written notification or request to the department for a permit modification to amend the closure plan at any time prior to the notification of partial or final closure of the facility.		Not a Requirement
(ii) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in the approved closure plan whenever:	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(A) Changes in operating plans or facility design affect the closure plan; or	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(B) There is a change in the expected year of closure, if applicable; or	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(C) In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan; or	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(D) The owner/operator requests the director apply alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d).	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iii) The owner or operator must submit a written request for a permit modification including a copy of the amended closure plan for approval at least sixty days prior to the proposed change in facility design or operation, or no later than sixty days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator must request a permit modification no later than thirty days after the unexpected event. An owner or operator of a surface impoundment or waste pile that intends to remove all dangerous waste at closure and is not otherwise required to prepare a contingent closure plan under WAC 173-303-650(6) or 173-303-660(9), must submit an amended closure plan to the department no later than sixty days from the date that the owner or operator or department determines that the dangerous waste management unit must be closed as a landfill, subject to the requirements of WAC 173-303-665, or no later than thirty days from that date if the determination is made during partial or final closure. The department will approve, disapprove, or modify this amended plan in accordance with the procedures in WAC 173-303-800 through 173-303-840. The approved closure plan will become a condition of any permit issued.	94-111 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(iv) The department may request modifications to the plan under the conditions described in (b)(ii) of this subsection. The owner or operator must submit the modified plan within sixty days of the department's request, or within thirty days if the change in facility conditions occurs during partial or final closure. Any modifications requested by the department will be approved in accordance with the procedures in WAC 173-303-800 through 173-303-840.		Not a Requirement

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(c) Notification of partial closure and final closure.		
(i) The owner or operator must notify the department in writing at least sixty days prior to the date on which they expect to begin closure of a surface impoundment, waste pile, land treatment, or landfill unit, or final closure of a facility with such a unit. The owner or operator must notify the department in writing at least forty-five days prior to the date on which they expect to begin closure of a treatment or storage tank, container storage, or incinerator unit, or final closure of a facility with only such units.		NA – Notification prior to implementing the closure plan.
(ii) The date when he "expects to begin closure" must be either:		
(A) No later than thirty days after the date on which any dangerous waste management unit receives the known final volume of dangerous wastes or, if there is a reasonable possibility that the dangerous waste management unit will receive additional dangerous wastes, no later than one year after the date on which the unit received the most recent volume of dangerous waste. If the owner or operator of a dangerous waste management unit can demonstrate to the department that the dangerous waste management unit or facility has the capacity to receive additional dangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit; or		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(B) For units meeting the requirements of subsection (4)(d) of this section, no later than thirty days after the date on which the dangerous waste management unit receives the known final volume of nondangerous wastes, or if there is a reasonable possibility that the dangerous waste management unit will receive additional nondangerous wastes, no later than one year after the date on which the unit received the most recent volume of nondangerous wastes. If the owner or operator can demonstrate to the department that the dangerous waste management unit has the capacity to receive additional nondangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit.		NA – Not a unit meeting (4)(d).
(iii) If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or final order to cease receiving dangerous wastes or to close, then the requirements of (c) of this subsection do not apply. However, the owner or operator must close the facility in accordance with the deadlines established in subsection (4) of this section.		NA – Permit has not been terminated.
(iv) Removal of wastes and decontamination or dismantling of equipment. Nothing in this subsection will preclude the owner or operator from removing dangerous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification of partial or final closure.		Not a Requirement
(4) Closure; time allowed for closure.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) Within ninety days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at a dangerous waste management unit or facility, the owner or operator must treat, remove from the unit or facility, or dispose of on site, all dangerous wastes in accordance with the approved closure plan. The department may approve a longer period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, and either:		NA – Landfill closure. Waste will not be removed.
(i) The activities required to comply with this paragraph will, of necessity, take longer than ninety days to complete; or		
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;		
(B) There is a reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and		
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) The owner or operator must complete partial and final closure activities in accordance with the approved closure plan and within one hundred eighty days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at the dangerous waste management unit or facility. The department may approve an extension to the closure period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating dangerous waste management unit or facility, including compliance with all applicable permit requirements, and either:	95-402 I1.4 Schedule for Closure 95-402 I1.4.1 Extension for Closure 94-111 8.3.2 Time Allowed for Closure 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(i) The partial or final closure activities will, of necessity, take longer than one hundred eighty days to complete; or	95-402 I1.4.1 Extension for Closure 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;	95-402 I1.4.1 Extension for Closure 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(B) There is reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and	95-402 I1.4.1 Extension for Closure 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.	95-402 I1.4.1 Extension for Closure 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(c) The demonstrations referred to in (a)(i) and (ii) and (b)(i) and (ii) of this subsection must be made as follows: The demonstrations in (a)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified ninety-day period; and the demonstration in (b)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified one hundred eighty-day period unless the owner or operator is otherwise subject to the deadlines in (d) of this subsection.	95-402 I1.4.1 Extension for Closure Time 94-111 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(d) The department may allow an owner or operator to receive only nondangerous wastes in a landfill, land treatment, or surface impoundment unit after the final receipt of dangerous wastes at that unit if:		Not requesting receipt of nondangerous waste.
(e) In addition to the requirements in (d) of this subsection, an owner or operator of a dangerous wastes surface impoundment that is not in compliance with the liner and leachate collection system requirements in 42 U.S.C. 3004 (o)(1) and 3005 (j)(1) or 42 U.S.C. 3004 (o)(2) or (3) or 3005 (j)(2), (3), (4) or (13) must:		NA – Not a Surface Impoundment
(5) Disposal or decontamination of equipment, structures and soils. During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in WAC 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), or under the authority of WAC 173-303-680 (2) and (4). By removing any dangerous wastes or dangerous constituents during partial and final closure, the owner or operator may become a generator of dangerous waste and must handle that waste in accordance with all applicable requirements of WAC 173-303-170 through 173-303-230.		NA – Any equipment (such as above ground piping) removed during closure would not be part of the permitted portion of the Trench. Above ground piping is associated with the <90-day leachate collection tank.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(6) Certification of closure. Within sixty days of completion of closure of each dangerous waste management unit (including tank systems and container storage areas), and within sixty days of the completion of final closure, the owner or operator must submit to the department by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the dangerous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification must be signed by the owner or operator and by an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until it releases the owner or operator from the financial assurance requirements for closure under WAC 173-303-620(4).	94-111 8.4 Closure Certification	H-A3.8 Closure Certification
(7) Post-closure care and use of property.		
(a) Post-closure care for each dangerous waste management unit subject to post-closure requirements must begin after completion of closure of the unit and continue for thirty years after that date and must consist of at least the following:		H-A6 Post Closure
(i) Groundwater monitoring and reporting as required by WAC 173-303-645, 173-303-650, 173-303-655, 173-303-660, 173-303-665, and 173-303-680; and		H-A6 Post Closure
(ii) Maintenance and monitoring of waste containment systems as applicable.		H-A6 Post-Closure
(b) Any time preceding partial closure of a dangerous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the department may, in accordance with the permit modification procedures in WAC 173-303-800 through 173-303-840:		Not a Requirement

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) Shorten the post-closure care period applicable to the dangerous waste management unit, or facility, if all disposal units have been closed, if it finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or groundwater monitoring results, characteristics of the dangerous waste, application of advanced technology, or alternative disposal, treatment, or reuse techniques indicate that the dangerous waste management unit or facility is secure); or		Not a Requirement
(ii) Extend the post-closure care period applicable to the dangerous waste management unit or facility if it finds that the extended period is necessary to protect human health and the environment (e.g., leachate or groundwater monitoring results indicate a potential for migration of dangerous waste at levels which may be harmful to human health and the environment).		Not a Requirement
(c) The department may require, at partial or final closure, continuation of any of the security requirements of WAC 173-303-310 during part or all of the post-closure period when:		H-A6.4 Post-Closure Use of Property
(i) Dangerous wastes may remain exposed after completion of partial or final closure; or		NA – Dangerous waste will not remain exposed.
(ii) Access by the public or domestic livestock may pose a hazard to human health.		H-A6.4 Post-Closure Security
(d) Post-closure use of property on or in which dangerous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of any containment system, or the function of the facility's monitoring systems, unless the department finds that the disturbance:		H-A6.1 Post-Closure Use of Property
(i) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) Is necessary to reduce a threat to human health or the environment.		
(e) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in subsection (8) of this section.		H-A6 Post Closure
(8) Post-closure plan; amendment of plan.		
(a) The owner or operator of a dangerous waste disposal unit must have a written post-closure plan. In addition, certain surface impoundments and certain piles from which the owner or operator intends to remove or decontaminate the dangerous wastes at partial or final closure are required by WAC 173-303-650 and 173-303-660, respectively, to have written contingent post-closure plans. Owners or operators of surface impoundments and waste piles not otherwise required to prepare contingent post-closure plans under WAC 173-303-650 or 173-303-660 must submit a post-closure plan to the department within ninety days from the date that the owner or operator or department determines that the dangerous waste management unit must be closed as a landfill, subject to the post-closure requirements. The plan must be submitted with the permit application, in accordance with WAC 173-303-806, and approved by the department as part of the permit issuance procedures under WAC 173-303-840. The approved post-closure plan will become a condition of any permit issued.		H-A6 Post Closure
(b) For each dangerous waste management unit subject to the requirements of this subsection, the post-closure plan must identify the activities which will be carried on after closure and the frequency of these activities, and include at least:		H-A6 Post Closure
(i) A description of the planned groundwater monitoring activities and frequencies at which they will be performed;		H-A6.2 Groundwater Monitoring and Reporting

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) A description of the planned maintenance activities, and frequencies at which they will be performed to comply with WAC 173-303-645, 173-303-650, 173-303-655, 173-303-660, 173-303-665, and 173-303-680 during the post-closure care period, to ensure:		H-A6.3.1 Facility Maintenance H-A6.3.2 Erosion Control H-A6.3.3 Cover Integrity Inspection and Maintenance H-A6.3.4 Monitoring Well Inspection and Maintenance H-6.3.5 Leachate Collection System Inspection and Maintenance
(A) The integrity of the cap and final cover or other containment structures in accordance with the requirements of 173-303-645, 173-303-650, 173-303-655, 173-303-660, 173-303-665, and 173-303-680; and		H-A6.3.3 Cover Integrity Inspection and Maintenance
(B) The function of the facility monitoring equipment;		H-A6.3 Leachate Collection System Monitoring and Reporting
(iii) The name, address, and phone number of the person or office to contact about the dangerous waste disposal unit or facility during the post-closure care period;		H-A6.5 Contact Information
(iv) And, for facilities where the director has applied alternative requirements under subsection (1) (e) of this section, WAC 173-303-645 (1)(e) or 173-303-620 (8)(d), the post-closure plan must include either the alternative requirements or a reference to the enforceable document that contains the alternative requirements.		NA – No alternative requirements applied.
(c) Until final closure of the facility, a copy of the approved post-closure plan must be furnished to the department upon request, including request by mail. After final closure has been certified, the person or office specified in (b)(iii) of this subsection must keep the approved post-closure plan during the remainder of the post-closure period.		NA – Post-closure plan will be incorporated into the permit therefore, the Department will have access at all times.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(d) Amendment of plan. The owner or operator must submit a written notification of or request for a permit modification to authorize a change in the approved post-closure plan in accordance with the applicable requirements of WAC 173-303-800 through 173-303-840. The written notification or request must include a copy of the amended post-closure plan for review or approval by the department.		H-A6.6 Amendment of the Plan
(i) The owner or operator may submit a written notification or request to the department for a permit modification to amend the post-closure plan at any time during the active life of the facility or during the post-closure care period.		Not a Requirement
(ii) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in the approved post-closure plan whenever:		H-A6.6 Amendment of the Plan
(A) Changes in operating plans or facility design affect the approved post-closure plan; or		H-A6.6 Amendment of the Plan
(B) There is a change in the expected year of final closure, if applicable; or		H-A6.6 Amendment of the Plan
(C) Events which occur during the active life of the facility, including partial and final closures, affect the approved post-closure plan; or		H-A6.6 Amendment of the Plan
(D) The owner/operator requests the director to apply alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d).		H-A6.6 Amendment of the Plan

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iii) The owner or operator must submit a written request for a permit modification at least sixty days prior to the proposed change in facility design or operation, or no later than sixty days after an unexpected event has occurred which has affected the post-closure plan. An owner or operator of a surface impoundment or waste pile that intends to remove all dangerous waste at closure and is not otherwise required to submit a contingent post-closure plan under WAC 173-303-650 or 173-303-660 must submit a post-closure plan to the department no later than ninety days after the date that the owner or operator or department determines that the dangerous waste management unit must be closed as a landfill, subject to the requirements of WAC 173-303-665. The department will approve, disapprove, or modify this plan in accordance with the procedures in WAC 173-303-800 through 173-303-840. The approved post-closure plan will become a permit condition.		H-A6.6 Amendment of the Plan
(iv) The department may request modifications to the plan under the conditions described in (d)(ii) of this subsection. The owner or operator must submit the modified plan no later than sixty days after the department's request, or no later than ninety days if the unit is a surface impoundment or waste pile not previously required to prepare a contingent post-closure plan. Any modifications requested by the department will be approved, disapproved, or modified in accordance with the procedures in WAC 173-303-800 through 173-303-840.		Not a Requirement

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(9) Notice to local land authority. No later than the submission of the certification of closure of each dangerous waste disposal unit, the owner or operator of a disposal facility must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department a survey plat indicating the location and dimensions of landfill cells or other dangerous waste disposal units with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat filed with the local zoning authority or the authority with jurisdiction over local land use must contain a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the dangerous waste disposal unit in accordance with the applicable requirements of this section. In addition, no later than sixty days after certification of closure of each dangerous waste disposal unit, the owner or operator must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department, a record of the type, location, and quantity of dangerous wastes disposed of within each cell or other disposal unit of the facility. For wastes disposed of before November 19, 1980 (March 12, 1982, for facilities subject to this chapter but not subject to 40 C.F.R. Part 264), the owner or operator must identify the type, location, and quantity of the dangerous wastes to the best of his knowledge and in accordance with any records he has kept.		H-A6.7 Survey Plat and Notice in Deed
(10) Notice in deed to property.		

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) No later than sixty days after certification of closure of each dangerous waste disposal unit, the owner or operator must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the department a record of the type, location, and quantity of dangerous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes (as defined in WAC 173-303-040) disposed of before January 12, 1981, the owner or operator must identify the type, location, and quantity of the dangerous wastes to the best of his knowledge and in accordance with any records he has kept.		H-A6.7 Survey Plat and Notice in Deed
(b) Within sixty days of certification of closure of the first dangerous waste disposal unit and within sixty days of certification of closure of the last dangerous waste disposal unit, the owner or operator must:		H-A6.7 Survey Plat and Notice in Deed
(i) Record, in accordance with state law, a notation on the deed to the facility property, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the property that:		H-A6.7 Survey Plat and Notice in Deed
(A) The land has been used to manage dangerous wastes;		H-A6.7 Survey Plat and Notice in Deed
(B) Its use is restricted under this section; and		H-A6.7 Survey Plat and Notice in Deed
(C) The survey plat and record of the type, location, and quantity of dangerous wastes disposed of within each cell or other dangerous waste disposal unit of the facility required in subsection (9) of this section have been filed with the local zoning authority, or the authority with jurisdiction over local land use, and with the department; and		H-A6.7 Survey Plat and Notice in Deed

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(ii) Submit a certification, signed by the owner or operator, that he has recorded the notation specified in (b)(i) of this subsection, including a copy of the document in which the notation has been placed, to the department.		H-A6.7 Survey Plat and Notice in Deed
(c) If the owner or operator or any subsequent owner of the land upon which a dangerous waste facility was located wishes to remove dangerous wastes and dangerous waste residues, the liner, if any, or contaminated soils, he must request a modification to the post-closure permit in accordance with the applicable requirements in WAC 173-303-800 through 173-303-840. The owner or operator must demonstrate that the removal of dangerous wastes will satisfy the criteria of subsection (7)(d) of this section. By removing dangerous waste, the owner or operator may become a generator of dangerous waste and must manage it in accordance with all applicable requirements of this chapter. If he is granted a permit modification or otherwise granted approval to conduct such removal activities, the owner or operator may request that the department approve either:		Not a Requirement
(i) The removal of the notation on the deed to the facility property or other instrument normally examined during title search; or		Not a Requirement
(ii) The addition of a notation to the deed or instrument indicating the removal of the dangerous waste.		Not a Requirement

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(11) Certification of completion of post-closure care. No later than sixty days after completion of the established post-closure care period for each dangerous waste disposal unit, the owner or operator must submit to the department, by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the post-closure care period for the dangerous waste disposal unit was performed in accordance with the specifications in the approved post-closure plan. The certification must be signed by the owner or operator and an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until he releases the owner or operator from the financial assurance requirements for post-closure care under WAC 173-303-620(6).		H-A6.8 Certification of Completion of Post-Closure Care
WAC 173-303-665 Landfills		
(6) Closure and post-closure care.		
(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:		H-A3.5 Final Landfill Cover
(i) Provide long-term minimization of migration of liquids through the closed landfill;		H-A3.5 Final Landfill Cover
(ii) Function with minimum maintenance;		H-A3.5 Final Landfill Cover
(iii) Promote drainage and minimize erosion or abrasion of the cover;		H-A3.5 Final Landfill Cover
(iv) Accommodate settling and subsidence so that the cover's integrity is maintained; and		H-A3.5 Final Landfill Cover
(v) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.		H-A3.5 Final Landfill Cover

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum H, Closure Plans Regulatory Crosswalk (Trenches 31 and 34)

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(b) After final closure, the owner or operator must comply with all post-closure requirements contained in WAC 173-303-610 (7), (8), (9), and (10) including maintenance and monitoring throughout the post-closure care period. The owner or operator must:		H-A6 Post-Closure
(i) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;		H-A6.3.3 Cover Integrity Inspection and Maintenance
(ii) Maintain and monitor the leak detection system in accordance with subsections (2)(h) and (4)(c) of this section, where such a system is present between double liner systems;		H-A6.3 Leachate Collection System Monitoring and Reporting
(iii) Continue to operate the leachate collection and removal system until leachate is no longer detected;		H-A6.3 Leachate Collection System Monitoring and Reporting
(iv) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of WAC 173-303-645;		H-A6.2 Groundwater Monitoring and Reporting
(v) Prevent run-on and runoff from eroding or otherwise damaging the final cover; and		H-A6.3.2 Erosion Control
(vi) Protect and maintain surveyed benchmarks used in complying with subsection (5) of this section.		H-A6.7 Survey Plat and Notice in Deed
(c) Reserve.		NA
WAC 173-303-806 Final facility permits		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum H, Closure Plans Regulatory Crosswalk (Trenches 31 and 34)

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) General requirements. Part B of the permit application consists of the general information requirements of this subsection, and the specific information requirements in (b) through (h) of this subsection as applicable to the facility. The Part B information requirements presented in (a) through (h) of this subsection, reflect the standards promulgated in WAC 173-303-600. These information requirements are necessary in order for the department to determine compliance with WAC 173-303-600 through 173-303-670. If owners and operators of TSD facilities can demonstrate that the information prescribed in Part B cannot be provided to the extent required, the department may make allowance for submission of such information on a case-by-case basis. Information required in Part B must be submitted to the department and signed in accordance with requirements in WAC 173-303-810(12). Certain technical data, such as design drawings and specifications, and engineering studies must be certified by a registered professional engineer. For post-closure permits, only the information specified in WAC 173-303-806 (4)(o) is required in Part B of the permit application. The following information is required for all TSD facilities, except as WAC 173-303-600(3) provides otherwise.	95-402 K. Part B Certification	H-A3.8 Closure Certification
(xiii) A copy of the closure plan and, where applicable, the post-closure plan required by WAC 173-303-610 (3) and (8). Include, where applicable, as part of the plans, specific requirements in WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), and 173-303-680 (2) and (4).		Addendum H
(xiv) For dangerous waste disposal units that have been closed, documentation that notices required under WAC 173-303-610(10) have been filed.		NA – LLBG Trenches 31-34 has not been closed.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(xv) The most recent closure cost estimate for the facility prepared in accordance with WAC 173-303-620(3) and a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(4). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.	95-402 I. Closure and Financial Assurance – Overview of Requirements	H-A5 Closure Costs
(xvi) Where applicable, the most recent post-closure cost estimate for the facility prepared in accordance with WAC 173-303-620(5) plus a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(6). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.		NA – Not required to do a cost estimate.
(xvii) Where applicable, a copy of the insurance policy or other documentation which comprises compliance with the requirements of WAC 173-303-620(8). For a new facility, documentation showing the amount of insurance meeting the specification of WAC 173-303-620 (8)(a) and, if applicable, WAC 173-303-620 (8)(b), that the owner or operator plans to have in effect before initial receipt of dangerous waste for treatment, storage, or disposal. A request for a variance in the amount of required coverage, for a new or existing facility, may be submitted as specified in WAC 173-303-620 (8)(c).		NA – No insurance requirements.

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following:	95-402 B4 Topographic Map	Addendum A, Part A Form, Attachment C.
WAC 173-303-630 Use and management of containers		
(10) Closure. At closure, all dangerous waste and dangerous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with dangerous waste or dangerous waste residues must be decontaminated or removed.		NA – Landfill closure. Waste will not be removed.

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Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum I, Inspection Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-806(4)(a)(v) Final facility permit		
A copy of the general inspection schedule required by WAC 173-303-320(2): Include where applicable, as part of the inspection schedule, specific requirements in WAC 173-303-395 (1)(d), 173-303-630(6), 173-303-640 (4)(a)(i) and (6), 173-303-650(4), 173-303-655(4), 173-303-660 (4) and (5), 173-303-665(4), 173-303-670(7), and 173-303-680(3), and 40 C.F.R. 264.1033, 264.1035, 264.1052, 264.1053, 264.1058, 264.1064, 264.1067, 264.1084, 264.1085, 264.1086, and 264.1088.		
WAC 173-303-320 General inspection		
(1) The owner or operator must inspect his facility to prevent malfunctions and deterioration, operator errors, and discharges which may cause or lead to the release of dangerous waste constituents to the environment, or a threat to human health. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.	F2. Inspections	Permit Condition II.O.1 General Inspection Requirements
(2) The owner or operator must develop and follow a written schedule for inspecting all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that help prevent, detect, or respond to hazards to the public health or the environment. In addition:	F2.1. General inspection requirements	Table I-1 Inspection Schedule
(a) The schedule must be kept at the facility;	F2.1. General inspection requirements	I1.2 Inspection Log
(b) The schedule must identify the types of problems which are to be looked for during inspections;	F2.1. General inspection requirements	I1.2 Inspection Log and Table I-1 Inspection Schedule

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(c) The schedule must indicate the frequency of inspection for specific items. The frequency should be based on the rate of possible deterioration of equipment, and the probability of an environmental or human health incident. Areas subject to spills must be inspected daily when in use. At a minimum the inspection schedule must also include the applicable items and frequencies required for the specific waste management methods described in 40 C.F.R. Part 265 Subparts F through R, 265.1033, 265.1052, 265.1053, 265.1058 and 265.1084 through 265.1090, for interim status facilities and in WAC 173-303-630 through 173-303-680, and 40 C.F.R. 264.1033, 264.1052, 264.1053, 264.1058 and 264.1083 through 264.1089 for final status facilities; and	F2.1. General inspection requirements	I1.1.2 Frequency of Inspections and Table I-1 Inspection Schedule
(d) The owner or operator must keep an inspection log or summary, including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made, an account of spills or discharges in accordance with WAC 173-303-145, and the date and nature of any repairs or remedial actions taken. The log or summary must be kept at the facility for at least five years from the date of inspection.	F2.2. Inspection Log	I1.2 Inspection Logs Permit Condition II.I Facility Operating Record
(3) The owner or operator must remedy any problems revealed by the inspection, on a schedule which prevents hazards to the public health and environment. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.	F2.3. Schedule for remedial action for problems revealed	I1.3 Schedule for Remedial Action for Problems Revealed
WAC 173-303-630 Use and management of containers		
(3) Identification of containers. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	F.2.4 Specific process or waste type inspection requirements	Table I-1 Inspection Schedule
(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system	F.2.4 Specific process or waste type inspection requirements	I1.4.2 Container Inspection and Table I-1 Inspection Schedule

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.		
WAC 173-303-665 Landfill inspection		
(4) Monitoring and inspection.	No equivalent	
(a) During construction or installation, liners (except in the case of existing portions of landfills exempt from subsection (2)(a) of this section), and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:		N/A – Trench 31 and 34 already constructed Does not apply to Trench 94
(i) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and		N/A – Trench 31 and 34 already constructed Does not apply to Trench 94
(ii) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.		N/A – Trench 31 and 34 already constructed Does not apply to Trench 94
(b) While a landfill is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:		I1.4.3 Landfill Inspections and Table I-2 Landfill Inspection Schedule
(i) Deterioration, malfunctions, or improper operation of run-on and runoff control systems;		I1.4.3.1 Run-On and Run-Off Control System and Table I-2 Landfill Inspection Schedule
(ii) Proper functioning of wind dispersal control systems; and		I1.4.3.2 Wind Dispersal Control System and Table I-2 Landfill Inspection Schedule

WAC Regulation	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iii) The presence of leachate in and proper functioning of leachate collection and removal systems.		I1.4.3.3 Leachate Collection and Removal System and Table I-2 Landfill Inspection Schedule
(c)(i) An owner or operator required to have a leak detection system under subsection (2)(h) or (j) of this section must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.		Table I-2 Landfill Inspection Schedule
(ii) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semiannually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semiannual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.		N/A - Trench 31 and 34 not in post-closure Does not apply to Trench 94
(iii) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the department based on pump activation level, sump dimensions, and level that avoids backup into the drainage layer and minimizes head in the sump.		Not a requirement

Low-Level Burial Grounds Trenches 31-34-94 Part B Addendum J, Contingency Plan Regulatory Crosswalk

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
WAC 173-303-350 Contingency plan and emergency procedures		
(1) Purpose. The purpose of this section and WAC 173-303-360 is to lessen the potential impact on the public health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or groundwater by a facility. A contingency plan must be developed to lessen the potential impacts of such emergency circumstances, and the plan must be implemented immediately in such emergency circumstances.	G. Contingency Plan – Overview of Requirements	**Site-level:** DOE/RL-94-02, *Hanford Emergency Management Plan* (referred to as **HEMP**) **OUG-level:** HNF-IP-0263-BG, *Building Emergency Plan for Low-Level Burial Grounds* (referred to as **BEP**)
(2) Contingency plan. Each owner or operator must have a contingency plan at his facility for use in emergencies or sudden or nonsudden releases which threaten human health and the environment. If the owner or operator has already prepared a spill prevention control and countermeasures (SPCC) plan in accordance with Part 112 of Title 40 C.F.R., or some other emergency or contingency plan, they need only amend that plan to incorporate dangerous waste management provisions that are sufficient to comply with the requirements of this section and WAC 173-303-360. The owner or operator may develop one contingency plan that meets all regulatory requirements. Ecology recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan") as found at www.nrt.org. When modifications are made to nondangerous waste (non-Hazardous Waste Management Act or nondangerous waste regulation) provisions in an integrated contingency plan, the changes do not trigger the need for a dangerous waste permit modification.	G. Contingency Plan – Overview of Requirements	**Site-level:** HEMP **OUG-level:** BEP LLBG
(3) The contingency plan must contain the following:		

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(a) A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** BEP - Section 7.0 Incident Response
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** BEP - Section 7.2.5.1 Damaged or Unacceptable Shipments
(c) A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4);	G6. Coordination Agreements	**Site-level:** HEMP - Sections 3.0 Offsite Response Interfaces and Table 3-1 Memorandums of Understanding **OUG-level:** BEP - Section 10.0 Coordination Agreements
(d) A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(i)), rather than as part of the permit application;	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2 Emergency Response Organization Structure **OUG-level:** BEP - Section 3.0 and Section 13.0 Facility/Building Emergency Response Organization

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(e) A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities; and	G5. Emergency Equipment	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** BEP - Section 9.0 Emergency Equipment
(f) An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	G7. Evacuation Plan	**Site-level:** HEMP – Section 7.2.3.7 Area or Site Evacuation, Figure 7-3 Hanford Site Evacuation Routes, and Table 5-1 Standard Emergency Signals **OUG-level:** BEP - Section 7.1.1 Evacuation and Figure 1
(4) Copies of contingency plan. A copy of the contingency plan and all revisions to the plan must be:		
(a) Maintained at the facility; and	No equivalent	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(b) Submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.	G9. Amendment to Contingency Plan	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** BEP - Section 10.0 Coordination Agreements

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(5) Amendments. The owner or operator must review and immediately amend the contingency plan, if necessary, whenever:	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1 Review and Update of the Hanford Emergency Management Plan and Richland Operations Office/Office of River Protection/Pacific Northwest Site Office and Site Contractor Implementing Procedures **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(a) Applicable regulations or the facility permit are revised;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(b) The plan fails in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(c) The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(d) The list of emergency coordinators changes; or	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(e) The list of emergency equipment changes.	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
WAC 173-303-360 Emergencies		
(1) Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by WAC 173-303-350(2), all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization **OUG-level:** BEP - Section 3.1 Building Emergency Director
(2) Emergency procedures. The following procedures must be implemented in the event of an emergency.	G4. Emergency Response Procedures	N/A
(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:	G4.1 Incident response, assessment, and identifications	N/A

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and	G4.2 Notification	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 7.0 Incident Response (not specific to the EC)
(ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	G4.2 Notification	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP – Section 4.0 Implementation of the Plan
(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	G4.4 Identification of dangerous materials	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan
(c) Concurrently, the emergency coordinator must assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2 2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, he must report his findings as follows:	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications
(i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and	G4.5 Hazard assessment and report	**Site-level:** HEMP – HEMP - Sections 2.2.1.1.2 and 2 2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan
(ii) He must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	G4.5 Hazard assessment and report	**OUG-level:** BEP - Section 7.0 Incident Response
(e) His assessment report must include:	G4.5 Hazard assessment and report	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications, and Section 5.1.2.1 Environmental Notifications
(i) Name and telephone number of reporter;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(ii) Name and address of facility;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(iii) Time and type of incident (e.g., release, fire);	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iv) Name and quantity of material(s) involved, to the extent known;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(v) The extent of injuries, if any; and	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(vi) The possible hazards to human health or the environment outside the facility.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	G4.3. Containment and control of emergencies	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP LLBG – Section 7.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases
(g) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	G4.6 Prevention of recurrence or spread of fires, explosions, or releases	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP – Section 7.2.4 Fire and/or Explosion, and Section 7.2.5 Hazardous Material, Dangerous and or Mixed Waste Spill
(h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** BEP – Section 8.3 Incompatible Waste
(i) The emergency coordinator must ensure that, in the affected area(s) of the facility:		

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** BEP - Section 8.3 Incompatible Waste
(ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** BEP - Section 8.4 Post Emergency Equipment Maintenance and Decontamination
(j) The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 5.1.2.3 Resumption of Operations **OUG-level:** BEP – Section 8.2 Incident Recovery and Restart of Operations
(k) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, he must submit a written report on the incident to the department. The report must include:	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(i) Name, address, and telephone number of the owner or operator;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(ii) Name, address, and telephone number of the facility;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(iii) Date, time, and type of incident (e.g., fire, explosion);	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting

WAC Requirements	Ecology Guidance Document Publication 95-402	LLBG Trench 31-34-94 Section
(iv) Name and quantity of material(s) involved;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(v) The extent of injuries, if any;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(vii) Estimated quantity and disposition of recovered material that resulted from the incident;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(viii) Cause of incident; and	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(ix) Description of corrective action taken to prevent reoccurrence of the incident.	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting

Low-Level Burial Grounds Trenches 31-34-94
Engineering Calculations

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Calculation ECF-200W-15-0028, Revision 0,
Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 06-24-2015

Calculation Title & Description: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0028 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
0	Initial Release	06-24-2015	All
			☒

Section 3: Completed by the Responsible Manager

Document Control:

Is the document intended to be controlled within the Document Management Control System (DMCS)? ☒ Yes ☐ No

Does document contain scientific and technical information intended for public use? ☐ Yes ☒ No

Does document contain controlled-use information? ☐ Yes ☒ No

Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
Preparer:	T.B. Salzano, P.E. / ARES Corporation		06-24-2015
Checker:	K.J. Emory, P.E. / ARES Corporation		06-24-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		06-24-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 10 Calculation No: 946412.15-M-001

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage & Treatment Pads

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored on the Low-Level Burial Ground (LLBG) Trenches 31 and 34 Waste Storage and Treatment Pads.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	10	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	6-24-15	6/24/15	6/24/15

Revision Description (Revision Description/Affected Pages):
Initial Release

		Print Name/ Sign:			
		Date:			

Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

Project No.	Calculation No.	Rev.	Page No.
946412.15	946412.15-M-001	0	2 of 10

Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	√					
2. Calculation sheet headers complete with calculation number, revision number, etc.	√					
3. Calculation sheet contents complete per format.	√					
4. Listed attachments included.	√					
5. Calculation objective clearly described.	√					
6. Criteria are suitable and properly referenced to task specific documents.	√					
7. Assumptions and input data described and attached or referenced to task documents.	√					
8. Calculation method identified and appropriate for the design activity.	√					
9. Calculation results reasonable and correctly described in results and conclusions.	√					
10. Physical property calculations generated by CAD software verified via hand calculations.	√					
11. Computer program identified with version and revision.			√			
12. Computer input/output provided or referenced.			√			
13. Computer run traceable to calculation (file #, etc.).			√			
14. Computer input data within permissible design input range.			√			
15. Computer program validation/verification addressed.			√			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			√			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	√	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	6/24/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	6-24-15

Signatures obtained only after discrepancies are corrected and comments are resolved.

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 3 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

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Attachments

Attachment 1
LLBG Trenches 31 and 34 Waste Storage and Treatment Pad Drawings

Figures

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Figure 6-2. LLBG Trench 34 Waste Storage and Treatment Pad Drum Array 6

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Table 7-1. Summary of Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads 7

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 4 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored on the Low-Level Burial Ground (LLBG) Trenches 31 and 34 Waste Storage and Treatment Pads. These asphalt pads are located in the southeast corner of each of the trenches.

2.0 METHODOLOGY

The LLBG Trenches 31 and 34 Waste Storage and Treatment Pads are used to store and treat containerized dangerous and/or mixed waste as well as, Land Disposal Restriction (LDR) compliant containerized waste prior to disposal. The general layout including overall dimensions of these pads are shown in Drawings H-2-836695, Revision 0, *LLBG Trench 31 Waste Storage and Treatment Pad*, and H-2-836696, Revision 0, *LLBG Trench 34 Waste Storage and Treatment Pad*, respectively (See Attachment 1). Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of drum pallets that can be stored are determined.

3.0 INPUTS

1. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

2. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

From Drawings H-2-836695, the overall area of the LLBG Trench 31 Waste Storage and Treatment Pad measures 49.4 meters (162 ft) by 43.6 meters (143 ft) and from Drawings H-2-836696, the overall area of the LLBG Trench 34 Waste Storage and Treatment Pad measures 48.8 meters (160 ft) by 44.2 meters (145 ft). A 3.66 meter (12 ft) wide strip is provided along the south and east side of each pad to allow access to the trench. Therefore, as shown in Figures 6-1 and 6-2, a total of 692 2X2 drum arrays can be placed on the LLBG Trench 31 Waste Storage and Treatment Pad and a total of 744 2X2 drum arrays can be placed on the LLBG Trench 34 Waste Storage and Treatment Pad.

CALCULATION SHEET

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Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

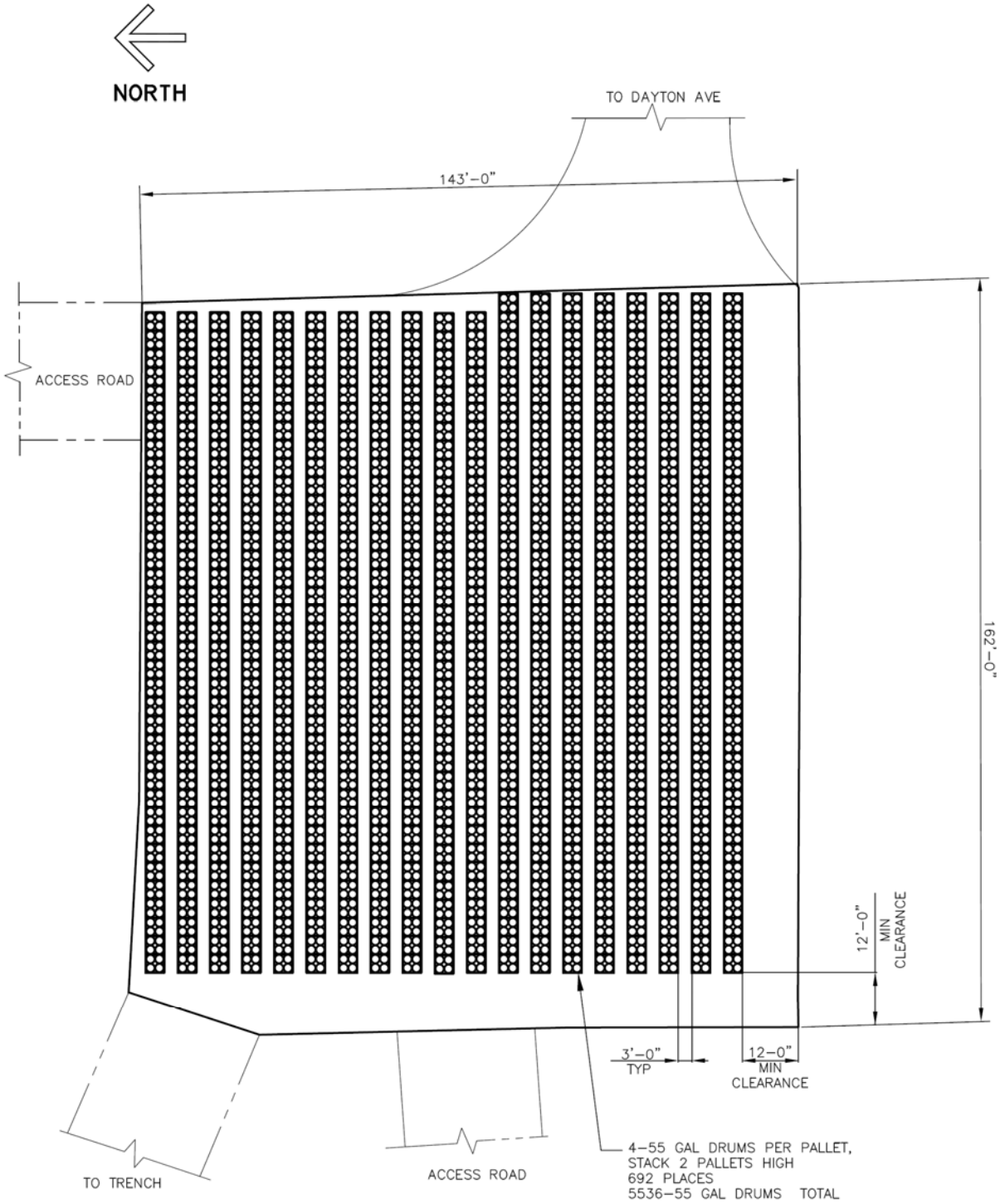

Figure 6-1. LLBG Trench 31 Waste Storage and Treatment Pad Drum Array

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 6 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

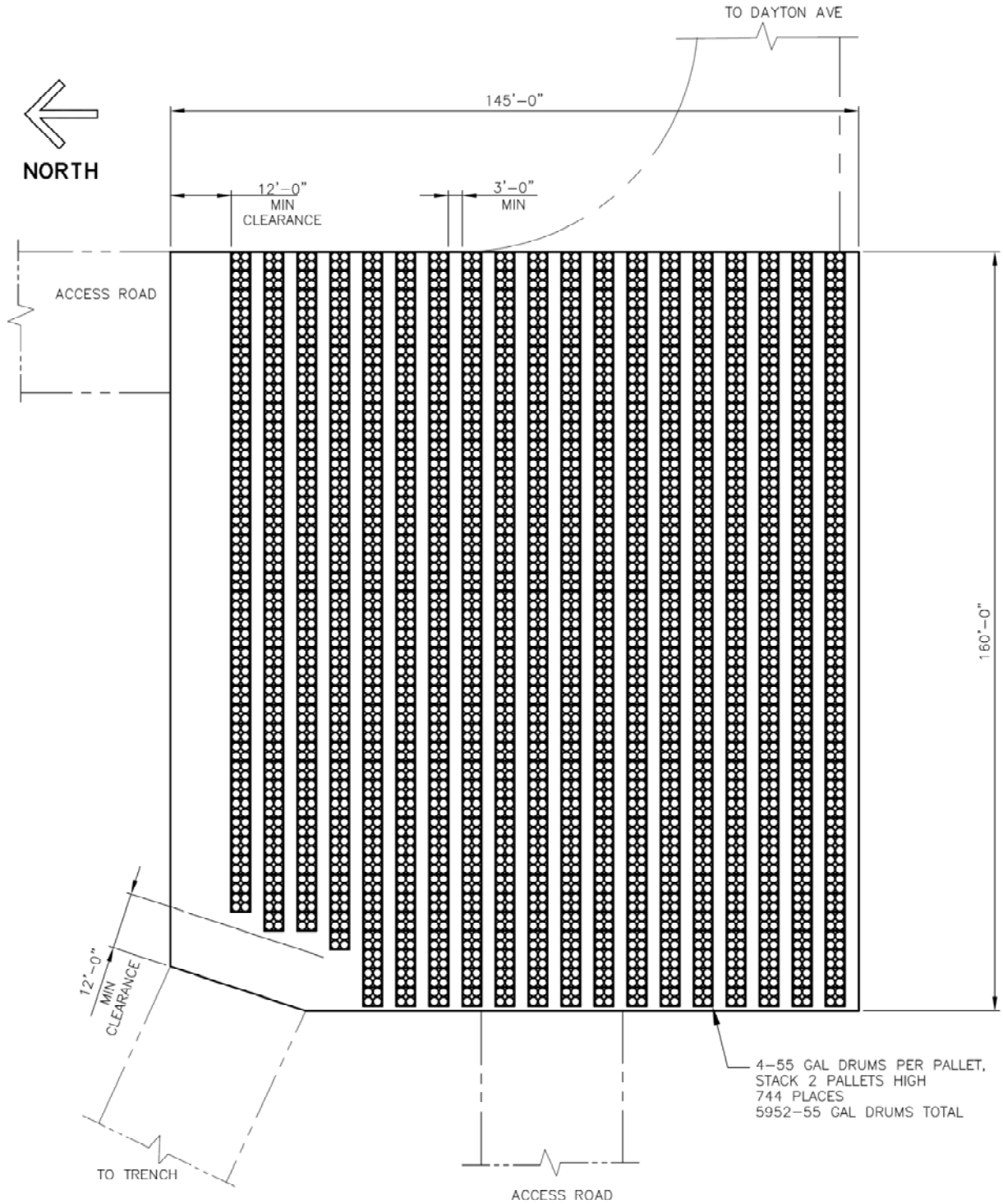

Figure 6-2. LLBG Trench 34 Waste Storage and Treatment Pad Drum Array

CALCULATION SHEET

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Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

Since the pallets can be stacked two high, the total storage volume for each trench pad is as follows:

LLBG Trench 31 Waste Storage and Treatment Pad:

692 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 5,536 total drums

1 drum = 208-liters (55 gallons), therefore,

5,536 total drums x 208-liters/drum = ~1,150,000 liters

Or, since 1 liter = 0.001 m^3 1,150,000 liters x 0.001 m^3/liter = **1,150 m^3**

And, since 1 m^3 = 35.31 ft^3 1,150 m^3 x 35.31 ft^3/m^3 = ~40,600 ft^3

LLBG Trench 34 Waste Storage and Treatment Pad:

744 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 5,952 total drums

5,952 total drums x 208-liters/drum = ~1,240,000 liters x 0.001 m^3/liter = **1,240 m^3**

or 1,240 m^3 x 35.31 ft^3/m^3 = ~43,780 ft^3

7.0 RESULTS AND CONCLUSIONS

The LLBG Trench 31 Waste Storage and Treatment Pad has a total waste storage area of approximately 1,825 m^2 (19,650 ft^2) [45.7 m (150 ft) wide by 39.9 m (131 ft) long]. Based on the drum array shown in Figure 6-1, the waste storage design capacity for this pad is 1,150 m^3.

The LLBG Trench 34 Waste Storage and Treatment Pad has a total waste storage area of approximately 1,977 m^2 (21,280 ft^2) [~48.8 m (~160 ft) wide by 40.5 m (133 ft) long]. Based on the drum array shown in Figure 6-2, the waste storage design capacity for this pad is 1,240 m^3.

The results are summarized in Table 7-1.

Table 7-1. Summary of Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads

Structure/Area	Waste Storage Area m^2 (ft^2)	Maximum Waste Storage Capacity m^3 (ft^3)
Trench 31	1,825 m^2 (19,650 ft^2)	1,150 m^3 (40,600 ft^3)
Trench 34	1,977 m^2 (21,280 ft^2)	1,240 m^3 (43,780 ft^3)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.
2. Drawing H-2-836695, Revision 0, *LLBG Trench 31 Waste Storage and Treatment Pad*.
3. Drawing H-2-836696, Revision 0, *LLBG Trench 34 Waste Storage and Treatment Pad*.

CALCULATION SHEET

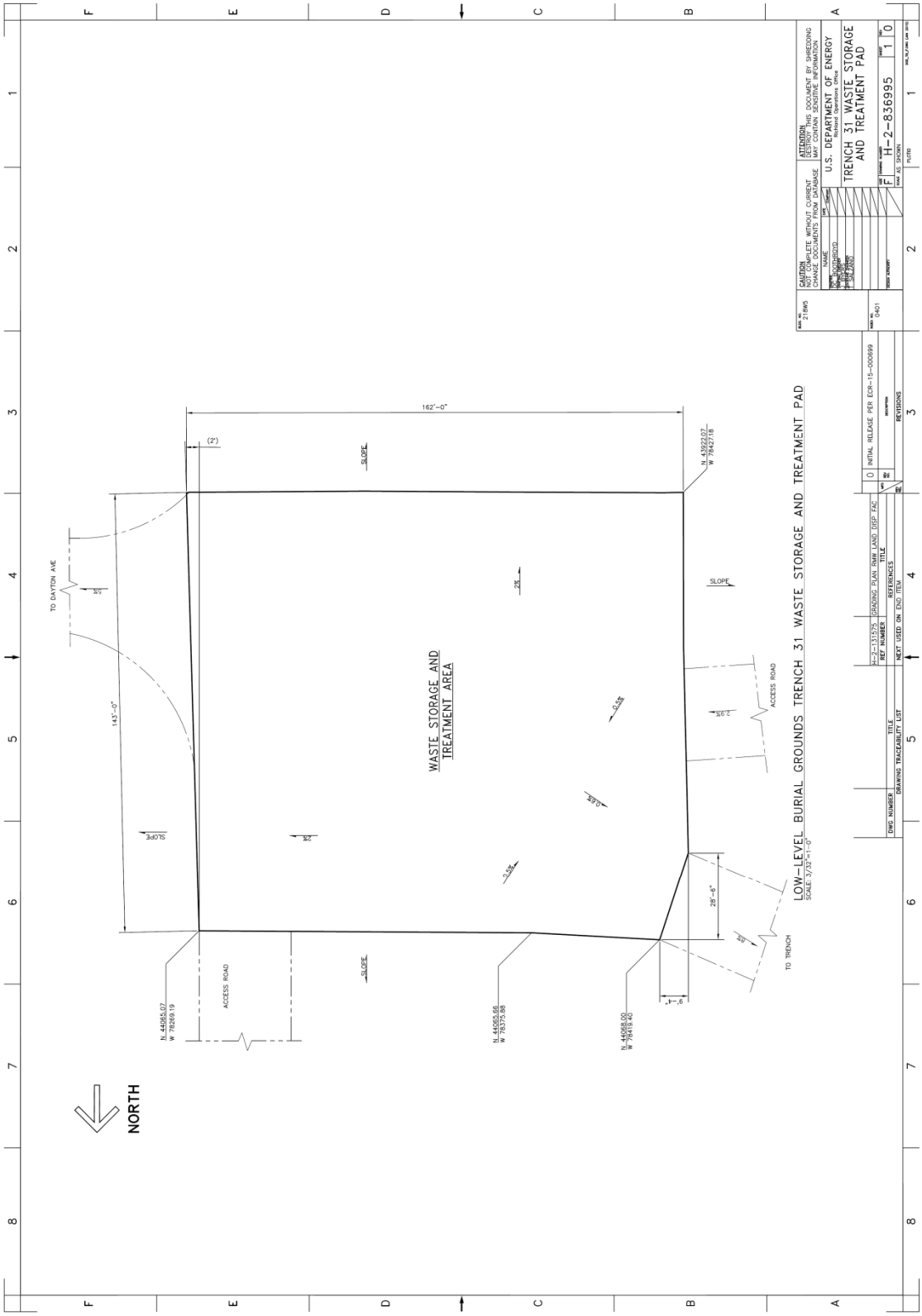
Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 8 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15

ATTACHMENT 1

LLBG TRENCHES 31 AND 34 WASTE STORAGE AND TREATMENT PAD DRAWINGS

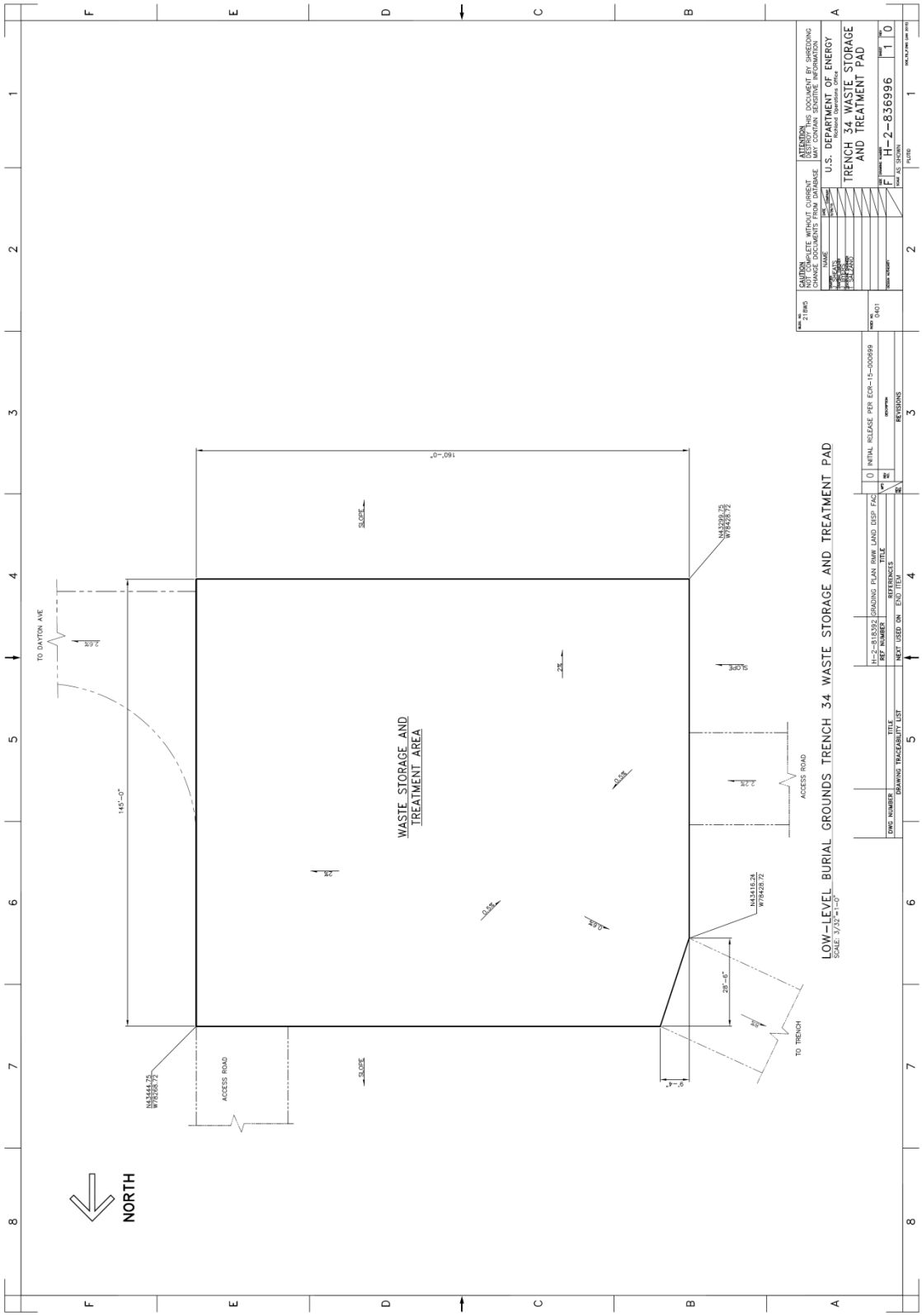
CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 9 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15



CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-001	Rev. 0	Page No. 10 of 10
Title: Maximum Storage Capacity for LLBG Trenches 31 and 34 Waste Storage and Treatment Pads			
Prepared By: T.B. Salzano, P.E.	Date: 06-24-15	Checked By: K.J. Emory, P.E.	Date: 06-24-15



CWC-WRAP
Operating Unit Group

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b. Calculation ECF-200W-15-0021, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2402-W Series Waste Storage Buildings.*

c. Calculation ECF-200W-15-0022, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2403-WA thru WC Series Waste Storage Buildings.*

d. Calculation ECF-200W-15-0023, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2403-WD Waste Storage Building.*

e. Calculation ECF-200W-15-0024, Revision 0, *Maximum Storage Capacity for CWC Shipping and Receiving Area.*

f. Calculation ECF-200W-15-0025, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2336-W Building Areas.*

g. Calculation ECF-200W-15-0026, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2404-WA thru WC Series Waste Storage Buildings.*

h. Calculation ECF-200W-15-0027, Revision 0, *Maximum Storage Capacity for HERTR and Super HENC Outdoor Storage Area.*

Central Waste Complex – Waste Receiving and Processing Facility

Facility Description and General Provisions

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1. Facility Description and General Provisions

This attachment briefly describes the general provisions and information identified in Ecology Publication 95-402, *Dangerous Waste Permit Application Requirements*, Section B, Facility Description and General Provisions, for the Central Waste Complex (CWC)-Waste Receiving and Processing Facility (WRAP) Operating Unit Group (OUG), hereinafter referred to as CWC-WRAP. Topics discussed include the following:

- General Facility Description
- Location, Ownership, and Management
- Dangerous Waste Categories Managed
- Traffic Information
- Seismic Consideration
- Topography

1.1. General Facility Description

This section provides a general description of the layout, history and function of the Hanford Site, the Hanford Facility, and CWC-WRAP.

1.1.1. Hanford Site

The Hanford Site covers approximately 1,450 km^2 (900 mi^2) of semiarid land that is owned by the U.S. Government, and is managed and operated by the U.S. Department of Energy, Richland Operations Office (DOE-RL). The city of Richland adjoins the southeastern most portion of the Hanford Site boundary and is the nearest population center.

In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for plutonium production for national defense. For over 20 years, activities were primarily dedicated to the continuation of plutonium production and managing the waste generated. In later years, activities became increasingly diverse, involving research and development for advanced reactors and renewable energy technologies. The end of the Cold War brought the shutdown of most of the Hanford Site's plutonium production and management facilities. Current missions are to safely clean up and manage the legacy waste on the Hanford Site, and to develop and deploy science and technology.

The Hanford Site is divided into numerically designated areas as shown in CWC-WRAP Addendum C, “Process Information” (Appendix C-A, “Topographic Map, Overall Facility Map of the Hanford Site”), located in DOE/RL-2015-74, *Hanford Facility Dangerous Waste Part B Permit Application; Low-Level Burial Grounds Trenches 31-34-94, T Plant Complex, and Central Waste Complex-Waste Receiving and Processing Facility*. These areas served as the location for reactor, chemical separation, and related activities for the production and purification of special nuclear materials and other nuclear activities. The reactors are located along the Columbia River in the l00 Areas. The reactor fuel reprocessing units are in the 200 Areas, which are on a plateau approximately 11 km (6.8 mi) from the Columbia River. The 300 Area, located adjacent to and north of Richland, contains the reactor fuel manufacturing plants, the research and development laboratories, and the Environmental and Molecular Sciences Laboratory. The 400 Area, 8 km (5 mi) northwest of the 300 Area, contains the Fast Flux Test Facility designed for testing liquid metal reactor systems. The 600 Area covers all locations not specifically given an area designation. Adjacent to and north of Richland, the 1100 Area contains offices associated with administration, maintenance, transportation, and materials procurement and distribution. Offices also are located in the 700 Area, which is in down town Richland.

1.1.2. Hanford Facility

The Hanford Facility consists of the contiguous portion of the Hanford Site that contains treatment, storage and disposal (TSD) units and for the purposes of RCRA, excludes lands north and east of the Columbia River, river islands, lands under the exclusive jurisdiction or control by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and lands owned by or leased to Washington State. The Hanford Facility RCRA permit operating boundary is shown in the overall facility map (DOE/RL-2015-74).

1.1.3. CWC-WRAP Operating Unit Group Description

CWC-WRAP is located in the 200 West Area of the Hanford Facility and is comprised of the dangerous waste management units (DWMU) listed below. Detailed information describing storage operations, waste management activities, treatment processes and land disposal operations are described in the process information located in Addendum C (DOE/RL-2015-74).

List of Dangerous Waste Management Units

- Low Flashpoint Storage Modules DWMU
- 2402-W, WB, WC, and WE through WL Waste Storage Buildings DWMU
- 2403-WA through WC Waste Storage Buildings DWMU
- CWC Shipping and Receiving Area DWMU
- 2336-W Building NDA/NDE Area DWMU
- 2336-W Building Shipping and Receiving Area DWMU
- 2336-W Building Room 152 DWMU
- 2404-WA and WB Waste Storage Buildings DWMU
- High Energy Real Time Radiography (HERTR) and Super High Energy Neutron Counter (HENC) Waste Outdoor Storage Area (HERTR and Super HENC Waste Outdoor Storage Area) DWMU
- 2402-WD Waste Storage Building DWMU
- 2403-WD Waste Storage Building DWMU
- 2336-W Building Process Area DWMU
- 2404-WC Waste Storage Building DWMU

1.2. Location, Ownership, and Management

The Hanford Facility is owned by the U.S. Government, and is managed and operated by DOE-RL and its contractor CH2M HILL Plateau Remediation Company. Contact information is as follows:

U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, WA 99352
(509) 372-2400

CH2M HILL Plateau Remediation Company
P.O. Box 1600
Richland, WA 99352
(509) 376-0556

1.3. Dangerous Waste Categories Managed

CWC-WRAP manages listed hazardous waste, characteristic hazardous waste, state only dangerous waste in accordance with the *Resource Conservation and Recovery Act of 1976* (RCRA) or WAC 173-303, “Dangerous Waste Regulations,” as well as, nondangerous low-level radioactive waste managed in accordance with the *Atomic Energy Act of 1954* (AEA). For a comprehensive list of RCRA waste managed, including classification and estimated annual quantities, refer to CWC-WRAP Addendum A, “Part A” located in DOE/RL-2015-74.

Other Hanford Site processes or activities regulated under Ecology's Dangerous Waste Regulations include recycling (e.g., WAC 173-303-017, “Recycling processes involving solid waste,” WAC 173-303-120, “Recycled, reclaimed, and recovered wastes,” and WAC 173-303-500, “Recycling requirements for state-only dangerous waste”), generator activities [e.g., WAC 173-303-170, “Requirements for generators of dangerous waste”), treatment-by-generator (WAC 173-303-170(3)(b))], transport (e.g., WAC 173-303-240, “Requirements for transporters of dangerous waste”), permits by rule (e.g., WAC 173-303-802, “Permits by rule”), and research, development, and demonstration permits (WAC 173-303-809, “Research, development and demonstration permits”).

1.4. Traffic information

The regional public highway network traversing the Hanford Site (Washington State Highways 24 and 240), nonrestricted access roadways (Route 10, and portions of Route 4S located south of the Wye Barricade), and restricted access roadways are shown in the overall facility map (DOE/RL-2015-74). Roadways east of the Yakima Barricade and north of the Wye Barricade, and within the 300 and 400 Areas, are restricted to authorized personnel only. Other U.S. Department of Energy roadways are subject to such restrictions or closure as the U.S. Department of Energy might require.

1.4.1. Hanford Site Roadways

Major roads located within the Hanford Site are classified as either primary or secondary routes. Primary routes include Routes 4S, 10, 2S, 3, 6, and 11A, as well as various avenues within each area. Primary routes are constructed of bituminous asphalt with an underlying aggregate base in accordance with U.S. Department of Transportation requirements. The bituminous asphalt measures approximately 5 cm (2 in.) thick, however, the asphalt layer thickness will vary with each road.

Secondary routes are constructed of layers of an oil and rock mixture, with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found onsite. The present load-bearing capacities of these roads are unknown; however, loads as large as 9.8 kg/cm^2 (140 lb/in.^{2}) have been transported without observable damage to road surfaces. All roads were originally constructed to meet the requirements for the American Association of State Highway and Transportation Officials HS-20-44 load rating (AASHTO 1983). An HS-20-44 loading represents a two-axle tractor [front axle loading of approximately 3,630 kg (8,000 lbs) and rear axle loading of 14,500 kg (31,900 lbs)], plus a single-axle trailer with a 14,500 kg (31,900 lbs)- axle loading.

1.4.2. Traffic Control Signs, Signals, and Procedures

Standard traffic control signs are used throughout the Hanford Site (e.g., octagonal stop signs, triangular yield signs). Speed limits are posted throughout the Hanford Site, and the maximum posted speed is 97 kph (60 mph) on major thoroughfares. For minor thoroughfares areas, posted speeds are reduced to a maximum of 56 kph (35 mph) and held to speeds as low as 24 kph (15 mph).

1.5. Seismic Consideration

The Hanford Facility is located in Zone 2B as identified in the Uniform Building Code (ICBO 1991). No active faults, or evidence of a fault that has had displacement during Holocene times have been found on the Hanford Facility (DOE/RW-0164). The youngest faults recognized on the Hanford Facility occur on Gable Mountain, approximately 1.6 km (1.0 mi) north of the 200 East Area, and 7.2 km (4.5 mi) northeast of the 200 West Area. These faults are of Quatemary age and are considered 'capable' by the U.S. Nuclear Regulatory Commission (NUREG-0892).

1.6. Topographic Map

This section addresses the general topographic map requirements for the Hanford Facility and CWC-WRAP including information on prevailing wind directions and floodplain area.

1.6.1. Hanford Facility

The overall facility map (DOE/RL-2015-74) illustrates the Hanford Site and includes the following:

- Hanford Site legal boundary (for area shown)
- Hanford Facility operating boundary
- Sufficient contours to show surface water flow
- Major access roads (i.e., state highways, regional and Hanford Site roads)
- Longitudes and latitudes
- DOE operating areas
- Rivers, lakes, perennial streams, intermittent streams, ditches
- FEMA 100 year and 500 year flood zones (probable maximum flood for Colombia and Yakima Rivers, and Cold Creek)
- Hanford Site waste management units and water supplies
- Surrounding land use.

1.6.2. Operating Unit Group

The CWC-WRAP general topographic map is located in Addendum A (DOE/RL-2015-74). The map show a distance of at least 305 m (1000 ft) around the OUG, and is drawn at a scale of 1 in. equaling no more than 200 ft (1:200). In addition, the following information is included:

- Map scale
- Date
- Prevailing wind direction
- A north arrow
- Surrounding land use
- Locations of DWMUs
- TSD operating unit group boundary
- DOE operating areas
- DWMU (operating, closing, buildings)
- Structures, concrete, major and service roads
- Access control (e.g., railroads and fences)
- Injection and withdrawal wells (if applicable)
- Other buildings.

1.6.3. Prevailing Wind Directions

Prevailing wind directions in the 200 East and 200 West Areas (located approximately in the center of the Hanford Site) are from the northwest in all months of the year. Secondary maxima occur for southwesterly winds.

Monthly average wind speeds are lowest during the winter months, averaging 9.7 to 11.3 kph (6 to7 mph), and highest during the summer, averaging 14.5 to 16.1 kph (9 to 10 mph). Wind speeds that are well above average usually are associated with southwesterly winds. However, the summertime drainage winds generally are northwesterly and frequently reach 50 kph (31 mph). Estimates of wind extremes have been summarized (PNL-4622). Information on the likelihood and frequency of strong winds and tornados in the region have been summarized in a final environmental impact statement (DOE/EIS-0113), the Hanford Meteorological Station climatological summary (PNL-4622), and reports from the National Severe Storms Forecast Center.

1.6.4. Floodplain Area

Three sources of potential flooding of the Hanford Facility are considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Facility. No perennial streams occur in the central part of the Hanford Facility. The only other potential source of flooding of the Hanford Facility is run-off from a large precipitation event in the Cold Creek watershed. This event could result in flooding of the ephemeral Cold Creek.

References

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Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq. Available at: http://www.epa.gov/epawaste/inforesources/online/index.htm.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303.

303-017, "Recycling Processes Involving Solid Waste."

303-120, "Recycled, Reclaimed, and Recovered Wastes."

303-170, "Requirements for Generators of Dangerous Waste."

303-240, "Requirements for Transporters of Dangerous Waste."

303-500, "Recycling Requirements for State-Only Dangerous Waste."

303-802, "Permits by Rule."

303-809, "Research, Development and Demonstration Permits."

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Central Waste Complex – Waste Receiving and Processing Facility

Regulatory Crosswalk

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CWC-WRAP Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-803(3) Contents of Part A of the permit application		
(3) Part A of the final facility permit application must include the following information:		
(a) The activities conducted by the applicant that require it to obtain a permit under the Hazardous Waste Management Act;	Section A1. Complete and Submit the Part A Form	Part A Form Section XI., Attachment A, Nature of Business.
(b) Name, mailing address, and location, including latitude and longitude of the facility for which the application is submitted;		Part A Form Section IV. (Per Part A CAP) Part A Form Section XV., Attachment C (Topo Map for Long/Lat.)
(c) Up to four NAICS codes that best reflect the principal products or services provided by the facility;		Part A Form Section IX.
(d) The operator's name, address, telephone number, ownership status, and status as federal, state, private, public, or other entity;		Part A Form Section VII.
(e) The name, address, and phone number of the owner of the facility;		Part A Form Section VIII.
(f) Whether the facility is located on tribal lands;		NA
(g) An indication of whether the facility is new or existing and whether it is a first or revised application;		Part A Form Section IV (D.) Part A Form Section XI., Attachment A, Nature of Business
(h) For existing facilities:		
(i) A scale drawing of the facility showing the location of all past, present, and future treatment, storage, and disposal areas; and	Section A1. Complete and Submit the Part A Form	Part A Form Section XV., Attachment C (Topo Map) Addendum C, Process Information (Drawings)
(ii) Photographs of the facility clearly delineating all existing structures, existing treatment, storage, and disposal areas, and sites of future treatment, storage, and disposal areas;		Part A Form Section XVII., Attachment C
(i) A description of the processes to be used for treating, storing, and disposing of dangerous waste, and the design capacity of these items;		Part A Form Section XI., Attachment A, Nature of Business Part A Form Section XII., Attachment A, Nature of Business

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(j) A specification of the dangerous wastes listed or designated under WAC 173-303-070 to be treated, stored, or disposed of at the facility, an estimate of the quantity of those wastes to be treated, stored, or disposed annually, and a general description of the processes to be used for the wastes;		Part A Form Section XIV., Attachment B, Waste Codes
(k) A listing of all permits or construction approvals received or applied for under any of the following programs:		
(i) Hazardous waste management program;	Section A1. Complete and Submit the Part A Form	Part A Form Section X.
(ii) UIC program under the SWDA;		
(iii) NPDES program under the CWA;		
(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;		
(v) Nonattainment program under the Clean Air Act;		
(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;		
(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act;		
(viii) Dredge or fill permits under section 404 of the CWA;		
(ix) Other relevant environmental permits, including state permits;		
(l) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its dangerous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundary;		Part A Form Section XV., Attachment C, Photos
(m) A brief description of the nature of the business;		Part A Form Section XI., Attachment A, Nature of Business

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(n) For hazardous debris, a description of the debris category(ies) and contaminant category(ies) to be treated, stored, or disposed of at the facility.		Part A Form Section XII and XIII, Attachment A, Nature of Business

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WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-110 Sampling, testing methods, and analytes		
(2) Representative samples.		
(a) The methods and equipment used for obtaining representative samples of a waste will vary with the type and form of the waste. The department will consider samples collected using the sampling methods below or the most recent version of such methods for wastes with properties similar to the indicated materials, to be representative samples of the wastes:	C4.6. Sampling and analysis methodologies	Section B2.1 – Identification and Classification of Waste. Section B3.1 – Confirmation Section B4 – CWC-WRAP Generated Waste Table B-2. Waste Requiring Verification or Characterization Analysis. Section B5.1 – Sampling Methods and Equipment Table B-3. CWC-WRAP Sampling Equipment
(i) Crushed or powdered material - ASTM Standard D346-04e1;		
(ii) Extremely viscous liquid - ASTM Standard D140-01 (2007);		
(iii) Fly ash-like material - ASTM Standard D2234/D2234M-03e1;		
(iv) Soil-like material - ASTM Standard D1452-80 (2000);		
(v) Soil or rock-like material - ASTM Standard D420-98 (2003);		
(vi) Containerized liquid wastes - "COLIWASA" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a), or the equivalent representative sampling method described in ASTM D5743-97 (2003). Per this method, the selection of an appropriate device must be best suited for the characteristics of the waste being sampled; and		
(vii) Liquid waste in pits, ponds, lagoons, and similar reservoirs - "Pond Sampler" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a).		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(5) Equivalent testing methods. Any person may request department approval for the use of an equivalent testing method by submitting a petition, prepared in accordance with WAC 173-303-910(2), to the department.	NA – CWC-WRAP is utilizing SW-846 or ASTM methods.	
(6) Reporting analytical results. Ecology requires that all test methods report their analytical results for solid and soil samples on a dry weight basis. Reporting on a dry weight basis compensates for variability in water content and provides a consistent procedure for all analytical results provided to ecology for designation purposes.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Table B-2 Waste Requiring Verification or Characterization Analysis
WAC 173-303-140 Land disposal restrictions		
Subpart A - General	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1.1 Verification of Waste from Non-SWOC Onsite or Offsite Generators Section B3.1.1.2 Verification of Waste from Other Hanford SWOC TSD Units Section B3.1.2 Preshipment Review Section B3.2.1 Container Receipt Inspection Section B4 CWC-WRAP Generated Waste
Subpart D – Treatment standards		
WAC 173-303-300 General waste analysis		
(1) Purpose. This section requires the facility owner or operator to confirm his knowledge about a dangerous waste before he stores, treats, or disposes of it. The purpose for the analysis is to insure that a dangerous waste is managed properly.	C4.1.1 Confirming/reconfirming waste stream profiles C4.4 Process analyses C4.5 Waste generated on site	Section B2 Waste Pre-acceptance Processes Section B3 Waste Acceptance Process Section B4 CWC-WRAP Generated Waste Section B5 Waste Analysis Parameters

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(2) The owner or operator must obtain a detailed chemical, physical, and/or biological analysis of a dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), before they store, treat, or dispose of it. This analysis must contain the information necessary to manage the waste in accordance with the requirements of this chapter. The analysis must include or consist of existing published or documented data on the dangerous waste, or on waste generated from similar processes, or data obtained by testing, or a combination of these.		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 CWC-WRAP Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(a) When an owner or operator relies on knowledge from the generator for waste designation or for this detailed analysis (commonly known as a waste profile) instead of analytical testing of a sample, that information must be documented and must meet the definition of "knowledge" as defined in WAC 173-303-040. To confirm the sufficiency and reliability of the "knowledge" used for the waste profile, the facility must do one or more of the following:		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval
(i) Be familiar with the generator's processes by conducting site visits, and reviewing sampling data and other information provided by the generator to ensure they are adequate for safe management of the waste;		
(ii) Ensure waste analysis contained in documented studies on the generator's waste is based on representative and appropriate sampling and test methods;		
(iii) Compare the generator's waste generating process to documented studies of similar waste generating processes to ensure the waste profile is accurate and current;		
(iv) Obtain other information as predetermined by the department on a case-by-case basis to be equivalent.		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(b) As required in WAC 173-303-380 (1)(c), records must be retained containing specific information that show compliance with this subsection for sufficient and reliable information on the waste whether the owner or operator relies on analytical testing of the waste or knowledge from the generator, or a combination of these.	C4.9 Recordkeeping	Section B7 Recordkeeping
(3) The owner or operator of an off-site facility must confirm, by analysis if necessary, that each dangerous waste received at the facility matches the identity of the waste specified on the accompanying manifest or shipping paper.	C4.2 Incoming waste procedures C4.2.2 Waste stream verification analyses	Section B3.1.1 Verification
(4) Analysis must be repeated as necessary to ensure that it is accurate and current. At a minimum, analysis must be repeated:	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Appendix B-A, Section B-A1 Initial Waste Profile Review
(a) When the owner or operator has been notified, or has reason to believe, that the process or operation generating the dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), has significantly changed; and		Section B2.2.2 Standing Waste Profile Review
(b) When a dangerous waste received at an off-site facility does not match the identity of the waste specified on the manifest or the shipping paper.		Section B2.2.2 Standing Waste Profile Review
(5) Waste analysis plan. The owner or operator must develop and follow a written waste analysis plan which describes the procedures he will use to comply with the waste analysis requirements of subsections (1), (2), (3), and (4) of this section. He must keep this plan at the facility, and the plan must contain at least:	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B4. CWC-WRAP Generated Waste Table B-2 Section B5 Waste Analysis Parameters
(a) The parameters for which each dangerous waste, or nondangerous waste if applicable under WAC 173-303-610 (4)(d), will be analyzed, and the rationale for selecting these parameters (i.e., how analysis for these parameters will provide sufficient information on the waste's properties to comply with subsections (1) through (4) of this section);		
(b) The methods of obtaining or testing for these parameters;		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(c) The methods for obtaining representative samples of wastes for analysis (representative sampling methods are discussed in WAC 173-303-110(2));		
(d) The frequency with which analysis of a waste will be reviewed or repeated to ensure that the analysis is accurate and current;	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Section B6.1 Waste Receipt Quality Assurance
(e) The waste analyses which generators have agreed to supply;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval
(f) Where applicable, the methods for meeting the additional waste analysis requirements for specific waste management methods as specified in WAC 173-303-400(3) which incorporates by reference the regulations in 40 C.F.R. Part 265 Subparts F through R, 265.1034, 265.1063(d), 265.1084, 268.4(a) and 268.7 for interim status facilities and in WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, and 40 C.F.R. 264.1034, 264.1063(d), 264.1083, 268.4(a) and 268.7 for final status facilities. Note that data provided from laboratory analyses for WAC 173-303-400(3) which incorporates by reference 40 C.F.R. Part 265 Subparts F through R, WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, 40 C.F.R. 268.4(a) and 268.7 must meet the requirements of WAC 173-303-110;	C4.6 Sampling and analyses methodologies	WAC 173-303-140(4)(b) – Disposal of liquid waste – NA Do not dispose of liquid wastes. WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible waste – NA Not accepted. WAC 173-303-630 – Use and management of containers (Process Information) WAC 173-303-640 – Tank systems – NA No tank systems. WAC 173-303-645 – Releases from regulated units - NA WAC 173-303-646 – Corrective action WAC 173-303-650 – Surface Impoundments – NA No surface impoundments WAC 173-303-655 – Land treatment – NA No land treatment WAC 173-303-670 – Incinerators – NA No incinerators

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
		40 C.F.R. 264.1034 – Subpart AA – Air emission standards for process vents, Test methods and procedures – NA No process vents 40 C.F.R. 264.1063(d) – Air emission standards for equipment leaks, Test methods and procedures – NA No equipment 40 C.F.R. 264.1083 – Air emission standards for tanks, surface impoundments, and containers, Waste determination procedures (Only containers are applicable) NA – waste is placed in a waste storage and/or treatment areas that employ air emission controls that are in compliance with the Subpart CC standards. (Process Information) 40 C.F.R. 268.4(a) Treatment surface impoundment exemption. NA No surface impoundment 40 C.F.R. 268.7 – Testing, tracking, and recordkeeping requirements for generators, treaters, and disposal facilities. – Section B7 Recordkeeping
(g) For off-site facilities, the waste analysis that dangerous waste generators have agreed to supply;	C4.2.2 Waste stream verification analyses	Section B2.2.1 New Waste Profile Review and Approval
(h) For surface impoundments exempted from land disposal restrictions under 40 C.F.R. 268.4(a), incorporated by reference in WAC 173-303-140(2), the procedures and schedules for:	NA – CWC-WRAP does not have surface impoundments	

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(i) For owners and operators seeking an exemption to the air emission standards of subpart CC in accordance with Sec. 264.1082, incorporated by reference at WAC 173-303-692, or with 265.1083, incorporated by reference at WAC 173-303-400 (3)(a):	NA – CWC-WRAP is not seeking an exemption from Subpart CC.	
(6) For off-site facilities, the waste analysis plan required in subsection (5) of this section must also specify the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan must describe:	C4.2.2 Waste stream verification analyses C4.8 Waste tracking	Section B3 Waste Acceptance Process
(a) The procedures which will be used to determine the identity of each movement of waste managed at the facility;		Section 3.1.2 Preshipment Review Section 3.2.1 Container Receipt Inspection
(b) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling; and		Section 3.1.1 Verification Table B-2 Waste Requiring Verification or Characterization Analysis Table B-3 CWC-WRAP Sampling Equipment
(c) The procedures that the owner or operator of an off-site landfill receiving containerized hazardous waste will use to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container.		Section 3.1.1 Verification
WAC 173-303-350 Contingency plan and emergency procedures - (3)(b)		
(3) The contingency plan must contain the following:		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4. Addressing Conformance Issues
WAC 173-303-370 Manifest System		
(1) Applicability. The requirements of this section apply to owners and operators of permitted treatment, storage, and disposal facilities and of dangerous waste recycling facilities operating under the requirements of this chapter who receive dangerous waste from off-site sources. If a facility receives dangerous waste accompanied by a manifest, the owner, operator, or his/her agent must sign and date the manifest as indicated in subsection (2) of this section to certify that the dangerous waste covered by the manifest was received, that the dangerous waste was received except as noted in the discrepancy space of the manifest, or that the dangerous waste was rejected as noted in the manifest discrepancy space.		
(2) If a facility receives dangerous waste shipment accompanied by a manifest, the owner, operator, or their agent, must:	C4.2 Incoming waste procedures C4.2.1 Manifest reviews and procedures C4.3 Discrepancy resolution	Section B3.2.1 Container Receipt Inspection
(a) Sign and date, by hand, each copy of the manifest;		
(b) Note any discrepancies (as defined in subsection (5)(a) of this section) on each copy of the manifest;		
(c) Immediately give the transporter at least one copy of the manifest;		
(d) Within thirty days of delivery, send a copy of the manifest to the generator; and		
(e) Retain at the facility a copy of each manifest for at least three years from the date of delivery.		
(3) If a facility receives hazardous waste imported from a foreign source, the receiving facility must mail a copy of the manifest and documentation confirming EPA's consent to the import of hazardous waste to the following address within thirty days of delivery: Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460.	NA – CWC-WRAP does not receive waste from foreign sources.	

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(4) If a facility receives, from a rail or water (bulk shipment) transporter, dangerous waste which is accompanied by a manifest or shipping paper containing all the information required on the manifest (excluding the EPA/state identification numbers, generator's certification, and signatures), the owner or operator, or his or her agent, must:	C4.2.2. Waste stream verification analyses	Section B3.2.1 Container Receipt Inspection
(a) Sign and date each copy of the manifest or shipping paper to certify that the dangerous waste covered by the manifest or shipping paper was received;		
(b) Note any significant discrepancies in the manifest or shipping paper, as described in subsection (5) of this section, on each copy of the manifest or shipping paper;		
(c) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper;		
(d) Within thirty days after the delivery, send a copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within thirty days after delivery) to the generator; and		
(e) Retain at the facility a copy of each shipping paper and manifest for at least three years from the date of delivery.		
(5) Manifest discrepancies.		
(a) Manifest discrepancies are:		
(i) Significant differences (as defined in (b) of this subsection) between the quantity or type of dangerous waste designated on the manifest or shipping paper, and the quantity and type of dangerous waste a facility actually receives;	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(ii) Rejected wastes, which may be a full or partial shipment of dangerous waste that the TSDF cannot accept; or		
(iii) Container residues, which are residues that exceed the quantity limits for "empty" containers set forth in WAC 173-303-160(2).		NA – CWC-WRAP does not receive shipments of empty containers.

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(b) Significant differences in quantity are: For bulk waste, variations greater than ten percent in weight (for example, tanker trucks, railroad tank cars, etc.); for batch waste, any variations in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies
(c) Upon discovering a significant difference in quantity or type, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter. If the discrepancy is not resolved within fifteen days after receiving the waste, the owner or operator must immediately submit to the department a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.	C4.3 Discrepancy resolution	
(d)(i) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2), the facility must consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the facility may return the rejected waste or residue to the generator. The facility must send the waste to the alternative facility or to the generator within sixty days of the rejection or the container residue identification.	NA – CWC-WRAP does not ship waste to an alternate facility, waste is returned to generator.	

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(ii) While the facility is making arrangements for forwarding rejected wastes or residues to another facility under this section, it must ensure that either the delivering transporter retains custody of the waste, or the facility must provide for secure, temporary custody of the waste, pending delivery of the waste to the first transporter designated on the manifest prepared under (e) or (f) of this subsection.		
(e) Except as provided in (e)(vii) of this section, for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	NA – CWC-WRAP does not ship waste to an alternate facility, waste is returned to generator.	
(f) Except as provided in (f)(vii) of this subsection, for rejected wastes and residues that must be sent back to the generator, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	C4.3. Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(i) Write the facility's U.S. EPA ID number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.		
(ii) Write the name of the initial generator and the generator's U.S. EPA ID number in the designated facility block (Item 8) of the new manifest.		
(iii) Copy the manifest tracking number found in Item 4 of the old manifest to the special handling and additional information block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(iv) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the discrepancy block of the old manifest (Item 18a).		
(v) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.		
(vi) Sign the generator's/offeror's certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation.		
(vii) For full load rejections that are made while the transporter remains at the facility, the facility may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the alternate facility space. The facility must retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with (f)(i), (ii), (iii), (iv), (v), (vi), and (viii) of this subsection.		
(viii) For full or partial load rejections and container residues contained in nonempty containers that are returned to the generator, the facility must also comply with the exception reporting requirements in WAC 173-303-220(2).		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(g) If a facility rejects a waste or identifies a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2) after it has signed, dated, and returned a copy of the manifest to the delivering transporter or to the generator, the facility must amend its copy of the manifest to indicate the rejected wastes or residues in the discrepancy space of the amended manifest. The facility must also copy the manifest tracking number from Item 4 of the new manifest to the discrepancy space of the amended manifest, and must re-sign and date the manifest to certify to the information as amended. The facility must retain the amended manifest for at least three years from the date of amendment, and must within thirty days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(6) Reasons for not accepting dangerous waste shipments. The owner or operator may decide that a dangerous shipment should not be accepted by his facility.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(a) The following are acceptable reasons for denying receipt of a dangerous waste shipment:		
(i) The facility is not capable of properly managing the type(s) of dangerous waste in the shipment;		
(ii) There is a significant discrepancy (as described in subsection (5) of this section) between the shipment and the wastes listed on the manifest or shipping paper; or		
(iii) The shipment has arrived in a condition which the owner or operator believes would present an unreasonable hazard to facility operations, or to facility personnel handling the dangerous waste(s) (including, but not limited to, leaking or damaged containers, and improperly labeled containers).		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(b) The owner or operator may send the shipment on to the alternate facility designated on the manifest or shipping paper, or contact the generator to identify another facility capable of handling the waste and provide for its delivery to that other facility, unless, the containers are damaged to such an extent, or the dangerous waste is in such a condition as to present a hazard to the public health or the environment in the process of further transportation.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(c) If the dangerous waste shipment cannot leave the facility for the reasons described in (b) of this subsection, then the owner or operator must take those actions described in the contingency plan, WAC 173-303-350 (3)(b).	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Addendum J, Contingency Plan
(7) Within three working days of the receipt of a shipment subject to 40 C.F.R. Part 262, subpart H (which is incorporated by reference at WAC 173-303-230(1)), the owner or operator of the facility must provide a copy of the movement document bearing all required signatures to the exporter, to the Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, D.C. 20460, and to competent authorities of all other concerned countries. The original copy of the movement document must be maintained at the facility for at least three years from the date of signature.	NA – CWC-WRAP does not import or export dangerous wastes destined for recovery operations in other countries.	
(8) A facility must determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated federally) as hazardous wastes under its state hazardous waste program. Facilities must also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.		NA
WAC 173-303-395 Other general requirements		
(1) Precautions for ignitable, reactive, or incompatible wastes.	C4.1 Waste pre-acceptance procedures – waste stream	Addendum F - Preparedness and Prevention

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(2) Compliance with other environmental protection laws and regulations. In receiving, storing, handling, treating, processing, or disposing of dangerous wastes, the owner/operator must design, maintain and operate his dangerous waste facility in compliance with all applicable federal, state and local laws and regulations (e.g., control of stormwater or sanitary water discharge, control of volatile air emissions, etc.).	characterization and profiling	Addendum C - Process Information
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:		Addendum C – Process Information
(5) Storage time limit for impoundments and piles.	NA – CWC-WRAP does not have impoundments or piles.	
(6) Labeling for containers and tanks.	No guidance section identified.	Addendum C - Process Information, Addendum I - Inspections
WAC 173-303-630 Use and management of containers - (7)(c) and (9)		
(7) Containment.		
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	No guidance section identified.	Addendum C - Process Information
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or	No guidance section identified.	
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.	No guidance section identified.	
(9) Special requirements for incompatible wastes.	No guidance section identified.	Addendum C – Process Information Addendum F – Preparedness & Prevention
WAC 173-303-640 Tank systems - (1)(b), 2(c), (3)(a), and (10)		
NA		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-690 Air emission standards for process vents		
NA		
WAC 173-303-691 Air emission standards for equipment leaks		
NA		
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
NA		
WAC 173-303-806 Final facility permits - (4)(a)(ii) and (iii), 4(b)(ii) and (v), and 4(c)(x)		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		
(a) General requirements. (ii) Chemical, biological, and physical analyses of the dangerous waste and hazardous debris to be handled at the facility. At a minimum, these analyses must contain all the information which must be known to treat, store, or dispose of the wastes properly in accordance with WAC 173-303-600.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 CWC-WRAP Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(iii) A copy of the waste analysis plan required by WAC 173-303-300(5) and, if applicable WAC 173-303-300 (5)(g).	C. Waste Analyses	WAP will be included in the Part B Application and is currently available electronically.
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including: **(A)** Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and **(B)** A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling C4.1.1 Confirming/reconfirming waste stream profiles	(A) Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1 Verification B4 CWC-WRAP Generated Waste Tables B-1 and B-2 (B) Waste storage description is covered in Addendum C, Process Information.

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(v) Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with WAC 173-303-630 (9)(a) and (b), and 173-303-395 (1)(b) and (c); and	No guidance section identified.	Addendum C, Process Information Addendum F, Preparedness & Prevention
(c) Specific Part B information requirements for tanks. Except as otherwise provided in WAC 173-303-600(3), owners and operators of facilities that use tanks to store or treat dangerous waste must provide the following information:	NA – CWC-WRAP does not have any tanks.	

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CWC-WRAP Part B Addendum C, Process Information Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-160 Containers		
(2) A container or inner liner is "empty" when:		
(a) All wastes in it have been taken out that can be removed using practices commonly employed to remove materials from that type of container or inner liner (for example, pouring, pumping, aspirating, etc.) and:	D2.1. Description of Containers	C2.2.1 Procedure for Handling
(i) No more than one inch of waste remains at the bottom of the container or inner liner; or		
(ii) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 119 gallons in size; or		
(iii) No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size. A container that held compressed gas is empty when the pressure inside the container equals or nearly equals atmospheric pressure; and		
(b) If the container or inner liner held acutely hazardous waste, as defined in WAC 173-303-040, toxic EHW as defined in WAC 173-303-100 or pesticides bearing the danger or warning label, the container or inner liner has been rinsed at least three times with an appropriate cleaner or solvent. The volume of cleaner or solvent used for each rinsing must be ten percent or more of the container's or inner liner's capacity or of sufficient quantity to thoroughly decontaminate the container. In lieu of rinsing for containers that might be damaged or made unusable by rinsing with liquids (for example, fiber or cardboard containers without inner liners), an empty container may be vacuum cleaned, struck, with the open end of the container up, three times (for example, on the ground, with a hammer or hand) to remove or loosen particles from the inner walls and corners, and vacuum cleaned again. Equipment used for the vacuum cleaning of residues from containers or inner liners		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
must be decontaminated before discarding, in accordance with procedures approved by the department. A container or inner liner is also considered "empty" if the container or inner liner has been cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generator, to achieve equivalent removal. Any rinsate or vacuumed residue that results from the cleaning of containers or inner liners must, whenever possible, be reused in a manner consistent with the original intended purpose of the substance in the container or inner liner. In the case of a farmer, if the rinsate is a pesticide residue then the rinsate must be managed or reused in a manner consistent with the application instructions on the pesticide label. On-site disposal or burial of pesticide residues is prohibited. Otherwise, the rinsate must be checked against the designation requirements (WAC 173-303-070 through 173-303-100) and, if designated, managed according to the requirements of this chapter.		
(c) In the case of a container, the inner liner, that prevented the container from contact with the commercial chemical product or manufacturing chemical, has been removed.		
WAC 173-303-190 Preparing dangerous waste for transport		
The generator must fulfill the following requirements before transporting off-site or offering for off-site transport any dangerous waste.	D2.3. Container Labeling	C2.1 Description of Containers
(1) Packaging. The generator must package all dangerous waste for transport in accordance with United States DOT regulations on packaging, 49 C.F.R. Parts 173, 178, and 179.		
(2) Labeling. The generator must label each package in accordance with United States DOT regulations, 49 C.F.R. Part 172.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(3) Marking. The generator must:		
(a) Mark each package of dangerous waste in accordance with the applicable United States DOT regulations on hazardous materials under 49 C.F.R. Part 172; and		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(b) Mark each container of one hundred nineteen gallons or less of dangerous waste used in such transportation with the following, or equivalent words and information in accordance with 49 C.F.R. 172.304. HAZARDOUS WASTE - State and federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, and the Washington state department of ecology or the United States Environmental Protection Agency. Generator's Name and Address Generator's EPA Identification Number Manifest Tracking Number		
WAC 173-303-340 Preparedness and prevention		
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Addendum F, *Preparedness and Prevention* Enclosure 5, Supporting Documentation
WAC 173-303-395 Other general requirements		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container Management Practices	Addendum F, *Preparedness and Prevention*
(a) Contain spills and leaks that might occur during loading or unloading;		
(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;		
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.		
(6) Labeling for containers and tanks. The owner or operator must label containers and tanks in a manner which adequately identifies the major risk(s) associated with the contents for employees, emergency response personnel and the public (Note—If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320. For tanks, the label or sign must be legible at a distance of at least fifty feet. For containers, the owner or operator must affix labels upon transfer of dangerous waste from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
WAC 173-303-630 Use and management of containers		
(2) Condition of containers. If a container holding dangerous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the dangerous waste from the container to a container that is in good condition or manage the waste in some other way that complies with the requirements of chapter 173-303 WAC. In addition, the owner or operator must address leaks and spills in accordance with the applicable provisions of WAC 173-303-145 and 173-303-360.	D2.1. Description of Containers	C2.1 Description of Containers C2.1.1 Condition

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WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(3) Identification of containers. The owner or operator must label containers in a manner which adequately identifies the major risk(s) associated with the contents of the containers for employees, emergency response personnel and the public (note: If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must affix labels upon transfer of dangerous wastes from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(4) Compatibility of waste with containers. The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the dangerous waste to be stored, so that the ability of the container to contain the waste is not impaired.	D2.1. Description of Containers	C2.1.3 Waste Compatibility
(5) Management of Containers	D2.2. Container Management Practices	C2.2 Managing Containers
(a) A container holding dangerous waste must always be closed, except when it is necessary to add or remove waste.	D2.2. Container Management Practices	C2.2.1 Procedure for Handling
(b) A container holding dangerous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.	D2.2. Container Management Practices	C2.2 Managing Containers C2.2.1 Procedure for Handling C2.2.2 Container Handling Equipment
(c) A minimum thirty-inch separation is required between aisles of containers holding dangerous waste(s). A row of drums must be no more than two drums wide.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Enclosure 5, Supporting Documentation

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(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.	D2.2. Container Management Practices	C2.2.4 Inspections Addendum I, *Inspections*
(7) Containment. **(a)** Container storage areas must have a containment system that is capable of collecting and holding spills and leaks. In addition to the necessary leak containment capacity, uncovered storage areas must be capable of holding the additional volume that would result from the precipitation of a maximum twenty-five year storm of twenty-four hours duration. The containment system must:	D2.4.1. Secondary Containment System Design for Containers D2.4.2. System Design	C2.3 Secondary Containment Enclosure 5, Supporting Documentation
(i) Have a base underlying the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated rainfall until the collected material is detected and removed. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;	D2.4.3. Structural Integrity of Base	C2.3.1 Base

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(ii) Be designed for positive drainage control (such as a locked drainage valve) to prevent release of contaminated liquids and so that uncontaminated precipitation can be drained promptly for convenience of operation. Spilled or leaked waste and accumulated precipitation must be removed from the containment system in as timely a manner as is necessary to prevent overflow; and	D2.4.3. Structural Integrity of Base D2.4.6. Removal of Liquids from Containment System	C2.3.2 Drainage Control C2.4 Removal Of Liquids from Containment System
(iii) Have sufficient capacity to contain ten percent of the volume of all containers or the volume of the largest container, whichever is greater. Only containers holding free liquids, or holding wastes designated as F020, F021, F022, F023, F026, or F027 need to be considered in this determination.	D2.4.4. Containment System Capacity	C2.3.3 Containment Capacity C2.3.3.1 DWMUs Managing Free Liquids C2.3.3.2 DWMUs Managing Ignitable and Reactive Waste C2.3.3.3 Capacity Calculations Table C-2 CWC-WRAP DWMU Capacities Enclosure 5, Supporting Documentation
(b) Run-on into the containment system must be prevented, unless the department waives this requirement in the permit after determining that the collection system has sufficient excess capacity in addition to that required in (a)(iii) of this subsection to accommodate any run-on which might enter the system.	D2.4.5. Control of Run-on	C2.3.4 Controlling Run-on and Runoff
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	D2.4.7. Demonstration that containment is not required because containers do not contain free liquids, wastes that exhibit ignitability or reactivity, or wastes designated F020 – 023, F026, or F027	C2.3 Secondary Containment
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or		
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(d) The department may require owners and operators to protect their containers from the elements by means of a building or other protective covering if the department determines that such protection is necessary to prevent a release of waste or waste constituents due to the nature of the waste or design of the container. The building or other protective covering must allow adequate inspection under subsection (6) of this section.	D2.4.2. System Design	Not Applicable
(8) Special requirements for ignitable or reactive waste.		
(a) Containers holding reactive waste exhibiting a characteristic specified in WAC 173-303-090 (7)(a)(vi), (vii) or (viii) must be stored in a manner equivalent to the International Fire Code's "*American Table of Distances for Storage of Explosives*" Table 3304.5.2(2) or "*Table of Separation Distances for Low Explosives*" Table 3304.5.2(3), 2003 edition, or the version adopted by the local fire district.	D2.5.1. Management of Certain Reactive Wastes in Containers	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) The owner or operator must design, operate, and maintain ignitable waste and reactive waste (other than a reactive waste which must meet (a) of this subsection) container storage in a manner equivalent with the International Fire Code. Where no specific standard or requirements are specified in the International Fire Code, or in existing state or local fire codes, applicable sections of the NFPA Pamphlet #30, "*Flammable and Combustible Liquids Code*," must be used. The owner/operator must also comply with the requirements of WAC 173-303-395 (1)(d).	D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers	C2.3.2 DWMUs Managing Ignitable and Reactive Wastes C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes Table C-2, CWC-WRAP DWMU Capacities *Notes*
(9) Special Requirements for Incompatible Wastes		
(a) Incompatible wastes, or incompatible wastes and materials must not be placed in the same container, unless WAC 173-303-395 (1)(b) is complied with.	D2.5.3. Design of Areas to Manage Incompatible Wastes	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) Dangerous waste must not be placed in an unwashed container that previously held an incompatible waste or material.		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(c) A storage container holding a dangerous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device. Containment systems for incompatible wastes must be separate.		
(11) Air emission standards. The owner or operator must manage all hazardous waste placed in a container in accordance with the applicable requirements of 40 C.F.R. Subparts AA, BB, and CC, which are incorporated by reference at WAC 173-303-690 through 173-303-692.	D2.2. Container Management Practices	Refer to WAC 173-303-690, *Air emission standards for process vents* through WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
WAC 173-303-690 Air emission standards for process vents		
(1)(a) The regulations in this section apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes.	D4.1. Process Vents	C2.7 Air Emissions C2.7.1. Applicability of Subpart AA Standards <u>Note</u> CWC-WRAP does not have any process vents subject to 40 CFR 264 Subpart AA requirements.
(b) Except for 40 C.F.R. 264.1034 (d) and (e), this section applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 ppmw, if these operations are conducted in one of the following:		
(i) A unit that is subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		
(ii) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of WAC 173-303-200(1) (i.e., a hazardous waste recycling unit that is not a ninety-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		
(iii) A unit that is exempt from permitting under the provisions of WAC 173-303-200(1) (that is, a "ninety-day" tank or container) and is not a recycling unit under the provisions of WAC 173-303-120.		

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WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-691 Air emission standards for equipment leaks		
(1)(f) Equipment that contains or contacts hazardous waste with an organic concentration of at least ten percent by weight for less than three hundred hours per calendar year is excluded from the requirements of 40 C.F.R. Parts 264.1052 through 264.1060 if it is identified, as required in 40 C.F.R. Part 264.1064 (g)(6).	D4.2. Equipment Leaks	C2.7 Air Emissions C2.7.2 Applicability of Subpart BB Standards C2.7.2.1 Demonstrating Compliance with Subpart BB Standards Note The only equipment within CWC-WRAP subject to the provisions of WAC 173-303-691 is the carbon canister associated with the aerosol can venting equipment. This equipment qualifies as a control device (40 CFR 264.1060) and is exempt from Subpart BB requirements (40 CFR 264.1050(f)).
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
(1)(a) The requirements of 40 C.F.R. Part 264 Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either WAC 173-303-630, 173-303-640, or 173-303-650 except as WAC 173-303-600 and (b) of this subsection provide otherwise.	D4.3. Tanks and Containers	C2.7 Air Emissions C2.7.3 Applicability of Subpart CC Standards Note CWC-WRAP does not have any tank systems or surface impoundments subject to 40 CFR 264, Subpart CC requirements. 40 CFR 264, Subpart CC, standards for MW containers do not apply.
(b) The requirements of 40 C.F.R. Part 264 Subpart CC do not apply to the following waste management units at the facility:		
(vi) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.		

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(2) 40 C.F.R. Parts 264.1081 through 264.1091 (Subpart CC) is incorporated by reference.	D2.2. Container Management Practices	C2.7 Air Emissions C2.7.3 Applicability of Subpart CC Standards Note CWC-WRAP does not have any tank systems or surface impoundments subject to 40 CFR 264, Subpart CC requirements. 40 CFR 264, Subpart CC, standards for MW containers do not apply.
WAC 173-303-806(4) Contents of Part B		
(a) General requirements.		
(i) A general description of the facility	B1. General Facility Description	Enclosure 5, Supporting Documentation
(viii) A description of procedures, structures, or equipment used at the facility to:	D2.2. Container Management Practices	Refer to WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
(F) Prevent releases to the atmosphere.		
(x) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).	B3. Traffic Information	Enclosure 5, Supporting Documentation
(xi) Seismic risk consideration. The owner/operator of a proposed facility or expansion of an existing facility must identify the seismic risk zone in which the facility is intended to be located. Where state or local maps are not available, United States Geological Survey Open File Report number 82-1033 may be used to identify seismic risk zones. The owner/operator must demonstrate that the facility can and will be designed to resist seismic ground motion and that the design is sufficient to withstand the maximum horizontal acceleration of a design earthquake specified in the demonstration.	B2. Seismic Consideration	Enclosure 5, Supporting Documentation

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following: **(A)** Map scale and date; **(B)** One hundred-year flood plain area; **(C)** Surface waters including intermittent streams; **(D)** Surrounding land uses (residential, commercial, agricultural, recreational); **(E)** A wind rose (i.e., prevailing windspeed and direction); **(F)** Orientation of the map (north arrow); **(G)** Legal boundaries of the TSD facility site; **(H)** Access control (fences, gates); **(I)** Injection and withdrawal wells both on-site and off-site; **(J)** Buildings; treatment, storage, or disposal operations; or other structure (recreation areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems, loading and unloading areas, fire control facilities, etc.); **(K)** Barriers for drainage or flood control; and	B4. Topographic Map	Appendix C-A, Topographic Map Overall Facility Map of the Hanford Site

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(L) Location of operational units within the TSD facility site, where dangerous waste is (or will be) treated, stored, or disposed (include equipment clean-up areas). (Note - For large TSD facilities the department will allow the use of other scales on a case-by-case basis.) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).		
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		
(i) A description of the containment system to demonstrate compliance with WAC 173-303-630(7). Show at least the following: **(E)** How accumulated liquids can be analyzed and removed to prevent overflow; and	D2.4.6. Removal of Liquids from Containment System	C2.4 Removal Of Liquids from Containment System
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including:	D2.4.7. Demonstration that containment is not required because containers do not contain free liquids, wastes that exhibit ignitability or reactivity, or wastes designated F020 – 023, F026, or F027	C2.3 Secondary Containment
(A) Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and		Addendum B, *Waste Analysis Plan*
(B) A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;		C2.3 Secondary Containment C2.3.1 Base C2.3.1.1 Portable Spill Pallets C2.3.1.2 Fabricated Spill Pans C2.3.1.3 Spill Berms C2.3.2 Drainage Control C2.4 Removal of Liquids from Containment System
(iii) A description of the procedures for labeling containers;	D2.3. Container Labeling	C2.1.2 Identification and Labeling

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(iv) Sketches, drawings, or data demonstrating compliance with WAC 173-303-630(8) (location of buffer zone and containers holding ignitable or reactive wastes) and WAC 173-303-630 (9)(c) (location of incompatible wastes), where applicable;	D2.5.1. Management of Certain Reactive Wastes in Containers D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers D2.5.3. Design of Areas to Manage Incompatible Wastes	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes Appendix C-B, Engineering Drawings Enclosure 5, Supporting Documentation
(vi) Information on air emission control equipment as required in (m) of this subsection.	D2.2. Container Management Practices	Refer to WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
40 CFR 264.1086 Standards: Containers		
(a) The provisions of this section apply to the control of air pollutant emissions from containers for which §264.1082(b) of this subpart references the use of this section for such air emission control. **(b)** *General requirements.* **(1)** The owner or operator shall control air pollutant emissions from each container subject to this section in accordance with the following requirements, as applicable to the container, except when the special provisions for waste stabilization processes specified in paragraph (b)(2) of this section apply to the container. **(i)** For a container having a design capacity greater than 0.1 m^3 and less than or equal to 0.46 m^3, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(ii)** For a container having a design capacity greater than 0.46 m^3 that is not in light material service, the owner or	D4.3. Tanks and Containers	C2.7.3 Demonstrating Compliance with Subpart CC Standards

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(iii)** For a container having a design capacity greater than 0.46 m^3 that is in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 2 standards specified in paragraph (d) of this section. **(2)** When a container having a design capacity greater than 0.1 m^3 is used for treatment of a hazardous waste by a waste stabilization process, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 3 standards specified in paragraph (e) of this section at those times during the waste stabilization process when the hazardous waste in the container is exposed to the atmosphere.		

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CWC-WRAP Part B Addendum E, Security Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-310 Security		
(1) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his or her facility, unless he can demonstrate to the department that:	Section F1. Security	E1.1 Security Provisions; E1.1.1 Access control
(a) Physical contact with waste, structures or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and	NA	NA – Meeting requirement of WAC 173-303-310(1)
(b) Disturbance of the waste or equipment by the unknowing or unauthorized entry of persons or livestock onto the active portion of the facility will not cause a violation of this chapter 173-303 WAC.	NA	NA – Meeting requirement of WAC 173-303-310(1)
(2) A facility must have:		
(a) Signs posted at each entrance to the active portion, and at other locations, in sufficient numbers to be seen from any approach to the active portion. Signs must bear the legend "Danger - unauthorized personnel keep out," or an equivalent legend, written in English, and must be legible from a distance of twenty-five feet or more; and either	Section F1.1.1.	E1.1.2 Warning Signs
(b) A 24-hour surveillance system which continuously monitors and controls entry onto the active portion of the facility; or	Section F1.1.2, Bullet 1	E1.1 Security Provisions: E1.1.1 Access Control
(c) An artificial or natural barrier, or a combination of both, which completely surrounds the active portion of the facility, with a means to control access through gates or other entrances to the active portion of the facility at all times.	Section F1.1.2, Bullet 2	NA – Rely on WAC 173-303-310(2)(b)

CWC-WRAP Part B Addendum E, Security Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(3) In lieu of WAC 173-303 310(2), above, the owner or operator of a totally enclosed treatment facility or an elementary neutralization or wastewater treatment unit (as defined in WAC 173-303-040) must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock into or onto the totally enclosed treatment facility or the elementary neutralization or wastewater treatment unit.	NA	NA – Rely on WAC 173-303-310(2)(b)

CWC-WRAP Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-806(4)(a)(vi) Contents of Part B		
(vi) A justification of any request for a waiver(s) of the preparedness and prevention requirements of WAC 173-303-340, or a description of the procedures used to comply with these requirements.	F3. Preparedness and Prevention Requirements	No waiver of WAC 173-303-340 is requested.
WAC 173-303-806(4)(a)(viii) Contents of Part B		
(viii) A description of procedures, structures, or equipment used at the facility to:	F4. Preventative Procedures, Structures, and Equipment	
(A) Prevent hazards and contain spills in unloading/loading operations (for example, ramps, berms, pavement, special forklifts);	F4. Preventative Procedures, Structures, and Equipment	F1.2.1 Container Loading, Unloading, and Handling Operations
(B) Prevent runoff from dangerous waste handling areas to other areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches);	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(C) Prevent contamination of water supplies;	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(D) Mitigate effects of equipment failure and power outages;	F4. Preventative Procedures, Structures, and Equipment	F1.2.3 Equipment and Power Failure
(E) Prevent undue exposure of personnel to dangerous waste (for example, protective clothing); and	F4. Preventative Procedures, Structures, and Equipment	F1.2.4 Personal Protective Equipment
(F) Prevent releases to the atmosphere.	No equivalent	NA. Prevention of releases to the atmosphere are covered in the AOP.
WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible wastes		

CWC-WRAP Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including, but not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. "No smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3 Prevention of Ignition or Reaction of Ignitable, Reactive, and/or Incompatible Waste
(b) Where specifically required by other sections of this chapter 173-303 WAC, the treatment, storage, or disposal of ignitable or reactive waste, and the mixture or commingling of incompatible wastes, or incompatible wastes and materials, must be conducted so that it does not:	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste. F1.3.2 Precautions for Handling Ignitable or Reactive Waste and Mixing Incompatible Wastes
(i) Generate extreme heat or pressure, fire or explosion, or violent reaction;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iv) Damage the structural integrity of the facility or device containing the waste; or	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(v) Through other like means, threaten human health or the environment.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(c) When required to comply with (a) and (b) of this subsection, the owner or operator must document that compliance in the operating record required under WAC 173-303-380(1). This documentation may be based on references to published scientific or engineering literature, data from trial tests, waste analyses, or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3 Prevention of Ignition or Reaction of Ignitable, Reactive, and/or Incompatible Waste
WAC 173-303-395(4) Loading and unloading areas		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures
(a) Contain spills and leaks that might occur during loading or unloading;	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures F1.1.3 Emergency Equipment
(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;	No equivalent	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and	No equivalent	NA Cleaning of transport vehicles is not allowed in CWC-WRAP.
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.	No equivalent	F1.2.1. Container Loading, Unloading, and Handling Preventative Measures
WAC 173-303-340 Preparedness and prevention		
(1) Required equipment: All facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below:	F3.1. Equipment requirements	No equipment exceptions requested

CWC-WRAP Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(a) An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel;	F3.1.1. Internal Communications	F1.1.1 Internal Communications
(b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams;	F3.1.2. External Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(c) Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment, and	F3.1.3. Emergency Equipment	F1.1.3 Emergency Equipment
(d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	F3.1.4. Water for Fire Control	F1.1.4 Water for Fire Control; F1.1.3 Emergency Equipment
(2) Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situation below:		
(a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (1) of this section;	F3.1.1. Internal Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (1) of this section.	F3.1.2. External Communications	F1.1.2 External Communications

CWC-WRAP Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	F3.2 Aisle space requirement	F1.1.5 Aisle Spacing
(4) Arrangement with local authorities. The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements:	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(a) Arrangements to familiarize police, fire departments, and emergency response with the layout of the facility, associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers; and Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements, with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(5) Where state or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities

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CWC-WRAP Part B Addendum G, Personnel Training Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-806(4)(a)(xii) Contents of Part B		
An outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330. A brief description of how training will be designed to meet actual job tasks in accordance with requirements in WAC 173-303-330 (1)(d).		
WAC 173-303-330 Personnel training		
(1) Training program. The facility owner or operator must provide a program of classroom instruction or on-the-job training for facility personnel. This program must teach personnel to perform their duties in a way that ensures the facility's compliance with this chapter 173-303 WAC, must teach facility personnel dangerous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed, must ensure that facility personnel are able to respond effectively to emergencies, and must include those elements set forth in the training plan required in subsection (2) of this section. In addition:	H. Personnel Training	Attachment 5 *Hanford Facility Personnel Training Program*
(a) The training program must be directed by a person knowledgeable in dangerous waste management procedures, and must include training relevant to the positions in which the facility personnel are employed;	H5. Training Program Administration	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.4 Training Program Direction)
(b) Facility personnel must participate in an annual review of the training provided in the training program;	H4. Continuing Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.2 Continuing Training)
(c) This program must be successfully completed by the facility personnel:	H2. Initial Training	
(i) Within six months after these regulations become effective; or	No equivalent	Refer to (c)(ii)
(ii) Within six months after their employment at or assignment to the facility, or to a new position at the facility, whichever is later.	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)
(d) Employees hired after the effective date of these regulations must be supervised until they complete the training program; and	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(e) At a minimum, the training program must familiarize facility personnel with emergency equipment and systems, and emergency procedures. The program must include other parameters as set forth by the department, but at a minimum must include, where applicable:	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1 Introductory and Continuing Training) PRC-STD-TQ-40229 and PRC-STD_TQ-40230 *CWC and WRAP Dangerous Waste Training Plans* (Section 2.1 Emergency Response Training), referenced in Addendum G, Personnel Training
(i) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;	H2. Initial Training	PRC-STD-TQ-40229 and PRC-STD_TQ-40230, *CWC and WRAP Dangerous Waste Training Plans (*Table 2-1, Applicability of WAC 173-303-330(1)(e)) , referenced in Addendum G, Personnel Training
(ii) Key parameters for automatic waste feed cut-off systems;		
(iii) Communications or alarm systems;		
(iv) Response to fires or explosions;		
(v) Response to ground-water contamination incidents; and		
(vi) Shutdown of operations.		
(2) Written training plan. The owner or operator must develop a written training plan which must be kept at the facility and which must include the following documents and records:	H. Overview of Requirements	Addendum G, Personnel Training PRC-STD-TQ-40229 and PRC-STD_TQ-40230, *CWC and WRAP Dangerous Waste Training Plans*
(a) For each position related to dangerous waste management at the facility, the job title, the job description, and the name of the employee filling each job. The job description must include the requisite skills, education, other qualifications, and duties for each position;	H6. Job Title/Job Description	PRC-STD-TQ-40229 and PRC-STD_TQ-40230, *CWC and WRAP Dangerous Waste Training Plans (*Section 3.0 Names, Job Descriptions, and Job Title/Positions)
(b) A written description of the type and amount of both introductory and continuing training required for each position; and	H3. Task Specific Training	Addendum G, Personnel Training (Table G-1 Training Matrix) PRC-STD-TQ-40229 and PRC-STD-TQ-40230, *CWC and WRAP Dangerous Waste Training Plans* (Section 2.0,

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
		Training Program; Table 3-2, Training Course Matrix)
(c) Records documenting that facility personnel have received and completed the training required by this section. The department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received.	H7. Documentation and Record Retention	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.3 Training Records)
(3) Training records. Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.	H7. Documentation and Record Retention	Permit Condition II.I.1: The Permittees will maintain a written Facility Operating Record until ten (10) years after post-closure, or corrective action is complete and certified for the Facility, whichever is later.

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CWC-WRAP Part B Addendum H, Closure Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-806(4)(a)(xiii) Contents of Part B		
(xiii) A copy of the closure plan and, where applicable, the post-closure plan required by WAC 173-303-610 (3) and (8). Include, where applicable, as part of the plans, specific requirements in WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), and 173-303-680 (2) and (4).		
WAC 173-303-610 Closure and post-closure		
See T Plant Complex Addendum H, Closure Plan Regulatory Crosswalk for similar closure plans.		

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CWC-WRAP Part B Addendum I, Inspection Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
WAC 173-303-806(4)(a)(v) Contents of Part B		
A copy of the general inspection schedule required by WAC 173-303-320(2): Include where applicable, as part of the inspection schedule, specific requirements in WAC 173-303-395 (1)(d), 173-303-630(6), 173-303-640 (4)(a)(i) and (6), 173-303-650(4), 173-303-655(4), 173-303-660 (4) and (5), 173-303-665(4), 173-303-670(7), and 173-303-680(3), and 40 C.F.R. 264.1033, 264.1035, 264.1052, 264.1053, 264.1058, 264.1064, 264.1067, 264.1084, 264.1085, 264.1086, and 264.1088.		
WAC 173-303-320 General inspections		
(1) The owner or operator must inspect his facility to prevent malfunctions and deterioration, operator errors, and discharges which may cause or lead to the release of dangerous waste constituents to the environment, or a threat to human health. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.	F2. Inspections	Permit Condition II.O.1 General Inspection Requirements
(2) The owner or operator must develop and follow a written schedule for inspecting all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that help prevent, detect, or respond to hazards to the public health or the environment. In addition:	F2.1. General inspection requirements	Table I-1 Inspection Schedule
(a) The schedule must be kept at the facility;	F2.1. General inspection requirements	I1.2 Inspection Log
(b) The schedule must identify the types of problems which are to be looked for during inspections;	F2.1. General inspection requirements	I1.2 Inspection Log and Table I-1 Inspection Schedule

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(c) The schedule must indicate the frequency of inspection for specific items. The frequency should be based on the rate of possible deterioration of equipment, and the probability of an environmental or human health incident. Areas subject to spills must be inspected daily when in use. At a minimum the inspection schedule must also include the applicable items and frequencies required for the specific waste management methods described in 40 C.F.R. Part 265 Subparts F through R, 265.1033, 265.1052, 265.1053, 265.1058 and 265.1084 through 265.1090, for interim status facilities and in WAC 173-303-630 through 173-303-680, and 40 C.F.R. 264.1033, 264.1052, 264.1053, 264.1058 and 264.1083 through 264.1089 for final status facilities; and	F2.1. General inspection requirements	I1.1.2 Frequency of Inspections and Table I-1 Inspection Schedule
(d) The owner or operator must keep an inspection log or summary, including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made, an account of spills or discharges in accordance with WAC 173-303-145, and the date and nature of any repairs or remedial actions taken. The log or summary must be kept at the facility for at least five years from the date of inspection.	F2.2. Inspection Log	I1.2 Inspection Logs Permit Condition II.I Facility Operating Record
(3) The owner or operator must remedy any problems revealed by the inspection, on a schedule which prevents hazards to the public health and environment. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.	F2.3. Schedule for remedial action for problems revealed	I1.3 Schedule for Remedial Action for Problems Revealed
WAC 173-303-630 Use and management of containers		
(3) Identification of containers. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	F.2.4 Specific process or waste type inspection requirements	Table I-1 Inspection Schedule

WAC Regulation	Ecology Guidance Document Publication 95-402	CWC-WRAP Section
(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.	F.2.4 Specific process or waste type inspection requirements	I1.4.2 Container Inspection and Table I-1 Inspection Schedule
WAC 173-303-395 Other general requirements		
(d) At least yearly, the owner or operator must inspect those areas of his facility where ignitable or reactive wastes are stored. This inspection must be performed in the presence of a professional person who is familiar with the International Fire Code, or in the presence of the local, state, or federal fire marshal. The owner or operator must enter the following information in his inspection log or operating record as a result of this inspection:	F2.5. Prevention of reaction of ignitable, reactive, and incompatible wastes	I1.4.4 Storage of Ignitable or Reactive Wastes and Table I-1 Inspection Schedule
(i) The date and time of the inspection;		I1.4.4 Storage of Ignitable or Reactive Wastes
(ii) The name of the professional inspector or fire marshal;		I1.4.4 Storage of Ignitable or Reactive Wastes
(iii) A notation of the observations made; and		I1.4.4 Storage of Ignitable or Reactive Wastes
(iv) Any remedial actions which were taken as a result of the inspection.		I1.4.4 Storage of Ignitable or Reactive Wastes

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WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
WAC 173-303-806(4)(a)(vii) Final facility permit		
A copy of the contingency plan required by WAC 173-303-350: Include, where applicable, as part of the contingency plan, specific requirements in WAC 173-303-640(7), 173-303-650(5) and 173-303-660(6).		
WAC 173-303-350 Contingency Plan and Emergency Procedures		
(1) Purpose. The purpose of this section and WAC 173-303-360 is to lessen the potential impact on the public health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or groundwater by a facility. A contingency plan must be developed to lessen the potential impacts of such emergency circumstances, and the plan must be implemented immediately in such emergency circumstances.	G. Contingency Plan – Overview of Requirements	**Site-level:** DOE/RL-94-02, *Hanford Emergency Management Plan* (referred to as **HEMP**) **OUG-level:** HNF-IP-0263-CWC, *Building Emergency Plan for Central Waste Complex* (referred to as **CWC-BEP**) HNF-IP-0263-WRAP, *Building Emergency Plan for WRAP* (referred to as **WRAP-BEP**)
(2) Contingency plan. Each owner or operator must have a contingency plan at his facility for use in emergencies or sudden or nonsudden releases which threaten human health and the environment. If the owner or operator has already prepared a spill prevention control and countermeasures (SPCC) plan in accordance with Part 112 of Title 40 C.F.R., or some other emergency or contingency plan, they need only amend that plan to incorporate dangerous waste management provisions that are sufficient to comply with the requirements of this section and WAC 173-303-360. The owner or operator may develop one contingency plan that meets all regulatory requirements. Ecology recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan") as found at www.nrt.org. When modifications are made to nondangerous waste (non-Hazardous Waste Management Act or nondangerous waste regulation) provisions in an integrated contingency plan, the changes do not trigger the need for a dangerous waste permit modification.	G. Contingency Plan – Overview of Requirements	**Site-level:** HEMP **OUG-level:** CWC and WRAP BEPs

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(3) The contingency plan must contain the following:		
(a) A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** CWC and WRAP BEPs - Section 7.0 Incident Response
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** CWC and WRAP BEPs - Section 7.2.5.1 Damaged or Unacceptable Shipments
(c) A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4);	G6. Coordination Agreements	**Site-level:** HEMP - Sections 3.0 Offsite Response Interfaces and Table 3-1 Memorandums of Understanding **OUG-level:** CWC and WRAP BEPs - Section 10.0 Coordination Agreements
(d) A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(i)), rather than as part of the permit application;	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2 Emergency Response Organization Structure **OUG-level:** CWC and WRAP BEPs - Section 3.0 and Section 13.0 Facility/Building Emergency Response Organization

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(e) A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities; and	G5. Emergency Equipment	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** CWC and WRAP BEPs - Section 9.0 Emergency Equipment
(f) An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	G7. Evacuation Plan	**Site-level:** HEMP – Section 7.2.3.7 Area or Site Evacuation, Figure 7-3 Hanford Site Evacuation Routes, and Table 5-1 Standard Emergency Signals **OUG-level:** CWC and WRAP BEPs - Section 7.1.1 Evacuation and Figure 1
(4) Copies of contingency plan. A copy of the contingency plan and all revisions to the plan must be:		
(a) Maintained at the facility; and	No equivalent	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
(b) Submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.	G9. Amendment to Contingency Plan	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** CWC and WRAP BEPs - Section 10.0 Coordination Agreements

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(5) Amendments. The owner or operator must review and immediately amend the contingency plan, if necessary, whenever:	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1 Review and Update of the Hanford Emergency Management Plan and Richland Operations Office/Office of River Protection/Pacific Northwest Site Office and Site Contractor Implementing Procedures **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
(a) Applicable regulations or the facility permit are revised;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
(b) The plan fails in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
(c) The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(d) The list of emergency coordinators changes; or	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
(e) The list of emergency equipment changes.	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** CWC and WRAP BEPs - Section 12.0 Plan Location and Amendments
WAC 173-303-360 Emergencies		
(1) Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by WAC 173-303-350(2), all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization **OUG-level:** CWC and WRAP BEPs - Section 3.1 Building Emergency Director
(2) Emergency procedures. The following procedures must be implemented in the event of an emergency.	G4. Emergency Response Procedures	N/A
(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:	G4.1 Incident response, assessment, and identifications	N/A

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and	G4.2 Notification	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs - Section 7.0 Incident Response (not specific to the EC)
(ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	G4.2 Notification	**Site-level:** HEMP - Sections 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs – Sections 4.0 Implementation of the Plan
(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	G4.4 Identification of dangerous materials	**Site-level:** HEMP - Sections 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs - Section 4.0 Implementation of the Plan
(c) Concurrently, the emergency coordinator must assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2 2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs - Section 4.0 Implementation of the Plan

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, he must report his findings as follows:	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications
(i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and	G4.5 Hazard assessment and report	**Site-level:** HEMP – Sections 2.2.1.1.2 and 2 2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs - Section 4.0 Implementation of the Plan
(ii) He must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	G4.5 Hazard assessment and report	**OUG-level:** CWC and WRAP BEPs - Section 7.0 Incident Response
(e) His assessment report must include:	G4.5 Hazard assessment and report	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications, and Section 5.1.2.1 Environmental Notifications
(i) Name and telephone number of reporter;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(ii) Name and address of facility;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(iii) Time and type of incident (e.g., release, fire);	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(iv) Name and quantity of material(s) involved, to the extent known;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(v) The extent of injuries, if any; and	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(vi) The possible hazards to human health or the environment outside the facility.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	G4.3. Containment and control of emergencies	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs – Section 7.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases
(g) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	G4.6 Prevention of recurrence or spread of fires, explosions, or releases	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** CWC and WRAP BEPs – Section 7.2.4 Fire and/or Explosion, and Section 7.2.5 Hazardous Material, Dangerous and or Mixed Waste Spill
(h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** CWC and WRAP BEPs – Section 8.3 Incompatible Waste
(i) The emergency coordinator must ensure that, in the affected area(s) of the facility:		
(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** CWC and WRAP BEPs - Section 8.3 Incompatible Waste

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** CWC and WRAP BEPs - Section 8.4 Post Emergency Equipment Maintenance and Decontamination
(j) The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 5.1.2.3 Resumption of Operations **OUG-level:** CWC and WRAP BEPs – Section 8.2 Incident Recovery and Restart of Operations
(k) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, he must submit a written report on the incident to the department. The report must include:	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(i) Name, address, and telephone number of the owner or operator;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(ii) Name, address, and telephone number of the facility;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(iii) Date, time, and type of incident (e.g., fire, explosion);	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(iv) Name and quantity of material(s) involved;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(v) The extent of injuries, if any;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting

WAC Requirement	Ecology Guidance Document Publication 95-402	CWC-WRAP
(vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(vii) Estimated quantity and disposition of recovered material that resulted from the incident;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(viii) Cause of incident; and	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting
(ix) Description of corrective action taken to prevent reoccurrence of the incident.	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** CWC and WRAP BEPs - Section 11.0 Required Reporting

Central Waste Complex – Waste Receiving and Processing Facility

Engineering Calculations

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Calculation ECF-200W-15-0020, Revision 0, *Secondary Containment and Maximum Storage Capacity for the Low Flashpoint Storage Modules*

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the Low Flashpoint Storage Modules

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0020 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
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Section 3: Completed by the Responsible Manager

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	(Name /Position)	Signature	Date
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Checker:	T.B. Salzano, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

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Integration Lead	N/A		

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ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 18 Calculation No: 946412.15-M-002

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the Low Flashpoint Storage Modules

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the Low Flashpoint Storage Modules (FS-01, FS-02, FS-03, FS-05, FS-06, FS-07, FS-09, FS-10, FS-11, FS-12, FS-14, FS-15, FS-16, FS-17, FS-18, FS-19, FS-20, FS-21, FS-22, FS-23, FS-24, FS-25, FS-26, FS-27, AMW-1, AMW-2).

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
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CALCULATION REVIEW CHECKLIST

Project No.	Calculation No.	Rev.	Page No.
946412.15	946412.15-M-002	0	2 of 18

Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	✓	All.
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None.

Checker (Print Name and Sign):	Date:
T.B. Salzano, P.E.	9-8-15
Originator (Print Name and Sign):	**Date:**
K.J. Emory, P.E.	9/8/15

Signatures obtained only after discrepancies are corrected and comments are resolved.

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the Low Flashpoint Storage Modules (FS-01, FS-02, FS-03, FS-05, FS-06, FS-07, FS-09, FS-10, FS-11, FS-12, FS-14, FS-15, FS-16, FS-17, FS-18, FS-19, FS-20, FS-21, FS-22, FS-23, FS-24, FS-25, FS-26, FS-27, AMW-1, AMW-2).

2.0 METHODOLOGY

The Low Flashpoint Storage Modules are skids used to store dangerous and/or mixed waste. The general layout and containment designs of these buildings are shown in Drawing H-2-836703 (provided in Attachment 1). Utilizing the floor area of each module and the depth of the containment sump, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in these buildings.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836703, Sheets 1 and 2 (See Attachment 1).

2. Drum diameter is 22.25”. Drum height is 34-9/16". Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. Drums are arranged so that they may be inspected from a walkway or access door. Walkways are a minimum of 3 feet wide.

4. Storage capacity results are rounded down to the nearest 10 liters.

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

The Low Flashpoint Storage Modules have floor sumps that serve as secondary waste containment. These sumps span the entire floor area of each module. As shown on Drawing H-2-836703 there are 9 different styles of Low Fashpoint Storage Modules. These styles are labeled Style ‘A’ through Style ‘J’ (the letter ‘I’ is unused for clarity). The floor dimensions and sump dimensions of these modules are summarized in Table 6-1.

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Table 6-1. Low Flashpoint Storage Module Dimensions

Storage Module Style	Module Length	Module Width	Sump Depth
'A'	20 ft	8 ft	4.5 in
'B'	32 ft	10 ft	8 in
'C'	22.83 ft	9 ft	6.75 in
'D'	24 ft	10 ft	7.5 in
'E'	22 ft	9 ft	7 in
'F'	24 ft	9 ft	6 in
'G'	24 ft	9 ft	6 in
'H'	24 ft	8.5 ft	6 in
'J'	26.5 ft	5 ft	6.25 in

6.1.1 Storage Module Style 'A' Secondary Containment Capacity

The floor area of the module is:

(20 ft) x (8 ft) = 160 ft^2

Or, since 1 ft^2 = 0.0929 m^2 160 ft^2 x 0.0929 m^2/ft^2 = 14.9 m^2

The sump depth of the module is 4.5 in, therefore the containment volume is:

160 ft^2 x (4.5 / 12) ft = 60 ft^3

Or, since 1 ft^3 = 0.0283 m^3 60 ft^3 x 0.0283 m^3/ft^3 = **1.70 m^3**

and, since 1 m^3 = 1,000 liters 1.70 m^3 x 1,000 liters/m^3 = **1,700 liters**

6.1.2 Storage Module Style 'B' Secondary Containment Capacity

The floor area of the module is:

(32 ft) x (10 ft) = 320 ft^2 x 0.0929 m^2/ft^2 = 29.7 m^2

The sump depth of the module is 8 in, therefore the containment volume is:

320 ft^2 x (8 / 12) ft = 213 ft^3 x 0.0283 m^3/ft^3 = **6.03 m^3** x 1,000 liters/m^3 = **6,030 liters**

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6.1.3 Storage Module Style 'C' Secondary Containment Capacity

The floor area of the module is:

(22.83 ft) x (9 ft) = 205.5 ft^2 x 0.0929 m^2/ft^2 = 19.1 m^2

The sump depth of the module is 6.75 in, therefore the containment volume is:

205.5 ft^2 x (6.75 / 12) ft = 115.6 ft^3 x 0.0283 m^3/ft^3 = **3.27 m^3** x 1,000 liters/m^3 = **3,270 liters**

6.1.4 Storage Module Style 'D' Secondary Containment Capacity

The floor area of the module is:

(24 ft) x (10 ft) = 240 ft^2 x 0.0929 m^2/ft^2 = 22.3 m^2

The sump depth of the module is 7.5 in, therefore the containment volume is:

240 ft^2 x (7.5 / 12) ft = 150 ft^3 x 0.0283 m^3/ft^3 = **4.25 m^3** x 1,000 liters/m^3 = **4,250 liters**

6.1.5 Storage Module Style 'E' Secondary Containment Capacity

The floor area of the module is:

(22 ft) x (9 ft) = 198 ft^2 x 0.0929 m^2/ft^2 = 18.4 m^2

The sump depth of the module is 7 in, therefore the containment volume is:

198 ft^2 x (7 / 12) ft = 115.5 ft^3 x 0.0283 m^3/ft^3 = **3.27 m^3** x 1,000 liters/m^3 = **3,270 liters**

6.1.6 Storage Module Style 'F' Secondary Containment Capacity

The floor area of the module is:

(24 ft) x (9 ft) = 216 ft^2 x 0.0929 m^2/ft^2 = 20.1 m^2

The sump depth of the module is 6 in, therefore the containment volume is:

216 ft^2 x (6 / 12) ft = 108 ft^3 x 0.0283 m^3/ft^3 = **3.06 m^3** x 1,000 liters/m^3 = **3,060 liters**

6.1.7 Storage Module Style 'G' Secondary Containment Capacity

The floor area of the module is:

(24 ft) x (9 ft) = 216 ft^2 x 0.0929 m^2/ft^2 = 20.1 m^2

The sump depth of the module is 6 in, therefore the containment volume is:

216 ft^2 x (6 / 12) ft = 108 ft^3 x 0.0283 m^3/ft^3 = **3.06 m^3** x 1,000 liters/m^3 = **3,060 liters**

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6.1.8 Storage Module Style 'H' Secondary Containment Capacity

The floor area of the module is:

(24 ft) x (8.5 ft) = 204 ft^2 x 0.0929 m^2/ft^2 = 19.0 m^2

The sump depth of the module is 6 in, therefore the containment volume is:

204 ft^2 x (6 / 12) ft = 102 ft^3 x 0.0283 m^3/ft^3 = **2.89 m^3** x 1,000 liters/m^3 = **2,890 liters**

6.1.9 Storage Module Style 'J' Secondary Containment Capacity

The floor area of the module is:

(26.5 ft) x (5 ft) = 132.5 ft^2 x 0.0929 m^2/ft^2 = 12.3 m^2

There are two levels on this module, however only the bottom level has a sump. The sump depth of the module is 6.25 in, therefore the containment volume is:

132.5 ft^2 x (6.25 / 12) ft = 69 ft^3 x 0.0283 m^3/ft^3 = **1.95 m^3** x 1,000 liters/m^3 = **1,950 liters**

6.2 Maximum Waste Storage Capacity

The maximum waste storage capacity of the Low Flashpoint Storage Modules is determined by using CAD to arrange the drums in the most efficient manner possible while still allowing a minimum 3 ft walkway and access to all drums for inspection via access doors or walkways.

6.2.1 Storage Module Style 'A' Waste Storage Capacity

The maximum possible drum packing into the Style 'A' modules is illustrated in Figure 6-1.

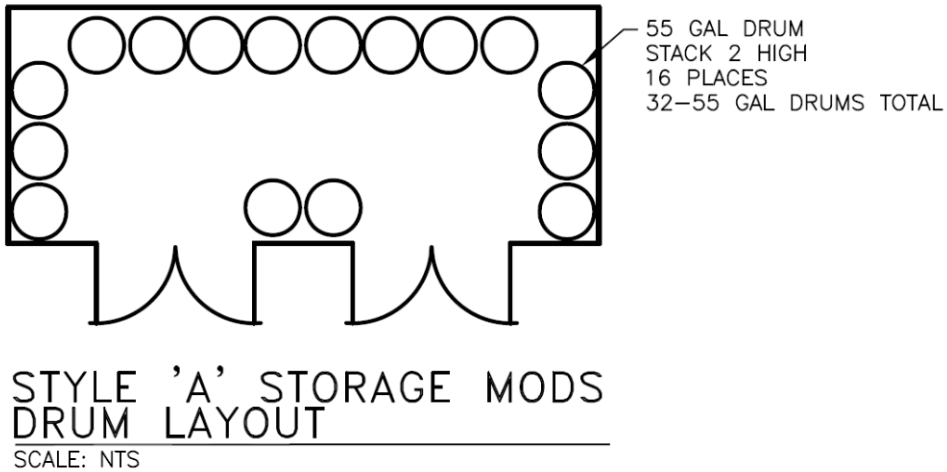

Figure 6-1. Storage Module Style 'A' Waste Storage Drum Arrangement

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As shown in Figure 6-1, a total of 16 drums can be placed in the Style 'A' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

16 drums x 2 pallets high = 32 total drums

1 drum = 208-liters (55 gallons), therefore,

32 drums x 208-liters = ~**6,650 liters** x 1/1000 m^3/liter = **6.65 m^3**

6.2.2 Storage Module Style 'B' Waste Storage Capacity

The maximum possible drum packing into the Style 'B' modules is illustrated in Figure 6-2.

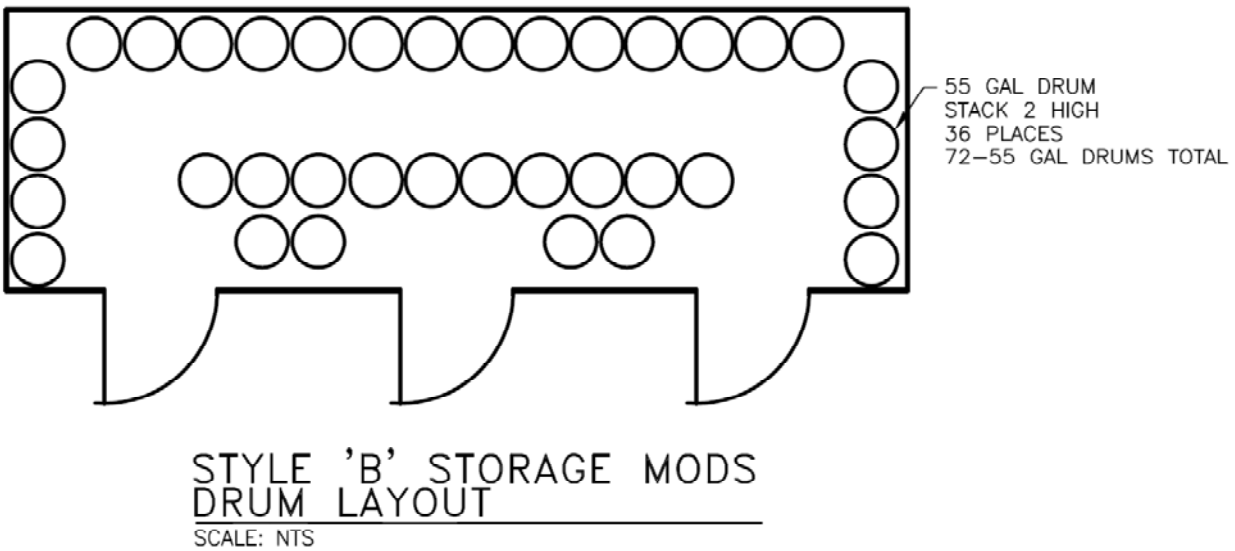

Figure 6-2. Storage Module Style 'B' Waste Storage Drum Arrangement

As shown Figure 6-2, a total of 36 drums can be placed in the Style 'B' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

36 drums x 2 pallets high = 72 total drums

1 drum = 208-liters (55 gallons), therefore,

72 drums x 208-liters = ~**14,970 liters** x 1/1000 m^3/liter = **14.97 m^3**

6.2.3 Storage Module Style 'C' Waste Storage Capacity

The maximum possible drum packing into the Style 'C' modules is illustrated in Figure 6-3.

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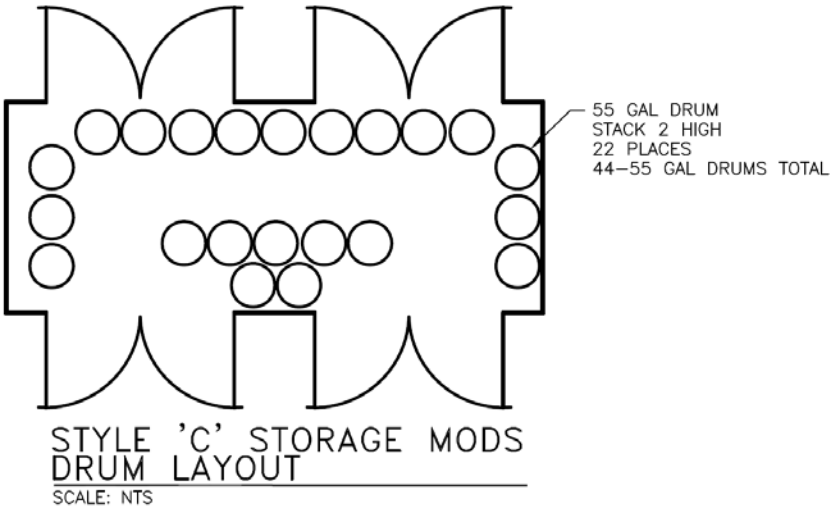

Figure 6-3. Storage Module Style 'C' Waste Storage Drum Arrangement

As shown Figure 6-3, a total of 22 drums can be placed in the Style 'C' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

22 drums x 2 pallets high = 44 total drums

1 drum = 208-liters (55 gallons), therefore,

44 drums x 208-liters = ~**9,150 liters** x 1/1000 m^3/liter = **9.15 m^3**

6.2.4 Storage Module Style 'D' Waste Storage Capacity

The maximum possible drum packing into the Style 'D' modules is illustrated in Figure 6-4.

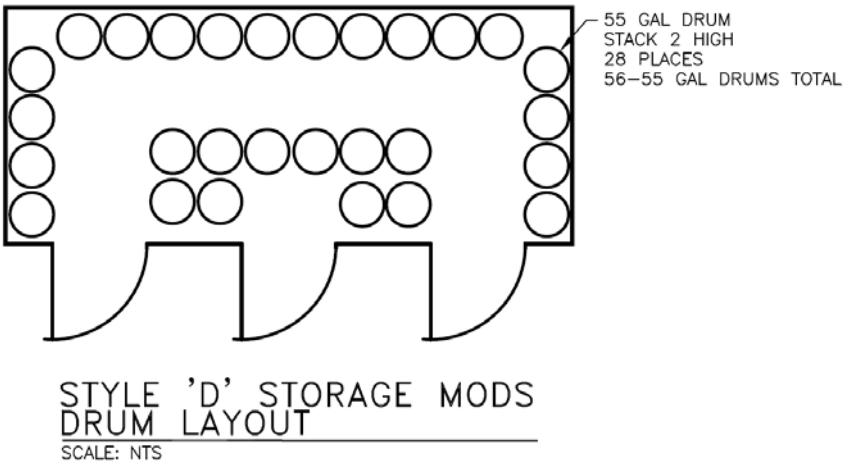

Figure 6-4. Storage Module Style 'D' Waste Storage Drum Arrangement

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As shown Figure 6-4, a total of 28 drums can be placed in the Style 'D' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

28 drums x 2 pallets high = 56 total drums

1 drum = 208-liters (55 gallons), therefore,

56 drums x 208-liters = ~**11,640 liters** x 1/1000 m^3/liter = **11.64 m^3**

6.2.5 Storage Module Style 'E' Waste Storage Capacity

The maximum possible drum packing into the Style 'E' modules is illustrated in Figure 6-5.

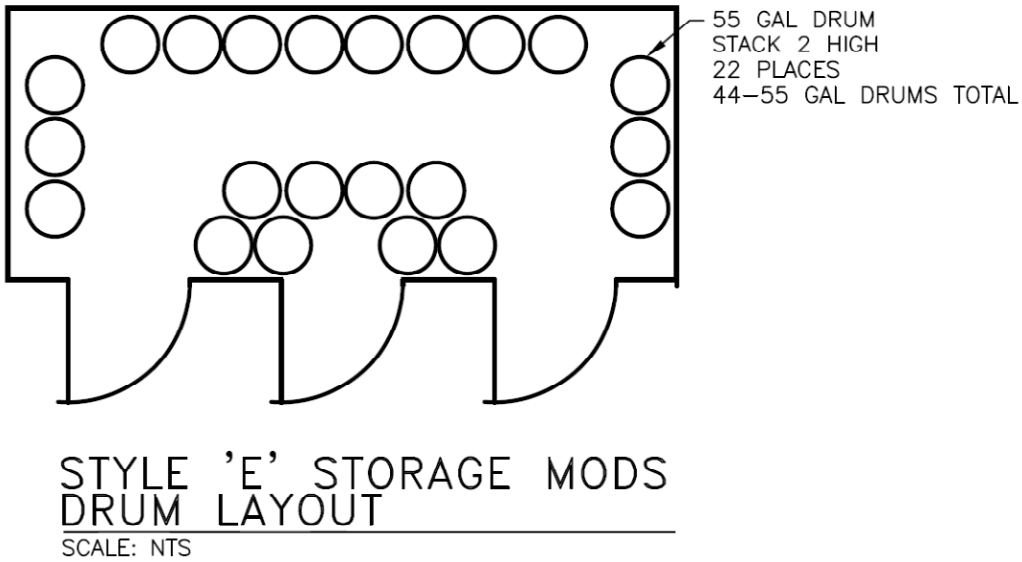

Figure 6-5. Storage Module Style 'E' Waste Storage Drum Arrangement

As shown Figure 6-5, a total of 22 drums can be placed in the Style 'E' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

22 drums x 2 pallets high = 44 total drums

1 drum = 208-liters (55 gallons), therefore,

44 drums x 208-liters = ~**9,150 liters** x 1/1000 m^3/liter = **9.15 m^3**

6.2.6 Storage Module Style 'F' Waste Storage Capacity

The maximum possible drum packing into the Style 'F' modules is illustrated in Figure 6-6.

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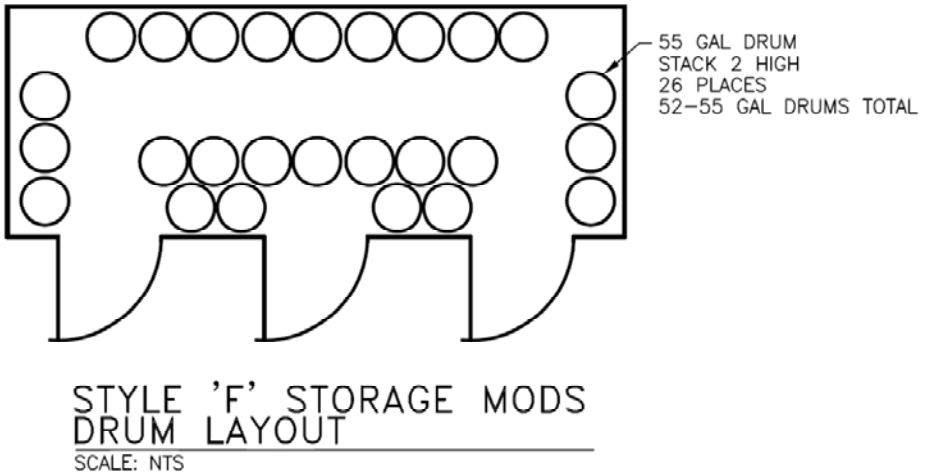

Figure 6-6. Storage Module Style 'F' Waste Storage Drum Arrangement

As shown Figure 6-6, a total of 26 drums can be placed in the Style 'F' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

26 drums x 2 pallets high = 52 total drums

1 drum = 208-liters (55 gallons), therefore,

52 drums x 208-liters = ~**10,810 liters** x 1/1000 m^3/liter = **10.81 m^3**

6.2.7 Storage Module Style 'G' Waste Storage Capacity

The maximum possible drum packing into the Style 'G' modules is illustrated in Figure 6-7.

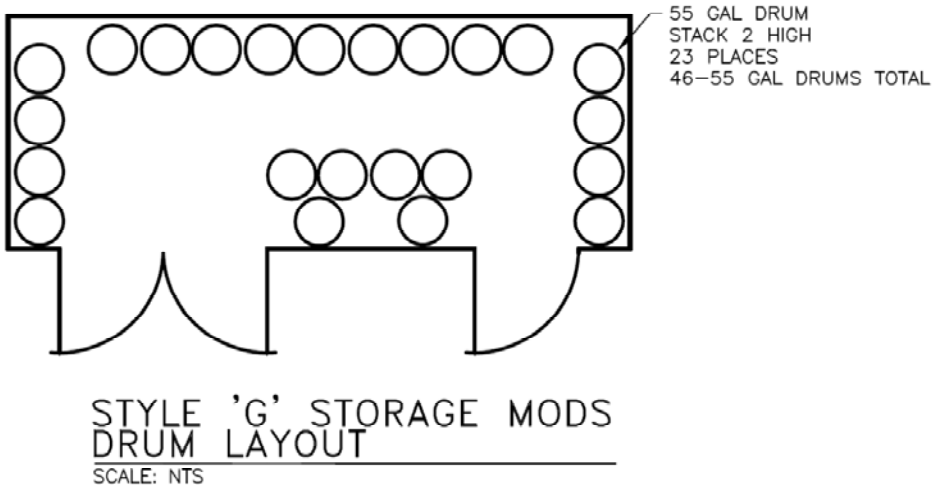

Figure 6-7. Storage Module Style 'G' Waste Storage Drum Arrangement

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As shown Figure 6-7, a total of 23 drums can be placed in the Style 'G' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

23 drums x 2 pallets high = 46 total drums

1 drum = 208-liters (55 gallons), therefore,

46 drums x 208-liters = ~**9,560 liters** x 1/1000 m^3/liter = **9.56 m^3**

6.2.8 Storage Module Style 'H' Waste Storage Capacity

The maximum possible drum packing into the Style 'H' modules is illustrated in Figure 6-8.

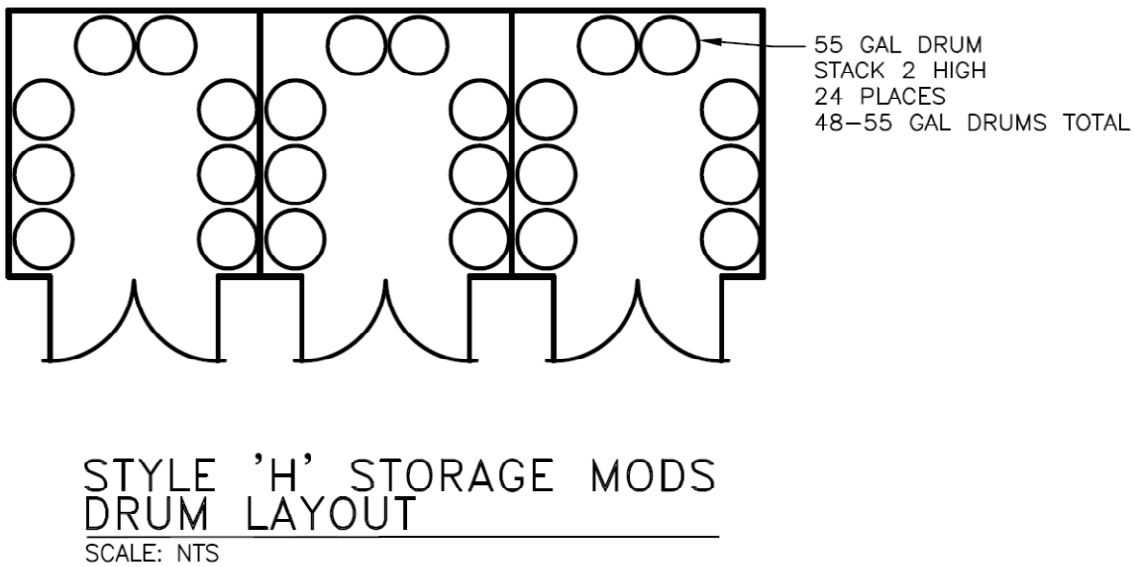

Figure 6-8. Storage Module Style 'H' Waste Storage Drum Arrangement

As shown Figure 6-8, a total of 24 drums can be placed in the Style 'H' modules. Since the pallets can be stacked two high, the total storage volume is as follows:

24 drums x 2 pallets high = 48 total drums

1 drum = 208-liters (55 gallons), therefore,

48 drums x 208-liters = ~**9,980 liters** x 1/1000 m^3/liter = **9.98 m^3**

6.2.9 Storage Module Style 'J' Waste Storage Capacity

The maximum possible drum packing into the Style 'J' modules is illustrated in Figure 6-9.

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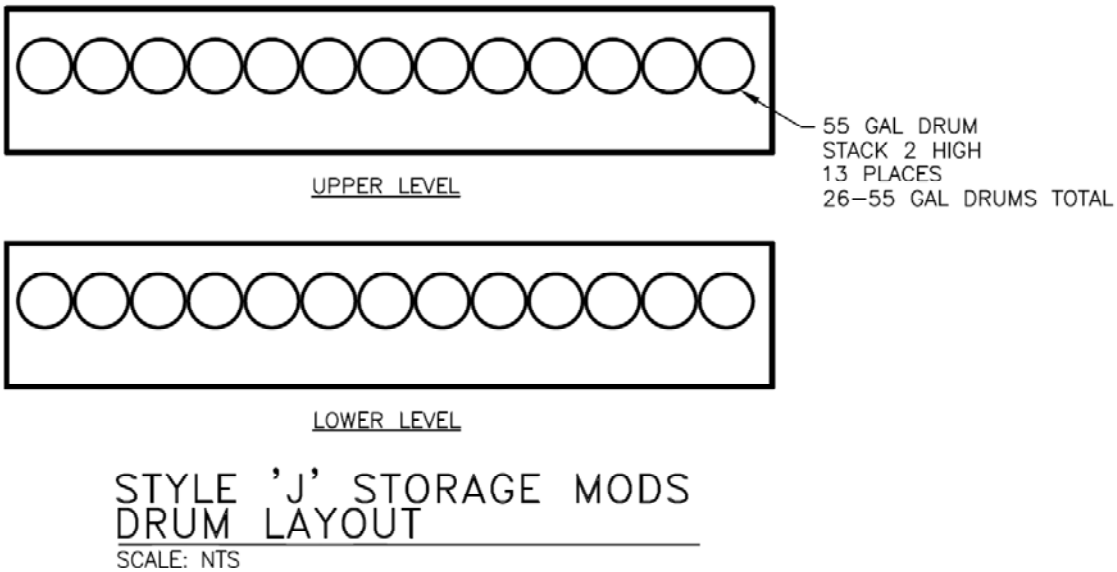

Figure 6-9. Storage Module Style 'J' Waste Storage Drum Arrangement

As shown Figure 6-9, a total of 13 drums can be placed on each level of the Style 'J' modules. Since there are two levels, the total storage volume is as follows:

13 drums x 2 levels = 26 total drums

1 drum = 208-liters (55 gallons), therefore,

26 drums x 208-liters = ~**5,400 liters** x 1/1000 m^3/liter = **5.40 m^3**

7.0 RESULTS AND CONCLUSIONS

The Low Flashpoint Storage Modules have a total secondary containment volume as indicated in Table 7-1. In addition, based on the waste storage arrangements shown in Figures 6-1 through 6-9, the waste storage design capacity of each of the storage module styles is as indicated in Table 8-1.

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836703, Sheet 1, Revision 0, *Low Flashpoint Storage Modules Plan*.

3. Drawing H-2-836703, Sheet 2, Revision 0, *Low Flashpoint Storage Modules Plan & Elevation*.

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Table 8-1. Summary of Secondary Containment and Maximum Storage Capacities for the Low Flashpoint Storage Modules

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
FS-01, FS-02 (Style 'A')	1.70 m^3 (1,700 liters)	6.65 m^3 (6,650 liters)
FS-03, FS-14 (Style 'B')	6.03 m^3 (6,030 liters)	14.97 m^3 (14,970 liters)
FS-05, FS-06, FS-07, FS-09, FS-10, FS-11, FS-12, FS-15 (Style 'C')	3.27 m^3 (3,270 liters)	9.15 m^3 (9,150 liters)
FS-16, FS-17, FS-18 (Style 'D')	4.25 m^3 (4,250 liters)	11.64 m^3 (11,640 liters)
FS-19, FS-20 (Style 'E')	3.27 m^3 (3,270 liters)	9.15 m^3 (9,150 liters)
AMW-2 (Style 'F')	3.06 m^3 (3,060 liters)	10.81 m^3 (10,810 liters)
AMW-1 (Style 'G')	3.06 m^3 (3,060 liters)	9.56 m^3 (9,560 liters)
FS-21, FS-22, FS-23, FS-24, FS-25 (Style 'H')	2.89 m^3 (2,890 liters)	9.98 m^3 (9,980 liters)
FS-26, FS-27 (Style 'J')	1.95 m^3 (1,950 liters)	5.40 m^3 (5,400 liters)

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ATTACHMENT 1

LOW FLASHPOINT STORAGE MODULES GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWINGS

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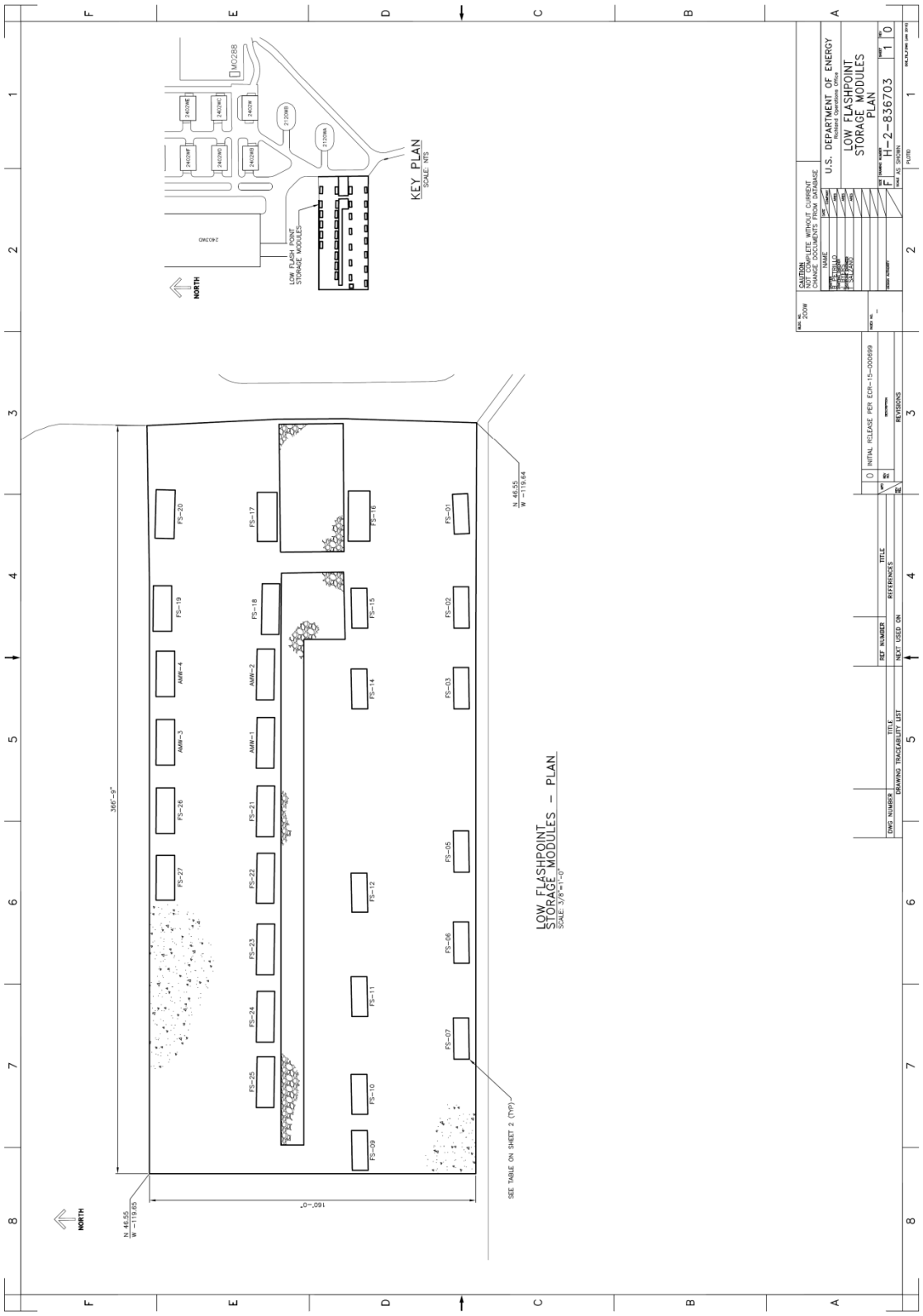

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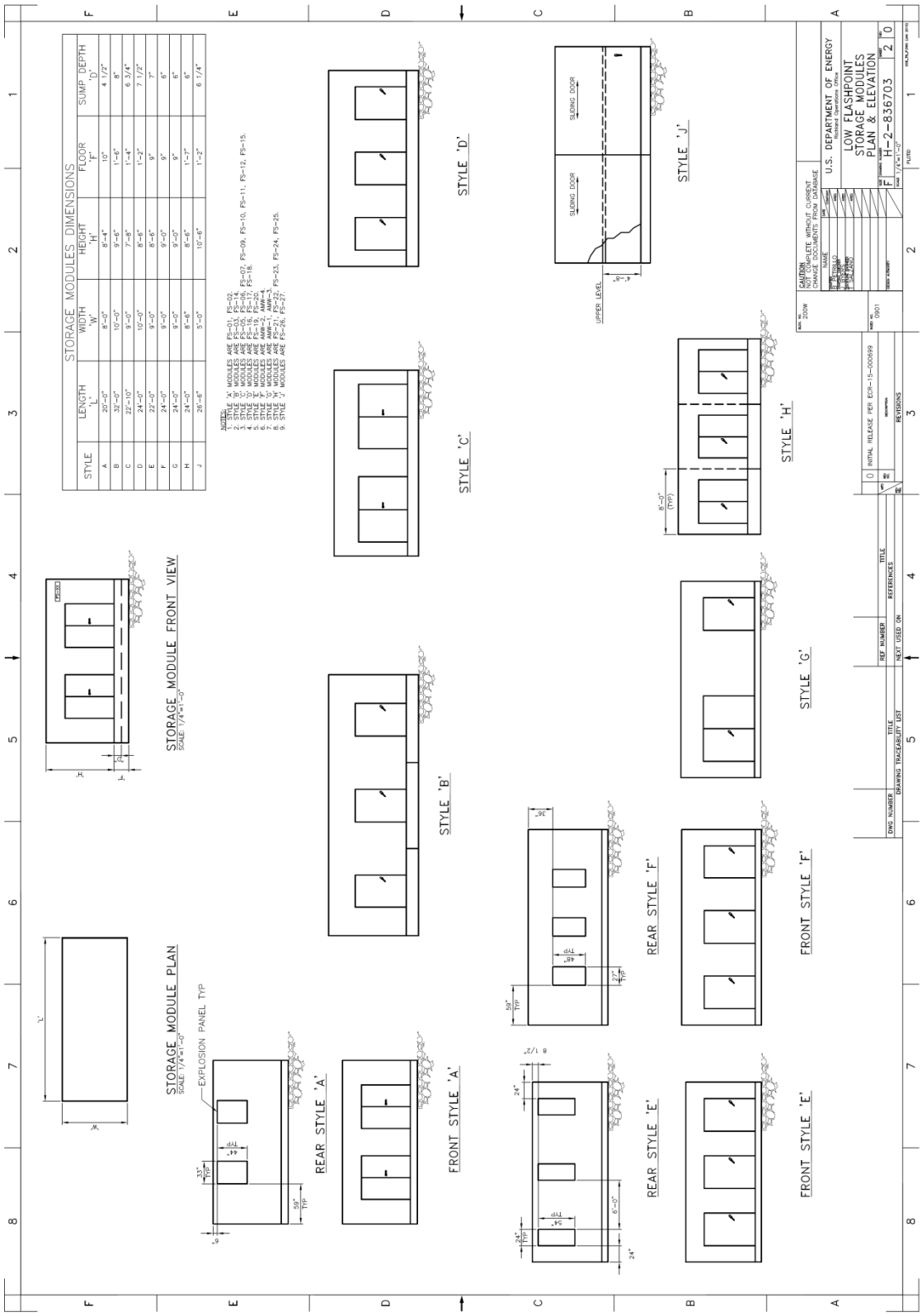

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Calculation ECF-200W-15-0021, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2402-W Series Waste Storage Buildings.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 2402-W Series Waste Storage Buildings

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0021 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
0	Initial Release	09-08-2015	All
			☒

Section 3: Completed by the Responsible Manager

Document Control:

Is the document intended to be controlled within the Document Management Control System (DMCS)? ☒ Yes ☐ No

Does document contain scientific and technical information intended for public use? ☐ Yes ☒ No

Does document contain controlled-use information? ☐ Yes ☒ No

Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
Preparer:	T.B. Salzano, P.E. / ARES Corporation		09-08-2015
Checker:	K.J. Emory, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 9 Calculation No: 946412.15-M-003

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2402-W Series Waste Storage Buildings

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2402-W Series Waste Storage Buildings (2402-W, 2402-WB, 2402-WC, 2402-WD, 2402-WE, 2402-WF, 2402-WG, 2402-WH, 2402-WI, 2402-WJ, 2402-WK, and 2402-WL).

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	9	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9/8/15	9/8/15

Revision Description (Revision Description/Affected Pages):
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CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	Y	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15

Originator (Print Name and Sign):	Date:
T.B. Salzano, P.E.	9-8-15

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Attachment 1
2402-W Series Waste Storage Building General Layout and Secondary Containment Design Drawing

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Figure 6-1. 2402-W Series Waste Storage Buildings Pad Drum Array. 6

Tables

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2402-W Series Waste Storage Buildings 7

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2402-W Series Waste Storage Buildings (2402-W, 2402-WB, 2402-WC, 2402-WD, 2402-WE, 2402-WF, 2402-WG, 2402-WH, 2402-WI, 2402-WJ, 2402-WK, and 2402-WL).

2.0 METHODOLOGY

The 2402-W, WB through WL Waste Storage Buildings are pre-engineered steel structures used to store dangerous and/or mixed waste. The general layout and containment designs of these buildings are shown in Drawings H-2-836701 and H-2-836704 through -836714. With the exception of a few minor differences in the 2402-W, the buildings are basically identical, therefore, only Drawing H-2-836705 for the 2402-WB Waste Storage Building is provided in Attachment 1. Any differences in the buildings are noted in the calculation.

Utilizing the overall area of the building floor and the depth of the containment curb, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in these buildings.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836705, Sheet 2 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift handling shall be considered, with 12 feet wide main aisles required in Central Waste Complex (CWC) buildings excluding 2402 series buildings. (Reference Contract 57118, Section 8.0 Part B Table 1).

4. Subsequent to the exclusion provided in Design Input 3, provide a 12’-0” access path through the center of the 2402 series buildings (Johansen, Stephanie K., *FW: ARES Action Items*, email to Tom Salzano, June 2, 2015).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

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6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawings H-2-836701 and H-2-836705 through -836714, each of the twelve (12) buildings has a foundation approximately 15.2 meters (50 ft) wide, by 24.4 meters (80 ft) long. There is a 0.15 meter (0.5 ft) high curb that is 0.15 meter (0.5 ft) thick along the North-South perimeter and 0.61 meters (2 ft) thick along the East-West perimeter of the buildings (Note: The curb for the 2402-W building is 0.10 (0.33 ft) around the perimeter). Therefore, the area of the floor is:

[(50 ft) - 2 x (0.5 ft)] x [(80 ft) - 2 x (2 ft)] = 3,724 ft^2

Or, since 1 ft^2 = 0.093 m^2 3,724 ft^2 x 0.093 m^2/ft^2 = 346 m^2

There is an enclosure in one corner of the building that is approximately 1.9 meter (6.3 ft) square (including the curb area), therefore, subtracting this from the available floor area, the area of the room is:

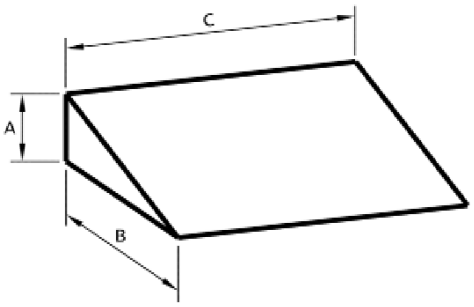
3,724 ft^2 - [(6.3 ft - 2 ft) x (6.3 ft - 0.5 ft)] = 3,699 ft^2 x 0.093 m^2/ft^2 = 344 m^2

With the 0.15 meter (0.5 ft) high curb, the containment volume for this area is:

3,699 ft^2 x 0.5 ft = 1,849.5 ft^3

Or, since 1 ft^3 = 0.0283 m^3 1,849.5 ft^3 x 0.0283 m^3/ft^3 = 52.3 m^3

In addition, there are two load-in ramps in the building that will reduce this containment volume. Each of the ramps can be approximated as a triangular wedge as follows:



where from drawing H-2-836705,

A = 0.15 meter (0.5 ft) high curb;

B = 2.54 meter (8.33 ft) wide ramp; and

C = 8.08 meter (26.5 ft) long ramp.

Therefore, the volume of the ramp is:

(1/2 x A x B) x C

[1/2 x (0.5 ft) x (8.33 ft)] x (26.5 ft) = 55.2 ft^3 x 0.0283 m^3/ft^3 = 1.56 m^3

Since there are two ramps, the total secondary containment volume for the buildings would be:

1,849.5 ft^3 - (2 x 55.2 ft^3) = 1,739 ft^3 x 0.0283 m^3/ft^3 = ~**49.2 m^3**

Or, since 1 m^3 = 1,000 liters 49.2 m^3 x 1,000 liters/m^3 = **49,200 liters**

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6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, each of the twelve (12) 2402-W Series Waste Storage Buildings has a floor area of 344 m^2 (3,699 ft^2). If a 3.66 meter (12 ft) wide access path is provided down the center of the building, a total of 94 2X2 drum arrays can be placed in the building as shown in Figure 6-1. It should be noted that with this arrangement, the pallets would be 2.5 ft from the outside walls; therefore, to meet the minimum 3 ft requirement, the center aisle would need to be reduced to 11 ft. If both requirements must be met, then the number of 2X2 drum arrays would be reduced to 70.

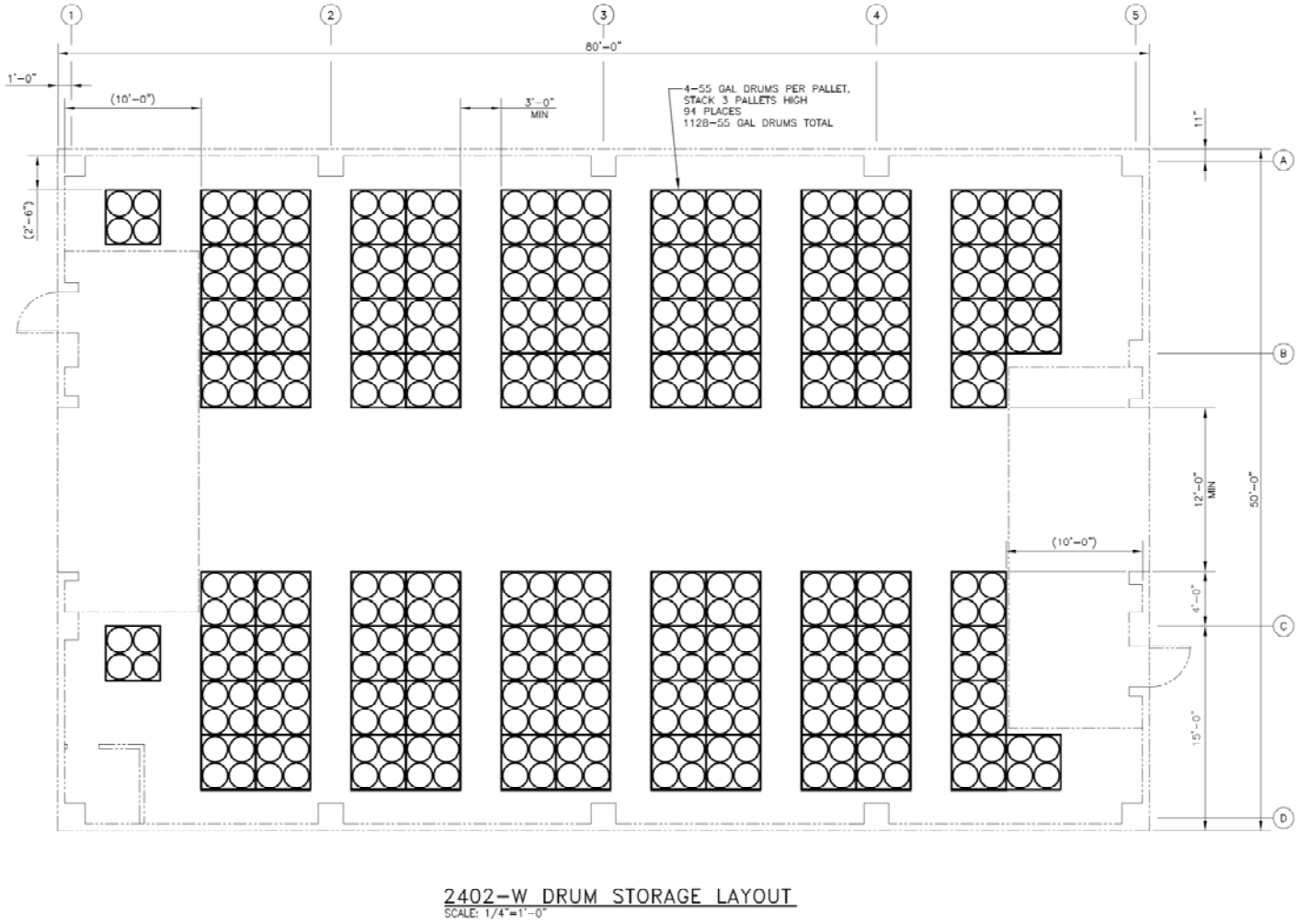

Figure 6-1. 2402-W Series Waste Storage Buildings Pad Drum Array.

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Assuming the 94 drum array arrangement is acceptable, since the pallets can be stacked three high, the total storage volume of each of the buildings is as follows:

94 2X2 drum arrays x 4 drums/pallet x 3 pallets high = 1,128 total drums

1 drum = 208-liters (55 gallons), therefore,

1,128 total drums x 208-liters = ~**234,600 liters**

Or, since 1 liter = 0.001 m^3 234,600 liters x 0.001 m^3/liter = ~**234.6 m^3**

7.0 RESULTS AND CONCLUSIONS

The 2402-W, WB through WL Waste Storage Buildings each have a total secondary containment volume of 49.2 m^3 or 49,200 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of each building is 234.6 m^3 or 234,600 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2402-W Series Waste Storage Buildings

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2402-W, 2402-WB, 2402-WC, 2402-WD, 2402-WE, 2402-WF, 2402-WG, 2402-WH, 2402-WI, 2402-WJ, 2402-WK, 2402-WL	49.2 m^3 (49,200 liters)	234.6 m^3 (234,600 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836701, Sheet 2, Revision 0, *Secondary Containment Design*.

3. Drawing H-2-836704 through -836714, Sheet 2, Revision 0, *Secondary Containment Design*.

4. Johansen, Stephanie K., *FW: ARES Action Items*, email to Tom Salzano, June 2, 2015.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

2402-W SERIES WASTE STORAGE BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

CALCULATION SHEET

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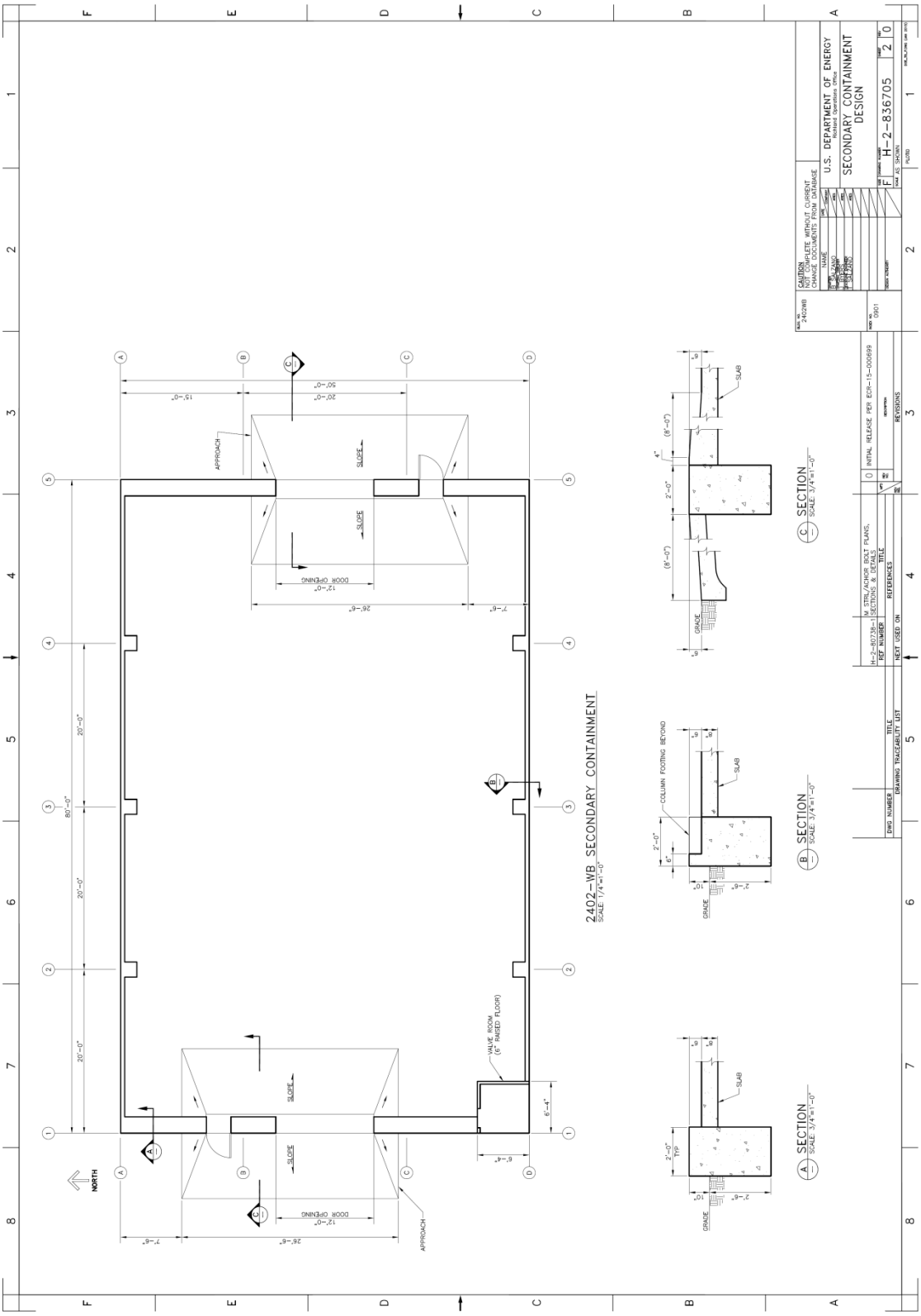
Title: Secondary Containment and Maximum Storage Capacity for the 2402-W Series Waste Storage Buildings			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



Calculation ECF-200W-15-0022, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2403-WA thru WC Series Waste Storage Buildings.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 2403-WA thru WC Series Waste Storage Buildings

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0022 **Revision No.:** 0

Revision History

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Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
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Checker:	K.J. Emory, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

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Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

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Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 10 Calculation No: 946412.15-M-004

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2403-WA thru WC Series Waste Storage Buildings

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2403-WA through WC Series Waste Storage Buildings (2403-WA, 2403-WB, and 2403-WC).

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	10	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9/8/15	9-8-15

Revision Description (Revision Description/Affected Pages):
Initial Release.

		Print Name/ Sign:			
		Date:			

Revision Description (Revision Description/Affected Pages):

ARES CORPORATION

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15

Originator (Print Name and Sign):	Date:
T.B. Salzano, P.E.	9-8-15

Signatures obtained only after discrepancies are corrected and comments are resolved.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2403-WA through WC Series Waste Storage Buildings (2403-WA, 2403-WB, and 2403-WC).

2.0 METHODOLOGY

The 2403-WA through WC Waste Storage Buildings are pre-engineered steel structures used to store dangerous and/or mixed waste. The general layout and containment designs of these buildings are shown in Drawings H-2-836697, H-2-836698, and H-2-836715. The buildings are basically identical, therefore, only Drawing H-2-836715 for the 2403-WA Waste Storage Building is provided in Attachment 1. Utilizing the overall area of the building floor, the slope of the floor, and the sump volumes, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in these buildings.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836715, Sheet 1 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift handling shall be considered, with 12 feet wide main aisles required in Central Waste Complex (CWC) buildings excluding 2402 series buildings. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawings H-2-836697, H-2-836698, and H-2-836715, each of the three (3) buildings has a foundation approximately 51.87 meters (170.17 ft) wide, by 61.01 meters (200.17 ft) long. There is a 1.56 meter (5.1 ft) wide non-sloping area around the perimeter and a 3.66 meter (12 ft) wide aisle down the middle that separates

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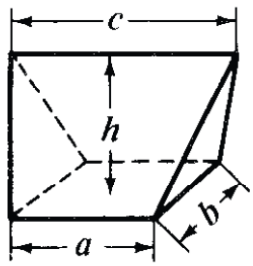
two main containment areas created by the sloping floor. The two containment areas have a concrete curb in the middle, however, this has negligible impact on the overall containment capacity and is therefore, neglected. Each of the two sloped containment areas can be approximated as a wedge as follows:



where the length, "a" of the wedge is,

a = (200.17 ft) - [2 x (5.1 ft)] = 190 ft

and the width, "b" of the wedge is,

b = {(170.17 ft) - [2 x (5.1 ft)] - (12 ft)} / 2 = 74 ft.

The length at the bottom of these sloping areas, "c", approximately runs between Column 2 and 8, therefore,

c = 25 ft x 6 = 150 ft.

The depth of these sloping areas, "h" is approximately 4-in. or 0.333 ft. Each quadrant slopes 1-in. more to a sump, however, this additional slope is negligible and therefore not included in the containment capacity.

Therefore, the volume of each of these wedge areas is:

V_{wedge} = (2a + c)bh / 6 (Ref. Machinery's Handbook, 29th Edition, p. 83)

V_{wedge} = [(2 x 190 ft) + 150 ft] x 74 ft x 0.333 ft / 6 = 2,176.7 ft^3

Or, since 1 ft^3 = 0.0283 m^3 2,176.7 ft^3 x 0.0283 m^3/ft^3 = 61.6 m^3

In addition to these two areas, there are four (4) sumps each with a volume of:

V_{sump} = 2 ft x 2 ft x 1.5 ft = 6 ft^3 x 0.0283 m^3/ft^3 = 0.17 m^3

Therefore, the total containment volume for the wedge areas and sumps would be:

2 x V_{wedge} + 4 x V_{sump} = 2 x (2,176.7 ft^3) + 4 x (6 ft^3) = 4,377.4 ft^3 x 0.0283 m^3/ft^3 = 123.9 m^3

In addition to these areas, the 3.66 meter (12 ft) wide aisle down the middle is recessed 1-in or 0.0833 ft, therefore, it could hold an additional volume of:

V_{aisle} = 12 ft x 190 ft x (0.0833 ft) = 190 ft^3

Therefore, the total secondary containment volume for the buildings would be:

4,377.4 ft^3 + V_{aisle} = 4,567.4 ft^3 x 0.0283 m^3/ft^3 = ~**129.3 m^3**

Or, since 1 m^3 = 1,000 liters 129.5 m^3 x 1,000 liters/m^3 = **129,300 liters**

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6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, each of the two containment areas in the 2403-WA through WC Waste Storage Buildings has a floor area approximately 22.6 meters (74 ft) wide, by 57.9 meters (190 ft) long. Therefore, the total area available for storage is:

[(74 ft) x (190 ft)] x 2 = 28,120 ft^2

Or, since 1 ft^2 = 0.093 m^2 28,120 ft^2 x 0.093 m^2/ft^2 = 2,615 m^2

Using the criteria indentified in the Design Inputs, a total of 1196 2X2 drum arrays can be placed in the building as shown in Figure 6-1.

Since the pallets can be stacked three high, the total storage volume of each of the buildings is as follows:

1196 2X2 drum arrays x 4 drums/pallet x 3 pallets high = 14,352 total drums

1 drum = 208-liters (55 gallons), therefore,

14,352 total drums x 208-liters = ~2,985,000 liters

Or, since 1 liter = 0.001 m^3 **2,985,000 liters** x 0.001 m^3/liter = **2,985 m^3**

7.0 RESULTS AND CONCLUSIONS

The 2403-WA, WB, and WC Waste Storage Buildings each have a total secondary containment volume of 129.3 m^3 or 129,300 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of each building is 2,985 m^3 or 2,985,000 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2403-WA thru WC Waste Storage Buildings

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2403-WA, 2403-WB, 2403-WC	129.3 m^3 (129,300 liters)	2,985 m^3 (2,985,000 liters)

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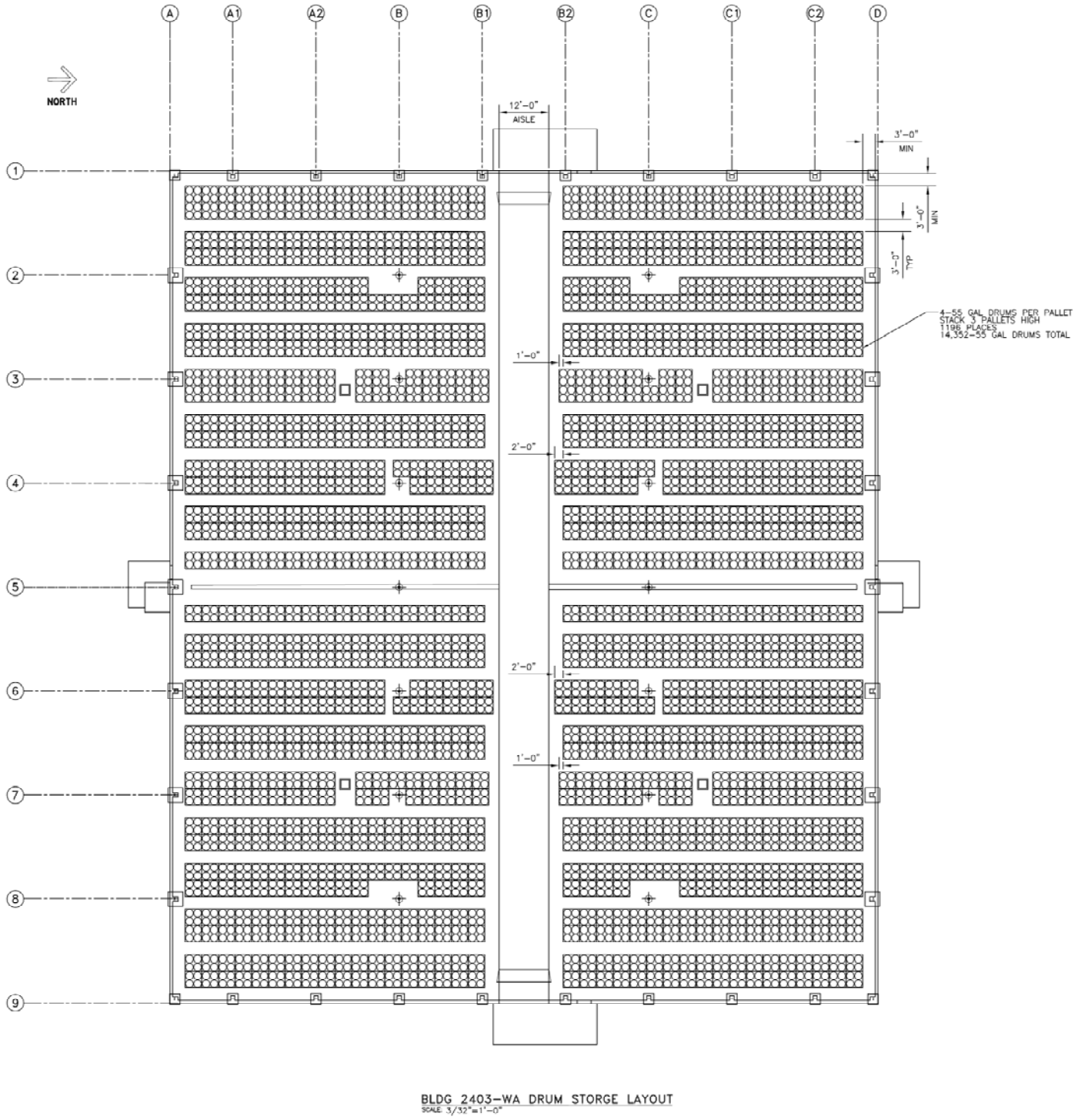

Figure 6-1. 2403-WA thru WC Waste Storage Buildings Pad Drum Array

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8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836697, Sheet 1, Revision 0, *Secondary Containment Design*.

3. Drawing H-2-836698, Sheet 1, Revision 0, *Secondary Containment Design*.

4. Drawing H-2-836715, Sheet 1, Revision 0, *Secondary Containment Design*.

5. Oberg, Erik et. al., Machinery's Handbook, 29th Edition, New York, Industrial Press, 2012.

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ATTACHMENT 1

2403-WA WASTE STORAGE BULDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

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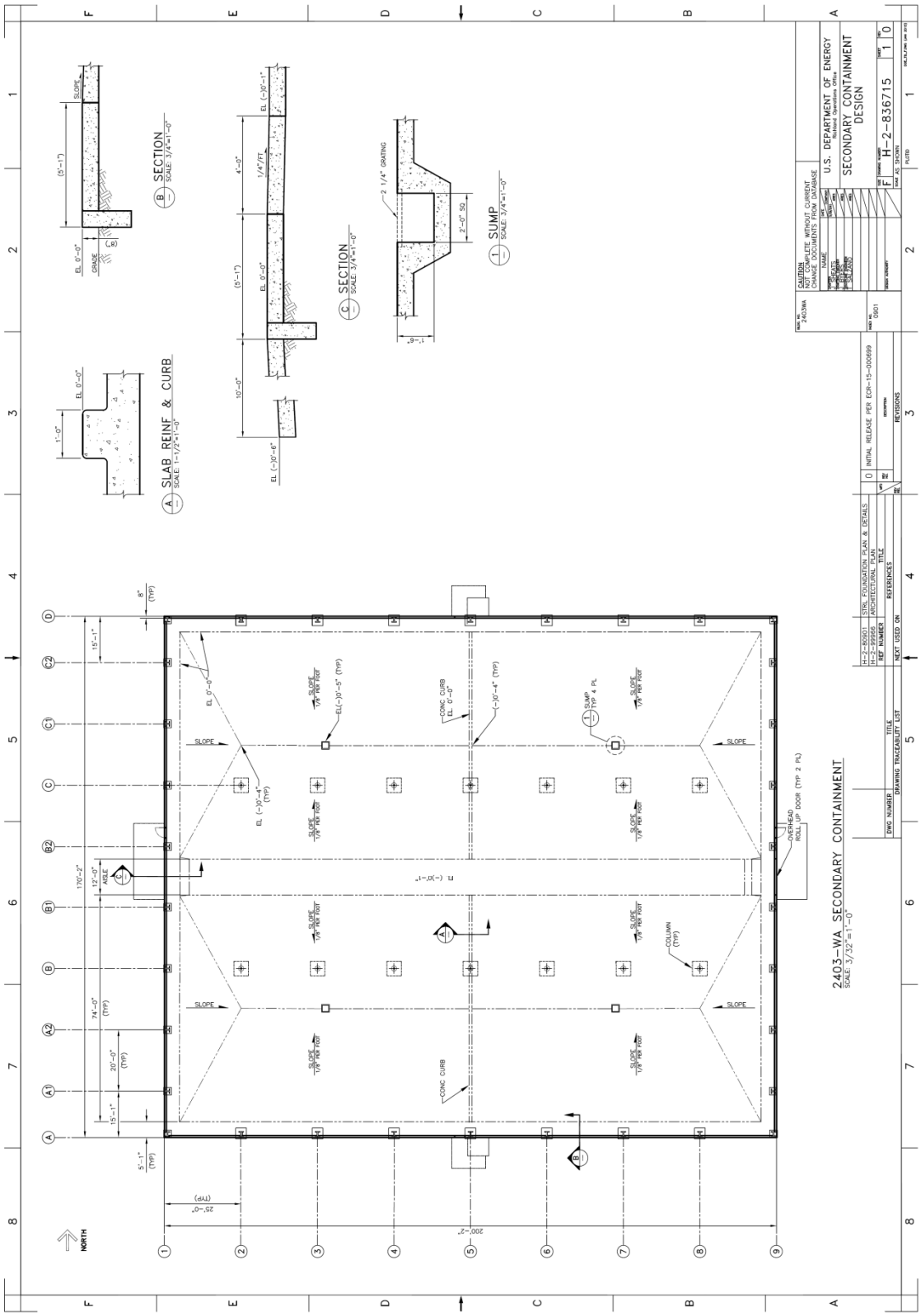
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



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Calculation ECF-200W-15-0023, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2403-WD Waste Storage Building.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

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Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 2403-WD Waste Storage Building

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Calculation No.: ECF-200W-15-0023 **Revision No.:** 0

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Preparer:	T.B. Salzano, P.E. / ARES Corporation		09-08-2015
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Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 9 Calculation No: 946412.15-M-005

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2403-WD Waste Storage Building

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2403-WD Waste Storage Building.

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0	9	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9/8/15	9-8-15

Revision Description (Revision Description/Affected Pages):
Initial Release.

		Print Name/ Sign:			
		Date:			

Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	9-8-15

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CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-005	Rev. 0	Page No. 3 of 9
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1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2403-WD Waste Storage Building.

2.0 METHODOLOGY

The 2403-WD Waste Storage Building is a pre-engineered steel structure used to store dangerous and/or mixed waste. The general layout and containment design of the building is shown in Drawing H-2-836699 (See Attachment 1). The floor area is divided into quadrants by concrete curbs with a sloping floor and sump. Utilizing the overall area of the building floor, the slope of the floor, and the sump volume, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in this building.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836699 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift handling shall be considered, with 12 feet wide main aisles required in Central Waste Complex (CWC) buildings excluding 2402 series buildings. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawing H-2-836699, the 2403-WD building has a foundation approximately 51.87 meters (170.17 ft) wide, by 99.11 meters (325.17 ft) long. There is a 1.55 meter (5.1 ft) wide non-sloping area around the perimeter and a 3.66 meter (12 ft) wide aisle down the middle that separates two main containment areas created by the sloping floor. The two containment areas have a concrete curb in the middle, however, this has

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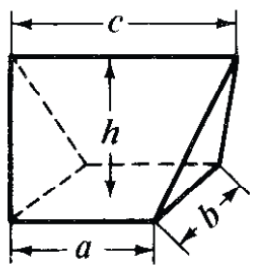
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

negligible impact on the overall containment capacity and is therefore, neglected. Each of the two sloped containment areas can be approximated as a wedge as follows:



where the length, "a" of the wedge is,

a = (325.17 ft) - [2 x (5.1 ft)] = ~315 ft

and the width, "b" of the wedge is,

b = {(170.17 ft) - [2 x (5.1 ft)] - (12 ft)} / 2 = 74 ft.

The length at the bottom of these sloping areas, "c", runs between Columns 2 and 13, therefore,

c = 25 ft x 11 = 275 ft.

The depth of these sloping areas, "h" is approximately 4-in. or 0.333 ft. Each quadrant slopes 1-in. more to a sump, however, this additional slope is negligible and therefore not included in the containment capacity.

Therefore, the volume of each of these wedge areas is:

V_{wedge} = (2a + c)bh / 6 (Ref. Machinery's Handbook, 29th Edition, p. 83)

V_{wedge} = [(2 x 315 ft) + 275 ft] x 74 ft x 0.333 ft / 6 = 3,716.8 ft^3

Or, since 1 ft^3 = 0.0283 m^3 3,716.8 ft^3 x 0.0283 m^3/ft^3 = ~105 m^3

In addition to these two areas, there are four (4) sumps each with a volume of:

V_{sump} = 2 ft x 2 ft x 1.5 ft = 6 ft^3 x 0.0283 m^3/ft^3 = 0.17 m^3

Therefore, the total containment volume for the wedge areas and sumps would be:

2 x V_{wedge} + 4 x V_{sump} = 2 x (3,716.8 ft^3) + 4 x (6 ft^3) = 7,457.6 ft^3 x 0.0283 m^3/ft^3 = ~211 m^3

In addition to these areas, the 3.66 meter (12 ft) wide aisle down the middle is recessed 1-in or 0.0833 ft, therefore, it could hold an additional volume of:

V_{aisle} = 12 ft x 315 ft x (0.0833 ft) = 315 ft^3

Therefore, the total secondary containment volume for the buildings would be:

7,457.6 ft^3 + V_{aisle} = 7,772.6 ft^3 x 0.0283 m^3/ft^3 = ~**220 m^3**

Or, since 1 m^3 = 1,000 liters 220 m^3 x 1,000 liters/m^3 = **220,000 liters**

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, each of the two containment areas in the 2403-WD Waste Storage Building has a floor area approximately 22.6 meters (74 ft) wide, by 96.0 meters (315 ft) long. Therefore, the total area available for storage is:

[(74 ft) x (315 ft)] x 2 = 46,620 ft^2

Or, since 1 ft^2 = 0.093 m^2 46,620 ft^2 x 0.093 m^2/ft^2 = 4,335 m^2

Using the criteria indentified in the Design Inputs, a total of 1,980 2X2 drum arrays can be placed in the building as shown in Figure 6-1.

Since the pallets can be stacked three high, the total storage volume of the 2403-WD Waste Storage Building is as follows:

1,980 2X2 drum arrays x 4 drums/pallet x 3 pallets high = 23,760 total drums

1 drum = 208-liters (55 gallons), therefore,

23,760 drums x 208-liters = ~**4,942,000 liters** x 1/1000 m^3/liter = **4,942 m^3**

7.0 RESULTS AND CONCLUSIONS

The 2403-WD Waste Storage Building has a total secondary containment volume of 220 m^3 or 220,000 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of the building is 4,942 m^3 or 4,942,000 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2403-WD Waste Storage Building

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2403-WD	220 m^3 (220,000 liters)	4,942 m^3 (4,942,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836699, Sheet1, Revision 0, *Secondary Containment Design*.

3. Oberg, Erik et. al., Machinery's Handbook, 29th Edition, New York, Industrial Press, 2012.

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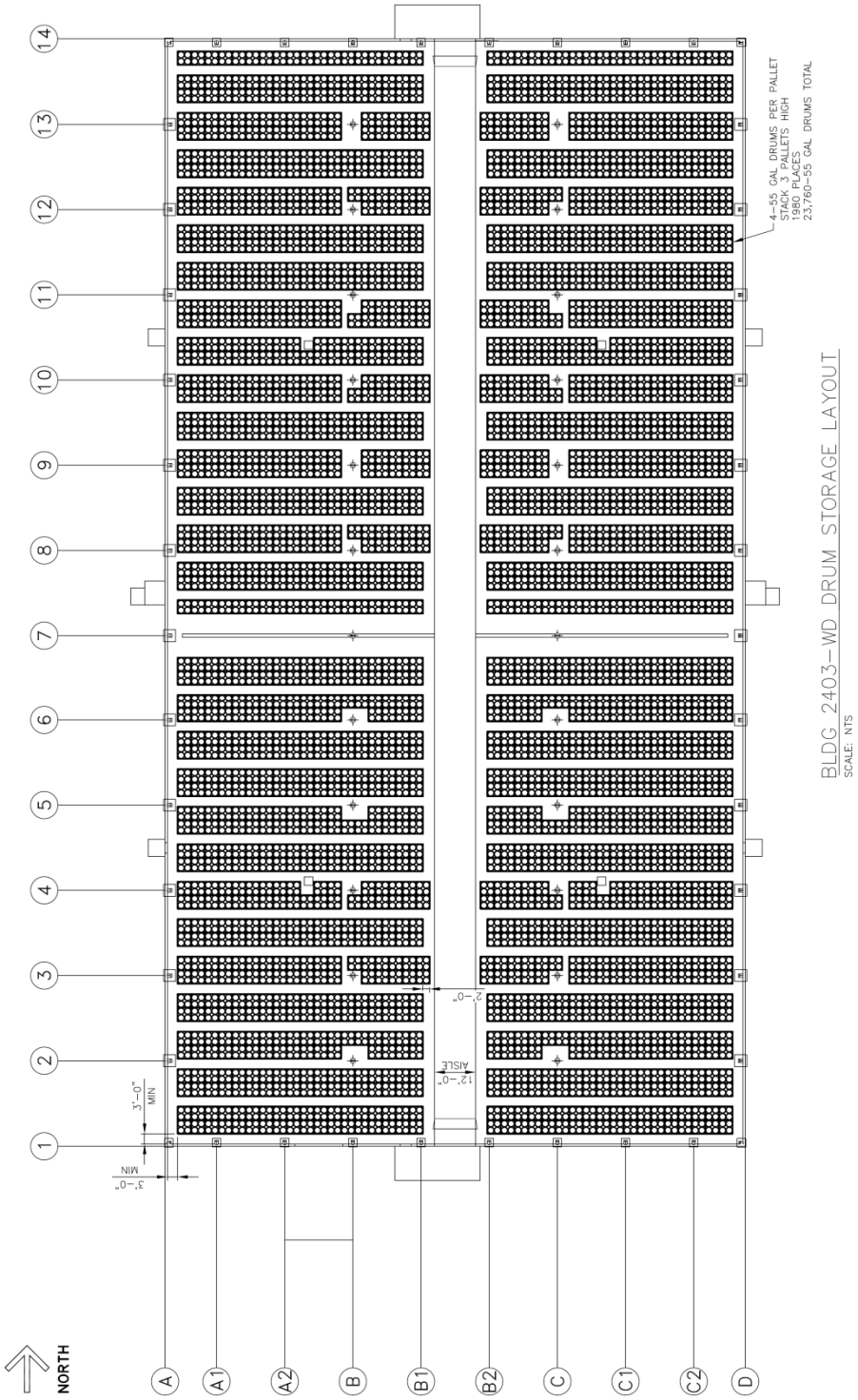

Figure 6-1. 2403-WD Waste Storage Building Pad Drum Array

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

2403-WD WASTE STORAGE BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

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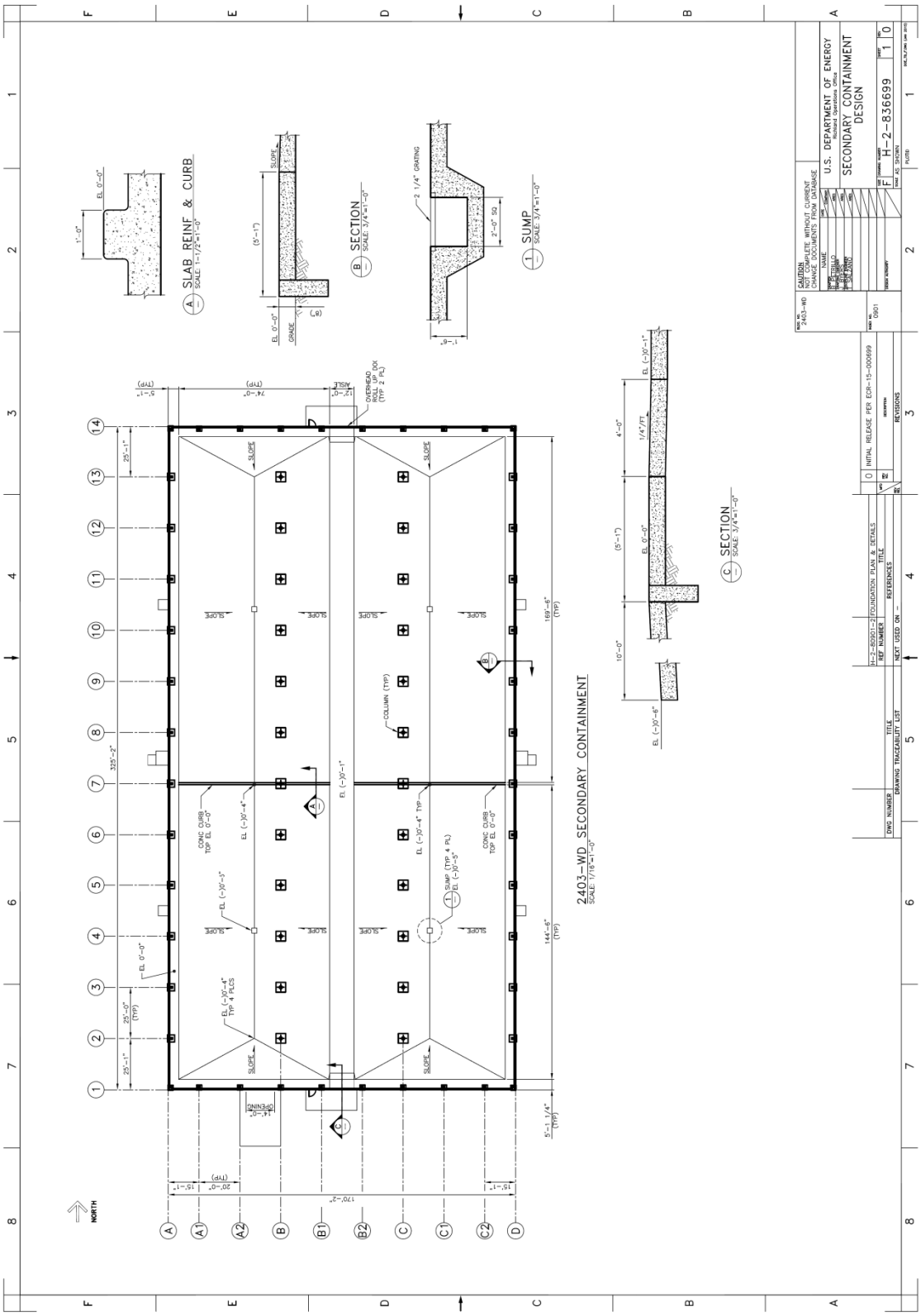

Calculation ECF-200W-15-0024, Revision 0, Maximum Storage Capacity for CWC Shipping and Receiving Area.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 11-18-2015

Calculation Title & Description: Maximum Storage Capacity for CWC Shipping and Receiving Area

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Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0024 **Revision No.:** 0

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Section 4: Document Review & Approval

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Preparer:	T.B. Salzano, P.E. / ARES Corporation		11-18-2015
Checker:	K.J. Emory, P.E. / ARES Corporation		11-18-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		11-18-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

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Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

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Integration Lead	N/A		

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Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 8 Calculation No: 946412.15-M-006

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for CWC Shipping and Receiving Area

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the Central Waste Complex (CWC) Shipping and Receiving Area.

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Revision Description (Revision Description/Affected Pages):
Per client direction, the size of the CWC Shipping and Receiving pad was changed from 206' to 199'. This affected pages 4, 5, 6, and 8.

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.	✓					
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All.
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the Central Waste Complex (CWC) Shipping and Receiving Area. This asphalt pad is located east of the 2402 Series buildings.

2.0 METHODOLOGY

The CWC Shipping and Receiving Area is used to stage dangerous and/or mixed waste awaiting disposal, however, this area does not have built-in engineered containment. The general layout including overall dimensions of this area is shown in Drawing H-2-836716, *Shipping & Receiving Area Waste Storage Pad* (See Attachment 1). Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of drum pallets that can be stored are determined.

3.0 INPUTS

1. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

2. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

From Drawing H-2-836716, the overall area of the CWC Shipping and Receiving Area measures 60.7 meters (199 ft) by 46.0 meters (151 ft). A 3.66 meter (12 ft) wide strip is provided along the east side of the pad to allow vehicle access. Therefore, as shown in Figure 6-1, a total of 1,188 2X2 drum arrays can be placed on in the CWC Shipping and Receiving Area.

Since the pallets can be stacked two high, the total storage volume of the CWC Shipping and Receiving Area is as follows:

1,188 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 9,504 total drums

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1 drum = 208-liters (55 gallons), therefore,

9,504 total drums x 208-liters = ~1,977,000 liters

Or, since 1 liter = 0.001 m^3 1,977,000 liters x 0.001 m^3/liter = **1,977 m^3**

And, since 1 m^3 = 35.31 ft^3 1,977 m^3 x 35.31 ft^3/m^3 = 69,800 ft^3

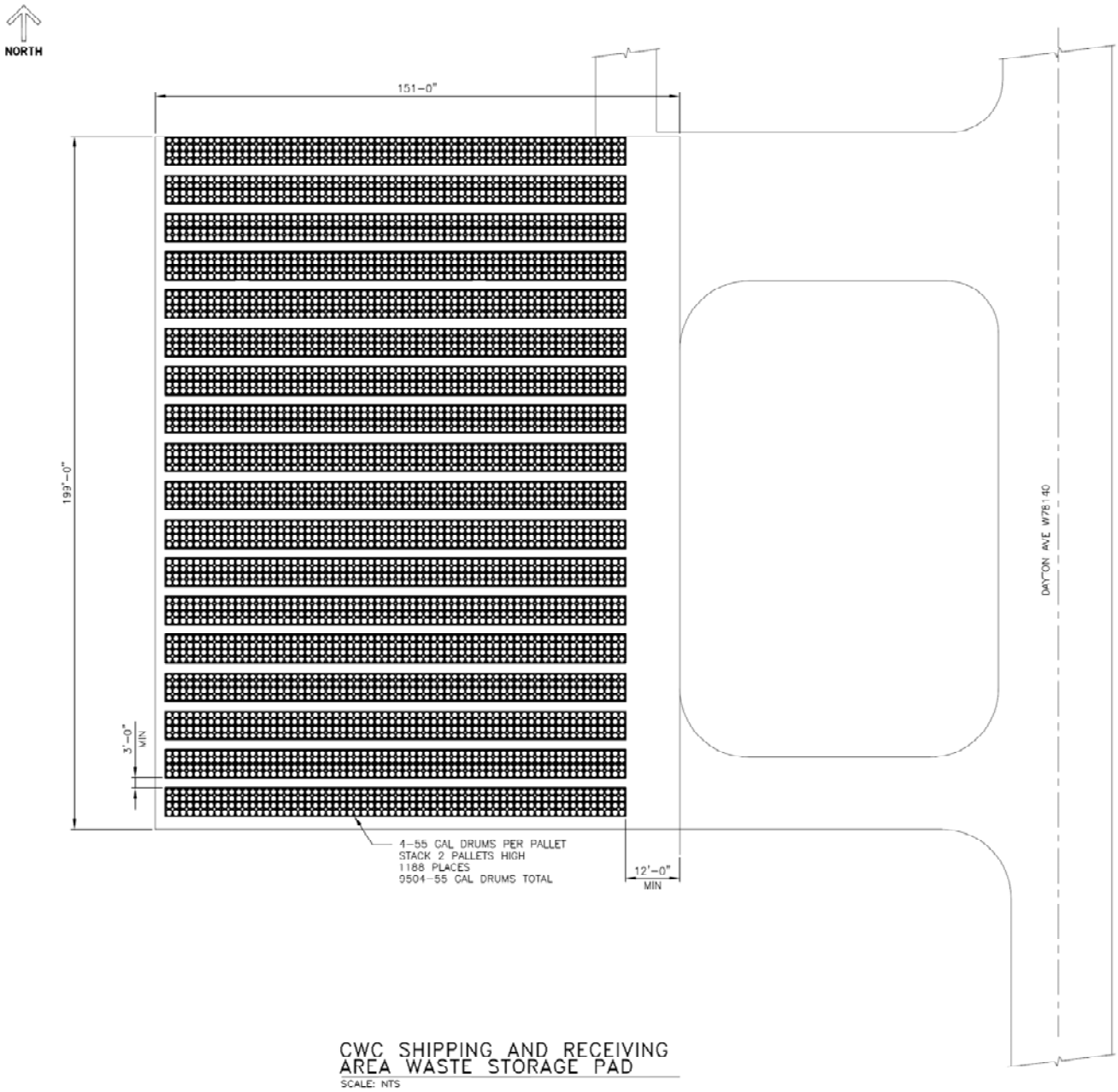

Figure 6-1. CWC Shipping and Receiving Area Drum Array

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7.0 RESULTS AND CONCLUSIONS

The CWC Shipping and Receiving Area has a total waste storage area of approximately 2,570 m^2 (27,660 ft^2) [60.7 meters (199 ft) by 42.4 meters (139 ft)]. Based on the drum array shown in Figure 6-1, the waste storage design capacity for this pad is 1,977 m^3 or 1,977,000 liters

The results are summarized in Table 7-1.

Table 7-1. Summary of Maximum Storage Capacity for CWC Shipping and Receiving Area

Structure/Area	Waste Storage Area m^2 (ft^2)	Maximum Waste Storage Capacity m^3 (liters)
CWC Shipping and Receiving Area	2,570 m^2 (27,660 ft^2)	1,977 m^3 (1,977,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836716, Revision 0, *CWC Shipping & Receiving Area Waste Storage Pad*.

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Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

ATTACHMENT 1

CWC SHIPPING AND RECEIVING AREA DRAWING

CALCULATION SHEET

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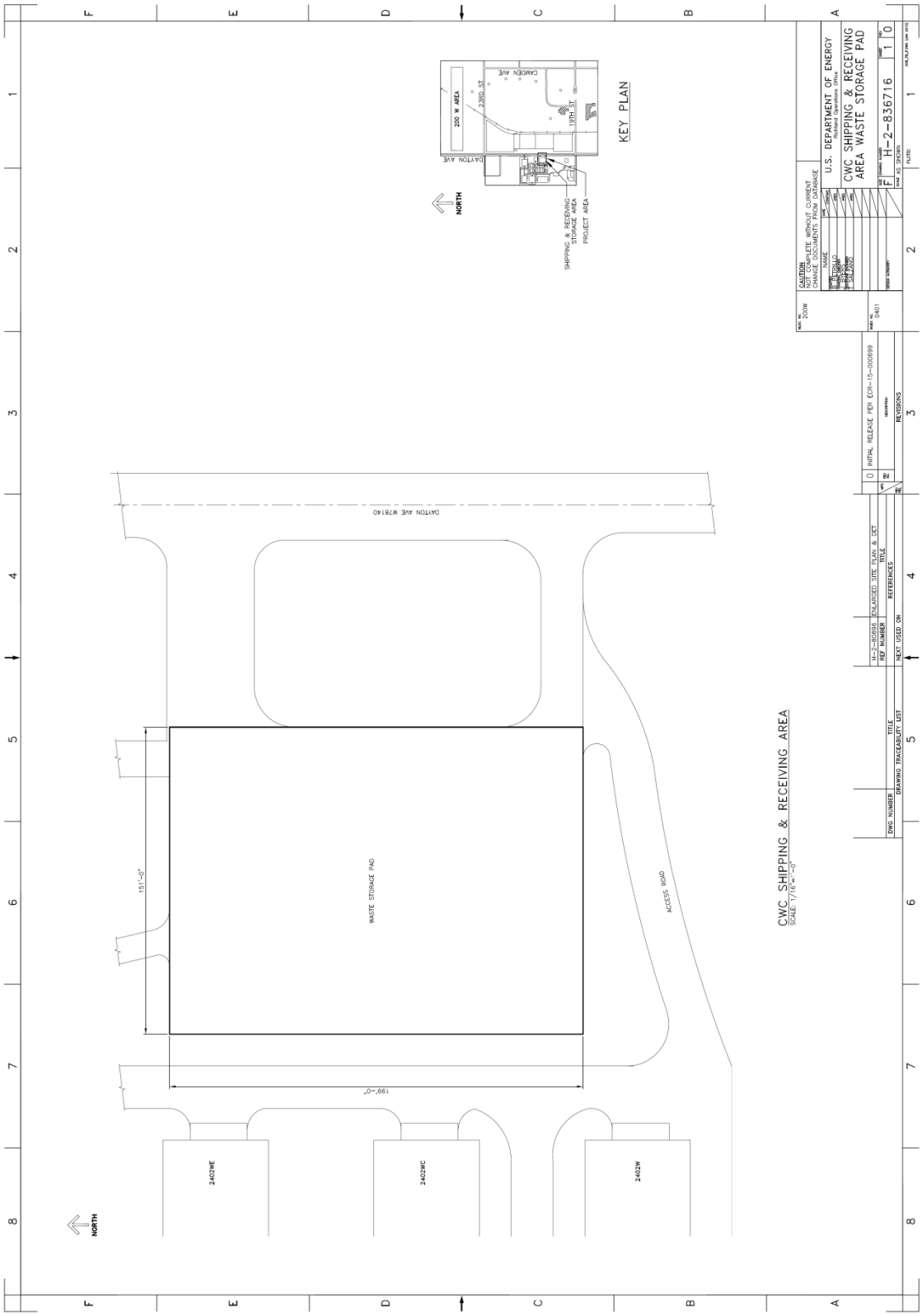
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15



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Calculation ECF-200W-15-0025, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2336-W Building Areas.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

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Integration Lead			

Safety Software Approved:

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	(Name /Position)	Signature	Date
Integration Lead			

CALCULATION APPROVED:

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	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:			

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 20 Calculation No: 946412.15-M-007

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2336-W Building Areas

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2336-W Building Areas. Specifically, the building areas covered by this calculation consist of the Process Area, Nondestructive Assay/Nondestructive Examination (NDA/NDE) Area, Shipping and Receiving Area (including outdoor storage area), and Room 152.

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CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2336-W Building Areas. Specifically, the building areas covered by this calculation consist of the Process Area, Nondestructive Assay/Nondestructive Examination (NDA/NDE) Area, Shipping and Receiving Area (including outdoor storage area), and Room 152.

2.0 METHODOLOGY

The 2336-W Building is the main Waste Receiving and Processing Facility (WRAP) Operating Unit Group building. The building is subdivided into the following areas where dangerous and mixed waste can be handled, stored and treated:

- Process Area;
- NDA/NDE Area;
- Shipping and Receiving Area; and
- Room 152.

The general layout and/or containment designs of these areas are shown in Drawings H-2-836717 through H-2-836720 and H-2-836741 (See Attachment 1). Utilizing the overall dimensions of the different areas and the depth of the containment curb, the capacity of the secondary containment for the Process Area, NDA/NDE Area, and Shipping and Receiving Area are determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of waste containers that can be stored in each of these areas.

3.0 INPUTS

1. Dimensions for each of the areas are from Sheet 1 of Drawings H-2-836717 through H-2-836720 and H-2-836741 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift handling shall be considered, with 12 feet wide main aisles required in Central Waste Complex (CWC) buildings excluding 2402 series buildings. (Reference Contract 57118, Section 8.0 Part B Table 1).

4. Gloveboxes shall be depicted as single line with drum entry ports similar to the TRU RWM glovebox at the 2336W facility (Reference H-2-131976). Active ventilation shall be depicted as two stage HEPA filter trains preceded by prefilters, external to the structure/area, with an associated exhaust stack.

(Reference Contract 57118, Section 8.0 Part B Table 1). However, additional direction was provided that the ventilation system does not need to be shown on the drawings. (Letter, Tom Salzano to Stephanie Johansen, *CH2M HILL Plateau Remediation Company, Contract 57118, SWOC Part B Permit Engineering Calculations And Drawings - Transmittal of Meeting Minutes - ARES Task No. 946412.15*, 15RL06151, dated June 15, 2015).

5. For 2336-W Process Area assume 13 drums on 107B room carousel, 10 staged on carousel at east end, 1 at venting station SW corner, 4 on floor in SW corner, and 10 drums staged for entry into gloveboxes (either underneath entry ports or nearby, reference drawing H-2-818276). (Reference Contract 57118, Section 8.0 Part B Table 1).

6. For 2336-W NDA/NDE Area assume drum arrays in Room 104, 18 on carousel and 3 on transfer conveyors, one drum in each NDA/NDE unit, approximately 5 pallets (4 drums each) between the box NDA/NDE units and the drum NDE units, pallets along both west and east walls, a single 4X4X8 box staged in the SE corner, and 1 Standard Waste Box (SWB) staged in easternmost box NDE counter (reference drawing H-2-818276). (Reference Contract 57118, Section 8.0 Part B Table 1).

7. For 2336-W Shipping and Receiving Area assume drum arrays as follows: one tier on drum conveyor as shown on H-2-818276, one drum on both drum scales, two pallets at jib crane servicing scale, 4 drums along north wall near the isolated drum scale, two pallets on the transfer station to the automatic storage/retriever, two tiers in automatic storage/retriever, 14 drums in each TRUPACT on the accumulation conveyor, and three TRUPACT's containing drums in the TRUCK loading bay. Also assume the floor space outside the south side of the automatic storage/retriever has one row of pallets, and the southwest corner of the area has approximately 3 rows of pallets extending eastward until even with the truck loading door. For the outdoor area portion of the DWMU, assume 3 TRUPACTs per trailer and a maximum of 5 trailers. (Reference Contract 57118, Section 8.0 Part B Table 1).

8. For 2336-W Room 152 assume 3 drums staged near entry door. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

The capacity of the secondary containment for the Process Area, NDA/NDE Area, and Shipping and Receiving Area are each determined separately in the sections below.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

6.1.1 Process Area

From Drawing H-2-836717, the Process Area (Room 107) is located between Columns 4 thru 7 and Columns A thru C.5 of the 2336-W Building. A 0.15 meter (0.5 ft) high containment curb is provided around the perimeter of this area. Although the Warm Maintenance Area (Room 108) and the Process HVAC Area (Room 113) are within this same curbed containment, only the Process Area containment volume is determined in this calculation.

The distance between Columns 4 thru 7 and Columns A thru C.5 is 22.86 meters (75 ft) and 30.48 meters (100 ft), respectively. Therefore, the area would be

(75 ft) x (100 ft) = 7,500 ft^2
Or, since 1 ft^2 = 0.093 m^2 7,500 ft^2 x 0.093 m^2/ft^2 = ~698 m^2

There is an area in the southeast corner approximately 6.1 meter (20 ft) square that is not part of the Process Area. In addition, there are step off pads at entry doors in the northwest and southwest corner of the room, as well as an entry ramp near the southeast corner that will also reduce the available floor area as follows:

(20 ft) x (20 ft) = 400 ft^2; (4 ft) x (5.2 ft) = ~21 ft^2; (4.7 ft) x (3 ft) = ~14 ft^2; (9.3 ft) x (7 ft) = ~65 ft^2

Therefore, the total floor area of the Process Area would be approximately:

(7,500 ft^2) - (400 ft^2) - (21 ft^2) - (14 ft^2) - (65 ft^2) = 7,000 ft^2 x 0.093 m^2/ft^2 = 651 m^2

With the 0.15 meter (0.5 ft) high "curbing", the total secondary containment volume for the Process Area would be:

(7,000 ft^2) x (0.5 ft) = 3,500 ft^3
Or, since 1 ft^3 = 0.0283 m^3 3,500 ft^3 x 0.0283 m^3/ft^3 = ~**99 m^3**
And, since 1 m^3 = 1,000 liters 99 m^3 x 1,000 liters/m^3 = **99,000 liters**

6.1.2 NDA/NDE Area

From Drawing H-2-836718, the NDA/NDE Area (Room 104) is located between Columns 1 thru 4 and Columns A thru C.5 of the 2336-W Building. A 0.15 meter (0.5 ft) high containment curb is provided around the perimeter of this area. The distance between Columns 1 thru 4 and Columns A thru C.5 is 22.86 meters (75 ft) and 30.48 meters (100 ft), respectively. Therefore, the area would be

(75 ft) x (100 ft) = 7,500 ft^2 x 0.093 m^2/ft^2 = ~698 m^2

There is an Airlock (Room 105), access pads, and shield walls that will reduce the available floor area as follows:

Airlock: (5.3 ft) x (17.7 ft) = ~94 ft^2
Southwest ramp: (6.5 ft) x (12 ft) = 78 ft^2
Northwest step off pad: (6 ft) x (16.7 ft) = ~100 ft^2

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Shield walls: [(2 ft) x (24.5 ft + 13.5 ft)] + [(2.8 ft) x (10 ft)] + [(1 ft) x (10 ft + 10 ft + 7.3 ft)] = ~131 ft^2

Therefore, the total floor area of the NDA/NDE Area would be approximately:

(7,500 ft^2) - (94 ft^2) - (78 ft^2) - (100 ft^2) - (131 ft^2) = 7,097 ft^2 x 0.093 m^2/ft^2 = 660 m^2

With the 0.15 meter (0.5 ft) high "curbing", the total secondary containment volume for the NDA/NDE Area would be:

(7,097 ft^2) x (0.5 ft) = 3,548.5 ft^3 x 0.0283 m^3/ft^3 = ~**100 m^3** x 1,000 liters/m^3 = **100,000 liters**

6.1.3 Shipping and Receiving Area

From Drawing H-2-836719, the Shipping and Receiving Area (Room 101) is located between Columns 1 thru 4 and Columns C.5 thru G of the 2336-W Building. A recessed drive-through bay for truck access is located on the east end of this area between Columns F.5 and G. A 0.15 meter (0.5 ft) high containment curb is provided around the perimeter of Room 101 and the drive-through bay area. The distance between Columns 1 thru 4 and Columns C.5 thru G is 22.86 meters (75 ft) and 42.67 meters (140 ft), respectively. Therefore, the area would be

(75 ft) x (140 ft) = 10,500 ft^2 x 0.093 m^2/ft^2 = ~977 m^2

There are several items (office, platform, etc.) that will reduce the available floor area as follows:

Northwest entry vestibule: (4 ft) x (7.3 ft) = ~29 ft^2
Two step off pads along south wall: [(4 ft) x (4.5 ft)] + [(4 ft) x (4.8 ft)] = ~37 ft^2
Two truck ramps along south wall: [(8 ft) x (5.5 ft)] + [(8 ft) x (~3 ft)] = 68 ft^2
Office: (~8 ft) x (9.3 ft) = ~74 ft^2
Access platform: (31 ft) x (8 ft) = 248 ft^2
Drive-through bay entry ramps: 2 x [(20 ft) x (5.5 ft)] = 220 ft^2
Stairwell: (4 ft) x (17.3 ft) = ~69 ft^2

Therefore, the total floor area of the Shipping and Receiving Area would be approximately:

(10,500 ft^2) - (29 ft^2) - (37 ft^2) - (68 ft^2) - (74 ft^2) - (248 ft^2) - (220 ft^2) - (69 ft^2) = 9,755 ft^2
Or, 9,755 ft^2 x 0.093 m^2/ft^2 = ~907 m^2

With the 0.15 meter (0.5 ft) high "curbing", the total secondary containment volume for the Shipping and Receiving Area would be:

(9,755 ft^2) x (0.5 ft) = 4,877.5 ft^3 x 0.0283 m^3/ft^3 = ~**138 m^3** x 1,000 liters/m^3 = **138,000 liters**

6.2 Maximum Waste Storage Capacity

6.2.1 Process Area

As determined in Section 6.1.1, the total floor area of the Process Area is 7,000 ft^2 or 651 m^2, however, this area houses four gloveboxes and two drum carousels. Therefore, waste storage in this area consists of containerized

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(drums) waste stored on the drum carousels, on conveyors, and on the floor. Using the criteria indentified in the Design Inputs, drum storage in the Process Area consists of the following (See Figure 6-1):

Drum Carousel (Room 107B): 13 drums
Drum Carousel (East End): 10 drums
Venting Station (SW Corner): 1 drum
Floor storage (SW Corner): 4 drums
Gloveboxes: 10 drums staged for entry

Therefore, the total number of drums is (13 + 10 + 1 + 4 + 10) = 38 drums. Since 1 drum = 208-liters (55 gallons), the total drum storage volume would be:

38 total drums x 208-liters = ~**7,900 liters** x 1/1000 m^3/liter = **7.9 m^3**

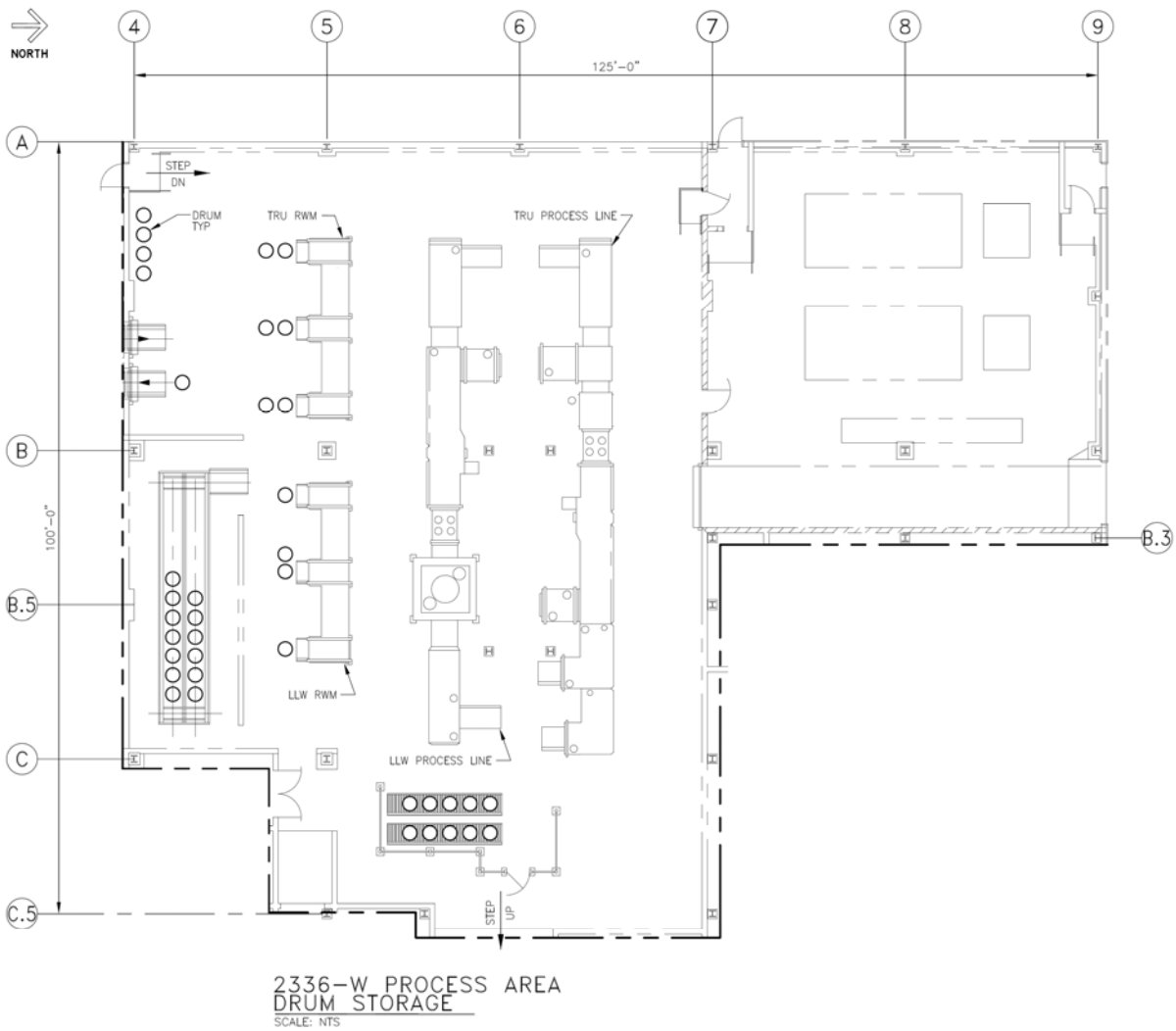

Figure 6-1. 2336-W Building Process Area Waste Storage

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6.2.2 NDA/NDE Area

As determined in Section 6.1.2, the total floor area of the NDA/NDE Area is 7,097 ft^2 or 660 m^2, however, this area houses a drum carousels as well as the NDA/NDE equipment used in support of certifying waste for acceptance. Therefore, waste storage in this area consists of standard waste boxes (SWBs) and containerized (drums) waste stored on the drum carousels, on conveyors, and on the floor. Using the criteria indentified in the Design Inputs, drum storage in the NDA/NDE Area consists of the following (See Figure 6-2):

Drum Carousel: 18 drums
Drum Transfer Conveyors: 3 drums
NDA/NDE units (i.e., 6 units): 1 drum on each unit = 6 drums
Floor storage between box NDA/NDE units (i.e., 2 units) and the drum NDE units:
[5 drum pallets x 4 drums/pallet] x 2 units = 20 drums
Along west wall: 7 drum pallets x 4 drums/pallet = 28 drums
Along east wall: 7 drum pallets x 4 drums/pallet = 28 drums

Therefore, the total number of drums is (18 + 3 + 6 + 20 + 28 + 28) = 103 drums, and the total drum storage volume would be:

103 total drums x 208-liters = 21,424 liters x 1/1000 m^3/liter = ~21.4 m^3

In addition to the drum storage, there is a single 4X4X8 box staged in the southeast corner and 1 SWB staged in the easternmost box NDE counter. The volumes of these are as follows:

4X4X8 box = (4 ft) x (4 ft) x (8 ft) = 128 ft^3 x 0.0283 m^3/ft^3 = ~3.6 m^3 (See Reference 7)
1 SWB = 1.8 m^3 (See Reference 7)

Therefore, the total waste storage volume in the NDA/NDE Area would be:

21.4 m^3 + 3.6 m^3 + 1.8 m^3 = **26.8 m^3** x 1000 liters/m^3 = **26,800 liters**

6.2.3 Shipping and Receiving Area

As determined in Section 6.1.3, the total floor area of the Shipping and Receiving Area is 9,755 ft^2 or 907 m^2, however, this area houses waste shipping and receiving equipment such as conveyors, automated stacker/retrieval system, etc. Therefore, waste storage in this area consists of TRUPACT containers and containerized (drums) waste stored on the drum carousels, on conveyors, and on the floor. In addition, as shown on Drawing H-2-836741, there is an outdoor storage area for additional storage capacity. Using the criteria indentified in the Design Inputs, storage in the Shipping and Receiving Area consists of the following:

<u>Inside Storage Area (See Figure 6-3):</u>
Drum Conveyor: 12 drums
Drum Scales: 1 drum on both scales = 2 drums
Jib Crane Servicing Scale: 2 drum pallets x 4 drums/pallet = 8 drums
Along north wall near Drum Scale: 4 drums
Pallet Transfer Station: 2 drum pallets x 4 drums/pallet = 8 drums
Automatic Storage/Receiver (AS/RS): 18 drum pallets x 4 drums/pallet x 2 pallets high = 144 drums
Accumulation Conveyor: 8 TRUPACT x 14 drums/TRUPACT = 112 drums

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Truck Loading Bay: 3 TRUPACT x 14 drums/TRUPACT = 42 drums
Floor storage on south side of AS/RS: 9 drum pallets x 4 drums/pallet = 36 drums
Floor storage in southwest corner: 22 drum pallets x 4 drums/pallet = 88 drums

Outdoor Storage Area (See Figure 6-4):
5 Trailers x 3 TRUPACT/trailer x 14 drums/TRUPACT = 210 drums

Therefore, the total number of drums is (12 + 2 + 8 + 4 + 8 + 144 + 112 + 42 + 36 + 88 + 210) = 666 drums, and the total waste storage volume of the Shipping and Receiving Area would be:

666 total drums x 208-liters = ~**138,500 liters** x 1/1000 m^3/liter = **138.5 m^3**

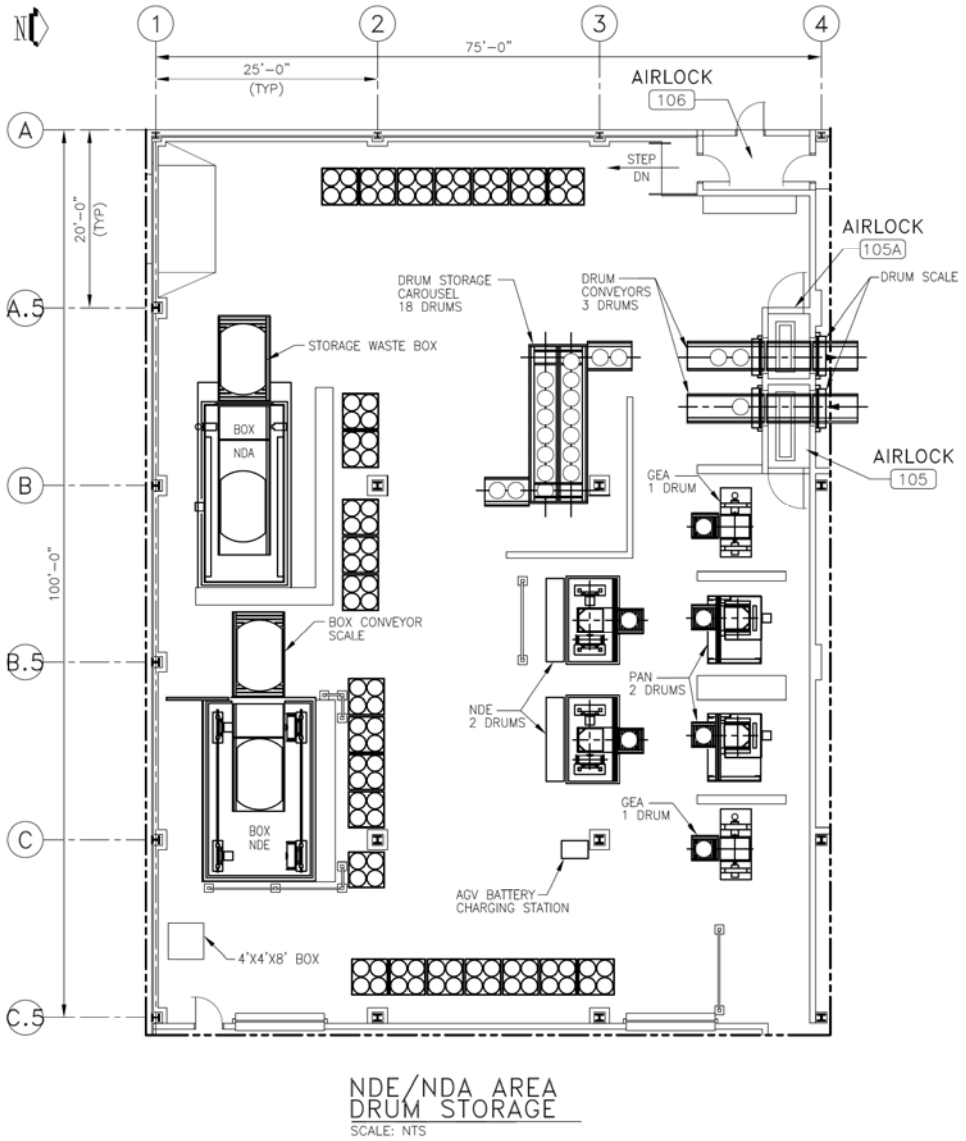

Figure 6-2. 2336-W Building NDA/NDE Area Waste Storage

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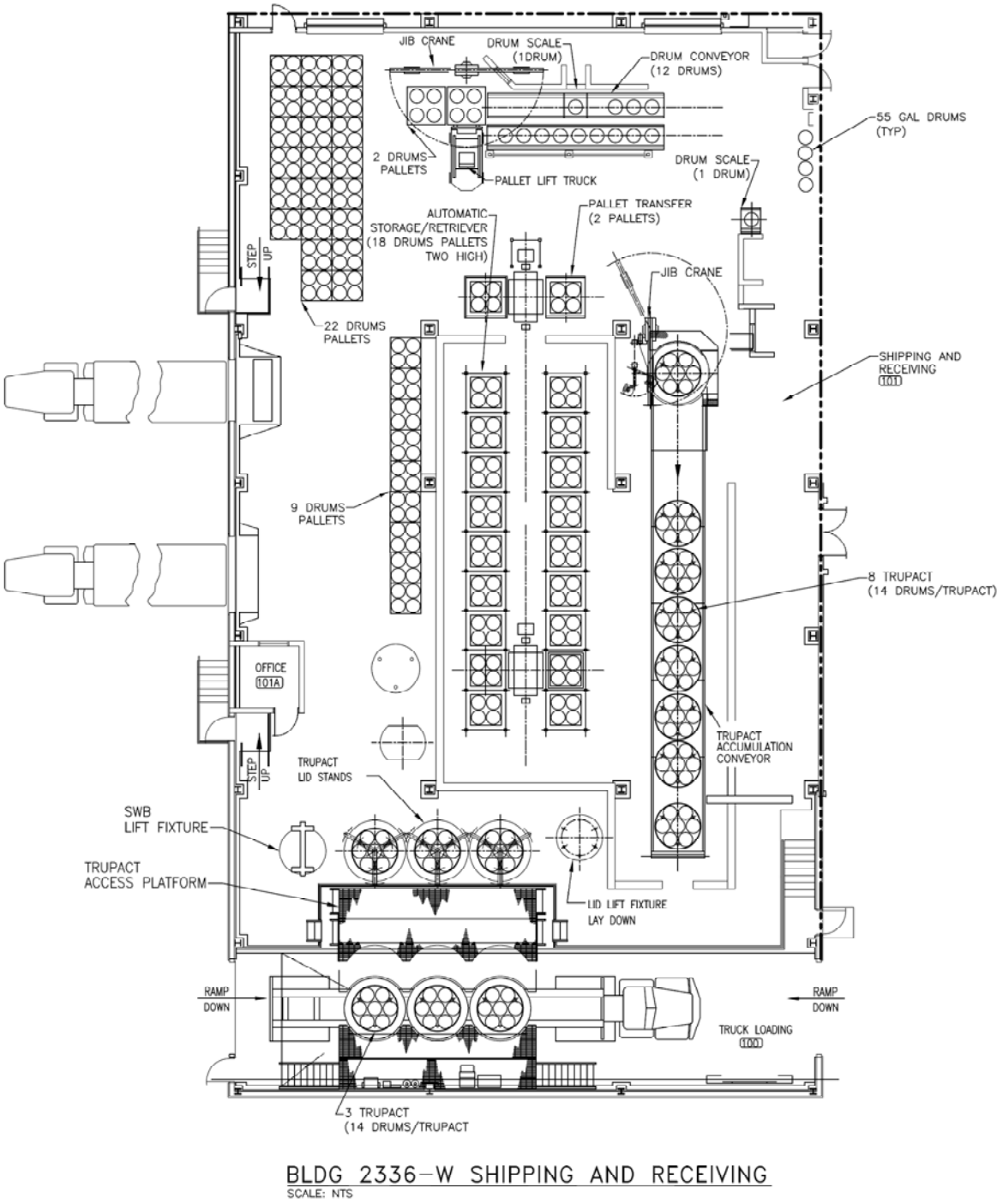

Figure 6-3. 2336-W Building Shipping and Receiving Area Waste Storage

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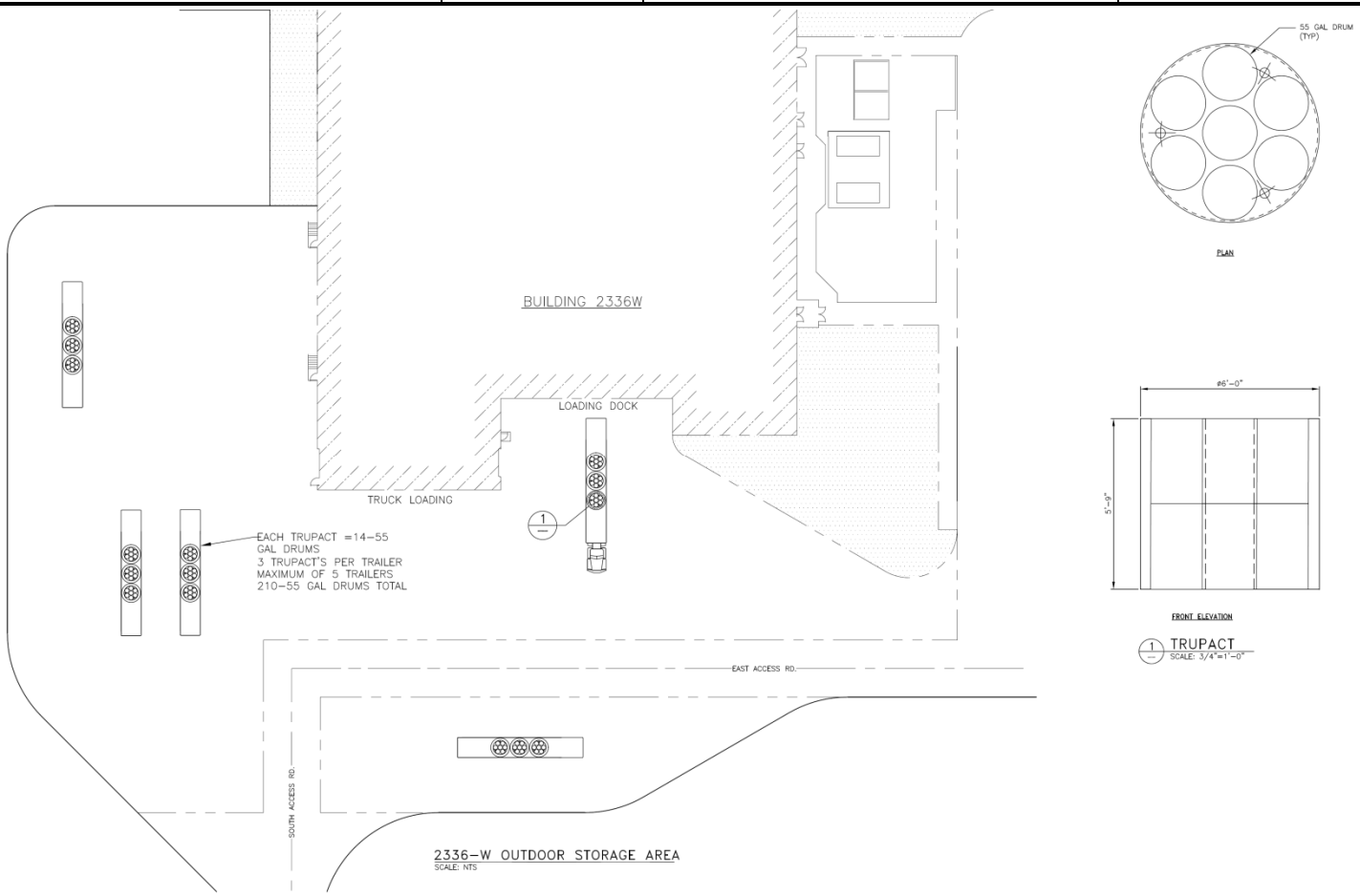

Figure 6-4. 2336-W Building Shipping and Receiving Outdoor Waste Storage Area

6.2.4 Room 152

The 2336-W Building Room 152 is a small room [nominally 3 meters (10 ft) by 8.5 meters (28 ft)] located next to the material receiving dock on the east side of the 2336-W Building. Using the criteria indentified in the Design Inputs, a total of 3 drums could be staged near the entry door as shown in Figure 6-5. Therefore, the total storage volume of this room is as follows:

3 total drums x 208-liters = ~**620 liters** x 1/1000 m^3/liter = **0.62 m^3**

7.0 RESULTS AND CONCLUSIONS

The 2336-W Building Areas have a total secondary containment volume as indicated in Table 7-1. In addition, based on the waste storage arrangements shown in Figures 6-1 through 6-5, the waste storage design capacity of each of the building areas is as indicated in Table 7-1.

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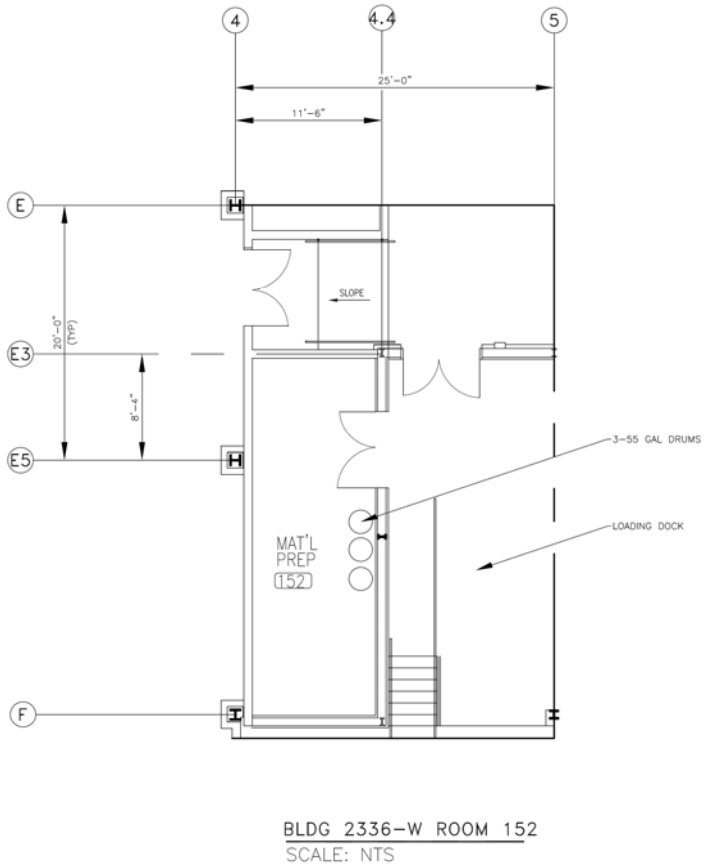

Figure 6-5. 2336-W Building Room 152 Waste Storage

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2336-W Building Areas

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2336-W Process Area	99 m^3 or 99,000 liters	7.9 m^3 (7,900 liters)
2336-W NDA/NDE Area	100 m^3 or 100,000 liters	26.8 m^3 (26,800 liters)
2336-W Shipping and Receiving Area	138 m^3 or 138,000 liters	138.5 m^3 (138,500 liters)
2336-W Room 152	N/A	0.62 m^3 (620 liters)

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8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-818276, *WRAP General Arrangement*.

3. Drawing H-2-836717, Sheet 1, Revision 0, *Process Area Secondary Containment*.

4. Drawing H-2-836718, Sheet 1, Revision 0, *NDE/NDA Area Secondary Containment*.

5. Drawing H-2-836719, Sheet 1, Revision 0, *Shipping & Receiving Secondary Containment*.

6. Drawing H-2-836720, Sheet 1, Revision 0, *Fire Protection System General Layout*.

7. Drawing H-2-836741, Sheet 1, Revision 0, *Shipping & Receiving Outdoor Storage General Structure/Area*.

8. Horn, Sarah R., *RE: A few simple clarifications on storage notes*, email to Tom Salzano, June 22, 2015.

9. Letter, Tom Salzano to Stephanie Johansen, *CH2M HILL Plateau Remediation Company, Contract 57118, SWOC Part B Permit Engineering Calculations And Drawings - Transmittal of Meeting Minutes - ARES Task No. 946412.15*, 15RL06151, dated June 15, 2015

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ATTACHMENT 1

2336-W BUILDING AREAS GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWINGS

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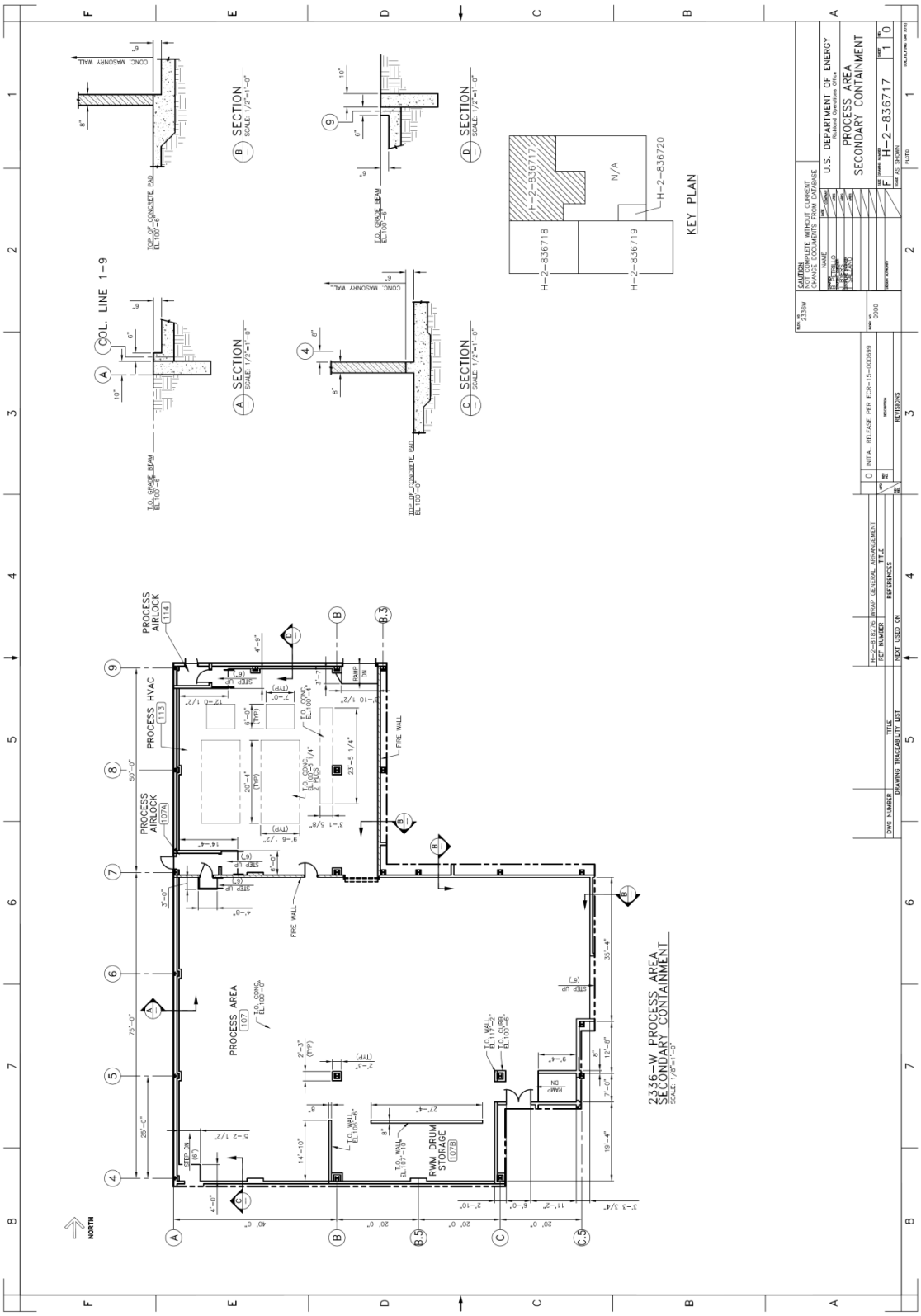

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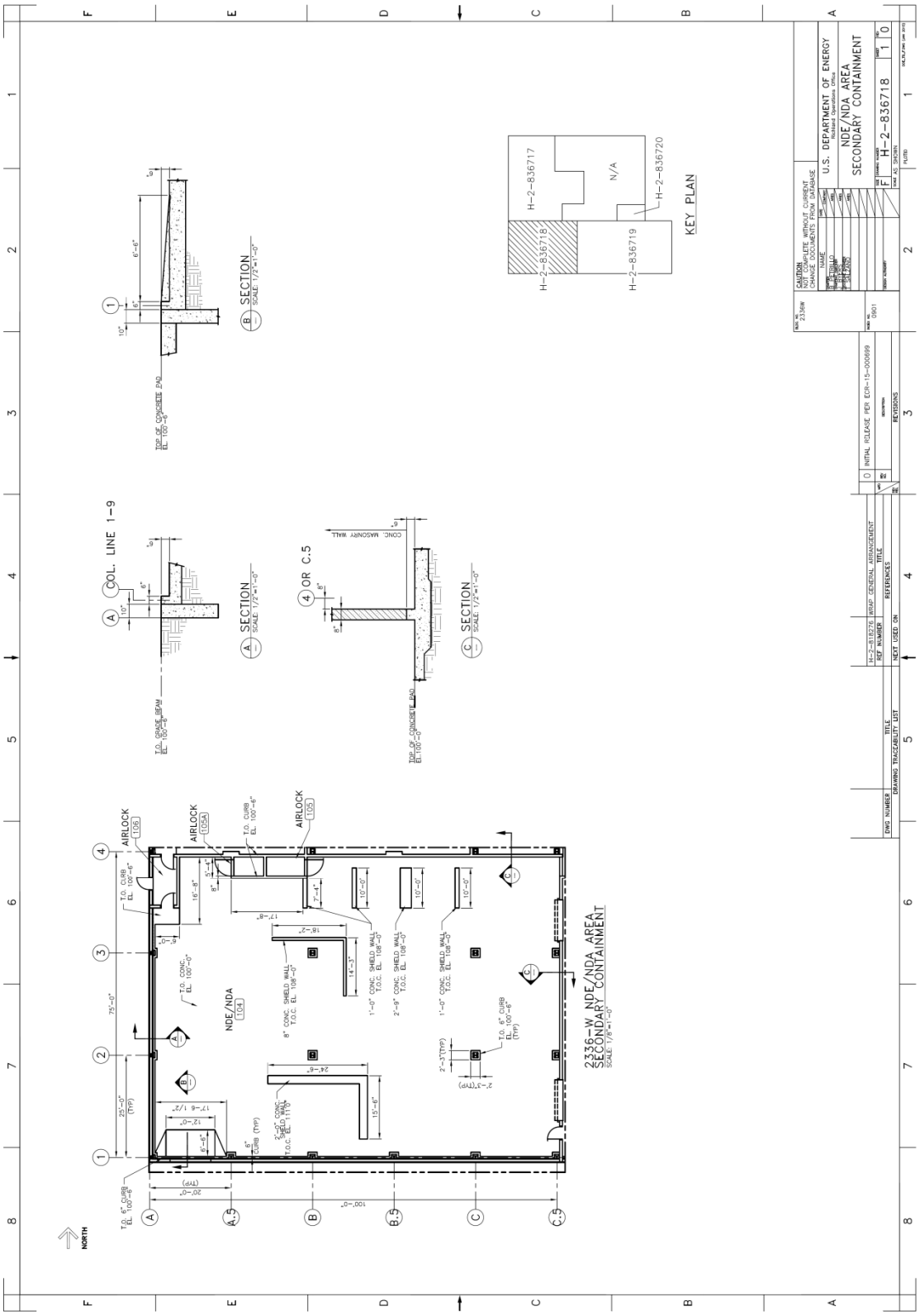

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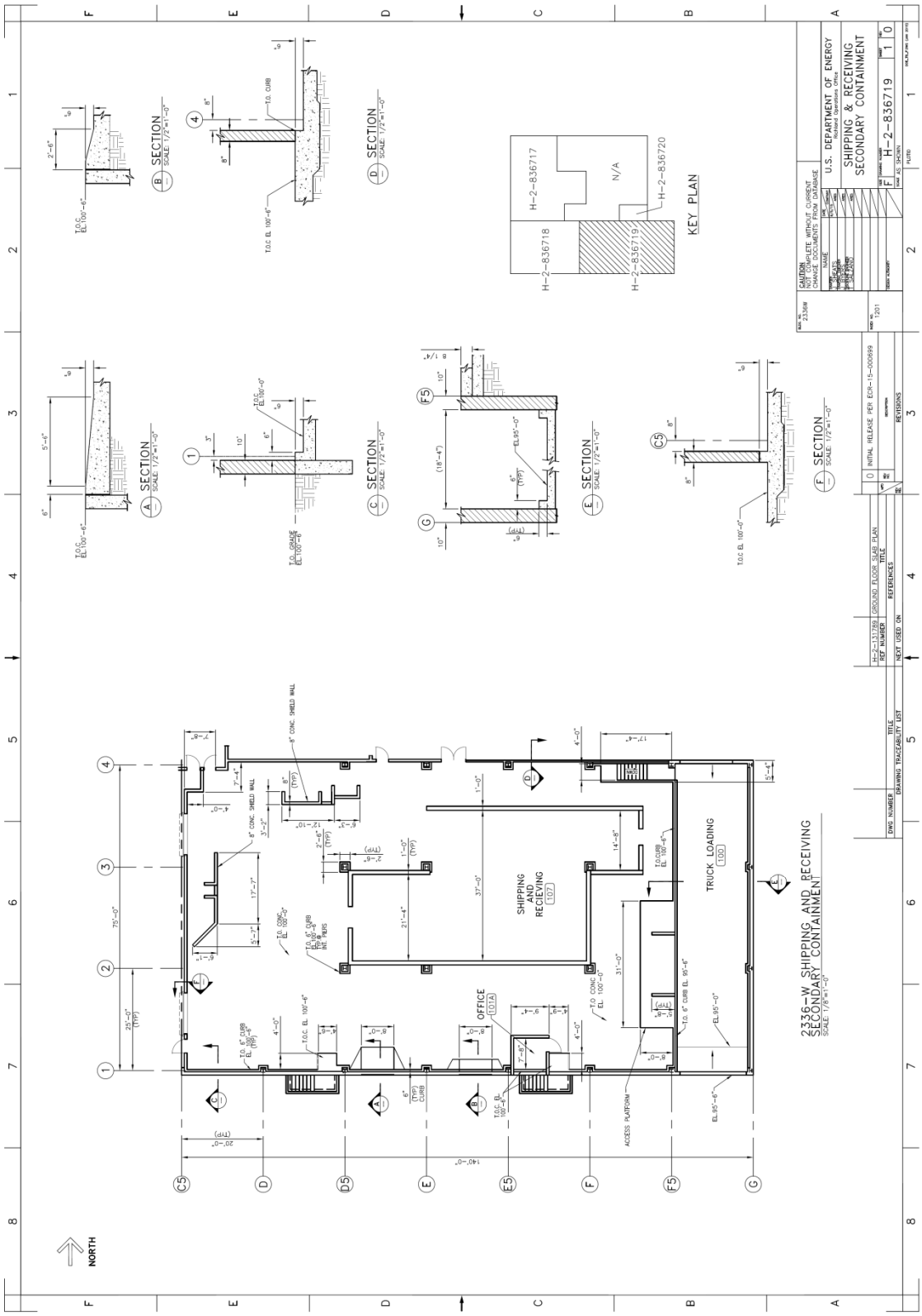

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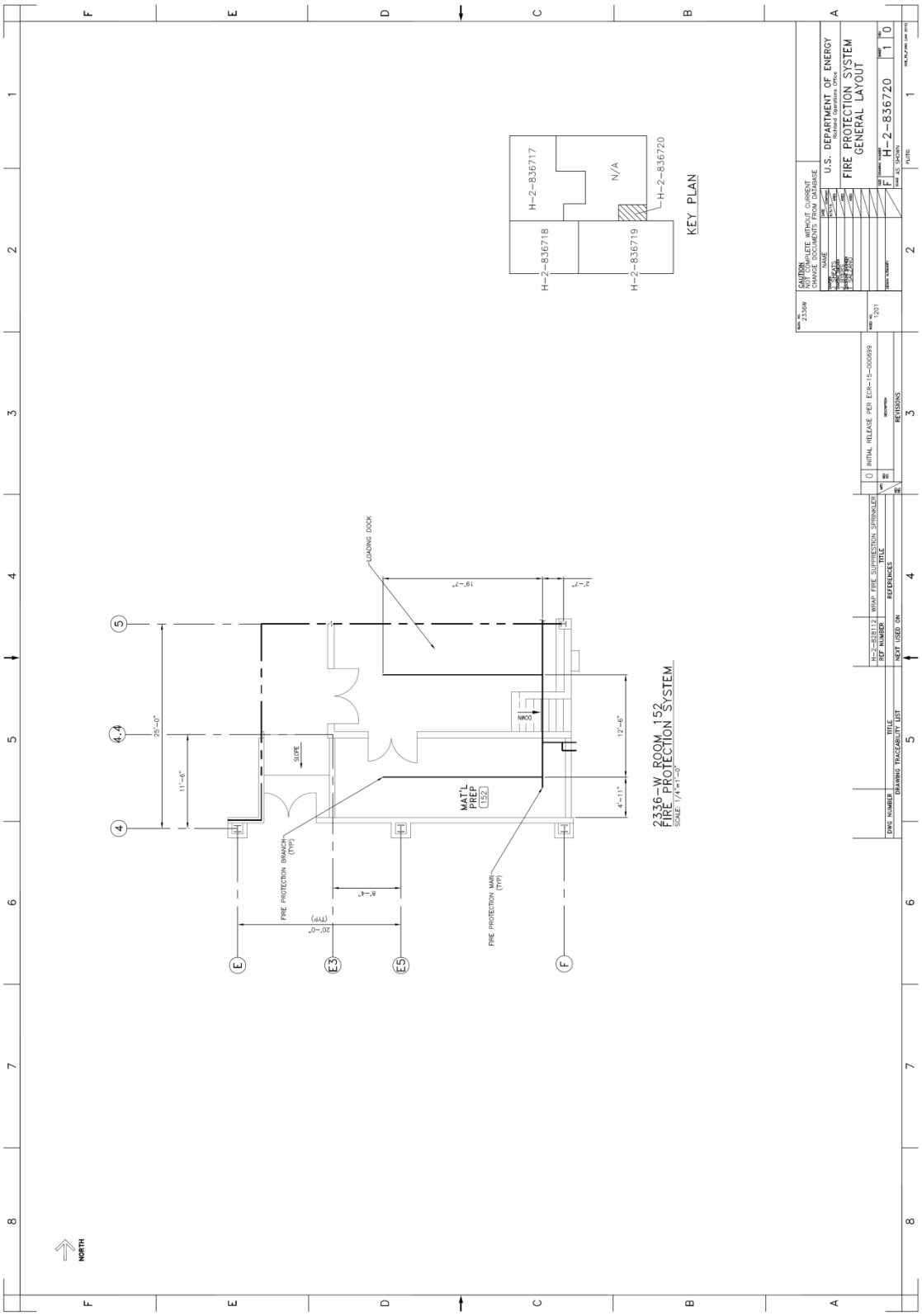

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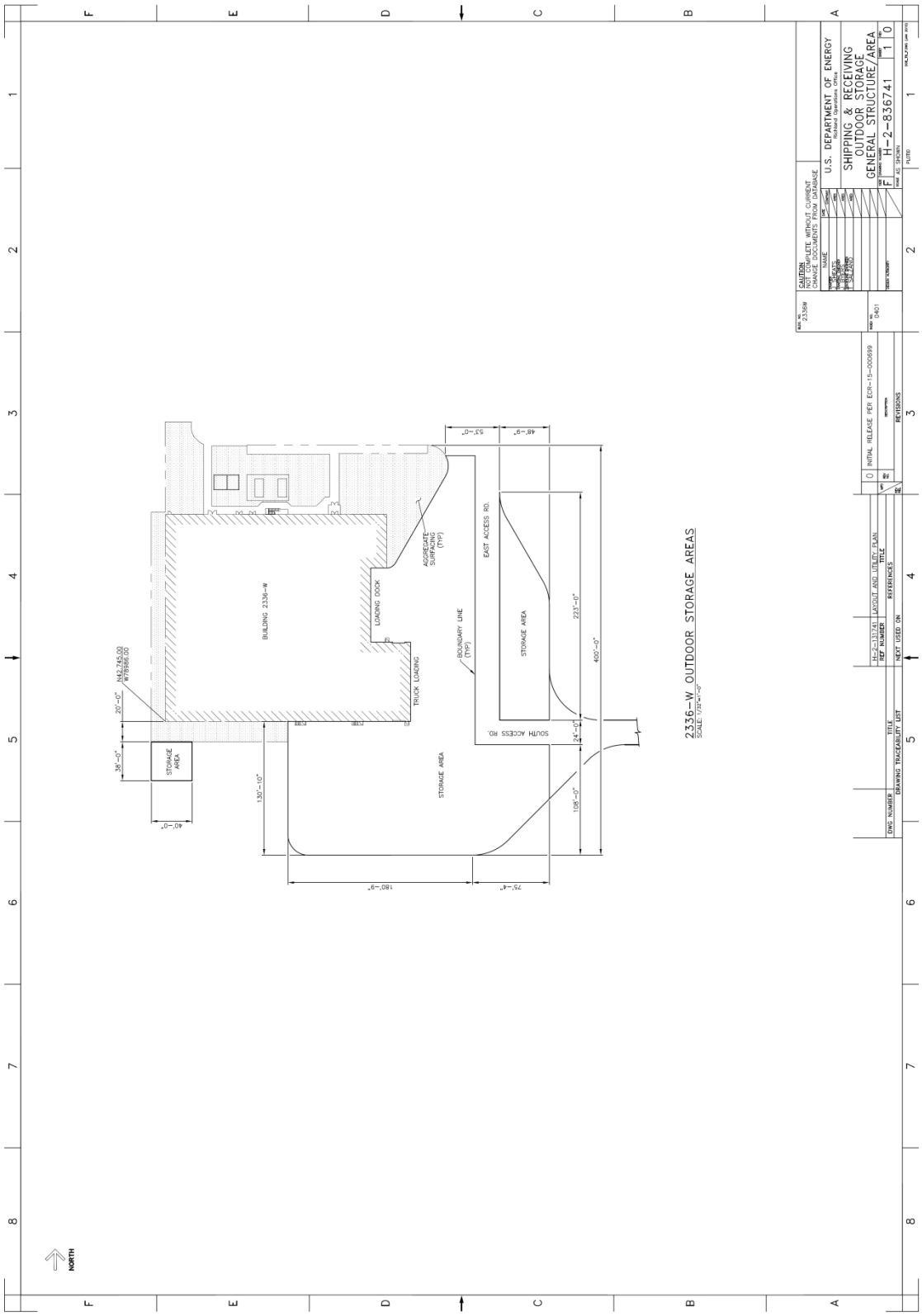

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Calculation ECF-200W-15-0026, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2404-WA thru WC Series Waste Storage Buildings.

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 2404-WA thru WC Series Waste Storage Buildings

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0026 **Revision No.:** 0

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Checker:	K.J. Emory, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
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ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 9 Calculation No: 946412.15-M-008

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2404-WA thru WC Series Waste Storage Buildings

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2404-WA through WC Series Waste Storage Buildings (2404-WA, 2404-WB, and 2404-WC).

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CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

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T.B. Salzano, P.E.	9-8-15

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2404-WA through WC Series Waste Storage Buildings (2404-WA, 2404-WB, and 2404-WC).

2.0 METHODOLOGY

The 2404-WA through WC Waste Storage Buildings are pre-engineered steel structures used to store dangerous and/or mixed waste. The general layout and containment designs of these buildings are shown in Drawings H-2-836700, H-2-836702, and H-2-836721. The buildings are basically identical, therefore, only Drawing H-2-836702 for the 2404-WA Waste Storage Building is provided in Attachment 1. Utilizing the overall area of the building floor, the slope of the floor, and the sump volumes, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in these buildings.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836702, Sheet 1 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift handling shall be considered, with 12 feet wide main aisles required in Central Waste Complex (CWC) buildings excluding 2402 series buildings. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawings H-2-836700, H-2-836702, and H-2-836721, each of the three (3) buildings has a foundation approximately 36.58 meters (120 ft) wide, by 54.86 meters (180 ft) long. There is a 0.15 meter (0.5 ft) wide by

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0.15 meter (0.5 ft) high foundation wall around the perimeter of the foundation. Therefore, the inside area of the building would be

(120 ft) x (180 ft) = 21,600 ft^2

Or, since 1 ft^2 = 0.093 m^2 21,600 ft^2 x 0.093 m^2/ft^2 = ~2,010 m^2

With the 0.15 meter (0.5 ft) high "curbing", this would provide a containment volume of

(21,600 ft^2) x (0.5 ft) = 10,800 ft^3

Or, since 1 ft^3 = 0.0283 m^3 10,800 ft^3 x 0.0283 m^3/ft^3 = ~305 m^3

In addition to this containment volume, the building floor is basically split in half where each half has a centrally located sump with the floor sloping to the sump. The sloping floors create two additional containment volumes that can be approximated as pyramids. The area of the base of the pyramid is half of the inside area of the building or (1/2) x 21,600 ft^2 = 10,800 ft^2 or 1,003 m^2. The height of the pyramid would be the depth of the slope at the sump. The east-to-west slope of the floor is at a slope of 1/8-in. per foot. With a distance of 45.25 ft to the sump, the depth would be (1/8-in/ft) x 45.25 ft = 5.66 in or 0.47 ft. Therefore, the volume of each of these pyramids is:

$V_{pyramid}$ = 1/3h x area of base (Ref. Machinery's Handbook, 29th Edition, p. 82)

$V_{pyramid}$ = (1/3 x 0.47 ft) x 10,800 ft^2 = 1,692 ft^3 x 0.0283 m^3/ft^3 = ~48 m^3

In addition to these two areas, there are two (2) sumps each with a volume of:

V_{sump} = 2 ft x 2 ft x 2 ft = 8 ft^3 x 0.0283 m^3/ft^3 = 0.23 m^3

Therefore, the total containment volume for the pyramid areas and sumps would be:

2 x $V_{pyramid}$ + 2 x V_{sump} = 2 x (1,692 ft^3) + 2 x (8 ft^3) = 3,400 ft^3 x 0.0283 m^3/ft^3 = ~96 m^3

Combining this volume with the containment volume provided by the curb, the total secondary containment volume for the buildings would be:

10,800 ft^3 + 3,400 ft^3 = 14,200 ft^3 x 0.0283 m^3/ft^3 = ~**402 m^3**

Or, since 1 m^3 = 1,000 liters 402 m^3 x 1,000 liters/m^3 = **402,000 liters**

6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, the total area available for storage is 21,600 ft^2 or 2,010 m^2. Therefore, using the criteria indentified in the Design Inputs, a total of 753 2X2 drum arrays can be placed in the building as shown in Figure 6-1.

Since the pallets can be stacked three high, the total storage volume of each of the buildings is as follows:

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753 2X2 drum arrays x 4 drums/pallet x 3 pallets high = 9,036 total drums

1 drum = 208-liters (55 gallons), therefore,

9,036 total drums x 208-liters = ~1,879,000 liters x 1/1000 m^3/liter = **1,879 m^3**

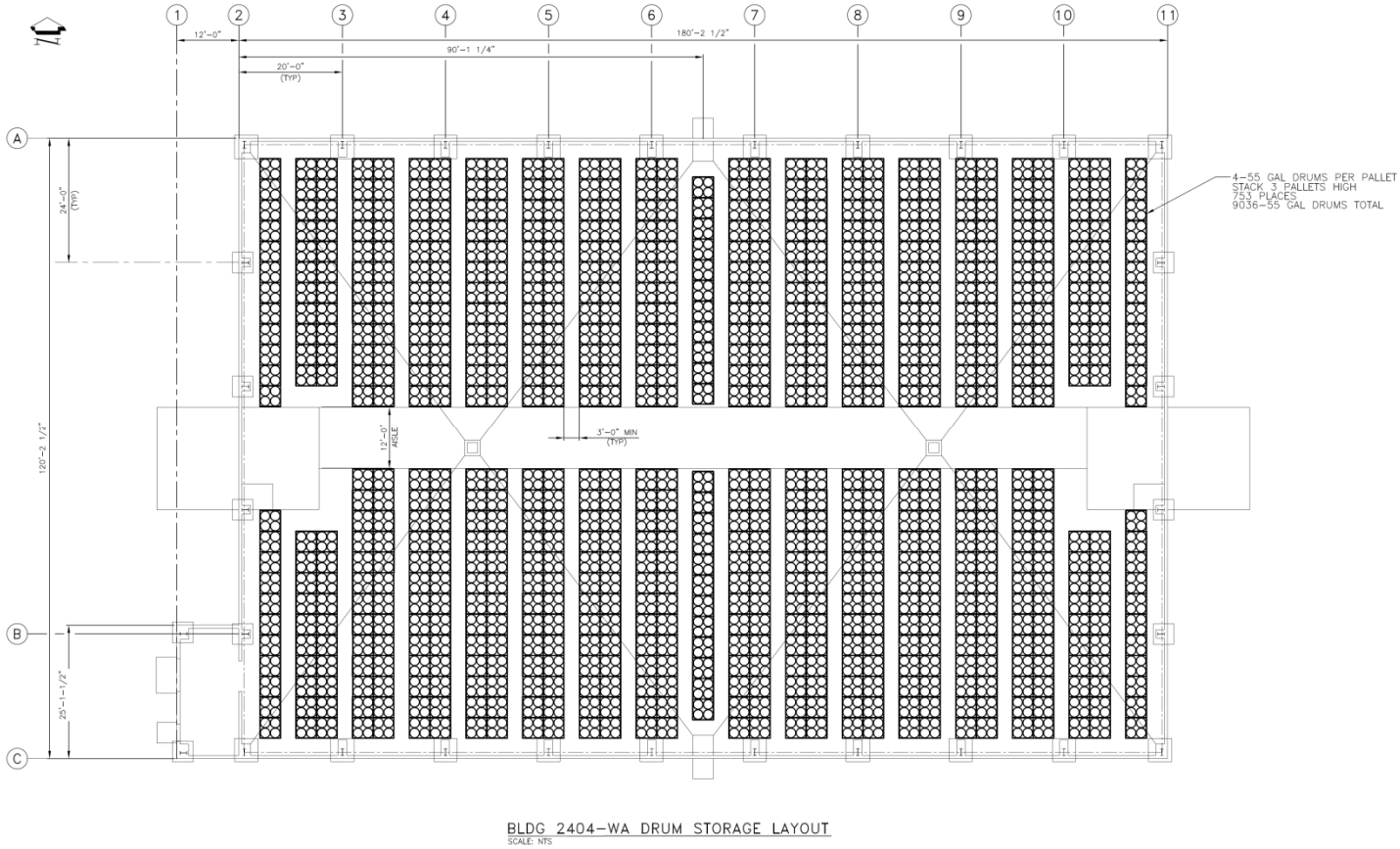

Figure 6-1. 2404-WA thru WC Waste Storage Buildings Pad Drum Array

7.0 RESULTS AND CONCLUSIONS

The 2404-WA, WB, and WC Waste Storage Buildings each have a total secondary containment volume of 402 m^3 or 402,000 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of each building is 1,879 m^3 or 1,879,000 liters.

The results are summarized in Table 7-1.

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Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2404-WA thru WC Waste Storage Buildings

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2404-WA, 2404-WB, 2404-WC	402 m^3 or 402,000 liters	1,879 m^3 (1,879,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836700, Sheet 1, Revision 0, *Secondary Containment Design*.

3. Drawing H-2-836702, Sheet 1, Revision 0, *Secondary Containment Design*.

4. Drawing H-2-836721, Sheet 1, Revision 0, *Secondary Containment Design*.

5. Oberg, Erik et. al., Machinery's Handbook, 29th Edition, New York, Industrial Press, 2012.

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ATTACHMENT 1

2404-WA WASTE STORAGE BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

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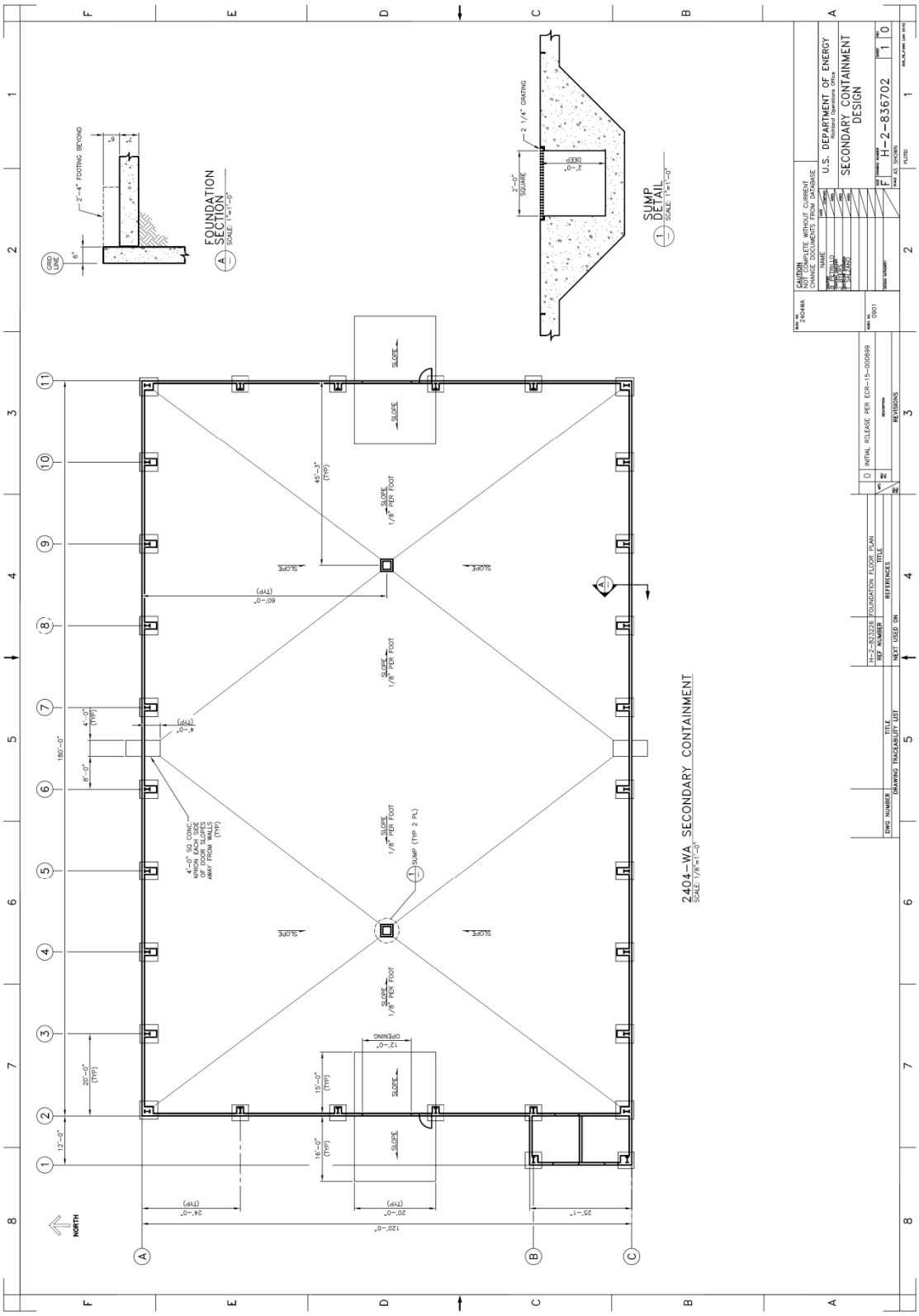

Calculation ECF-200W-15-0027, Revision 0, Maximum Storage Capacity for HERTR and Super HENC Outdoor Storage Area

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

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Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 8 Calculation No: 946412.15-M-009

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for HERTR and Super HENC Outdoor Storage Area

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the High Energy Real Time Radiography (HERTR) and Super High Energy Neutron Counter (HENC) Outdoor Storage Area.

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Per client direction, the size of the storage area was changed to include additional asphalt area. This affected pages 4, 5, 6, and 8.

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	√					
2. Calculation sheet headers complete with calculation number, revision number, etc.	√					
3. Calculation sheet contents complete per format.	√					
4. Listed attachments included.	√					
5. Calculation objective clearly described.	√					
6. Criteria are suitable and properly referenced to task specific documents.	√					
7. Assumptions and input data described and attached or referenced to task documents.	√					
8. Calculation method identified and appropriate for the design activity.	√					
9. Calculation results reasonable and correctly described in results and conclusions.	√					
10. Physical property calculations generated by CAD software verified via hand calculations.	√					
11. Computer program identified with version and revision.			√			
12. Computer input/output provided or referenced.			√			
13. Computer run traceable to calculation (file #, etc.).			√			
14. Computer input data within permissible design input range.			√			
15. Computer program validation/verification addressed.			√			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			√			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	√	All
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3. Alternate Calculation (Append Documentation)		

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Signatures obtained only after discrepancies are corrected and comments are resolved.

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the High Energy Real Time Radiography (HERTR) and Super High Energy Neutron Counter (HENC) Outdoor Storage Area. This concrete pad is adjacent to the Super HENC.

2.0 METHODOLOGY

The HERTR and Super HENC Outdoor Storage Area is used to stage dangerous and/or mixed waste that will be ran through the HERTR and Super HENC, however, this area does not have built-in engineered containment. The general layout including overall dimensions of this area is shown in Drawing H-2-836722, *HERTR and Super HENC Outdoor Storage Area* (See Attachment 1). Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of drum pallets that can be stored are determined.

3.0 INPUTS

1. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

2. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

From Drawing H-2-836722, the overall area of the HERTR and Super HENC Outdoor Storage Area is an uncovered, irregular shaped area encompassing concrete and asphalt pads. Storage is assumed to be within an area that is approximately 18.8 meters (61.7 ft) by 23.1 meters (75.8 ft). Using the criteria indentified in the Design Inputs, a total of 119 2X2 drum arrays can be placed in the HERTR and Super HENC Outdoor Storage Area as shown in Figure 6-1.

Since the pallets can be stacked two high, the total storage volume of the HERTR and Super HENC Outdoor Storage Area is as follows:

119 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 952 total drums

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1 drum = 208-liters (55 gallons), therefore,

952 total drums x 208-liters = ~198,000 liters

Or, since 1 liter = 0.001 m^3 198,000 liters x 0.001 m^3/liter = **198.0 m^3**

And, since 1 m^3 = 35.31 ft^3 198.0 m^3 x 35.31 ft^3/m^3 = 6,991 ft^3

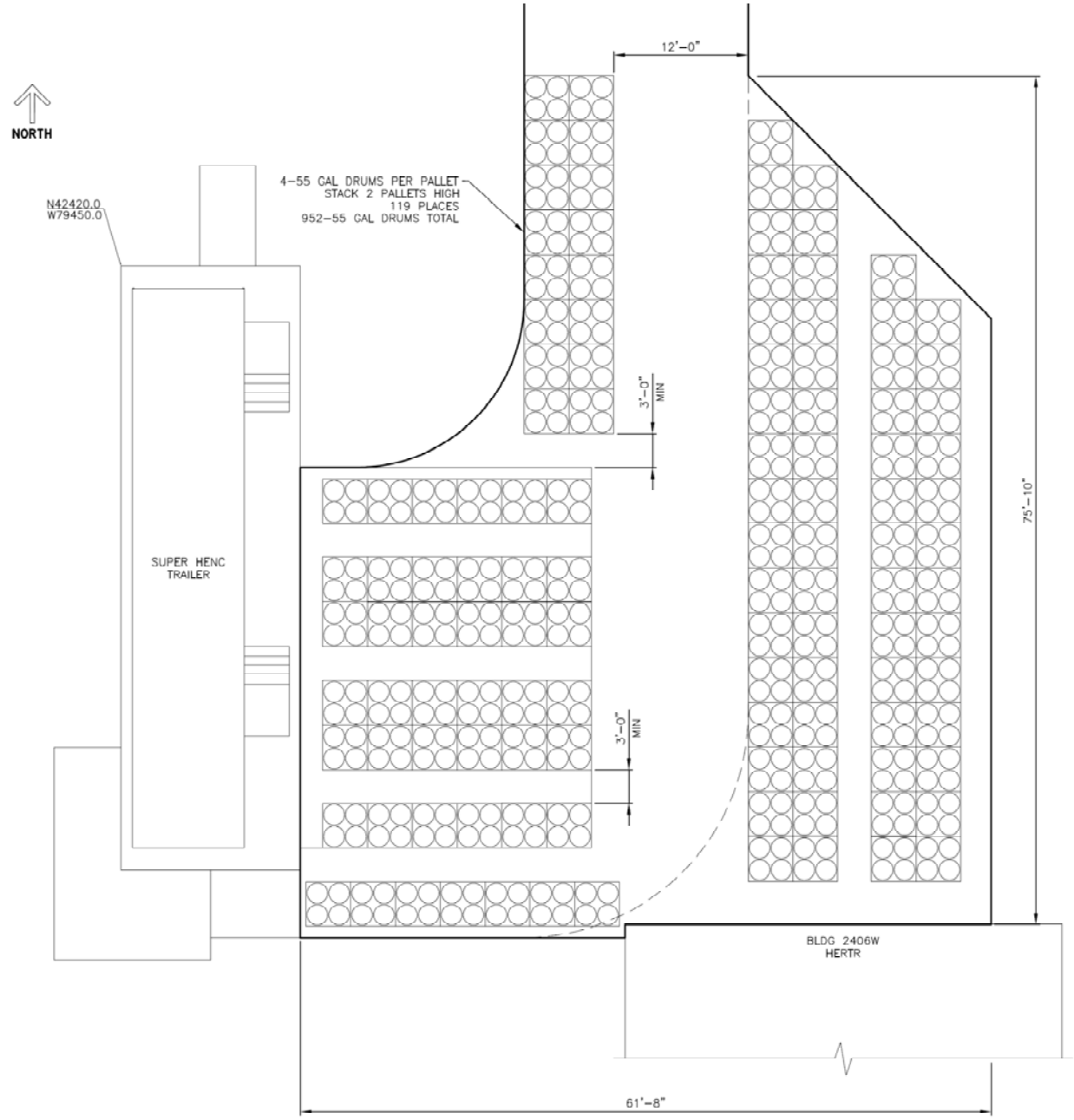

Figure 6-1. HERTR and Super HENC Waste Outdoor Storage Area Drum Array

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Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

7.0 RESULTS AND CONCLUSIONS

Based on the drum array shown in Figure 6-1, the waste storage design capacity for the HERTR and Super HENC Outdoor Storage Area is as summarized in Table 7-1.

Table 7-1. Summary of Maximum Storage Capacity for HERTR and Super HENC Waste Outdoor Storage Area

Structure/Area	Maximum Waste Storage Capacity m^3 (liters)
HERTR, Super HENC Waste Outdoor Storage Area	198.0 m^3 (198,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836722, Revision 1, *HERTR and Super HENC Outdoor Storage Area*.

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ATTACHMENT 1

HERTR AND SUPER HENC WASTE OUTDOOR STORAGE AREA DRAWING

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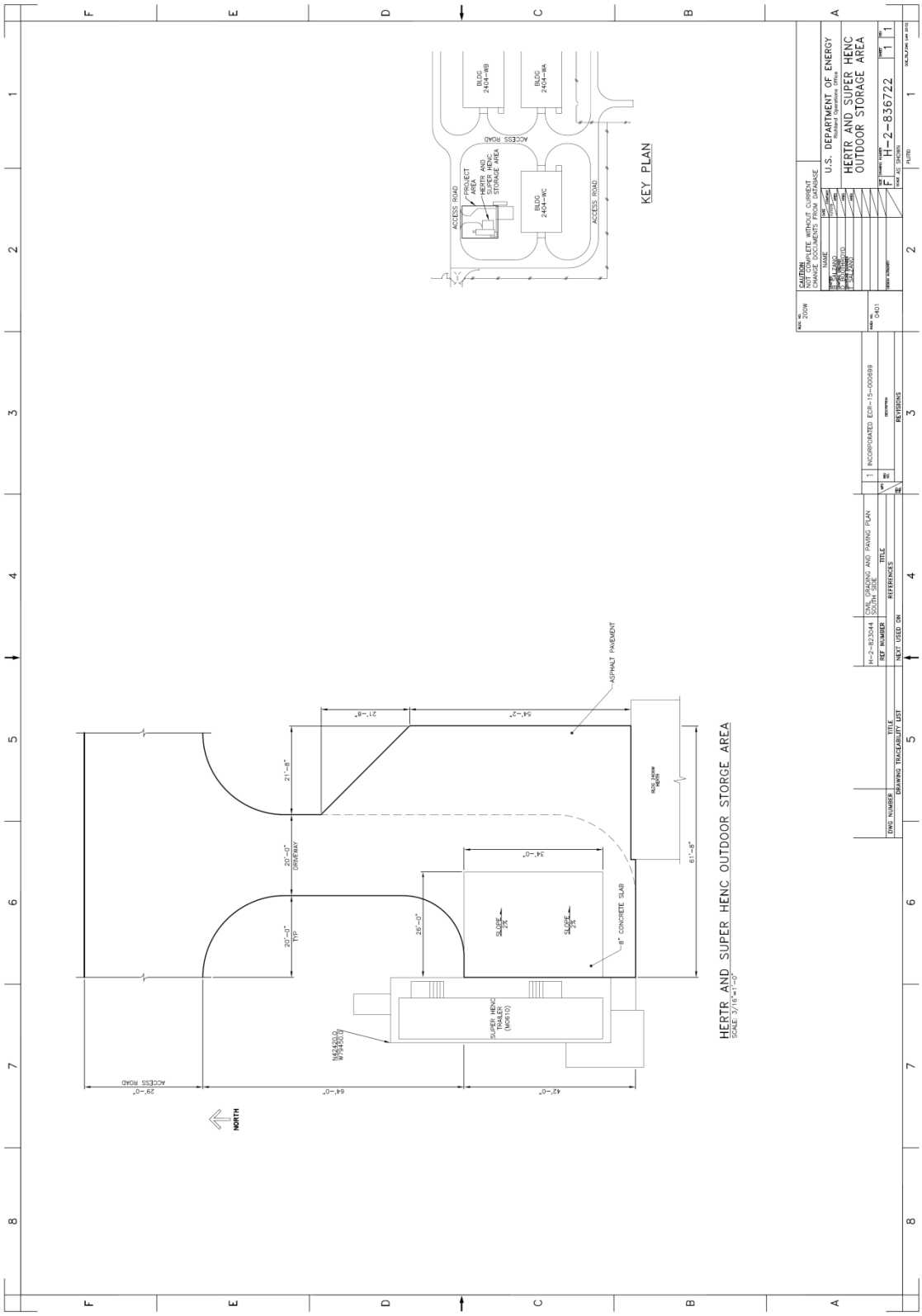

T Plant
Operating Unit Group

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b. Calculation ECF-200W-15-0030, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2706-T Building.*

c. Calculation ECF-200W-15-0031, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 2706-TA Building.*

d. Calculation ECF-200W-15-0032, Revision 0, *Maximum Storage Capacity for 2706-T Yard and Asphalt Pad.*

e. Calculation ECF-200W-15-0033, Revision 0, *Maximum Storage Capacity for 243-T Covered Storage Pad.*

f. Calculation ECF-200W-15-0034, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 214-T Building.*

g. Calculation ECF-200W-15-0035, Revision 0, *Secondary Containment and Maximum Storage Capacity for the 211-T Cage.*

T Plant Complex

Facility Description and General Provisions

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1. Facility Description and General Provisions

This attachment briefly describes the general provisions and information identified in Ecology Publication 95-402, *Dangerous Waste Permit Application Requirements*, Section B, Facility Description and General Provisions, for the T Plant Complex Operating Unit Group (OUG), hereinafter referred to as T Plant. Topics discussed include the following:

- General Facility Description
- Location, Ownership, and Management
- Dangerous Waste Categories Managed
- Traffic Information
- Seismic Consideration
- Topography

1.1. General Facility Description

This section provides a general description of the layout, history and function of the Hanford Site, the Hanford Facility, and T Plant.

1.1.1. Hanford Site

The Hanford Site covers approximately 1,450 km^2 (900 mi^2) of semiarid land that is owned by the U.S. Government, and is managed and operated by the U.S. Department of Energy, Richland Operations Office (DOE-RL). The city of Richland adjoins the southeastern most portion of the Hanford Site boundary and is the nearest population center.

In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for plutonium production for national defense. For over 20 years, activities were primarily dedicated to the continuation of plutonium production and managing the waste generated. In later years, activities became increasingly diverse, involving research and development for advanced reactors and renewable energy technologies. The end of the Cold War brought the shutdown of most of the Hanford Site's plutonium production and management facilities. Current missions are to safely clean up and manage the legacy waste on the Hanford Site, and to develop and deploy science and technology.

The Hanford Site is divided into numerically designated areas as shown in T Plant Addendum C, “Process Information” (Appendix C-A, “Topographic Map, Overall Facility Map of the Hanford Site”), located in DOE/RL-2015-74, *Hanford Facility Dangerous Waste Part B Permit Application; Low-Level Burial Grounds Trenches 31-34-94, T Plant Complex, and Central Waste Complex-Waste Receiving and Processing Facility*. These areas served as the location for reactor, chemical separation, and related activities for the production and purification of special nuclear materials and other nuclear activities. The reactors are located along the Columbia River in the l00 Areas. The reactor fuel reprocessing units are in the 200 Areas, which are on a plateau approximately 11 km (6.8 mi) from the Columbia River. The 300 Area, located adjacent to and north of Richland, contains the reactor fuel manufacturing plants, the research and development laboratories, and the Environmental and Molecular Sciences Laboratory. The 400 Area, 8 km (5 mi) northwest of the 300 Area, contains the Fast Flux Test Facility designed for testing liquid metal reactor systems. The 600 Area covers all locations not specifically given an area designation. Adjacent to and north of Richland, the 1100 Area contains offices associated with administration, maintenance, transportation, and materials procurement and distribution. Offices also are located in the 700 Area, which is in down town Richland.

1.1.2. Hanford Facility

The Hanford Facility consists of the contiguous portion of the Hanford Site that contains treatment, storage and disposal (TSD) units and for the purposes of RCRA, excludes lands north and east of the Columbia River, river islands, lands under the exclusive jurisdiction or control by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and lands owned by or leased to Washington State. The Hanford Facility RCRA permit operating boundary is shown in the overall facility map (DOE/RL-2015-74).

1.1.3. T Plant Operating Unit Group Description

T Plant is located in the 200 West Area of the Hanford Facility and is comprised of the dangerous waste management units (DWMU) listed below. Detailed information describing storage operations, waste management activities, treatment processes and land disposal operations are described in the process information located in Addendum C (DOE/RL-2015-74).

List of Dangerous Waste Management Units

- 221-T Head End DWMU
- 221-T Operations Gallery Storage DWMU
- 221-T BY Storage Area DWMU
- 2706-T Yard (Including HS-030 and HS-032 Storage Modules) DWMU
- 2706-T Outdoor Storage Area DWMU
- 2706-TA Outdoor Storage Area DWMU
- 2706-T Asphalt Pad DWMU
- 243-T Covered Storage Pad DWMU
- 211-T Cage DWMU
- 221-T Canyon Deck DWMU
- 221-T Cells (7L, 13R, 16R, and 17R) DWMU
- 221-T Railroad Tunnel DWMU
- 2706-T Building DWMU
- 2706-TA Building DWMU
- 214-T Building DWMU

1.2. Location, Ownership, and Management

The Hanford Facility is owned by the U.S. Government, and is managed and operated by DOE-RL and its contractor CH2M HILL Plateau Remediation Company. Contact information is as follows:

U.S. Department of Energy, Richland Operations Office
P.O. Box 550
Richland, WA 99352
(509) 372-2400

CH2M HILL Plateau Remediation Company
P.O. Box 1600
Richland, WA 99352
(509) 376-0556

1.3. Dangerous Waste Categories Managed

T Plant manages listed hazardous waste, characteristic hazardous waste, state only dangerous waste in accordance with the *Resource Conservation and Recovery Act of 1976* (RCRA) or WAC 173-303, “Dangerous Waste Regulations,” as well as, nondangerous low-level radioactive waste managed in

accordance with the *Atomic Energy Act of 1954* (AEA). For a comprehensive list of RCRA waste managed, including classification and estimated annual quantities, refer to T Plant Addendum A, “Part A” located in DOE/RL-2015-74.

Other Hanford Site processes or activities regulated under Ecology's Dangerous Waste Regulations include recycling (e.g., WAC 173-303-017, “Recycling processes involving solid waste,” WAC 173-303-120, “Recycled, reclaimed, and recovered wastes,” and WAC 173-303-500, “Recycling requirements for state-only dangerous waste”), generator activities [e.g., WAC 173-303-170, “Requirements for generators of dangerous waste”), treatment-by-generator (WAC 173-303-170(3)(b))], transport (e.g., WAC 173-303-240, “Requirements for transporters of dangerous waste”), permits by rule (e.g., WAC 173-303-802, “Permits by rule”), and research, development, and demonstration permits (WAC 173-303-809, “Research, development and demonstration permits”).

1.4. Traffic information

The regional public highway network traversing the Hanford Site (Washington State Highways 24 and 240), nonrestricted access roadways (Route 10, and portions of Route 4S located south of the Wye Barricade), and restricted access roadways are shown in the overall facility map (DOE/RL-2015-74). Roadways east of the Yakima Barricade and north of the Wye Barricade, and within the 300 and 400 Areas, are restricted to authorized personnel only. Other U.S. Department of Energy roadways are subject to such restrictions or closure as the U.S. Department of Energy might require.

1.4.1. Hanford Site Roadways

Major roads located within the Hanford Site are classified as either primary or secondary routes. Primary routes include Routes 4S, 10, 2S, 3, 6, and 11A, as well as various avenues within each area. Primary routes are constructed of bituminous asphalt with an underlying aggregate base in accordance with U.S. Department of Transportation requirements. The bituminous asphalt measures approximately 5 cm (2 in.) thick, however, the asphalt layer thickness will vary with each road.

Secondary routes are constructed of layers of an oil and rock mixture, with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found onsite. The present load-bearing capacities of these roads are unknown; however, loads as large as 9.8 kg/cm^2 (140 lb/in.^{2}) have been transported without observable damage to road surfaces. All roads were originally constructed to meet the requirements for the American Association of State Highway and Transportation Officials HS-20-44 load rating (AASHTO 1983). An HS-20-44 loading represents a two-axle tractor [front axle loading of approximately 3,630 kg (8,000 lbs) and rear axle loading of 14,500 kg (31,900 lbs)], plus a single-axle trailer with a 14,500 kg (31,900 lbs)- axle loading.

1.4.2. Traffic Control Signs, Signals, and Procedures

Standard traffic control signs are used throughout the Hanford Site (e.g., octagonal stop signs, triangular yield signs). Speed limits are posted throughout the Hanford Site, and the maximum posted speed is 97 kph (60 mph) on major thoroughfares. For minor thoroughfares areas, posted speeds are reduced to a maximum of 56 kph (35 mph) and held to speeds as low as 24 kph (15 mph).

1.5. Seismic Consideration

The Hanford Facility is located in Zone 2B as identified in the Uniform Building Code (ICBO 1991). No active faults, or evidence of a fault that has had displacement during Holocene times have been found on the Hanford Facility (DOE/RW-0164). The youngest faults recognized on the Hanford Facility occur on Gable Mountain, approximately 1.6 km (1.0 mi) north of the 200 East Area, and 7.2 km (4.5 mi) northeast of the 200 West Area. These faults are of Quatemary age and are considered 'capable' by the U.S. Nuclear Regulatory Commission (NUREG-0892).

1.6. Topographic Map

This section addresses the general topographic map requirements for the Hanford Facility and T Plant including information on prevailing wind directions and floodplain area.
Hanford Facility
The overall facility map (DOE/RL-2015-74) illustrates the Hanford Site and includes the following:

- Hanford Site legal boundary (for area shown)
- Hanford Facility operating boundary
- Sufficient contours to show surface water flow
- Major access roads (i.e., state highways, regional and Hanford Site roads)
- Longitudes and latitudes
- DOE operating areas
- Rivers, lakes, perennial streams, intermittent streams, ditches
- FEMA 100 year and 500 year flood zones (probable maximum flood for Colombia and Yakima Rivers, and Cold Creek)
- Hanford Site waste management units and water supplies
- Surrounding land use.

1.6.1. Operating Unit Group

The T Plant general topographic map is located in Addendum A (DOE/RL-2015-74). The map shows a distance of at least 305 m (1000 ft) around the OUG, and is drawn at a scale of 1 in. equaling no more than 200 ft (1:200). In addition, the following information is included:

- Map scale
- Date
- Prevailing wind direction
- A north arrow
- Surrounding land use
- Locations of DWMUs
- TSD operating unit group boundary
- DOE operating areas
- DWMU (operating, closing, buildings)
- Structures, concrete, major and service roads
- Access control (e.g., railroads and fences)
- Injection and withdrawal wells (if applicable)
- Other buildings.

1.6.2. Prevailing Wind Directions

Prevailing wind directions in the 200 East and 200 West Areas (located approximately in the center of the Hanford Site) are from the northwest in all months of the year. Secondary maxima occur for southwesterly winds.

Monthly average wind speeds are lowest during the winter months, averaging 9.7 to 11.3 kph (6 to7 mph), and highest during the summer, averaging 14.5 to 16.1 kph (9 to 10 mph). Wind speeds that are well above average usually are associated with southwesterly winds. However, the summertime drainage winds generally are northwesterly and frequently reach 50 kph (31 mph). Estimates of wind extremes have been summarized (PNL-4622). Information on the likelihood and frequency of strong winds and tornados in the region have been summarized in a final environmental impact statement (DOE/EIS-0113), the Hanford Meteorological Station climatological summary (PNL-4622), and reports from the National Severe Storms Forecast Center.

1.6.3. Floodplain Area

Three sources of potential flooding of the Hanford Facility are considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Facility. No perennial streams occur in the central part of the Hanford Facility. The only other potential source of flooding of the Hanford Facility is run-off from a large precipitation event in the Cold Creek watershed. This event could result in flooding of the ephemeral Cold Creek.

References

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PNL-4622, 1983, *Climatological Summary for the Hanford Area*, Pacific Northwest Laboratory, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D195059530.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq. Available at: http://www.epa.gov/epawaste/inforesources/online/index.htm.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303.

303-017, "Recycling Processes Involving Solid Waste."

303-120, "Recycled, Reclaimed, and Recovered Wastes."

303-170, "Requirements for Generators of Dangerous Waste."

303-240, "Requirements for Transporters of Dangerous Waste."

303-500, "Recycling Requirements for State-Only Dangerous Waste."

303-802, "Permits by Rule."

303-809, “Research, Development and Demonstration Permits.”

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T Plant Complex
Regulatory Crosswalk

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T Plant Complex Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-803(3) Contents of Part A of the permit application		
(3) Part A of the final facility permit application must include the following information:		
(a) The activities conducted by the applicant that require it to obtain a permit under the Hazardous Waste Management Act;	Section A1. Complete and Submit the Part A Form	Part A Form Section XI., Attachment A, Nature of Business.
(b) Name, mailing address, and location, including latitude and longitude of the facility for which the application is submitted;		Part A Form Section IV. (Per Part A CAP) Part A Form Section XV., Attachment C (Topo Map for Long/Lat.)
(c) Up to four NAICS codes that best reflect the principal products or services provided by the facility;		Part A Form Section IX.
(d) The operator's name, address, telephone number, ownership status, and status as federal, state, private, public, or other entity;		Part A Form Section VII.
(e) The name, address, and phone number of the owner of the facility;		Part A Form Section VIII.
(f) Whether the facility is located on tribal lands;		NA
(g) An indication of whether the facility is new or existing and whether it is a first or revised application;		Part A Form Section IV (D.) Part A Form Section XI., Attachment A, Nature of Business
(h) For existing facilities:		
(i) A scale drawing of the facility showing the location of all past, present, and future treatment, storage, and disposal areas; and	Section A1. Complete and Submit the Part A Form	Part A Form Section XV., Attachment C (Topo Map) Addendum C, Process Information (Drawings)
(ii) Photographs of the facility clearly delineating all existing structures, existing treatment, storage, and disposal areas, and sites of future treatment, storage, and disposal areas;		Part A Form Section XVII., Attachment C
(i) A description of the processes to be used for treating, storing, and disposing of dangerous waste, and the design capacity of these items;		Part A Form Section XI., Attachment A, Nature of Business Part A Form Section XII., Attachment A, Nature of Business

T Plant Complex Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(j) A specification of the dangerous wastes listed or designated under WAC 173-303-070 to be treated, stored, or disposed of at the facility, an estimate of the quantity of those wastes to be treated, stored, or disposed annually, and a general description of the processes to be used for the wastes;		Part A Form Section XIV., Attachment B, Waste Codes
(k) A listing of all permits or construction approvals received or applied for under any of the following programs:		
(i) Hazardous waste management program;	Section A1. Complete and Submit the Part A Form	Part A Form Section X.
(ii) UIC program under the SWDA;		
(iii) NPDES program under the CWA;		
(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;		
(v) Nonattainment program under the Clean Air Act;		
(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;		
(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act;		
(viii) Dredge or fill permits under section 404 of the CWA;		
(ix) Other relevant environmental permits, including state permits;		
(l) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its dangerous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundary;		Part A Form Section XV., Attachment C, Photos
(m) A brief description of the nature of the business;		Part A Form Section XI., Attachment A, Nature of Business

T Plant Complex Part B Addendum A, Part A Form Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(n) For hazardous debris, a description of the debris category(ies) and contaminant category(ies) to be treated, stored, or disposed of at the facility.		Part A Form Section XII and XIII, Attachment A, Nature of Business

T Plant Complex Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-110 Sampling, testing methods, and analytes		
(2) Representative samples.		
(a) The methods and equipment used for obtaining representative samples of a waste will vary with the type and form of the waste. The department will consider samples collected using the sampling methods below or the most recent version of such methods for wastes with properties similar to the indicated materials, to be representative samples of the wastes:	C4.6. Sampling and analysis methodologies	Section B2.1 – Identification and Classification of Waste. Section B3.1 – Confirmation Section B4 – T Plant Generated Waste Table B-2. Waste Requiring Verification or Characterization Analysis. Section B5.1 – Sampling Methods and Equipment Table B-3. T Plant Sampling Equipment
(i) Crushed or powdered material - ASTM Standard D346-04e1;		
(ii) Extremely viscous liquid - ASTM Standard D140-01 (2007);		
(iii) Fly ash-like material - ASTM Standard D2234/D2234M-03e1;		
(iv) Soil-like material - ASTM Standard D1452-80 (2000);		
(v) Soil or rock-like material - ASTM Standard D420-98 (2003);		
(vi) Containerized liquid wastes - "COLIWASA" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a), or the equivalent representative sampling method described in ASTM D5743-97 (2003). Per this method, the selection of an appropriate device must be best suited for the characteristics of the waste being sampled; and		
(vii) Liquid waste in pits, ponds, lagoons, and similar reservoirs - "Pond Sampler" described in SW-846, as incorporated by reference at WAC 173-303-110 (3)(a).		
(5) Equivalent testing methods. Any person may request department approval for the use of an equivalent testing method by submitting a petition, prepared in accordance with WAC 173-303-910(2), to the department.	NA – T Plant is utilizing SW-846 or ASTM methods.	

T Plant Complex Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(6) Reporting analytical results. Ecology requires that all test methods report their analytical results for solid and soil samples on a dry weight basis. Reporting on a dry weight basis compensates for variability in water content and provides a consistent procedure for all analytical results provided to ecology for designation purposes.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Table B-2 Waste Requiring Verification or Characterization Analysis
WAC 173-303-140 Land disposal restrictions		
Subpart A - General	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1.1 Verification of Waste from Non-SWOC Onsite or Offsite Generators Section B3.1.1.2 Verification of Waste from Other Hanford SWOC TSD Units Section B3.1.2 Preshipment Review Section B3.2.1 Container Receipt Inspection Section B4 T Plant Generated Waste
Subpart D – Treatment standards		
WAC 173-303-300 General waste analysis		
(1) Purpose. This section requires the facility owner or operator to confirm his knowledge about a dangerous waste before he stores, treats, or disposes of it. The purpose for the analysis is to insure that a dangerous waste is managed properly.	C4.1.1 Confirming/reconfirming waste stream profiles C4.4 Process analyses C4.5 Waste generated on site	Section B2 Waste Pre-acceptance Processes Section B3 Waste Acceptance Process Section B4 T Plant Generated Waste Section B5 Waste Analysis Parameters

T Plant Complex Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(2) The owner or operator must obtain a detailed chemical, physical, and/or biological analysis of a dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), before they store, treat, or dispose of it. This analysis must contain the information necessary to manage the waste in accordance with the requirements of this chapter. The analysis must include or consist of existing published or documented data on the dangerous waste, or on waste generated from similar processes, or data obtained by testing, or a combination of these.		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 T Plant Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(a) When an owner or operator relies on knowledge from the generator for waste designation or for this detailed analysis (commonly known as a waste profile) instead of analytical testing of a sample, that information must be documented and must meet the definition of "knowledge" as defined in WAC 173-303-040. To confirm the sufficiency and reliability of the "knowledge" used for the waste profile, the facility must do one or more of the following:		Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval
(i) Be familiar with the generator's processes by conducting site visits, and reviewing sampling data and other information provided by the generator to ensure they are adequate for safe management of the waste;		
(ii) Ensure waste analysis contained in documented studies on the generator's waste is based on representative and appropriate sampling and test methods;		
(iii) Compare the generator's waste generating process to documented studies of similar waste generating processes to ensure the waste profile is accurate and current;		
(iv) Obtain other information as predetermined by the department on a case-by-case basis to be equivalent.		

T Plant Complex Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(b) As required in WAC 173-303-380 (1)(c), records must be retained containing specific information that show compliance with this subsection for sufficient and reliable information on the waste whether the owner or operator relies on analytical testing of the waste or knowledge from the generator, or a combination of these.	C4.9 Recordkeeping	Section B7 Recordkeeping
(3) The owner or operator of an off-site facility must confirm, by analysis if necessary, that each dangerous waste received at the facility matches the identity of the waste specified on the accompanying manifest or shipping paper.	C4.2 Incoming waste procedures C4.2.2 Waste stream verification analyses	Section B3.1.1 Verification
(4) Analysis must be repeated as necessary to ensure that it is accurate and current. At a minimum, analysis must be repeated:	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Appendix B-A, Section B-A1 Initial Waste Profile Review
(a) When the owner or operator has been notified, or has reason to believe, that the process or operation generating the dangerous waste, or nondangerous wastes if applicable under WAC 173-303-610 (4)(d), has significantly changed; and		Section B2.2.2 Standing Waste Profile Review
(b) When a dangerous waste received at an off-site facility does not match the identity of the waste specified on the manifest or the shipping paper.		Section B2.2.2 Standing Waste Profile Review
(5) Waste analysis plan. The owner or operator must develop and follow a written waste analysis plan which describes the procedures he will use to comply with the waste analysis requirements of subsections (1), (2), (3), and (4) of this section. He must keep this plan at the facility, and the plan must contain at least:	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B4. T Plant Generated Waste Table B-2 Section B5 Waste Analysis Parameters
(a) The parameters for which each dangerous waste, or nondangerous waste if applicable under WAC 173-303-610 (4)(d), will be analyzed, and the rationale for selecting these parameters (i.e., how analysis for these parameters will provide sufficient information on the waste's properties to comply with subsections (1) through (4) of this section);		
(b) The methods of obtaining or testing for these parameters;		

T Plant Complex Part B Addendum B, Waste Analysis Plan Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(c) The methods for obtaining representative samples of wastes for analysis (representative sampling methods are discussed in WAC 173-303-110(2));		
(d) The frequency with which analysis of a waste will be reviewed or repeated to ensure that the analysis is accurate and current;	C4.1.1 Confirming/reconfirming waste stream profiles	Section B3.1.1 Verification Section B6.1 Waste Receipt Quality Assurance
(e) The waste analyses which generators have agreed to supply;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval

(f) Where applicable, the methods for meeting the additional waste analysis requirements for specific waste management methods as specified in WAC 173-303-400(3) which incorporates by reference the regulations in 40 C.F.R. Part 265 Subparts F through R, 265.1034, 265.1063(d), 265.1084, 268.4(a) and 268.7 for interim status facilities and in WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, and 40 C.F.R. 264.1034, 264.1063(d), 264.1083, 268.4(a) and 268.7 for final status facilities. Note that data provided from laboratory analyses for WAC 173-303-400(3) which incorporates by reference 40 C.F.R. Part 265 Subparts F through R, WAC 173-303-140 (4)(b), 173-303-395(1), 173-303-630 through 173-303-670, 40 C.F.R. 268.4(a) and 268.7 must meet the requirements of WAC 173-303-110;	C4.6 Sampling and analyses methodologies	WAC 173-303-140(4)(b) – Disposal of liquid waste – NA Do not dispose of liquid wastes. WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible waste – NA Not accepted. WAC 173-303-630 – Use and management of containers (Process Information) WAC 173-303-640 – Tank systems – NA No tank systems. WAC 173-303-645 – Releases from regulated units - NA WAC 173-303-646 – Corrective action WAC 173-303-650 – Surface Impoundments – NA No surface impoundments WAC 173-303-655 – Land treatment – NA No land treatment WAC 173-303-670 – Incinerators – NA No incinerators 40 C.F.R. 264.1034 – Subpart AA – Air emission standards for process vents, Test methods and procedures – NA No process vents 40 C.F.R. 264.1063(d) – Air emission standards for equipment leaks, Test methods and procedures – NA No equipment 40 C.F.R. 264.1083 – Air emission standards for tanks, surface impoundments, and containers, Waste determination procedures (Only containers are applicable) NA – waste is placed in a waste storage and/or treatment areas that employ air emission controls

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
		that are in compliance with the Subpart CC standards. (Process Information) 40 C.F.R. 268.4(a) Treatment surface impoundment exemption. NA No surface impoundment 40 C.F.R. 268.7 – Testing, tracking, and recordkeeping requirements for generators, treaters, and disposal facilities. – Section B7 Recordkeeping
(g) For off-site facilities, the waste analysis that dangerous waste generators have agreed to supply;	C4.2.2 Waste stream verification analyses	Section B2.2.1 New Waste Profile Review and Approval
(h) For surface impoundments exempted from land disposal restrictions under 40 C.F.R. 268.4(a), incorporated by reference in WAC 173-303-140(2), the procedures and schedules for:	NA – T Plant does not have surface impoundments	
(i) For owners and operators seeking an exemption to the air emission standards of subpart CC in accordance with Sec. 264.1082, incorporated by reference at WAC 173-303-692, or with 265.1083, incorporated by reference at WAC 173-303-400 (3)(a):	NA – T Plant is not seeking an exemption from Subpart CC.	
(6) For off-site facilities, the waste analysis plan required in subsection (5) of this section must also specify the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan must describe:	C4.2.2 Waste stream verification analyses C4.8 Waste tracking	Section B3 Waste Acceptance Process
(a) The procedures which will be used to determine the identity of each movement of waste managed at the facility;		Section 3.1.2 Preshipment Review Section 3.2.1 Container Receipt Inspection

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(b) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling; and		Section 3.1.1 Verification Table B-2 Waste Requiring Verification or Characterization Analysis Table B-3 T Plant Sampling Equipment
(c) The procedures that the owner or operator of an off-site landfill receiving containerized hazardous waste will use to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container.		Section 3.1.1 Verification
WAC 173-303-350 Contingency plan and emergency procedures - (3)(b)		
(3) The contingency plan must contain the following:		
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4. Addressing Conformance Issues
WAC 173-303-370 Manifest System		
(1) Applicability. The requirements of this section apply to owners and operators of permitted treatment, storage, and disposal facilities and of dangerous waste recycling facilities operating under the requirements of this chapter who receive dangerous waste from off-site sources. If a facility receives dangerous waste accompanied by a manifest, the owner, operator, or his/her agent must sign and date the manifest as indicated in subsection (2) of this section to certify that the dangerous waste covered by the manifest was received, that the dangerous waste was received except as noted in the discrepancy space of the manifest, or that the dangerous waste was rejected as noted in the manifest discrepancy space.		
(2) If a facility receives dangerous waste shipment accompanied by a manifest, the owner, operator, or their agent, must:	C4.2 Incoming waste procedures C4.2.1 Manifest reviews and procedures C4.3 Discrepancy resolution	Section B3.2.1 Container Receipt Inspection
(a) Sign and date, by hand, each copy of the manifest;		
(b) Note any discrepancies (as defined in subsection (5)(a) of this section) on each copy of the manifest;		
(c) Immediately give the transporter at least one copy of the manifest;		

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(d) Within thirty days of delivery, send a copy of the manifest to the generator; and		
(e) Retain at the facility a copy of each manifest for at least three years from the date of delivery.		
(3) If a facility receives hazardous waste imported from a foreign source, the receiving facility must mail a copy of the manifest and documentation confirming EPA's consent to the import of hazardous waste to the following address within thirty days of delivery: Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460.	NA – T Plant does not receive waste from foreign sources.	
(4) If a facility receives, from a rail or water (bulk shipment) transporter, dangerous waste which is accompanied by a manifest or shipping paper containing all the information required on the manifest (excluding the EPA/state identification numbers, generator's certification, and signatures), the owner or operator, or his or her agent, must:	C4.2.2. Waste stream verification analyses	Section B3.2.1 Container Receipt Inspection
(a) Sign and date each copy of the manifest or shipping paper to certify that the dangerous waste covered by the manifest or shipping paper was received;		
(b) Note any significant discrepancies in the manifest or shipping paper, as described in subsection (5) of this section, on each copy of the manifest or shipping paper;		
(c) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper;		
(d) Within thirty days after the delivery, send a copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within thirty days after delivery) to the generator; and		
(e) Retain at the facility a copy of each shipping paper and manifest for at least three years from the date of delivery.		
(5) Manifest discrepancies.		

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(a) Manifest discrepancies are:		
(i) Significant differences (as defined in (b) of this subsection) between the quantity or type of dangerous waste designated on the manifest or shipping paper, and the quantity and type of dangerous waste a facility actually receives;	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(ii) Rejected wastes, which may be a full or partial shipment of dangerous waste that the TSDF cannot accept; or		
(iii) Container residues, which are residues that exceed the quantity limits for "empty" containers set forth in WAC 173-303-160(2).		NA – T Plant does not receive shipments of empty containers.
(b) Significant differences in quantity are: For bulk waste, variations greater than ten percent in weight (for example, tanker trucks, railroad tank cars, etc.); for batch waste, any variations in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.	C4.3 Discrepancy resolution	Section 3.2.2 Waste Receipt Discrepancies
(c) Upon discovering a significant difference in quantity or type, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter. If the discrepancy is not resolved within fifteen days after receiving the waste, the owner or operator must immediately submit to the department a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.	C4.3 Discrepancy resolution	

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(d)(i) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2), the facility must consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the facility may return the rejected waste or residue to the generator. The facility must send the waste to the alternative facility or to the generator within sixty days of the rejection or the container residue identification.	NA – T Plant does not ship waste to an alternate facility, waste is returned to generator.	
(ii) While the facility is making arrangements for forwarding rejected wastes or residues to another facility under this section, it must ensure that either the delivering transporter retains custody of the waste, or the facility must provide for secure, temporary custody of the waste, pending delivery of the waste to the first transporter designated on the manifest prepared under (e) or (f) of this subsection.		
(e) Except as provided in (e)(vii) of this section, for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	NA – T Plant does not ship waste to an alternate facility, waste is returned to generator.	
(f) Except as provided in (f)(vii) of this subsection, for rejected wastes and residues that must be sent back to the generator, the facility is required to prepare a new manifest in accordance with WAC 173-303-180 and the following instructions:	C4.3. Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(i) Write the facility's U.S. EPA ID number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.		

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(ii) Write the name of the initial generator and the generator's U.S. EPA ID number in the designated facility block (Item 8) of the new manifest.		
(iii) Copy the manifest tracking number found in Item 4 of the old manifest to the special handling and additional information block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.		
(iv) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the discrepancy block of the old manifest (Item 18a).		
(v) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.		
(vi) Sign the generator's/offeror's certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation.		
(vii) For full load rejections that are made while the transporter remains at the facility, the facility may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the alternate facility space. The facility must retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with (f)(i), (ii), (iii), (iv), (v), (vi), and (viii) of this subsection.		
(viii) For full or partial load rejections and container residues contained in nonempty containers that are returned to the generator, the facility must also comply with the exception reporting requirements in WAC 173-303-220(2).		

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(g) If a facility rejects a waste or identifies a container residue that exceeds the quantity limits for "empty" containers set forth in WAC 173-303-160(2) after it has signed, dated, and returned a copy of the manifest to the delivering transporter or to the generator, the facility must amend its copy of the manifest to indicate the rejected wastes or residues in the discrepancy space of the amended manifest. The facility must also copy the manifest tracking number from Item 4 of the new manifest to the discrepancy space of the amended manifest, and must re-sign and date the manifest to certify to the information as amended. The facility must retain the amended manifest for at least three years from the date of amendment, and must within thirty days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies
(6) Reasons for not accepting dangerous waste shipments. The owner or operator may decide that a dangerous shipment should not be accepted by his facility.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(a) The following are acceptable reasons for denying receipt of a dangerous waste shipment:		
(i) The facility is not capable of properly managing the type(s) of dangerous waste in the shipment;		
(ii) There is a significant discrepancy (as described in subsection (5) of this section) between the shipment and the wastes listed on the manifest or shipping paper; or		
(iii) The shipment has arrived in a condition which the owner or operator believes would present an unreasonable hazard to facility operations, or to facility personnel handling the dangerous waste(s) (including, but not limited to, leaking or damaged containers, and improperly labeled containers).		

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(b) The owner or operator may send the shipment on to the alternate facility designated on the manifest or shipping paper, or contact the generator to identify another facility capable of handling the waste and provide for its delivery to that other facility, unless, the containers are damaged to such an extent, or the dangerous waste is in such a condition as to present a hazard to the public health or the environment in the process of further transportation.	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Appendix B-A, Section B-A4 Addressing Conformance Issues
(c) If the dangerous waste shipment cannot leave the facility for the reasons described in (b) of this subsection, then the owner or operator must take those actions described in the contingency plan, WAC 173-303-350 (3)(b).	C4.3 Discrepancy resolution	Section B3.2.2 Waste Receipt Discrepancies Addendum J, Contingency Plan
(7) Within three working days of the receipt of a shipment subject to 40 C.F.R. Part 262, subpart H (which is incorporated by reference at WAC 173-303-230(1)), the owner or operator of the facility must provide a copy of the movement document bearing all required signatures to the exporter, to the Office of Enforcement and Compliance Assurance, Office of Federal Activities, International Compliance Assurance Division (2254A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, D.C. 20460, and to competent authorities of all other concerned countries. The original copy of the movement document must be maintained at the facility for at least three years from the date of signature.	NA – T Plant does not import or export dangerous wastes destined for recovery operations in other countries.	
(8) A facility must determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated federally) as hazardous wastes under its state hazardous waste program. Facilities must also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.		NA
WAC 173-303-395 Other general requirements		
(1) Precautions for ignitable, reactive, or incompatible wastes.	C4.1 Waste pre-acceptance procedures – waste stream	Addendum F - Preparedness and Prevention

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(2) Compliance with other environmental protection laws and regulations. In receiving, storing, handling, treating, processing, or disposing of dangerous wastes, the owner/operator must design, maintain and operate his dangerous waste facility in compliance with all applicable federal, state and local laws and regulations (e.g., control of stormwater or sanitary water discharge, control of volatile air emissions, etc.).	characterization and profiling	Addendum C - Process Information
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:		Addendum C – Process Information
(5) Storage time limit for impoundments and piles.	NA – T Plant does not have impoundments or piles.	
(6) Labeling for containers and tanks.	No guidance section identified.	Addendum C - Process Information, Addendum I - Inspections
WAC 173-303-630 Use and management of containers - (7)(c) and (9)		
(7) Containment.		
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	No guidance section identified.	Addendum C - Process Information
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or	No guidance section identified.	
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.	No guidance section identified.	
(9) Special requirements for incompatible wastes.	No guidance section identified.	Addendum C – Process Information Addendum F – Preparedness & Prevention
WAC 173-303-640 Tank systems - (1)(b), 2(c), (3)(a), and (10)		
NA		

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WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-690 Air emission standards for process vents		
NA		
WAC 173-303-691 Air emission standards for equipment leaks		
NA		
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
NA		
WAC 173-303-806 Final facility permits - (4)(a)(ii) and (iii), 4(b)(ii) and (v), and 4(c)(x)		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		
(a) General requirements. (ii) Chemical, biological, and physical analyses of the dangerous waste and hazardous debris to be handled at the facility. At a minimum, these analyses must contain all the information which must be known to treat, store, or dispose of the wastes properly in accordance with WAC 173-303-600.	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling	Section B2.1 Identification and Classification of Waste Section B2.1.1 Use of Knowledge Section B2.2.1 New Waste Profile Review and Approval Section B4 T Plant Generated Waste Table B-2. Waste Requiring Verification and Characterization Analysis
(iii) A copy of the waste analysis plan required by WAC 173-303-300(5) and, if applicable WAC 173-303-300 (5)(g).	C. Waste Analyses	WAP will be included in the Part B Application and is currently available electronically.
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including: **(A)** Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and **(B)** A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;	C4.1 Waste pre-acceptance procedures – waste stream characterization and profiling C4.1.1 Confirming/reconfirming waste stream profiles	(A) Section B2.1 Identification and Classification of Waste Section B2.2.1 New Waste Profile Review and Approval Section B3.1.1 Verification B4 T Plant Generated Waste Tables B-1 and B-2 (B) Waste storage description is covered in Addendum C, Process Information.

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(v) Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with WAC 173-303-630 (9)(a) and (b), and 173-303-395 (1)(b) and (c); and	No guidance section identified.	Addendum C, Process Information Addendum F, Preparedness & Prevention
(c) Specific Part B information requirements for tanks. Except as otherwise provided in WAC 173-303-600(3), owners and operators of facilities that use tanks to store or treat dangerous waste must provide the following information:	NA – T Plant does not have any operating tank systems.	

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WAC 173-303-160 Containers		
(2) A container or inner liner is "empty" when:		
(a) All wastes in it have been taken out that can be removed using practices commonly employed to remove materials from that type of container or inner liner (for example, pouring, pumping, aspirating, etc.) and:	D2.1. Description of Containers	C2.2.1 Procedure for Handling
(i) No more than one inch of waste remains at the bottom of the container or inner liner; or		
(ii) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 119 gallons in size; or		
(iii) No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size. A container that held compressed gas is empty when the pressure inside the container equals or nearly equals atmospheric pressure; and		
(b) If the container or inner liner held acutely hazardous waste, as defined in WAC 173-303-040, toxic EHW as defined in WAC 173-303-100 or pesticides bearing the danger or warning label, the container or inner liner has been rinsed at least three times with an appropriate cleaner or solvent. The volume of cleaner or solvent used for each rinsing must be ten percent or more of the container's or inner liner's capacity or of sufficient quantity to thoroughly decontaminate the container. In lieu of rinsing for containers that might be damaged or made unusable by rinsing with liquids (for example, fiber or cardboard containers without inner liners), an empty container may be vacuum cleaned, struck, with the open end of the container up, three times (for example, on the ground, with a hammer or hand) to remove or loosen particles from the inner walls and corners, and vacuum cleaned again. Equipment used for the vacuum cleaning of residues from containers or inner liners		

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must be decontaminated before discarding, in accordance with procedures approved by the department. A container or inner liner is also considered "empty" if the container or inner liner has been cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generator, to achieve equivalent removal. Any rinsate or vacuumed residue that results from the cleaning of containers or inner liners must, whenever possible, be reused in a manner consistent with the original intended purpose of the substance in the container or inner liner. In the case of a farmer, if the rinsate is a pesticide residue then the rinsate must be managed or reused in a manner consistent with the application instructions on the pesticide label. On-site disposal or burial of pesticide residues is prohibited. Otherwise, the rinsate must be checked against the designation requirements (WAC 173-303-070 through 173-303-100) and, if designated, managed according to the requirements of this chapter.		
(c) In the case of a container, the inner liner, that prevented the container from contact with the commercial chemical product or manufacturing chemical, has been removed.		
WAC 173-303-190 Preparing dangerous waste for transport		
The generator must fulfill the following requirements before transporting off-site or offering for off-site transport any dangerous waste.	D2.3. Container Labeling	C2.1 Description of Containers
(1) Packaging. The generator must package all dangerous waste for transport in accordance with United States DOT regulations on packaging, 49 C.F.R. Parts 173, 178, and 179.		
(2) Labeling. The generator must label each package in accordance with United States DOT regulations, 49 C.F.R. Part 172.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(3) Marking. The generator must:		

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Section
(a) Mark each package of dangerous waste in accordance with the applicable United States DOT regulations on hazardous materials under 49 C.F.R. Part 172; and		
(b) Mark each container of one hundred nineteen gallons or less of dangerous waste used in such transportation with the following, or equivalent words and information in accordance with 49 C.F.R. 172.304. HAZARDOUS WASTE - State and federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, and the Washington state department of ecology or the United States Environmental Protection Agency. Generator's Name and Address Generator's EPA Identification Number Manifest Tracking Number		
WAC 173-303-340 Preparedness and prevention		
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Addendum F, *Preparedness and Prevention* Enclosure 5, Supporting Documentation
WAC 173-303-395 Other general requirements		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container Management Practices	Addendum F, *Preparedness and Prevention*
(a) Contain spills and leaks that might occur during loading or unloading;		

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(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;		
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and		
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.		
(6) Labeling for containers and tanks. The owner or operator must label containers and tanks in a manner which adequately identifies the major risk(s) associated with the contents for employees, emergency response personnel and the public (Note—If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320. For tanks, the label or sign must be legible at a distance of at least fifty feet. For containers, the owner or operator must affix labels upon transfer of dangerous waste from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
WAC 173-303-630 Use and management of containers		
(2) Condition of containers. If a container holding dangerous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the dangerous waste from the container to a container that is in good condition or manage the waste in some other way that complies with the requirements of chapter 173-303 WAC. In addition, the owner or operator must address leaks and spills in accordance with the applicable provisions of WAC 173-303-145 and 173-303-360.	D2.1. Description of Containers	C2.1 Description of Containers C2.1.1 Condition

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(3) Identification of containers. The owner or operator must label containers in a manner which adequately identifies the major risk(s) associated with the contents of the containers for employees, emergency response personnel and the public (note: If there is already a system in use that performs this function in accordance with local, state or federal regulations, then such system will be adequate). The owner or operator must affix labels upon transfer of dangerous wastes from one container to another. The owner or operator must destroy or otherwise remove labels from the emptied container, unless the container will continue to be used for storing dangerous waste at the facility. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	D2.3. Container Labeling	C2.1.2 Identification and Labeling C2.2 Managing Containers
(4) Compatibility of waste with containers. The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the dangerous waste to be stored, so that the ability of the container to contain the waste is not impaired.	D2.1. Description of Containers	C2.1.3 Waste Compatibility
(5) Management of Containers	D2.2. Container Management Practices	C2.2 Managing Containers
(a) A container holding dangerous waste must always be closed, except when it is necessary to add or remove waste.	D2.2. Container Management Practices	C2.2.1 Procedure for Handling
(b) A container holding dangerous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.	D2.2. Container Management Practices	C2.2 Managing Containers C2.2.1 Procedure for Handling C2.2.2 Container Handling Equipment
(c) A minimum thirty-inch separation is required between aisles of containers holding dangerous waste(s). A row of drums must be no more than two drums wide.	D2.2. Container Management Practices	C2.2.3 Aisle Spacing Enclosure 5, Supporting Documentation

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(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.	D2.2. Container Management Practices	C2.2.4 Inspections Addendum I, *Inspections*
(7) Containment. **(a)** Container storage areas must have a containment system that is capable of collecting and holding spills and leaks. In addition to the necessary leak containment capacity, uncovered storage areas must be capable of holding the additional volume that would result from the precipitation of a maximum twenty-five year storm of twenty-four hours duration. The containment system must:	D2.4.1. Secondary Containment System Design for Containers D2.4.2. System Design	C2.3 Secondary Containment Enclosure 5, Supporting Documentation
(i) Have a base underlying the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated rainfall until the collected material is detected and removed. The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;	D2.4.3. Structural Integrity of Base	C2.3.1 Base

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(ii) Be designed for positive drainage control (such as a locked drainage valve) to prevent release of contaminated liquids and so that uncontaminated precipitation can be drained promptly for convenience of operation. Spilled or leaked waste and accumulated precipitation must be removed from the containment system in as timely a manner as is necessary to prevent overflow; and	D2.4.3. Structural Integrity of Base D2.4.6. Removal of Liquids from Containment System	C2.3.2 Drainage Control C2.4 Removal Of Liquids from Containment System
(iii) Have sufficient capacity to contain ten percent of the volume of all containers or the volume of the largest container, whichever is greater. Only containers holding free liquids, or holding wastes designated as F020, F021, F022, F023, F026, or F027 need to be considered in this determination.	D2.4.4. Containment System Capacity	C2.3.3 Containment Capacity C2.3.3.1 DWMUs Managing Free Liquids C2.3.3.2 DWMUs Managing Ignitable and Reactive Waste C2.3.3.3 Capacity Calculations Table C-2 T Plant DWMU Capacities Enclosure 5, Supporting Documentation
(b) Run-on into the containment system must be prevented, unless the department waives this requirement in the permit after determining that the collection system has sufficient excess capacity in addition to that required in (a)(iii) of this subsection to accommodate any run-on which might enter the system.	D2.4.5. Control of Run-on	C2.3.4 Controlling Run-on and Runoff
(c) Storage areas that store containers holding only wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090 (5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027, need not have a containment system as described in this subsection: Provided, That:	D2.4.7. Demonstration that containment is not required because containers do not contain free liquids, wastes that exhibit ignitability or reactivity, or wastes designated F020 – 023, F026, or F027	C2.3 Secondary Containment
(i) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation; or		
(ii) The containers are elevated or are otherwise protected from contact with accumulated liquids.		

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(d) The department may require owners and operators to protect their containers from the elements by means of a building or other protective covering if the department determines that such protection is necessary to prevent a release of waste or waste constituents due to the nature of the waste or design of the container. The building or other protective covering must allow adequate inspection under subsection (6) of this section.	D2.4.2. System Design	Not Applicable
(8) Special requirements for ignitable or reactive waste.		
(a) Containers holding reactive waste exhibiting a characteristic specified in WAC 173-303-090 (7)(a)(vi), (vii) or (viii) must be stored in a manner equivalent to the International Fire Code's "*American Table of Distances for Storage of Explosives*" Table 3304.5.2(2) or "*Table of Separation Distances for Low Explosives*" Table 3304.5.2(3), 2003 edition, or the version adopted by the local fire district.	D2.5.1. Management of Certain Reactive Wastes in Containers	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) The owner or operator must design, operate, and maintain ignitable waste and reactive waste (other than a reactive waste which must meet (a) of this subsection) container storage in a manner equivalent with the International Fire Code. Where no specific standard or requirements are specified in the International Fire Code, or in existing state or local fire codes, applicable sections of the NFPA Pamphlet #30, "*Flammable and Combustible Liquids Code*," must be used. The owner/operator must also comply with the requirements of WAC 173-303-395 (1)(d).	D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers	C2.3.2 DWMUs Managing Ignitable and Reactive Wastes C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes Table C-2, T Plant DWMU Capacities *Notes*
(9) Special Requirements for Incompatible Wastes		
(a) Incompatible wastes, or incompatible wastes and materials must not be placed in the same container, unless WAC 173-303-395 (1)(b) is complied with.	D2.5.3. Design of Areas to Manage Incompatible Wastes	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes
(b) Dangerous waste must not be placed in an unwashed container that previously held an incompatible waste or material.		

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(c) A storage container holding a dangerous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device. Containment systems for incompatible wastes must be separate.		
(11) Air emission standards. The owner or operator must manage all hazardous waste placed in a container in accordance with the applicable requirements of 40 C.F.R. Subparts AA, BB, and CC, which are incorporated by reference at WAC 173-303-690 through 173-303-692.	D2.2. Container Management Practices	Refer to WAC 173-303-690, *Air emission standards for process vents* through WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
WAC 173-303-690 Air emission standards for process vents		
(1)(a) The regulations in this section apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes.	D4.1. Process Vents	C2.7 Air Emissions C2.7.1. Applicability of Subpart AA Standards <u>Note</u> T Plant does not have any process vents subject to 40 CFR 264 Subpart AA requirements.
(b) Except for 40 C.F.R. 264.1034 (d) and (e), this section applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 ppmw, if these operations are conducted in one of the following:		
(i) A unit that is subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		
(ii) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of WAC 173-303-200(1) (i.e., a hazardous waste recycling unit that is not a ninety-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of WAC 173-303-800 through 173-303-840; or		

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(iii) A unit that is exempt from permitting under the provisions of WAC 173-303-200(1) (that is, a "ninety-day" tank or container) and is not a recycling unit under the provisions of WAC 173-303-120.		
WAC 173-303-691 Air emission standards for equipment leaks		
(1)(f) Equipment that contains or contacts hazardous waste with an organic concentration of at least ten percent by weight for less than three hundred hours per calendar year is excluded from the requirements of 40 C.F.R. Parts 264.1052 through 264.1060 if it is identified, as required in 40 C.F.R. Part 264.1064 (g)(6).	D4.2. Equipment Leaks	C2.7 Air Emissions C2.7.2 Applicability of Subpart BB Standards C2.7.2.1 Demonstrating Compliance with Subpart BB Standards Note The only equipment within T Plant subject to the provisions of WAC 173-303-691 is the carbon canister associated with the aerosol can venting equipment. This equipment qualifies as a control device (40 CFR 264.1060) and is exempt from Subpart BB requirements (40 CFR 264.1050(f)).
WAC 173-303-692 Air emission standards for tanks, surface impoundments, and containers		
(1)(a) The requirements of 40 C.F.R. Part 264 Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either WAC 173-303-630, 173-303-640, or 173-303-650 except as WAC 173-303-600 and (b) of this subsection provide otherwise.	D4.3. Tanks and Containers	C2.7 Air Emissions C2.7.3 Applicability of Subpart CC Standards Note T Plant does not have any tank systems or surface impoundments subject to 40 CFR 264, Subpart CC requirements. 40 CFR 264, Subpart CC, standards for MW containers do not apply.
(b) The requirements of 40 C.F.R. Part 264 Subpart CC do not apply to the following waste management units at the facility:		
(vi) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.		

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(2) 40 C.F.R. Parts 264.1081 through 264.1091 (Subpart CC) is incorporated by reference.	D2.2. Container Management Practices	C2.7 Air Emissions C2.7.3 Applicability of Subpart CC Standards Note T Plant does not have any tank systems or surface impoundments subject to 40 CFR 264, Subpart CC requirements. 40 CFR 264, Subpart CC, standards for MW containers do not apply.
WAC 173-303-806(4) Contents of Part B		
(a) General requirements.		
(i) A general description of the facility	B1. General Facility Description	Enclosure 5, Supporting Documentation
(viii) A description of procedures, structures, or equipment used at the facility to:	D2.2. Container Management Practices	Refer to WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
(F) Prevent releases to the atmosphere.		
(x) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).	B3. Traffic Information	Enclosure 5, Supporting Documentation
(xi) Seismic risk consideration. The owner/operator of a proposed facility or expansion of an existing facility must identify the seismic risk zone in which the facility is intended to be located. Where state or local maps are not available, United States Geological Survey Open File Report number 82-1033 may be used to identify seismic risk zones. The owner/operator must demonstrate that the facility can and will be designed to resist seismic ground motion and that the design is sufficient to withstand the	B2. Seismic Consideration	Enclosure 5, Supporting Documentation

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maximum horizontal acceleration of a design earthquake specified in the demonstration.		
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following: **(A)** Map scale and date; **(B)** One hundred-year flood plain area; **(C)** Surface waters including intermittent streams; **(D)** Surrounding land uses (residential, commercial, agricultural, recreational); **(E)** A wind rose (i.e., prevailing windspeed and direction); **(F)** Orientation of the map (north arrow); **(G)** Legal boundaries of the TSD facility site; **(H)** Access control (fences, gates); **(I)** Injection and withdrawal wells both on-site and off-site; **(J)** Buildings; treatment, storage, or disposal operations; or other structure (recreation areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems,	B4. Topographic Map	Appendix C-A, Topographic Map Overall Facility Map of the Hanford Site

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loading and unloading areas, fire control facilities, etc.); **(K)** Barriers for drainage or flood control; and **(L)** Location of operational units within the TSD facility site, where dangerous waste is (or will be) treated, stored, or disposed (include equipment clean-up areas). (Note - For large TSD facilities the department will allow the use of other scales on a case-by-case basis.) Traffic pattern, estimated volume (number, types of vehicles) and control (for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals).		
(b) Specific Part B information requirements for containers. Except as otherwise provided in WAC 173-303-600(3), owners or operators of facilities that store containers of dangerous waste must provide the following additional information:		
(i) A description of the containment system to demonstrate compliance with WAC 173-303-630(7). Show at least the following: **(E)** How accumulated liquids can be analyzed and removed to prevent overflow; and	D2.4.6. Removal of Liquids from Containment System	C2.4 Removal Of Liquids from Containment System
(ii) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with WAC 173-303-630 (7)(c), including:	D2.4.7. Demonstration that containment is not required because containers do not contain free liquids, wastes that exhibit ignitability or reactivity, or wastes	C2.3 Secondary Containment
(A) Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and		Addendum B, *Waste Analysis Plan*

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Section
(B) A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids;	designated F020 – 023, F026, or F027	C2.3 Secondary Containment C2.3.1 Base C2.3.1.1 Portable Spill Pallets C2.3.1.2 Fabricated Spill Pans C2.3.1.3 Spill Berms C2.3.2 Drainage Control C2.4 Removal of Liquids from Containment System
(iii) A description of the procedures for labeling containers;	D2.3. Container Labeling	C2.1.2 Identification and Labeling
(iv) Sketches, drawings, or data demonstrating compliance with WAC 173-303-630(8) (location of buffer zone and containers holding ignitable or reactive wastes) and WAC 173-303-630 (9)(c) (location of incompatible wastes), where applicable;	D2.5.1. Management of Certain Reactive Wastes in Containers D2.5.2. Management of Ignitable and Certain other Reactive Wastes in Containers D2.5.3. Design of Areas to Manage Incompatible Wastes	C2.5 Requirements for Ignitable, Reactive, and Incompatible Wastes Appendix C-B, Engineering Drawings Enclosure 5, Supporting Documentation
(vi) Information on air emission control equipment as required in (m) of this subsection.	D2.2. Container Management Practices	Refer to WAC 173-303-692, *Air emission standards for tanks, surface impoundments, and containers* of this checklist.
40 CFR 264.1086 Standards: Containers		
(a) The provisions of this section apply to the control of air pollutant emissions from containers for which §264.1082(b) of this subpart references the use of this section for such air emission control. **(b)** *General requirements.* **(1)** The owner or operator shall control air pollutant emissions from each container subject to this section in accordance with the following requirements, as applicable to the container, except when the special provisions for waste stabilization	D4.3. Tanks and Containers	C2.7.3 Demonstrating Compliance with Subpart CC Standards

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Section
processes specified in paragraph (b)(2) of this section apply to the container. **(i)** For a container having a design capacity greater than 0.1 m^3 and less than or equal to 0.46 m^3, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(ii)** For a container having a design capacity greater than 0.46 m^3 that is not in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section. **(iii)** For a container having a design capacity greater than 0.46 m^3 that is in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 2 standards specified in paragraph (d) of this section. **(2)** When a container having a design capacity greater than 0.1 m^3 is used for treatment of a hazardous waste by a waste stabilization process, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 3 standards specified in paragraph (e) of this section at those times during the waste stabilization process when the hazardous waste in the container is exposed to the atmosphere.		
WAC 173-303-695 Containment buildings (see following table)		
The requirements for containment buildings at 40 CFR Part 264 Subpart DD are incorporated by reference. The words "regional administrator" will mean "department." The sentence at 40 CFR 264.1101(c)(2) is modified by changing "qualified Professional Engineer" to "independent qualified registered professional engineer."		

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10 Containment Buildings			
D-10a Containment Building Description			
D-10a(1) Construction	270.14(a) 270.14(b) 264.1100(a) 264.1101(a)	Provide description of unit; include dimensions and materials of construction. The containment building must be completely enclosed with a floor, walls and a roof to prevent exposure to the elements, and to assure containment of managed wastes. The unit must be constructed of manmade materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit. The unit must be constructed to prevent failure due to pressure gradients, settlement, compression, uplift, physical contact with the wastes, climatic conditions, or the stresses of daily operation.	C1.3.1 Construction
D-10a(2) Strength Requirements	270.14(a) 270.14(b) 264.1100(a) 264.1101(a)	Provide results of calculations defining maximum loads or stresses that will be placed on containment building system.	C1.3.1 Construction *Structural Integrity* Enclosure 5, Supporting Documentation
D-10a(3) Design Requirements for Units Not Managing Liquids			

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10a(3)(a) Primary Barrier	270.14(a) 270.14(b) 264.1100(a) 264.1100(b) 264.1101(a)(4)	Provide detailed description of primary barrier, and demonstrate that it is sufficiently durable to withstand movement of personnel, waste, and handling equipment within unit.	C1.3.1 Construction *Primary Barrier Description*
D-10a(4) Design Requirements for Units Managing Liquids	270.14(a) 270.14(b) 264.1100(c) 264.1101(a)(4) 264.1101(b)	Provide a detailed description of the primary barrier, and demonstrate that it is sufficiently durable to withstand the movement of personnel, wastes, and handling equipment within the unit. Demonstrate that the primary barrier is appropriate for the physical and chemical characteristics of the waste to be managed.	Not Applicable
D-10a(4)(a) Primary Barrier	270.14(a) 270.14(b) 264.1100(c)(1) 264.1101(b)(1)	Describe how primary barrier is designed and constructed to prevent migration of hazardous constituents into barrier.	Not Applicable
D-10a(4)(b) Liquid Collection System	270.14(a) 270.14(b) 264.1100(c)(2) 264.1101(b)(3)	Describe in detail liquid collection system that must be designed and constructed of materials to minimize accumulation of liquid on primary barrier.	Not Applicable
D-10a(4)(c) Secondary Containment System			Not Applicable
D-10a(4)(c)(i) Leak Detection System	270.14(a) 270.14(b) 264.1100(c)(3) 264.1101(a) 264.1101(b)(3)	Describe design and operating features of leak detection system.	Not Applicable

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10a(4)(C)(ii) Secondary Barrier	270.14(a) 270.14(b) 264.1100(b)(3) 264.1101(b)(3)	Describe how secondary barrier is designed and constructed to prevent migration of hazardous constituents into barrier.	Not Applicable
D-10a(4)(d) Temporary Variance from Secondary Containment Requirements	270.14(a) 270.14(b) 264.1101(b)(4)	For existing units, the Regional Administrator may delay the secondary containment requirements for up to two (2) years. To obtain such a variance: (1) provide written notice of the request was submitted to the Regional Administrator by November 16, 1992; (2) describe the units and operating practices with specific reference to the performance of existing containment system; and (3) describe specific plans to retrofit the unit with secondary containment.	Not Applicable
D-10a(4)(e) Waiver of Secondary Containment Requirements	270.14(a) 270.14(b) 264.1101(e)	If requesting a waiver from secondary containment requirements, demonstrate that the only free liquids that will be in the unit will be a limited amount of dust suppression liquids required to meet occupational health and safety requirements. Describe in detail how containment of managed wastes and liquids can be assured without a secondary containment system.	Not Applicable
D-10a(5) Design of Units Managing Both Liquids and Nonliquids in the Same Unit	270.14(a) 270.14(b) 264.1101(d)	Identify areas of containment building that are constructed both with and without secondary containment, if applicable.	Not Applicable
D-10a(6) Compatibility of Structure with Wastes	270.14(a) 270.14(b) 264.1101(a)(2) 264.1101(b)(3)(iii)	Demonstrate that all surfaces in contact with hazardous waste, collected liquids, or leachate must be chemically compatible with those wastes.	C1.3.1 Construction *Compatibility of Structure with Wastes*

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10a(7) Fugitive Dust Emissions	270.14(a) 270.14(b) 264.1100(d) 264.1101(c)(1)(iv) Part 60 Appendix A	Describe in detail the system used to prevent fugitive dust emissions such that any opening (e.g., doors, windows, vents, cracks, etc.) exhibit no visible emissions (as defined in 40 CFR Part 60 Appendix A Method 22). Describe the design, operation, and maintenance of particulate collection devices that will be used in the unit to control air pollution.	C1.3.1 Construction *Fugitive Dust Emissions*
D-10a(8) Structural Integrity Requirements	270.14(a) 270.14(b) 264.1101(a)(2)	Describe the professionally recognized standards (e.g., American Concrete Institute [ACI], American Society of Testing Materials [ASTM], etc.) that were or will be used to judge and meet the structural integrity requirements of the unit (as described in checklist Section D-10a(2)). If appropriate to the nature of the waste management operations, an exception to the structural strength requirement may be made for light-weight doors and windows, provided that: (1) they provide an effective barrier against fugitive emissions, and (2) the unit is designed and operated in a fashion that assure wastes will not actually come in contact with these openings. Identify any portions of the unit that do not meet the structural strength requirements (see checklist Section D-10a(2)).	C1.3.1 Construction *Structural Integrity*
D-10a(9) Certification of Design	270.14(a) 270.14(b) 264.1101(c)(2)	Maintain a certification by a qualified Professional Engineer that the containment building design meets the requirements of paragraphs (a), (b), and (c) of 40 CFR 264.1101.	C1.3.1 Construction *Certification of Design*

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10b Containment Building Operations			
D-10b(1) Primary Barrier Integrity	270.14(a) 270.14(b) 264.1101(b)(2)(ii) 264.1101(c)(1)(i)	Describe how the owner/operator will maintain the primary barrier to be free of significant cracks, gaps, corrosion, or other deterioration that could cause hazardous waste to be released from the primary barrier.	C1.3.1.1 Operating Standards *Primary Barrier Integrity*
D-10b(2) Volume of Waste	270.14(a) 270.14(b) 264.1101(c)(1)(ii)	Describe how owner/operator will maintain level of stored and/or treated hazardous waste within containment walls of unit so that height of any containment wall is not exceeded.	C1.3.1.1 Operating Standards *Volume of Waste*
D-10b(3) Tracking of Waste Out of Unit	270.14(a) 270.14(b) 264.1100(e) 264.1101(c)(1)(iii)	Describe how owner/operator will prevent the tracking of hazardous waste out of the unit by personnel or by equipment used in handling the waste.	C1.3.1.1 Operating Standards *Tracking Waste out of the Unit*
D-10b(4) Liquids Removal	270.14(a) 270.14(b) 264.1101(b)(2)(ii) 264.1101(b)(3)	Describe sumps and liquid removal methods for liquids collection and leak detection systems. Indicate fate of collected liquids and leachates, which are considered hazardous waste.	Not Applicable
D-10b(5) Management of Incompatible Wastes	270.14(a) 270.14(b) 264.1101(a)(3)	Indicate whether incompatible waste or treatment reagents will be placed in the unit or its secondary containment system.	C1.3.1.1 Operating Standards *Management of Incompatible Wastes*
D-10b(6) Management of Liquids and Nonliquids in the Same Unit	270.14(a) 270.14(b) 264.1101(d)(2) 264.1101(d)(3)	For containment buildings that contain areas both with and without secondary containment, describe measures to prevent release of liquids or wet materials into areas without secondary containment.	Not Applicable

T Plant Complex Part B Addendum C, Process Information Regulatory Crosswalk – Containment Building

EPA Guidance Document EPA 530-R-11-006, Version 4 Dated 12/01/2014[a]	Federal Regulation 40 CFR	Review Consideration	Location in Application
D-10b(7) Fugitive Dust Emissions	270.14(a) 270.14(b) 264.1100(d) 264.1101(c)(1)(iv) Part 60 Appendix A		C1.3.1.1 Operating Standards *Fugitive Dust Emissions*
D-10b(8) Treatment of Wastes	270.14(a) 270.14(b) 264.1101(b)(3)(ii)	If treatment of waste is conducted in containment building, describe how treatment will be conducted to prevent release of liquids, wet materials, or liquid aerosols to other portions of building.	C1.3.1.1 Operating Standards *Treatment of Wastes*
D-10b(9) Equipment Decontamination	270.14(a) 270.14(b) 264.1101(c)(1)(iii)	Identify area used to decontaminate equipment and collect and manage any rinsate from decontamination. Identify fate of decontamination residues.	Not Applicable
D-10c Containment Buildings as Tank Secondary Containment	270.14(a) 270.14(b) 264.1101(b)(3)(iii)	Indicate whether containment building is intended to serve as a secondary containment system for a tank placed in the building. The unit must meet the requirements of 264.193(b), 264.193(c)(1), 264.193(c)(2), and 264.193(d)(1).	Not Applicable

[a]EPA guidance document, *Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) Regulations* [EPA 530-R-11-006, Version 4 dated 12/1/2014]. Example RCRA Subtitle C Permit Application Checklist for Review of Federal RCRA Permit Applications, Section D. Process Information – Containment Buildings.

Addendum D – Reserved

T Plant Complex Part B Addendum E, Security Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-310 Security		
(1) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his or her facility, unless he can demonstrate to the department that:	F1. Security	E1.1 Security Provisions; E1.1.1 Access control
(a) Physical contact with waste, structures or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and	NA	NA – Meeting requirement of WAC 173-303-310(1)
(b) Disturbance of the waste or equipment by the unknowing or unauthorized entry of persons or livestock onto the active portion of the facility will not cause a violation of this chapter 173-303 WAC.	NA	NA – Meeting requirement of WAC 173-303-310(1)
(2) A facility must have:		
(a) Signs posted at each entrance to the active portion, and at other locations, in sufficient numbers to be seen from any approach to the active portion. Signs must bear the legend "Danger - unauthorized personnel keep out," or an equivalent legend, written in English, and must be legible from a distance of twenty-five feet or more; and either	F1.1.1.	E1.1.2 Warning Signs
(b) A 24-hour surveillance system which continuously monitors and controls entry onto the active portion of the facility; or	F1.1.2, Bullet 1	E1.1 Security Provisions: E1.1.1 Access Control
(c) An artificial or natural barrier, or a combination of both, which completely surrounds the active portion of the facility, with a means to control access through gates or other entrances to the active portion of the facility at all times.	F1.1.2, Bullet 2	NA – Rely on WAC 173-303-310(2)(b)
(3) In lieu of WAC 173-303 310(2), above, the owner or operator of a totally enclosed treatment facility or an elementary neutralization or wastewater treatment unit (as defined in WAC 173-303-040) must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock into	NA	NA – Rely on WAC 173-303-310(2)(b)

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or onto the totally enclosed treatment facility or the elementary neutralization or wastewater treatment unit.		

T Plant Complex Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-806(4)(a)(vi) Contents of Part B		
(vi) A justification of any request for a waiver(s) of the preparedness and prevention requirements of WAC 173-303-340, or a description of the procedures used to comply with these requirements.	F3. Preparedness and Prevention Requirements	No waiver of WAC 173-303-340 is requested.
WAC 173-303-806(4)(a)(viii) Contents of Part B		
(viii) A description of procedures, structures, or equipment used at the facility to:	F4. Preventative Procedures, Structures, and Equipment	
(A) Prevent hazards and contain spills in unloading/loading operations (for example, ramps, berms, pavement, special forklifts);	F4. Preventative Procedures, Structures, and Equipment	F1.2.1 Container Loading, Unloading, and Handling Operations
(B) Prevent runoff from dangerous waste handling areas to other areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches);	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(C) Prevent contamination of water supplies;	F4. Preventative Procedures, Structures, and Equipment	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(D) Mitigate effects of equipment failure and power outages;	F4. Preventative Procedures, Structures, and Equipment	F1.2.3 Equipment and Power Failure
(E) Prevent undue exposure of personnel to dangerous waste (for example, protective clothing); and	F4. Preventative Procedures, Structures, and Equipment	F1.2.4 Personal Protective Equipment
(F) Prevent releases to the atmosphere.	No equivalent	NA. Prevention of releases to the atmosphere are covered in the AOP.
WAC 173-303-395(1) Precautions for ignitable, reactive, or incompatible wastes		

T Plant Complex Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including, but not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. "No smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3 Prevention of Reaction of Ignitable, Reactive, and/or Incompatible Waste
(b) Where specifically required by other sections of this chapter 173-303 WAC, the treatment, storage, or disposal of ignitable or reactive waste, and the mixture or commingling of incompatible wastes, or incompatible wastes and materials, must be conducted so that it does not:	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste. F1.3.2 Precautions for Handling Ignitable or Reactive Waste and Mixing Incompatible Wastes
(i) Generate extreme heat or pressure, fire or explosion, or violent reaction;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(iv) Damage the structural integrity of the facility or device containing the waste; or	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	
(v) Through other like means, threaten human health or the environment.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(c) When required to comply with (a) and (b) of this subsection, the owner or operator must document that compliance in the operating record required under WAC 173-303-380(1). This documentation may be based on references to published scientific or engineering literature, data from trial tests, waste analyses, or the results of the treatment of similar wastes by similar treatment processes and under similar operating conditions.	F5. Prevent Reaction of Ignitable, Reactive, and/or Incompatible Wastes	F1.3 Prevention of Ignition or Reaction of Ignitable, Reactive, and/or Incompatible Waste
WAC 173-303-395(4) Loading and unloading areas		
(4) Loading and unloading areas. TSD facilities which receive or ship manifested shipments of liquid dangerous waste for treatment, storage or disposal must provide for and use an area (or areas) for loading and unloading waste shipments. The loading and unloading area(s) must be designed, constructed, operated and maintained to:	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures
(a) Contain spills and leaks that might occur during loading or unloading;	D2.2. Container management practices	F1.2.1 Container Loading, Unloading, and Handling Preventative Measures F1.1.3 Emergency Equipment
(b) Prevent release of dangerous waste or dangerous waste constituents to ground or surface waters;	No equivalent	F1.2.2 Prevention of Run-on, Run-off, and Contamination to Water Supplies
(c) Contain wash waters (if any) resulting from the cleaning of contaminated transport vehicles and load/unload equipment; and	No equivalent	NA Cleaning of transport vehicles is not allowed at T Plant Complex
(d) Allow for removal, as soon as possible, of collected wastes resulting from spills, leaks and equipment cleaning (if any) in a manner which assures compliance with (b) of this subsection.	No equivalent	F1.2.1. Container Loading, Unloading, and Handling Preventative Measures
WAC 173-303-340 Preparedness and Prevention		
(1) Required equipment: All facilities must be equipped with the following, unless it can be demonstrated to the department that none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below:	F3.1. Equipment requirements	No equipment exceptions requested

T Plant Complex Part B Addendum F, Preparedness and Prevention Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(a) An internal communications or alarm system capable of providing immediate emergency instruction to facility personnel;	F3.1.1. Internal Communications	F1.1.1 Internal Communications
(b) A device, such as a telephone or a hand-held, two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or state or local emergency response teams;	F3.1.2. External Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(c) Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment, and	F3.1.3. Emergency Equipment	F1.1.3 Emergency Equipment
(d) Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.	F3.1.4. Water for Fire Control	F1.1.4 Water for Fire Control; F1.1.3 Emergency Equipment
(2) Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situation below:	F3.1.1. Internal Communications	
(a) Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless such a device is not required in subsection (1) of this section;	F3.1.1. Internal Communications	F1.1.1 Internal Communications; F1.1.2 External Communications
(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held, two-way radio, capable of summoning external emergency assistance, unless such a device is not required in subsection (1) of this section.	F3.1.2. External Communications	F1.1.2 External Communications

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WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(3) Aisle space. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the department that aisle space is not needed for any of these purposes.	F3.2 Aisle space requirement	F1.1.5 Aisle Spacing
(4) Arrangement with local authorities. The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations, unless the hazards posed by wastes handled at the facility would not require these arrangements:	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(a) Arrangements to familiarize police, fire departments, and emergency response with the layout of the facility, associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(b) Arrangements to familiarize local hospitals with the properties of dangerous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility;	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(c) Agreements with state emergency response teams, emergency response contractors, and equipment suppliers; and Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements, with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(d) Where more than one party might respond to an emergency, agreements designating primary emergency authority and agreements with any others to provide support to the primary emergency authority.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities
(5) Where state or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.	G6. Coordination Agreements	F1.4 Arrangements with Local Authorities

T Plant Complex Part B Addendum G, Personnel Training Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
WAC 173-303-806(4)(a)(xii) Final facility permit		
An outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330. A brief description of how training will be designed to meet actual job tasks in accordance with requirements in WAC 173-303-330 (1)(d).		
WAC 173-303-330 Personnel training		
(1) Training program. The facility owner or operator must provide a program of classroom instruction or on-the-job training for facility personnel. This program must teach personnel to perform their duties in a way that ensures the facility's compliance with this chapter 173-303 WAC, must teach facility personnel dangerous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed, must ensure that facility personnel are able to respond effectively to emergencies, and must include those elements set forth in the training plan required in subsection (2) of this section. In addition:	H. Personnel Training	Attachment 5 *Hanford Facility Personnel Training Program*
(a) The training program must be directed by a person knowledgeable in dangerous waste management procedures, and must include training relevant to the positions in which the facility personnel are employed;	H5. Training Program Administration	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.4 Training Program Direction)
(b) Facility personnel must participate in an annual review of the training provided in the training program;	H4. Continuing Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.2 Continuing Training)
(c) This program must be successfully completed by the facility personnel:	H2. Initial Training	
(i) Within six months after these regulations become effective; or	No equivalent	Refer to (c)(ii)
(ii) Within six months after their employment at or assignment to the facility, or to a new position at the facility, whichever is later.	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(d) Employees hired after the effective date of these regulations must be supervised until they complete the training program; and	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1.1 Introductory Training)
(e) At a minimum, the training program must familiarize facility personnel with emergency equipment and systems, and emergency procedures. The program must include other parameters as set forth by the department, but at a minimum must include, where applicable:	H2. Initial Training	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.1 Introductory and Continuing Training) PRC-STD-TQ-40228 *T Plant Dangerous Waste Training Plans* (Section 2.1 Emergency Response Training), referenced in Addendum G, Personnel Training
(i) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;	H2. Initial Training	PRC-STD-TQ-40228 *T Plant Dangerous Waste Training Plans* (Table 2-1, Applicability of WAC 173-303-330(1)(e)) , referenced in Addendum G, Personnel Training
(ii) Key parameters for automatic waste feed cut-off systems;		
(iii) Communications or alarm systems;		
(iv) Response to fires or explosions;		
(v) Response to ground-water contamination incidents; and		
(vi) Shutdown of operations.		
(2) Written training plan. The owner or operator must develop a written training plan which must be kept at the facility and which must include the following documents and records:	H. Overview of Requirements	Addendum G, Personnel Training PRC-STD-TQ-40228 *T Plant Dangerous Waste Training Plans*
(a) For each position related to dangerous waste management at the facility, the job title, the job description, and the name of the employee filling each job. The job description must include the requisite skills, education, other qualifications, and duties for each position;	H6. Job Title/Job Description	PRC-STD-TQ-40228 *T Plant Dangerous Waste Training Plans (*Section 3.0 Names, Job Descriptions, and Job Title/Positions), referenced in Addendum G, Personnel Training

T Plant Complex Part B Addendum G, Personnel Training Regulatory Crosswalk

WAC Regulation	Ecology Guidance Document Publication 95-402	T Plant Complex Section
(b) A written description of the type and amount of both introductory and continuing training required for each position; and	H3. Task Specific Training	Addendum G, Personnel Training (Table G-1 Training Matrix) PRC-STD-TQ-40228 *T Plant Dangerous Waste Training Plans* (Section 2.0, Training Program; Table 3-2, Training Course Matrix)
(c) Records documenting that facility personnel have received and completed the training required by this section. The department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received.	H7. Documentation and Record Retention	Attachment 5 *Hanford Facility Personnel Training Program* (Section 5.3 Training Records)
(3) Training records. Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility. Personnel training records may accompany personnel transferred within the same company.	H7. Documentation and Record Retention	Permit Condition II.I.1: The Permittees will maintain a written Facility Operating Record until ten (10) years after post-closure, or corrective action is complete and certified for the Facility, whichever is later.

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (2706-T Asphalt Pad)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
WAC 173-303-610 Closure and post-closure		
(2) Closure performance standard. The owner or operator must close the facility in a manner that:		
(a)(i) Minimizes the need for further maintenance;	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard	H-D2 Closure Performance Standards
(ii) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(iii) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.		
(b) Where the closure requirements of this section, or of WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680 (2) through (4), or 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695) call for the removal or decontamination of dangerous wastes, waste residues, or equipment, bases, liners, soils or other materials containing or contaminated with dangerous wastes or waste residue, then such removal or decontamination must assure that the levels of dangerous waste or dangerous waste constituents or residues do not exceed:		
(i) For soils, groundwater, surface water, and air, the numeric cleanup levels calculated using unrestricted use exposure assumptions according to the Model Toxics Control Act Regulations, chapter 173-340 WAC as of the effective date or hereafter amended. Primarily, these will be numeric cleanup levels calculated according to MTCA Method B, although MTCA Method A may be used as appropriate, see WAC 173-340-700 through 173-340-760, excluding WAC 173-340-745; and	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard **94-111** 2.1 Clean Closure Levels	H-D2.1 Clean Closure Levels
(ii) For all structures, equipment, bases, liners, etc., clean closure standards will be set by the department on a case-by-case basis in accordance with the closure performance standards of WAC 173-303-610 (2)(a)(ii) and in a manner that minimizes or eliminates post-closure escape of dangerous waste constituents.	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard	H-D2.1 Clean Closure Levels
(3) Closure plan; amendment of plan.		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(a) The owner or operator of a dangerous waste management facility must have a written closure plan. In addition, certain surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the dangerous waste at partial or final closure are required by WAC 173-303-650(6) and 173-303-660(9) to have contingent closure plans. The plan must be submitted with the permit application, in accordance with WAC 173-303-806(4), and approved by the department as part of the permit issuance procedures under WAC 173-303-840. The approved closure plan will become a condition of any permit. The department's decision must assure that the approved closure plan is consistent with subsections (2), (3), (4), (5), and (6) of this section, and the applicable requirements of WAC 173-303-630(10), 173-303-640(8), 173-303-645, 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680(2), and 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695). A copy of the approved plan and all revisions to the plan must be furnished to the department upon request, including request by mail until final closure is completed and certified in accordance with subsection (6) of this section. The plan must identify steps necessary to perform partial and/or final closure of the facility at any point during its active life. The closure plan must include at least:	**94-111** 8.2 The Closure Plan	H-D1 Introduction
(i) A description of how each dangerous waste management unit at the facility will be closed in accordance with subsection (2) of this section;	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-D3 Closure Activities

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (2706-T Asphalt Pad)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(ii) A description of how final closure of the facility will be conducted in accordance with subsection (2) of this section. The description must identify the maximum extent of the operation which will be unclosed during the active life of the facility;	**94-111** 8.2.1 Contents of the Closure Plan	H-D3 Closure Activities H-D1.1.1 Maximum Waste Inventory
(iii) An estimate of the maximum inventory of dangerous wastes ever on-site over the active life of the facility. (Any change in this estimate is a Class 1 modification with prior approval under WAC 173-303-830(4));	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-D1.1.1 Maximum Waste Inventory
(iv) A detailed description of the methods to be used during partial closures and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the type(s) of the off-site dangerous waste management units to be used, if applicable;	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-D3.2 Removal of Wastes and Waste Residues H-D3.6 Demolition of the 2706-T Asphalt Pad H-D2.8 Identifying and Managing Waste Generated During Closure
(v) A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard;	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **95-402** I1.3.3 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard **94-111** 7.0 Sampling and Analysis for Clean Closure **94-111** 8.2.1 Contents of the Closure Plan	H-D3.7 Identifying and Managing Contaminated Media H-D3.8 Identifying and Managing Waste Generated During Closure H-D3.10 Sampling and Analysis Plan
(vi) A detailed description of other activities necessary during the closure period to ensure that all partial closures and final closure satisfy the closure performance standards, including, but not limited to, groundwater monitoring, leachate collection, and run-on and runoff control;		NA – No additional activities beyond what is identified in Section H-D3 Closure Activities

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(vii) A schedule for closure of each dangerous waste management unit and for final closure of the facility. The schedule must include, at a minimum, the total time required to close each dangerous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all dangerous waste inventory and of the time required to place a final cover must be included.); and	**95-402** I1.4 Schedule for Closure	H-D4 closure Schedule and Time Frame
(viii) For facilities that use trust funds to establish financial assurance under WAC 173-303-620 (4) or (6) and that are expected to close prior to the expiration of the permit, an estimate of the expected year of final closure.		NA – No trust fund used.
(ix) For facilities where the director has applied alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d), the closure plan must include either the alternative requirements or a reference to the enforceable document that contains the alternative requirements.		NA – No alternative requirements.
(b) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan in accordance with the applicable procedures in WAC 173-303-800 through 173-303-840. The written notification or request must include a copy of the amended closure plan for review or approval by the department.	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(i) The owner or operator may submit a written notification or request to the department for a permit modification to amend the closure plan at any time prior to the notification of partial or final closure of the facility.		Not a Requirement

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(ii) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in the approved closure plan whenever:	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(A) Changes in operating plans or facility design affect the closure plan; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(B) There is a change in the expected year of closure, if applicable; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(C) In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(D) The owner/operator requests the director apply alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d).	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(iii) The owner or operator must submit a written request for a permit modification including a copy of the amended closure plan for approval at least sixty days prior to the proposed change in facility design or operation, or no later than sixty days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator must request a permit modification no later than thirty days after the unexpected event. An owner or operator of a surface impoundment or waste pile that intends to remove all dangerous waste at closure and is not otherwise required to prepare a contingent closure plan under WAC 173-303-650(6) or 173-303-660(9), must submit an amended closure plan to the department no later than sixty days from the date that the owner or operator or department determines that the dangerous waste management unit must be closed as a landfill, subject to the requirements of WAC 173-303-665, or no later than thirty days from that date if the determination is made during partial or final closure. The department will approve, disapprove, or modify this amended plan in accordance with the procedures in WAC 173-303-800 through 173-303-840. The approved closure plan will become a condition of any permit issued.	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(iv) The department may request modifications to the plan under the conditions described in (b)(ii) of this subsection. The owner or operator must submit the modified plan within sixty days of the department's request, or within thirty days if the change in facility conditions occurs during partial or final closure. Any modifications requested by the department will be approved in accordance with the procedures in WAC 173-303-800 through 173-303-840.		Not a Requirement
(c) Notification of partial closure and final closure.		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(i) The owner or operator must notify the department in writing at least sixty days prior to the date on which they expect to begin closure of a surface impoundment, waste pile, land treatment, or landfill unit, or final closure of a facility with such a unit. The owner or operator must notify the department in writing at least forty-five days prior to the date on which they expect to begin closure of a treatment or storage tank, container storage, or incinerator unit, or final closure of a facility with only such units.		NA – Notification prior to implementing the closure plan.
(ii) The date when he "expects to begin closure" must be either:		
(A) No later than thirty days after the date on which any dangerous waste management unit receives the known final volume of dangerous wastes or, if there is a reasonable possibility that the dangerous waste management unit will receive additional dangerous wastes, no later than one year after the date on which the unit received the most recent volume of dangerous waste. If the owner or operator of a dangerous waste management unit can demonstrate to the department that the dangerous waste management unit or facility has the capacity to receive additional dangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit; or		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(B) For units meeting the requirements of subsection (4)(d) of this section, no later than thirty days after the date on which the dangerous waste management unit receives the known final volume of nondangerous wastes, or if there is a reasonable possibility that the dangerous waste management unit will receive additional nondangerous wastes, no later than one year after the date on which the unit received the most recent volume of nondangerous wastes. If the owner or operator can demonstrate to the department that the dangerous waste management unit has the capacity to receive additional nondangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit.		NA – Not a unit meeting (4)(d)
(iii) If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or final order to cease receiving dangerous wastes or to close, then the requirements of (c) of this subsection do not apply. However, the owner or operator must close the facility in accordance with the deadlines established in subsection (4) of this section.		NA – Permit has not been terminated.
(iv) Removal of wastes and decontamination or dismantling of equipment. Nothing in this subsection will preclude the owner or operator from removing dangerous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification of partial or final closure.		Not a Requirement
(4) Closure; time allowed for closure.		

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (2706-T Asphalt Pad)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(a) Within ninety days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at a dangerous waste management unit or facility, the owner or operator must treat, remove from the unit or facility, or dispose of on site, all dangerous wastes in accordance with the approved closure plan. The department may approve a longer period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, and either:	**95-402** I1.4 Schedule for Closure **95-402** I1.4.1 Extension for Closure **94-111** 8.3.2 Time Allowed for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(i) The activities required to comply with this paragraph will, of necessity, take longer than ninety days to complete; or	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(B) There is a reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (2706-T Asphalt Pad)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(b) The owner or operator must complete partial and final closure activities in accordance with the approved closure plan and within one hundred eighty days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at the dangerous waste management unit or facility. The department may approve an extension to the closure period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating dangerous waste management unit or facility, including compliance with all applicable permit requirements, and either:	**95-402** I1.4 Schedule for Closure **95-402** I1.4.1 Extension for Closure **94-111** 8.3.2 Time Allowed for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(i) The partial or final closure activities will, of necessity, take longer than one hundred eighty days to complete; or	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(B) There is reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(c) The demonstrations referred to in (a)(i) and (ii) and (b)(i) and (ii) of this subsection must be made as follows: The demonstrations in (a)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified ninety-day period; and the demonstration in (b)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified one hundred eighty-day period unless the owner or operator is otherwise subject to the deadlines in (d) of this subsection.	**95-402** I1.4.1 Extension for Closure Time **94-111** 8.3.3 Additional Time Allowed for Closure	H-D4 Closure Schedule and Time Frame
(d) The department may allow an owner or operator to receive only nondangerous wastes in a landfill, land treatment, or surface impoundment unit after the final receipt of dangerous wastes at that unit if:		Not requesting receipt of nondangerous waste.
(e) In addition to the requirements in (d) of this subsection, an owner or operator of a dangerous wastes surface impoundment that is not in compliance with the liner and leachate collection system requirements in 42 U.S.C. 3004 (o)(1) and 3005 (j)(1) or 42 U.S.C. 3004 (o)(2) or (3) or 3005 (j)(2), (3), (4) or (13) must:		NA – Not a Surface Impoundment
(5) Disposal or decontamination of equipment, structures and soils. During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in WAC 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), or under the authority of WAC 173-303-680 (2) and (4). By removing any dangerous wastes or dangerous constituents during partial and final closure, the owner or operator may become a generator of dangerous waste and must handle that waste in accordance with all applicable requirements of WAC 173-303-170 through 173-303-230.	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **94-111** 5.0 Debris **94-111** 6.0 Environmental Media	H-D3.7 Identifying and Managing Contaminated Environmental Waste H-A3.8 Identifying and Managing Waste Generated During Closure

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(6) Certification of closure. Within sixty days of completion of closure of each dangerous waste management unit (including tank systems and container storage areas), and within sixty days of the completion of final closure, the owner or operator must submit to the department by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the dangerous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification must be signed by the owner or operator and by an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until it releases the owner or operator from the financial assurance requirements for closure under WAC 173-303-620(4).	**94-111** 8.4 Closure Certification	H-D3.12 Closure Certificate H-D4 Closure Schedule and Time Frame
(7) Post-closure care and use of property.		NA- Clean Closure, not subject to post-closure requirements.
(8) Post-closure plan; amendment of plan.		NA- Clean Closure, not subject to post-closure requirements.

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(9) Notice to local land authority. No later than the submission of the certification of closure of each dangerous waste disposal unit, the owner or operator of a disposal facility must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department a survey plat indicating the location and dimensions of landfill cells or other dangerous waste disposal units with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat filed with the local zoning authority or the authority with jurisdiction over local land use must contain a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the dangerous waste disposal unit in accordance with the applicable requirements of this section. In addition, no later than sixty days after certification of closure of each dangerous waste disposal unit, the owner or operator must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department, a record of the type, location, and quantity of dangerous wastes disposed of within each cell or other disposal unit of the facility. For wastes disposed of before November 19, 1980 (March 12, 1982, for facilities subject to this chapter but not subject to 40 C.F.R. Part 264), the owner or operator must identify the type, location, and quantity of the dangerous wastes to the best of his knowledge and in accordance with any records he has kept.		NA- Clean Closure, not subject to post-closure requirements.
(10) Notice in deed to property.		NA- Clean Closure, not subject to post-closure requirements.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(11) Certification of completion of post-closure care. No later than sixty days after completion of the established post-closure care period for each dangerous waste disposal unit, the owner or operator must submit to the department, by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the post-closure care period for the dangerous waste disposal unit was performed in accordance with the specifications in the approved post-closure plan. The certification must be signed by the owner or operator and an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until he releases the owner or operator from the financial assurance requirements for post-closure care under WAC 173-303-620(6).		NA- Clean Closure, not subject to post-closure requirements.
WAC 173-303-806 Final facility permits		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(a) General requirements. Part B of the permit application consists of the general information requirements of this subsection, and the specific information requirements in (b) through (h) of this subsection as applicable to the facility. The Part B information requirements presented in (a) through (h) of this subsection, reflect the standards promulgated in WAC 173-303-600. These information requirements are necessary in order for the department to determine compliance with WAC 173-303-600 through 173-303-670. If owners and operators of TSD facilities can demonstrate that the information prescribed in Part B cannot be provided to the extent required, the department may make allowance for submission of such information on a case-by-case basis. Information required in Part B must be submitted to the department and signed in accordance with requirements in WAC 173-303-810(12). Certain technical data, such as design drawings and specifications, and engineering studies must be certified by a registered professional engineer. For post-closure permits, only the information specified in WAC 173-303-806 (4)(o) is required in Part B of the permit application. The following information is required for all TSD facilities, except as WAC 173-303-600(3) provides otherwise.	**95-402** K. Part B Certification	H-D3.11 Role of the Independent Qualified Registered Professional Engineer H-D3.12 Closure Certification
(xiii) A copy of the closure plan and, where applicable, the post-closure plan required by WAC 173-303-610 (3) and (8). Include, where applicable, as part of the plans, specific requirements in WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), and 173-303-680 (2) and (4).		Addendum H
(xiv) For dangerous waste disposal units that have been closed, documentation that notices required under WAC 173-303-610(10) have been filed.		NA – 2706-T Asphalt Pad has not been closed.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(xv) The most recent closure cost estimate for the facility prepared in accordance with WAC 173-303-620(3) and a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(4). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.	**95-402** I. Closure and Financial Assurance-Overview of Requirements	H-D5 Closure Costs
(xvi) Where applicable, the most recent post-closure cost estimate for the facility prepared in accordance with WAC 173-303-620(5) plus a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(6). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.		NA – Clean closure, not subject to post-closure requirements.
(xvii) Where applicable, a copy of the insurance policy or other documentation which comprises compliance with the requirements of WAC 173-303-620(8). For a new facility, documentation showing the amount of insurance meeting the specification of WAC 173-303-620 (8)(a) and, if applicable, WAC 173-303-620 (8)(b), that the owner or operator plans to have in effect before initial receipt of dangerous waste for treatment, storage, or disposal. A request for a variance in the amount of required coverage, for a new or existing facility, may be submitted as specified in WAC 173-303-620 (8)(c).		NA – No insurance requirements.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following:	**95-402** B4 Topographic Map	Addendum A, Part A Form, Attachment C
WAC 173-303-630 Use and management of containers		
(10) Closure. At closure, all dangerous waste and dangerous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with dangerous waste or dangerous waste residues must be decontaminated or removed.	**95-402** I1.3.2 Decontaminating Structures, Equipment, and Soil **94-111** 6.0 Environmental Media	H-D3.6 Demolition of the 2706-T Asphalt Pad H-D3.7 Identifying and Managing Contaminated Environmental Media H-D3.8 Identifying and Managing Waste Generated During Closure
WAC 173-303-610 Closure and post-closure – FOCUS ON SAMPLING AND ANALYSIS PLAN		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(3)(a)(v) A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard;	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **95-402** I1.3.3 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard 94-111 **7.0 Sampling and** Analysis for Clean Closure **94-111** 8.2.1 Contents of the Closure Plan	H-D3.7 Identifying and Managing Contaminated Environmental Media H-D3.8 Identifying and Managing Waste Generated during Closure H-D3.10 Sampling and Analysis Plan
	94-111 7.1 Sampling and Analysis Plan	H-D3.10 Sampling and Analysis Plan
	94-111 7.2 Designing a Sampling Program	H-D3.10.5 Sampling Design
	94-111 7.3 Sampling to Determine or Confirm Clean Closure	H-D3.10.5 Sampling Design
	94-111 7.5 Soil Sampling During Closure	H-D2.1 Clean Closure Levels H-D3.9 Confirming Clean Closure
	94-111 7.7 Selection of Constituents to be Analyzed	H-D3.10.2 Target Analytes
	94-111 7.8 Approved Analytical Methods	H-D3.10.7 Analytical Methods
	94-111-7.10 Quality Assurance and Quality Control Requirements	H-D3.10.8 Quality Control

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
	94-111 7.11 Data Quality Objectives	H-D3.10.8 Quality Control Need to beef this section up or add additional language for DQO process
	94-111 7.12 Practical Quantitation Limits	Table H-D4 Soil Analytical Performance Requirements
WAC 173-340-705 Use of Method B		
(1) Applicability. Method B is applicable to all sites. It shall be used to develop cleanup levels unless one or more of the conditions for using Method A or Method C are demonstrated to exist and the person conducting the cleanup action elects to use that method.		H-D2.1 Clean Closure Levels
(2) Cleanup levels. Method B consists of two approaches, standard and modified. Standard Method B uses default formulas, assumptions, and procedures to develop cleanup levels. Under modified Method B chemical-specific or site-specific information may be used to change certain assumptions to calculate different cleanup levels. When the term "Method B" is used in this chapter, it means both standard and modified Method B. Method B cleanup levels shall be established in accordance with the procedures in WAC 173-340-720 through 173-340-760. Method B cleanup levels shall be at least as stringent as all of the following:		H-D2.1 Clean Closure Levels
(a) Concentrations of individual hazardous substances established under applicable state and federal laws;		H-D2.1 Clean Closure Levels
(b) Concentrations that are estimated to result in no adverse effects on the protection and propagation of aquatic life, and no significant adverse effects on terrestrial ecological receptors using the procedures specified in WAC 173-340-7490 through 173-340-7494;		H-D2.1 Clean Closure Levels
(c) For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the following methods:		H-D2.1 Clean Closure Levels

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(i) Concentrations that are estimated to result in no acute or chronic toxic effects on human health as determined using a hazard quotient of one (1) and the procedures specified in WAC 173-340-720 through 173-340-760;		H-D2.1 Clean Closure Levels
(ii) For known or suspected carcinogens, concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to one in one million (1 x 10-6) as determined using the procedures specified in WAC 173-340-720 through 173-340-760; and		H-D2.1 Clean Closure Levels
(iii) Concentrations that eliminate or minimize the potential for food chain contamination as necessary to protect human health.		H-D2.1 Clean Closure Levels
(3) More stringent cleanup levels. The department may establish Method B cleanup levels that are more stringent than those required by subsection (2) of this section, when based upon a site-specific evaluation, the department determines that such levels are necessary to protect human health and the environment. Any imposition of more stringent requirements under this provision shall comply with WAC 173-340-702 and 173-340-708.		H-D2.1 Clean Closure Levels
(4) Multiple hazardous substances or pathways. Concentrations of individual hazardous substances established under subsections (2) and (3) of this section, including those based on applicable state and federal laws, shall be adjusted downward to take into account exposure to multiple hazardous substances and/or exposure resulting from more than one pathway of exposure. These adjustments need to be made only if, without these adjustments, the hazard index would exceed one (1) or the total excess cancer risk would exceed one in one hundred thousand (1 x 10-5). These adjustments shall be made in accordance with the procedures in WAC 173-340-708 (5) and (6). In making these adjustments, the hazard index shall not exceed one (1) and the total excess cancer risk shall not exceed one in one hundred thousand (1 x 10-5).		H-D2.1 Clean Closure Levels

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(5) Adjustments to cleanup levels based on applicable laws. Where a cleanup level is based on an applicable state or federal law, and the level of risk upon which the applicable state and federal law is based exceeds an excess cancer risk of one in one hundred thousand (1 x 10-5) or a hazard index of one (1), the cleanup level must be adjusted downward so that the total excess cancer risk and hazard index at the site does not exceed the limits established in subsection (4) of this section.		H-D2.1 Clean Closure Levels
(6) Limitation on adjustments. Cleanup levels determined using Method B, including cleanup levels adjusted under subsections (4) and (5) of this section, shall not be set at levels below the practical quantitation limit or natural background, whichever is higher. See WAC 173-340-707 and 173-340-709 for additional requirements on practical quantitation limits and natural background.		H-D2.1 Clean Closure Levels
(7) Remediation levels. Method B formulas may be modified for the purpose of using a human health risk assessment to evaluate the protectiveness of a remedy. WAC 173-340-708 (3) and (10) describe the adjustments that can be made to the Method B formulas. Also see WAC 173-340-355 and 173-340-357 for more detailed information on remediation levels and quantitative risk assessment		H-D2.1 Clean Closure Levels
(8) Inconsistencies. If there are any inconsistencies between this section and any specifically referenced sections, the referenced section shall govern.		Table H-D4

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
WAC 173-303-610 Closure and post-closure		
(2) Closure performance standard. The owner or operator must close the facility in a manner that:		
(a)(i) Minimizes the need for further maintenance;		H-A2 Closure Performance Standards

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(ii) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard	H-A2 Closure Performance Standards
(iii) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.		H-A2 Closure Performance Standards
(b) Where the closure requirements of this section, or of WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680 (2) through (4), or 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695) call for the removal or decontamination of dangerous wastes, waste residues, or equipment, bases, liners, soils or other materials containing or contaminated with dangerous wastes or waste residue, then such removal or decontamination must assure that the levels of dangerous waste or dangerous waste constituents or residues do not exceed:		
(i) For soils, groundwater, surface water, and air, the numeric cleanup levels calculated using unrestricted use exposure assumptions according to the Model Toxics Control Act Regulations, chapter 173-340 WAC as of the effective date or hereafter amended. Primarily, these will be numeric cleanup levels calculated according to MTCA Method B, although MTCA Method A may be used as appropriate, see WAC 173-340-700 through 173-340-760, excluding WAC 173-340-745; and	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard **94-111** 2.1 Clean Closure Levels	H-A2.1 Clean Closure Levels
(ii) For all structures, equipment, bases, liners, etc., clean closure standards will be set by the department on a case-by-case basis in accordance with the closure performance standards of WAC 173-303-610 (2)(a)(ii) and in a manner that minimizes or eliminates post-closure escape of dangerous waste constituents.	**95-402** I1.2 Closure Performance Standard **94-111** 2.0 Closure Performance Standard	H-A2.1 Clean Closure Levels
(3) Closure plan; amendment of plan.		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(a) The owner or operator of a dangerous waste management facility must have a written closure plan. In addition, certain surface impoundments and waste piles from which the owner or operator intends to remove or decontaminate the dangerous waste at partial or final closure are required by WAC 173-303-650(6) and 173-303-660(9) to have contingent closure plans. The plan must be submitted with the permit application, in accordance with WAC 173-303-806(4), and approved by the department as part of the permit issuance procedures under WAC 173-303-840. The approved closure plan will become a condition of any permit. The department's decision must assure that the approved closure plan is consistent with subsections (2), (3), (4), (5), and (6) of this section, and the applicable requirements of WAC 173-303-630(10), 173-303-640(8), 173-303-645, 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), 173-303-680(2), and 40 C.F.R. 264.1102 (incorporated by reference at WAC 173-303-695). A copy of the approved plan and all revisions to the plan must be furnished to the department upon request, including request by mail until final closure is completed and certified in accordance with subsection (6) of this section. The plan must identify steps necessary to perform partial and/or final closure of the facility at any point during its active life. The closure plan must include at least:	**94-111** 8.2 The Closure Plan	H-A1 Introduction
(i) A description of how each dangerous waste management unit at the facility will be closed in accordance with subsection (2) of this section;	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Waste Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-A3 Closure Activities

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(ii) A description of how final closure of the facility will be conducted in accordance with subsection (2) of this section. The description must identify the maximum extent of the operation which will be unclosed during the active life of the facility;	**94-111** 8.2.1 Contents of the Closure Plan	H-A3 Closure Activities H-A1.1.1 Maximum Waste Inventory
(iii) An estimate of the maximum inventory of dangerous wastes ever on-site over the active life of the facility. (Any change in this estimate is a Class 1 modification with prior approval under WAC 173-303-830(4));	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Waste Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-A1.1.1 Maximum Waste Inventory
(iv) A detailed description of the methods to be used during partial closures and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the type(s) of the off-site dangerous waste management units to be used, if applicable;	**95-402** I1.3.1 Removing Dangerous Wastes (for Maximum Waste Inventory Elimination) **94-111** 8.2.1 Contents of the Closure Plan	H-A3.2 Removal of Wastes and Waste Residues H-A3.6 Demolition of the 214-T Building H-A3.8 Identifying and Managing Waste Generated During Closure
(v) A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard;	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **95-402** I1.3.3 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard **94-111** 7.0 Sampling and Analysis for Clean Closure **94-111** 8.2.1 Contents of the Closure Plan	H-A3.7 Identifying and Managing Contaminated Environmental Media H-A3.8 Identifying and Managing Waste Generated during Closure H-A3.10 Sampling and Analysis Plan
(vi) A detailed description of other activities necessary during the closure period to ensure that all partial closures and final closure satisfy the closure performance standards, including, but not limited to, groundwater monitoring, leachate collection, and run-on and runoff control;		NA – No additional activities beyond what is identified in Section H-A3 Closure Activities.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(vii) A schedule for closure of each dangerous waste management unit and for final closure of the facility. The schedule must include, at a minimum, the total time required to close each dangerous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all dangerous waste inventory and of the time required to place a final cover must be included.); and	**94-402** I1.4 Schedule for Closure	H-A4 Closure Schedule and Time Frame
(viii) For facilities that use trust funds to establish financial assurance under WAC 173-303-620 (4) or (6) and that are expected to close prior to the expiration of the permit, an estimate of the expected year of final closure.		NA – No trust fund used.
(ix) For facilities where the director has applied alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d), the closure plan must include either the alternative requirements or a reference to the enforceable document that contains the alternative requirements.		NA – No alternative requirements.
(b) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in operating plans, facility design, or the approved closure plan in accordance with the applicable procedures in WAC 173-303-800 through 173-303-840. The written notification or request must include a copy of the amended closure plan for review or approval by the department.	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(i) The owner or operator may submit a written notification or request to the department for a permit modification to amend the closure plan at any time prior to the notification of partial or final closure of the facility.		Not a Requirement

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WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(ii) The owner or operator must submit a written notification of or request for a permit modification to authorize a change in the approved closure plan whenever:	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(A) Changes in operating plans or facility design affect the closure plan; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(B) There is a change in the expected year of closure, if applicable; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(C) In conducting partial or final closure activities, unexpected events require a modification of the approved closure plan; or	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(D) The owner/operator requests the director apply alternative requirements under subsection (1)(e) of this section, WAC 173-303-645 (1)(e), or 173-303-620 (1)(d).	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(iii) The owner or operator must submit a written request for a permit modification including a copy of the amended closure plan for approval at least sixty days prior to the proposed change in facility design or operation, or no later than sixty days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator must request a permit modification no later than thirty days after the unexpected event. An owner or operator of a surface impoundment or waste pile that intends to remove all dangerous waste at closure and is not otherwise required to prepare a contingent closure plan under WAC 173-303-650(6) or 173-303-660(9), must submit an amended closure plan to the department no later than sixty days from the date that the owner or operator or department determines that the dangerous waste management unit must be closed as a landfill, subject to the requirements of WAC 173-303-665, or no later than thirty days from that date if the determination is made during partial or final closure. The department will approve, disapprove, or modify this amended plan in accordance with the procedures in WAC 173-303-800 through 173-303-840. The approved closure plan will become a condition of any permit issued.	**94-111** 8.2.4 Duty to Amend Approved Closure Plans	H-A1 Introduction
(iv) The department may request modifications to the plan under the conditions described in (b)(ii) of this subsection. The owner or operator must submit the modified plan within sixty days of the department's request, or within thirty days if the change in facility conditions occurs during partial or final closure. Any modifications requested by the department will be approved in accordance with the procedures in WAC 173-303-800 through 173-303-840.		Not a Requirement
(c) Notification of partial closure and final closure.		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(i) The owner or operator must notify the department in writing at least sixty days prior to the date on which they expect to begin closure of a surface impoundment, waste pile, land treatment, or landfill unit, or final closure of a facility with such a unit. The owner or operator must notify the department in writing at least forty-five days prior to the date on which they expect to begin closure of a treatment or storage tank, container storage, or incinerator unit, or final closure of a facility with only such units.		NA – Notification prior to implementing the closure plan.
(ii) The date when he "expects to begin closure" must be either:		
(A) No later than thirty days after the date on which any dangerous waste management unit receives the known final volume of dangerous wastes or, if there is a reasonable possibility that the dangerous waste management unit will receive additional dangerous wastes, no later than one year after the date on which the unit received the most recent volume of dangerous waste. If the owner or operator of a dangerous waste management unit can demonstrate to the department that the dangerous waste management unit or facility has the capacity to receive additional dangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit; or		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(B) For units meeting the requirements of subsection (4)(d) of this section, no later than thirty days after the date on which the dangerous waste management unit receives the known final volume of nondangerous wastes, or if there is a reasonable possibility that the dangerous waste management unit will receive additional nondangerous wastes, no later than one year after the date on which the unit received the most recent volume of nondangerous wastes. If the owner or operator can demonstrate to the department that the dangerous waste management unit has the capacity to receive additional nondangerous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, the department may approve an extension to this one-year limit.		NA – Not a unit meeting (4)(d).
(iii) If the facility's permit is terminated, or if the facility is otherwise ordered, by judicial decree or final order to cease receiving dangerous wastes or to close, then the requirements of (c) of this subsection do not apply. However, the owner or operator must close the facility in accordance with the deadlines established in subsection (4) of this section.		NA – Permit has not been terminated.
(iv) Removal of wastes and decontamination or dismantling of equipment. Nothing in this subsection will preclude the owner or operator from removing dangerous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification of partial or final closure.		Not a Requirement
(4) Closure; time allowed for closure.		

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (214-T Building)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(**a**) Within ninety days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at a dangerous waste management unit or facility, the owner or operator must treat, remove from the unit or facility, or dispose of on site, all dangerous wastes in accordance with the approved closure plan. The department may approve a longer period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, and either:	**95-402** I1.4 Schedule for Closure **95-402** I1.4.1 Extension for Closure **94-111** 8.3.2 Time Allowed for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(i) The activities required to comply with this paragraph will, of necessity, take longer than ninety days to complete; or	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(B) There is a reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(b) The owner or operator must complete partial and final closure activities in accordance with the approved closure plan and within one hundred eighty days after receiving the final volume of dangerous wastes, or the final volume of nondangerous wastes if the owner or operator complies with all applicable requirements in (d) and (e) of this subsection, at the dangerous waste management unit or facility. The department may approve an extension to the closure period if the owner or operator complies with all applicable requirements for requesting a modification to the permit and demonstrates that he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating dangerous waste management unit or facility, including compliance with all applicable permit requirements, and either:	**95-402** I1.4 Schedule for Closure **95-402** I1.4.1 Extension for Closure **94-111** 8.3.2 Time Allowed for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(i) The partial or final closure activities will, of necessity, take longer than one hundred eighty days to complete; or	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(ii)(A) The dangerous waste management unit or facility has the capacity to receive additional dangerous wastes, or has the capacity to receive nondangerous wastes if the owner or operator complies with (d) and (e) of this subsection;	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(B) There is reasonable likelihood that he or another person will recommence operation of the dangerous waste management unit or the facility within one year; and	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(C) Closure of the dangerous waste management unit or facility would be incompatible with continued operation of the site.	**95-402** I1.4.1 Extension for Closure **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(c) The demonstrations referred to in (a)(i) and (ii) and (b)(i) and (ii) of this subsection must be made as follows: The demonstrations in (a)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified ninety-day period; and the demonstration in (b)(i) and (ii) of this subsection must be made at least thirty days prior to the expiration of the specified one hundred eighty-day period unless the owner or operator is otherwise subject to the deadlines in (d) of this subsection.	**95-402** I1.4.1 Extension for Closure Time **94-111** 8.3.3 Additional Time Allowed for Closure	H-A4 Closure Schedule and Time Frame
(d) The department may allow an owner or operator to receive only nondangerous wastes in a landfill, land treatment, or surface impoundment unit after the final receipt of dangerous wastes at that unit if:		Not requesting receipt of nondangerous waste.
(e) In addition to the requirements in (d) of this subsection, an owner or operator of a dangerous wastes surface impoundment that is not in compliance with the liner and leachate collection system requirements in 42 U.S.C. 3004 (o)(1) and 3005 (j)(1) or 42 U.S.C. 3004 (o)(2) or (3) or 3005 (j)(2), (3), (4) or (13) must:		NA – Not a Surface Impoundment
(5) Disposal or decontamination of equipment, structures and soils. During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in WAC 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), or under the authority of WAC 173-303-680 (2) and (4). By removing any dangerous wastes or dangerous constituents during partial and final closure, the owner or operator may become a generator of dangerous waste and must handle that waste in accordance with all applicable requirements of WAC 173-303-170 through 173-303-230.	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **94-111** 5.0 Debris **94-111** 6.0 Environmental Media	H-A3.7 Identifying and Managing Contaminated Environmental Waste H-A3.8 Identifying and Managing Waste Generated During Closure

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(6) Certification of closure. Within sixty days of completion of closure of each dangerous waste management unit (including tank systems and container storage areas), and within sixty days of the completion of final closure, the owner or operator must submit to the department by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the dangerous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification must be signed by the owner or operator and by an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until it releases the owner or operator from the financial assurance requirements for closure under WAC 173-303-620(4).	**94-111** 8.4 Closure Certification	H-D3.12 Closure Certificate H-A4 Closure Schedule and Time Frame
(7) Post-closure care and use of property.		NA – Clean closure, not subject to post-closure requirements.
(8) Post-closure plan; amendment of plan.		NA – Clean closure, not subject to post-closure requirements.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(9) Notice to local land authority. No later than the submission of the certification of closure of each dangerous waste disposal unit, the owner or operator of a disposal facility must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department a survey plat indicating the location and dimensions of landfill cells or other dangerous waste disposal units with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat filed with the local zoning authority or the authority with jurisdiction over local land use must contain a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the dangerous waste disposal unit in accordance with the applicable requirements of this section. In addition, no later than sixty days after certification of closure of each dangerous waste disposal unit, the owner or operator must submit to the local zoning authority or the authority with jurisdiction over local land use and to the department, a record of the type, location, and quantity of dangerous wastes disposed of within each cell or other disposal unit of the facility. For wastes disposed of before November 19, 1980 (March 12, 1982, for facilities subject to this chapter but not subject to 40 C.F.R. Part 264), the owner or operator must identify the type, location, and quantity of the dangerous wastes to the best of his knowledge and in accordance with any records he has kept.		NA- Clean Closure, not subject to post-closure requirements.
(10) Notice in deed to property.		NA – Clean closure, not subject to post-closure requirements.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(11) Certification of completion of post-closure care. No later than sixty days after completion of the established post-closure care period for each dangerous waste disposal unit, the owner or operator must submit to the department, by registered mail or other means that establish proof of receipt (including applicable electronic means), a certification that the post-closure care period for the dangerous waste disposal unit was performed in accordance with the specifications in the approved post-closure plan. The certification must be signed by the owner or operator and an independent qualified registered professional engineer. Documentation supporting the independent qualified registered professional engineer's certification must be furnished to the department upon request until he releases the owner or operator from the financial assurance requirements for post-closure care under WAC 173-303-620(6).		NA – Clean closure, not subject to post-closure requirements.
WAC 173-303-806 Final facility permits		
(4) Contents of Part B. Part B of a permit application must consist of the information required in (a) through (m) of this subsection.		

T Plant Complex Part B Addendum H, Closure Plan Regulatory Crosswalk (214-T Building)

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(a) General requirements. Part B of the permit application consists of the general information requirements of this subsection, and the specific information requirements in (b) through (h) of this subsection as applicable to the facility. The Part B information requirements presented in (a) through (h) of this subsection, reflect the standards promulgated in WAC 173-303-600. These information requirements are necessary in order for the department to determine compliance with WAC 173-303-600 through 173-303-670. If owners and operators of TSD facilities can demonstrate that the information prescribed in Part B cannot be provided to the extent required, the department may make allowance for submission of such information on a case-by-case basis. Information required in Part B must be submitted to the department and signed in accordance with requirements in WAC 173-303-810(12). Certain technical data, such as design drawings and specifications, and engineering studies must be certified by a registered professional engineer. For post-closure permits, only the information specified in WAC 173-303-806 (4)(o) is required in Part B of the permit application. The following information is required for all TSD facilities, except as WAC 173-303-600(3) provides otherwise.	**95-402** K. Part B Certification	H-A3.11 Role of the Independent Qualified Registered Professional Engineer H-A3.12 Closure Certification
(xiii) A copy of the closure plan and, where applicable, the post-closure plan required by WAC 173-303-610 (3) and (8). Include, where applicable, as part of the plans, specific requirements in WAC 173-303-630(10), 173-303-640(8), 173-303-650(6), 173-303-655(8), 173-303-660(9), 173-303-665(6), 173-303-670(8), and 173-303-680 (2) and (4).		Addendum H
(xiv) For dangerous waste disposal units that have been closed, documentation that notices required under WAC 173-303-610(10) have been filed.		NA – 214-T Building has not been closed.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(xv) The most recent closure cost estimate for the facility prepared in accordance with WAC 173-303-620(3) and a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(4). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.	**95-402** I. Closure and Financial Assurance-Overview of Requirements	H-A5 Closure Costs
(xvi) Where applicable, the most recent post-closure cost estimate for the facility prepared in accordance with WAC 173-303-620(5) plus a copy of the documentation required to demonstrate financial assurance under WAC 173-303-620(6). For a new facility, a copy of the required documentation may be submitted sixty days prior to the initial receipt of dangerous wastes, if that is later than the submission of the Part B.		NA – Clean closure, not subject to post-closure requirements.
(xvii) Where applicable, a copy of the insurance policy or other documentation which comprises compliance with the requirements of WAC 173-303-620(8). For a new facility, documentation showing the amount of insurance meeting the specification of WAC 173-303-620 (8)(a) and, if applicable, WAC 173-303-620 (8)(b), that the owner or operator plans to have in effect before initial receipt of dangerous waste for treatment, storage, or disposal. A request for a variance in the amount of required coverage, for a new or existing facility, may be submitted as specified in WAC 173-303-620 (8)(c).		NA – No insurance requirements.

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(xviii) A topographic map showing a distance of one thousand feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of TSD facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map must clearly show the following:	**95-402** B4 Topographic Map	Addendum A, Part A Form, Attachment C
WAC 173-303-630 Use and management of containers		
(10) Closure. At closure, all dangerous waste and dangerous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with dangerous waste or dangerous waste residues must be decontaminated or removed.	**95-402** I.1.3.2 Decontaminating Structures, Equipment, and Soil **94-111** 6.0 Environmental Media	H-A3.6 Demolition of the 214-T Building H-A3.7 Identifying and Managing Contaminated Environmental Media H-A3.8 Identifying and Managing Waste Generated During Closure
WAC 173-303-610 Closure and post-closure – FOCUS ON SAMPLING AND ANALYSIS PLAN		

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(3)(a)(v) A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination required to satisfy the closure performance standard;	**95-402** I1.3.2 Decontaminating Structures, Equipment and Soil **95-402** I1.3.3 Sampling and Analysis to Identify Extent of Decontamination/Removal and to Verify Achievement of Closure Standard **94-111** 7.0 Sampling and Analysis for Clean Closure **94-111** 8.2.1 Contents of the Closure Plan	H-A3.7 Identifying and Managing Contaminated Environmental Media H-A3.8 Identifying and Managing Waste Generated during Closure H-A3.10 Sampling and Analysis Plan
	94-111 7.1 Sampling and Analysis Plan	H-A3.10 Sampling and Analysis Plan
	94-111 7.2 Designing a Sampling Program	H-A3.10.5 Sampling Design
	94-111 7.3 Sampling to Determine or Confirm Clean Closure	H-A3.10.5 Sampling Design
	94-111 7.5 Soil Sampling During Closure	H-A2.1 Clean Closure Levels H-A3.9 Confirming Clean Closure
	94-111 7.7 Selection of Constituents to be Analyzed	H-A3.10.2 Target Analytes
	94-111 7.8 Approved Analytical Methods	H-A3.10.7 Analytical Methods
	94-111-7.10 Quality Assurance and Quality Control Requirements	H-A3.10.8 Quality Control

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
	94-111 7.11 Data Quality Objectives	H-A3.10.8 Quality Control Need to beef this section up or add additional language for DQO process
	94-111 7.12 Practical Quantitation Limits	Table H-A4 Soil Analytical Performance Requirements
WAC 173-340-705 Use of Method B		
(1) Applicability. Method B is applicable to all sites. It shall be used to develop cleanup levels unless one or more of the conditions for using Method A or Method C are demonstrated to exist and the person conducting the cleanup action elects to use that method.		H-A2.1 Clean Closure Levels
(2) Cleanup levels. Method B consists of two approaches, standard and modified. Standard Method B uses default formulas, assumptions, and procedures to develop cleanup levels. Under modified Method B chemical-specific or site-specific information may be used to change certain assumptions to calculate different cleanup levels. When the term "Method B" is used in this chapter, it means both standard and modified Method B. Method B cleanup levels shall be established in accordance with the procedures in WAC 173-340-720 through 173-340-760. Method B cleanup levels shall be at least as stringent as all of the following:		H-A2.1 Clean Closure Levels
(a) Concentrations of individual hazardous substances established under applicable state and federal laws;		H-A2.1 Clean Closure Levels
(b) Concentrations that are estimated to result in no adverse effects on the protection and propagation of aquatic life, and no significant adverse effects on terrestrial ecological receptors using the procedures specified in WAC 173-340-7490 through 173-340-7494;		H-A2.1 Clean Closure Levels
(c) For hazardous substances for which sufficiently protective, health-based criteria or standards have not been established under applicable state and federal laws, those concentrations which protect human health as determined by the following methods:		H-A2.1 Clean Closure Levels

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(i) Concentrations that are estimated to result in no acute or chronic toxic effects on human health as determined using a hazard quotient of one (1) and the procedures specified in WAC 173-340-720 through 173-340-760;		H-A2.1 Clean Closure Levels
(ii) For known or suspected carcinogens, concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to one in one million (1 x 10-6) as determined using the procedures specified in WAC 173-340-720 through 173-340-760; and		H-A2.1 Clean Closure Levels
(iii) Concentrations that eliminate or minimize the potential for food chain contamination as necessary to protect human health.		H-A2.1 Clean Closure Levels
(3) More stringent cleanup levels. The department may establish Method B cleanup levels that are more stringent than those required by subsection (2) of this section, when based upon a site-specific evaluation, the department determines that such levels are necessary to protect human health and the environment. Any imposition of more stringent requirements under this provision shall comply with WAC 173-340-702 and 173-340-708.		H-A2.1 Clean Closure Levels
(4) Multiple hazardous substances or pathways. Concentrations of individual hazardous substances established under subsections (2) and (3) of this section, including those based on applicable state and federal laws, shall be adjusted downward to take into account exposure to multiple hazardous substances and/or exposure resulting from more than one pathway of exposure. These adjustments need to be made only if, without these adjustments, the hazard index would exceed one (1) or the total excess cancer risk would exceed one in one hundred thousand (1 x 10-5). These adjustments shall be made in accordance with the procedures in WAC 173-340-708 (5) and (6). In making these adjustments, the hazard index shall not exceed one (1) and the total excess cancer risk shall not exceed one in one hundred thousand (1 x 10-5).		H-A2.1 Clean Closure Levels

WAC Regulation	Ecology Guidance Document Publication	T Plant Complex Section
(5) Adjustments to cleanup levels based on applicable laws. Where a cleanup level is based on an applicable state or federal law, and the level of risk upon which the applicable state and federal law is based exceeds an excess cancer risk of one in one hundred thousand (1 x 10-5) or a hazard index of one (1), the cleanup level must be adjusted downward so that the total excess cancer risk and hazard index at the site does not exceed the limits established in subsection (4) of this section.		H-A2.1 Clean Closure Levels
(6) Limitation on adjustments. Cleanup levels determined using Method B, including cleanup levels adjusted under subsections (4) and (5) of this section, shall not be set at levels below the practical quantitation limit or natural background, whichever is higher. See WAC 173-340-707 and 173-340-709 for additional requirements on practical quantitation limits and natural background.		H-A2.1 Clean Closure Levels
(7) Remediation levels. Method B formulas may be modified for the purpose of using a human health risk assessment to evaluate the protectiveness of a remedy. WAC 173-340-708 (3) and (10) describe the adjustments that can be made to the Method B formulas. Also see WAC 173-340-355 and 173-340-357 for more detailed information on remediation levels and quantitative risk assessment		H-A2.1 Clean Closure Levels
(8) Inconsistencies. If there are any inconsistencies between this section and any specifically referenced sections, the referenced section shall govern.		Table H-A4

T Plant Complex Part B Addendum I, Inspection Plan Regulatory Crosswalk

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Section
WAC 173-303-806 (4)(a)(v) Final facility permit		
A copy of the general inspection schedule required by WAC 173-303-320(2): Include where applicable, as part of the inspection schedule, specific requirements in WAC 173-303-395 (1)(d), 173-303-630(6), 173-303-640 (4)(a)(i) and (6), 173-303-650(4), 173-303-655(4), 173-303-660 (4) and (5), 173-303-665(4), 173-303-670(7), and 173-303-680(3), and 40 C.F.R. 264.1033, 264.1035, 264.1052, 264.1053, 264.1058, 264.1064, 264.1067, 264.1084, 264.1085, 264.1086, and 264.1088.		
WAC 173-303-320 General inspection		
(1) The owner or operator must inspect his facility to prevent malfunctions and deterioration, operator errors, and discharges which may cause or lead to the release of dangerous waste constituents to the environment, or a threat to human health. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.	F2. Inspections	Permit Condition II.O.1 General Inspection Requirements
(2) The owner or operator must develop and follow a written schedule for inspecting all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that help prevent, detect, or respond to hazards to the public health or the environment. In addition:	F2.1. General inspection requirements	Table I-1 Inspection Schedule
(a) The schedule must be kept at the facility;	F2.1. General inspection requirements	I1.2 Inspection Log
(b) The schedule must identify the types of problems which are to be looked for during inspections;	F2.1. General inspection requirements	I1.2 Inspection Log and Table I-1 Inspection Schedule

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Section
(c) The schedule must indicate the frequency of inspection for specific items. The frequency should be based on the rate of possible deterioration of equipment, and the probability of an environmental or human health incident. Areas subject to spills must be inspected daily when in use. At a minimum the inspection schedule must also include the applicable items and frequencies required for the specific waste management methods described in 40 C.F.R. Part 265 Subparts F through R, 265.1033, 265.1052, 265.1053, 265.1058 and 265.1084 through 265.1090, for interim status facilities and in WAC 173-303-630 through 173-303-680, and 40 C.F.R. 264.1033, 264.1052, 264.1053, 264.1058 and 264.1083 through 264.1089 for final status facilities; and	F2.1. General inspection requirements	I1.1.2 Frequency of Inspections and Table I-1 Inspection Schedule
(d) The owner or operator must keep an inspection log or summary, including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made, an account of spills or discharges in accordance with WAC 173-303-145, and the date and nature of any repairs or remedial actions taken. The log or summary must be kept at the facility for at least five years from the date of inspection.	F2.2. Inspection Log	I1.2 Inspection Log Permit Condition II.I Facility Operating Record
(3) The owner or operator must remedy any problems revealed by the inspection, on a schedule which prevents hazards to the public health and environment. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.	F2.3. Schedule for remedial action for problems revealed	I.1.3 Schedule for Remedial Action for Problems Revealed
WAC 173-303-630 Use and management of containers		
(3) Identification of containers. The owner or operator must ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection required under WAC 173-303-320.	F.2.4 Specific process or waste type inspection requirements	Table I-1 Inspection Schedule

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Section
(6) Inspections. At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. The owner or operator must keep an inspection log including at least the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made and the date and nature of any repairs or remedial actions taken. The log must be kept at the facility for at least five years from the date of inspection.	F.2.4 Specific process or waste type inspection requirements	I1.4.2 Container Inspection and Table I-1 Inspection Schedule
WAC 173-303-395 Other general requirements		
(d) At least yearly, the owner or operator must inspect those areas of his facility where ignitable or reactive wastes are stored. This inspection must be performed in the presence of a professional person who is familiar with the International Fire Code, or in the presence of the local, state, or federal fire marshal. The owner or operator must enter the following information in his inspection log or operating record as a result of this inspection:	F2.5. Prevention of reaction of ignitable, reactive, and incompatible wastes	I1.4.5 Storage of Ignitable or Reactive Wastes and Table I-1 Inspection Schedule
(i) The date and time of the inspection;		I1.4.5 Storage of Ignitable or Reactive Wastes
(ii) The name of the professional inspector or fire marshal;		I1.4.5 Storage of Ignitable or Reactive Wastes
(iii) A notation of the observations made; and		I1.4.5 Storage of Ignitable or Reactive Wastes
(iv) Any remedial actions which were taken as a result of the inspection.		I1.4.5 Storage of Ignitable or Reactive Wastes
WAC 173-303-695 Containment buildings		
The requirements for containment buildings at 40 C.F.R. Part 264 Subpart DD are incorporated by reference. The words "regional administrator" will mean "department." The sentence at 40 C.F.R. 264.1101 (c)(2) is modified by changing "qualified Professional Engineer" to "independent qualified registered professional engineer."	No equivalent	See subpart DD below

T Plant Complex Part B Addendum I, Inspection Plan Regulatory Crosswalk

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Section
40 CFR Part 264 Subpart DD – Containment Buildings		
(4) Inspect and record in the facility's operating record, at least once every seven days, except for Performance Track member facilities that must inspect at least once each month, upon approval by the Director, data gathered from monitoring and leak detection equipment as well as the containment building and the area immediately surrounding the containment building to detect signs of releases of hazardous waste. To apply for reduced inspection frequency, the Performance Track member facility must follow the procedures described in §264.15(b)(5).	No equivalent	I1.4.4 Containment Building Inspection

T Plant Complex Part B Addendum J, Contingency Plan Regulatory Crosswalk

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
WAC 173-303-350 Contingency Plan and Emergency Procedures		
(1) Purpose. The purpose of this section and WAC 173-303-360 is to lessen the potential impact on the public health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or groundwater by a facility. A contingency plan must be developed to lessen the potential impacts of such emergency circumstances, and the plan must be implemented immediately in such emergency circumstances.	G. Contingency Plan – Overview of Requirements	**Site-level:** DOE/RL-94-02, *Hanford Emergency Management Plan* (referred to as **HEMP**) **OUG-level:** HNF-IP-0263-TPC, *Building Emergency Plan for T Plant Complex* (referred to as **BEP**)

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(2) Contingency plan. Each owner or operator must have a contingency plan at his facility for use in emergencies or sudden or nonsudden releases which threaten human health and the environment. If the owner or operator has already prepared a spill prevention control and countermeasures (SPCC) plan in accordance with Part 112 of Title 40 C.F.R., or some other emergency or contingency plan, they need only amend that plan to incorporate dangerous waste management provisions that are sufficient to comply with the requirements of this section and WAC 173-303-360. The owner or operator may develop one contingency plan that meets all regulatory requirements. Ecology recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan") as found at www.nrt.org. When modifications are made to nondangerous waste (non-Hazardous Waste Management Act or nondangerous waste regulation) provisions in an integrated contingency plan, the changes do not trigger the need for a dangerous waste permit modification.	G. Contingency Plan – Overview of Requirements	**Site-level:** HEMP **OUG-level:** BEP
(3) The contingency plan must contain the following:		
(a) A description of the actions which facility personnel must take to comply with this section and WAC 173-303-360;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** BEP T Plant - Section 7.0 Incident Response
(b) A description of the actions which will be taken in the event that a dangerous waste shipment, which is damaged or otherwise presents a hazard to the public health and the environment, arrives at the facility, and is not acceptable to the owner or operator, but cannot be transported, pursuant to the requirements of WAC 173-303-370(6), Manifest system, reasons for not accepting dangerous waste shipments;	G4. Emergency Response Procedures	**Site-level:** HEMP - Section 1.3.4 Hanford Site Emergency Response **OUG-level:** BEP - Section 7.2.5.1 Damaged or Unacceptable Shipments

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(c) A description of the arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services as required in WAC 173-303-340(4);	G6. Coordination Agreements	**Site-level:** HEMP - Sections 3.0 Offsite Response Interfaces and Table 3-1 Memorandums of Understanding **OUG-level:** BEP - Section 10.0 Coordination Agreements
(d) A current list of names, addresses, and phone numbers (office and home) of all persons qualified to act as the emergency coordinator required under WAC 173-303-360(1). Where more than one person is listed, one must be named as primary emergency coordinator, and others must be listed in the order in which they will assume responsibility as alternates. For new facilities only, this list may be provided to the department at the time of facility certification (as required by WAC 173-303-810 (14)(a)(i)), rather than as part of the permit application;	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2 Emergency Response Organization Structure **OUG-level:** BEP - Section 3.0 and Section 13.0 Facility/Building Emergency Response Organization
(e) A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems, and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities; and	G5. Emergency Equipment	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** BEP - Section 9.0 Emergency Equipment
(f) An evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe the signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.	G7. Evacuation Plan	**Site-level:** HEMP – Section 7.2.3.7 Area or Site Evacuation, Figure 7-3 Hanford Site Evacuation Routes, and Table 5-1 Standard Emergency Signals **OUG-level:** BEP - Section 7.1.1 Evacuation and Figure 1
(4) Copies of contingency plan. A copy of the contingency plan and all revisions to the plan must be:		

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(a) Maintained at the facility; and	No equivalent	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(b) Submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services.	G9. Amendment to Contingency Plan	**Site-level:** HEMP Section 14.3.7 Plan Locations **OUG-level:** BEP - Section 10.0 Coordination Agreements
(5) Amendments. The owner or operator must review and immediately amend the contingency plan, if necessary, whenever:	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1 Review and Update of the Hanford Emergency Management Plan and Richland Operations Office/Office of River Protection/Pacific Northwest Site Office and Site Contractor Implementing Procedures **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(a) Applicable regulations or the facility permit are revised;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(b) The plan fails in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(c) The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(d) The list of emergency coordinators changes; or	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
(e) The list of emergency equipment changes.	G9. Amendment to Contingency Plan	**Site-level:** HEMP – Section 14.3.1.1 Review and Update Based on WAC 173-303 **OUG-level:** BEP - Section 12.0 Plan Location and Amendments
WAC 173-303-360 Emergencies		
(1) Emergency coordinator. At all times, there must be at least one employee either on the facility premises or on call (that is, available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, required by WAC 173-303-350(2), all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.	G2. Emergency Coordinators	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization **OUG-level:** BEP - Section 3.1 Building Emergency Director
(2) Emergency procedures. The following procedures must be implemented in the event of an emergency.	G4. Emergency Response Procedures	N/A

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:	G4.1 Incident response, assessment, and identifications	N/A
(i) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and	G4.2 Notification	**Site-level:** HEMP - Section 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 7.0 Incident Response (not specific to the EC)
(ii) Notify appropriate state or local agencies with designated response roles if their help is needed.	G4.2 Notification	**Site-level:** HEMP - Sections 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP – Sections 4.0 Implementation of the Plan
(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials.	G4.4 Identification of dangerous materials	**Site-level:** HEMP - Sections 2.2.1.1 Facilities/Building Emergency Response Organization (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan
(c) Concurrently, the emergency coordinator must assess possible hazards to human health and the environment (considering direct, indirect, immediate, and long-term effects) that may result from the release, fire, or explosion.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2 2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, he must report his findings as follows:	G4.5 Hazard assessment and report	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications
(i) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and	G4.5 Hazard assessment and report	**Site-level:** HEMP – Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP - Section 4.0 Implementation of the Plan
(ii) He must immediately notify the department and either the government official designated as the on-scene coordinator, or the National Response Center (using their 24-hour toll free number (800) 424-8802).	G4.5 Hazard assessment and report	**OUG-level:** BEP - Section 7.0 Incident Response
(e) His assessment report must include:	G4.5 Hazard assessment and report	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) & Section 5.1.1 Operational Emergency Notifications, and Section 5.1.2.1 Environmental Notifications
(i) Name and telephone number of reporter;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(ii) Name and address of facility;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(iii) Time and type of incident (e.g., release, fire);	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(iv) Name and quantity of material(s) involved, to the extent known;	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(v) The extent of injuries, if any; and	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(vi) The possible hazards to human health or the environment outside the facility.	G4.5 Hazard assessment and report	**Site-level:** HEMP - Figure 5-2 Hanford Emergency Notification Form
(f) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.	G4.3. Containment and control of emergencies	**Site-level:** HEMP Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP – Section 7.3 Prevention of Recurrence or Spread of Fires, Explosions, or Releases
(g) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.	G4.6 Prevention of recurrence or spread of fires, explosions, or releases	**Site-level:** HEMP - Sections 2.2.1.1.2 and 2.2.1.1.3 (Specific responsibilities of the BW/BED) **OUG-level:** BEP – Section 7.2.4 Fire and/or Explosion, and Section 7.2.5 Hazardous Material, Dangerous and or Mixed Waste Spill
(h) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** BEP – Section 8.3 Incompatible Waste
(i) The emergency coordinator must ensure that, in the affected area(s) of the facility:		
(i) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 9.2.3 Incompatible Waste **OUG-level:** BEP - Section 8.3 Incompatible Waste

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(ii) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 11.2 Emergency Equipment **OUG-level:** BEP - Section 8.4 Post Emergency Equipment Maintenance and Decontamination
(j) The owner or operator must notify the department, and appropriate local authorities, that the facility is in compliance with (i) of this subsection before operations are resumed in the affected area(s) of the facility.	G4.7 Post-Emergency Actions	**Site-level:** HEMP - Section 5.1.2.3 Resumption of Operations **OUG-level:** BEP T Plant – Section 8.2 Incident Recovery and Restart of Operations
(k) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within fifteen days after the incident, he must submit a written report on the incident to the department. The report must include:	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(i) Name, address, and telephone number of the owner or operator;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(ii) Name, address, and telephone number of the facility;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(iii) Date, time, and type of incident (e.g., fire, explosion);	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(iv) Name and quantity of material(s) involved;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(v) The extent of injuries, if any;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting

WAC Requirement	Ecology Guidance Document Publication 95-402	T Plant Complex
(vi) An assessment of actual or potential hazards to human health or the environment, where this is applicable;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(vii) Estimated quantity and disposition of recovered material that resulted from the incident;	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(viii) Cause of incident; and	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting
(ix) Description of corrective action taken to prevent reoccurrence of the incident.	G8. Required Reports, Recordkeeping, and Certifications	**OUG-level:** BEP - Section 11.0 Required Reporting

HNF-19668, 2005, *T Plant Complex 221-T Building Dangerous Waste Containment Building Certification*, Revision 5

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T Plant Complex, 221-T Building Dangerous Waste Containment Building Certification Rev. 5

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March 2005

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CONTAINMENT BUILDING CERTIFICATION IN ACCORDANCE WITH 40 CFR 264, SUBPART DD

CERTIFICATION:

I, David S. Messinger, Professional Engineer, do hereby certify that I have reviewed the pertinent internal work requirements/processes and documents and have made sufficient on-site inspections to determine that the 221-T canyon deck, railroad tunnel and cells 3- L, 7-L, 8-R, 9-L, 10-L, 13-L, 13-R, 14-R, 15-L, 16-R and 17-R, within the 221-T building meet the requirements stipulated in 40 Code of Federal Regulations (40 CFR), Part 264, Subpart DD, section 264.1101, paragraphs (a) and (c), for the storage of non-liquid (no free liquids) dangerous waste.

COMPLIANCE DETERMINATION:

BACKGROUND:

The 221-T building is located within the T Plant Complex, 200 West Area of the Hanford Site (Figure 1). The 221-T is a large reinforced concrete building constructed about 1948. It is similar in construction to other "canyon" type facilities located on the Hanford Site (i.e., 221-B and 221-U). The 221-T building has inside dimensions of about 58 feet wide by approximately 800 feet in length and consists of 20 sections, each approximately 40 feet long. The internal height above ground or deck level is approximately 40 feet and the building extends approximately 40 feet below ground level (Figures 2 and 3). Each section contains two process cells located below ground level. Drawings for the various sections making up the 221-T building are identified on the Structural Key Plan Drawing W-70064. Sections 1 and 2, which include the cells and the railroad tunnel are shown on Drawing W-69333. Concrete cover blocks for the cells are shown on Drawing W-69332, D-60784, H-2-88618, W-69100, H-2-32782 and H-2-32246.

Specific areas of the building covered under this certification are:

- The Canyon Deck (including cover blocks)
- The Railroad Tunnel
- Process Cells 3-L, 7-L, 8-R, 9-L, 10-L, 13-L, 13-R, 14-R, 15-L, 16-R and 17-R

Of significance in this evaluation was that the older cover blocks, which are shown in drawing W-69332 and the later drawing H-2-88618, do not provide load capacity information. It was therefore necessary to perform an analysis of these items based on information in the drawings to determine a safe load capacity.

It was also determined through review of the drawings that provisions of neither the Uniform Building Code (UBC) 1997 or the American Concrete Institute (ACI) 318-99 could be met with

respect to minimum allowable reinforcing steel in the crane gallery floor slab where it joins the shielding wall. The crane gallery cannot be certified for storage of materials until a more rigorous analysis can demonstrate that sufficient structural strength exists in this member. If such analysis finds sufficient strength in this area of the structure, then this certification can be amended accordingly.

ASSESSMENT PROCESS AND FINDINGS:

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1. *Is building completely enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, run-on) and to assure containment of managed waste? (Ref. 264.1101 (a)(1))*

   The 221-T building is completely enclosed with floor, walls and a roof to prevent exposure to the elements. There are very minor roof leaks (10 drops per minute) that are not considered significant. These leaks should be addressed in a normal maintenance program. (Refer to "221T Roof Leaks: Evaluation & Recommendations, Work Package 2T-00-00324, Repair Roof of 221T Canyon," dated 05/10/2001 and DOE/RL-95-36. Rev. 1, Sec. 4.6.1.1)

2. *Are the floors and containment walls designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit? (Ref. 264.1101 (a)(2))*

   The 221-T building walls, canyon deck, railroad tunnel and process cells are reinforced concrete construction adequate for containment of the waste contents (See figs. 2, 3 & 4). The canyon deck needs to be posted for allowable loads. Although loads are moved through the canyon facility with the overhead crane, waste packages, boxes, and other equipment have been placed on the deck consisting of cell cover blocks. These cover blocks do not appear to be load rated consistently and many do not appear to have a load rating at all. Inspection of the construction drawings (W-69100, H-2-88618) and subsequent calculations reveal that the cover blocks conform to ACI-318-99 and American Institute of Steel Construction (AISC) requirements for composite reinforced flexural members (beams or one-way slabs). *A structural analysis of the cover blocks has been made to verify these findings prior to certification of this deck.* (Refer to Calc. No. 101650-CA40-C-001 and Drawings W-69332, H-2-88618, H-2-32782 and H-2-32246 and DOE/RL-95-36. Rev. 1, Sec. 4.6.1.2.)

3. *Will the building elements prevent failure due to pressure gradients, settlement, compression, uplift, physical contact with the hazardous waste to which they are exposed, climatic conditions and the stresses of daily operation? (Ref. 264.1101 (a)(2))*

   The 221-T building elements are safe from failure due to pressure gradients, settlement, compression, uplift, physical contact with the hazardous waste, climatic conditions, and the stresses of daily operation. Various structural analyses have been

performed that reveal the structure is adequate for earthquake and tornado events. The building is founded in nearly 40 feet of granular soils and will not experience uplift or settling of any significant amount. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.1.1 and Sec. 4.6.1.2)

4. *Will heavy equipment operating within the building damage containment walls if equipment comes in contact with the wall? (Ref. 264.1101 (a)(2))*

   The 221-T building is constructed of reinforced concrete and as such will not be significantly damaged by equipment coming in contact with the walls. Loads are moved through the 221-T building using the traveling overhead crane and as such, placement of loads is accurate and does not involve vehicles. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.1.1 and Sec. 4.6.1.2)

5. *Does the building have sufficient structural strength to prevent collapse or other failure? (Ref. 264.1101 (a)(2))*

   The 221-T building was analyzed for structural adequacy in support of the Interim Storage of K Basin Sludge and found to be structurally sound. (Refer to HNF-6033, Rev. 0 and DOE/RL-95-36. Rev. 1, Sec. 4.6.1.1 and Sec. 4.6.1.2)

6. *Are all surfaces that will come in contact with hazardous waste chemically compatible with those wastes? (Ref. 264.1101 (a)(2))*

   Only dry waste (mainly contaminated equipment) is being considered for storage within the 221-T building. The walls and floors are of heavy reinforced concrete construction and should not be affected by the stored materials. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.2)

7. *Is the building operated in such a manner as to prevent hazardous waste from coming in contact with the doors and windows? (Ref. 264.1101 (a)(2))*

   Operational work requirements/processes prevent contamination from reaching the 221-T building portals either by personnel or equipment.

8. *Do the doors and windows provide an effective barrier against fugitive dust emission? (Ref. 264.1101 (a)(2))*

   The 221-T building has a ventilation system that keeps the building at a negative pressure. The ventilation system discharges through large HEPA filters to prevent any fugitive dust or other airborne contamination from reaching the outside environment. The doors are structurally adequate and there are no windows. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.5)

9. *Will any incompatible hazardous waste or treatment reagents be placed in the unit that may cause the unit to leak, corrode or otherwise fail? (Ref. 264.1101 (a)(3))*

The 221-T building containment building areas are being considered for storage of materials that do not contain free liquids and that will primarily be contaminated equipment and materials. No incompatible waste or treatment reagents that could corrode or damage the containment area are brought into or used within the 221-T building unless special precautions are taken to prevent commingling of incompatibles. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.2)

10. *Does the containment building have a primary barrier designed to withstand the movement of personnel, waste, and handling equipment in the unit during the operating life of the unit and appropriate for the physical and chemical characteristics of the waste to be managed? (Ref. 264.1101(a)(4))*

The 221-T building containment primary barrier consists of the concrete canyon deck, the concrete floor of the railroad tunnel and the concrete floor of process cells 3-L, 7-L, 8-R, 9-L, 10-L, 13-L, 13-R, 14-R, 15-L, 16-R and 17-R. The canyon deck, tunnel, and cell floors will serve as the floor for the storage areas. The canyon deck consists of 6-foot thick concrete cover-blocks that cover the process cells. The floor in the railroad tunnel and process cells is approximately 8 feet thick reinforced concrete. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.2.1)

11. *Are there controls and procedures in place to maintaining the primary barrier to be free of significant cracks, gaps, corrosion, or other deterioration that could cause hazardous waste to be released from the primary barrier? (Ref. 264.1101 (c)(1)(i))*

Controls and practices used to maintain the primary barrier include daily surveillance of the canyon deck and railroad tunnel (if personnel enter the 221-T canyon) looking for cracks, gaps, corrosion, or other deterioration that could cause releases of waste. The cover blocks forming the canyon deck contain an intentional 1-inch gap around the perimeter of the cover block to provide for positive airflow down through the deck to the exhaust and filter system. These gaps are not significant to the form of waste being stored. The existing floor drains in the 7-L, 8-R, 9-L, 13-R, 14-R, 16-R and 17-R process cells have been sealed to eliminate the possibility of small stored items or waste from entering the drainage system. Cells 3-L, 10-L, 13-L and 15-L are equipped with a freestanding carbon-steel liner (originally designed as a secondary containment assembly for the Spent Nuclear Fuel sludge handling system for the storage of KE sludge) which prevent small stored items or waste from entering the cell drainage system. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.1)

12. *Are there controls and procedures in place to maintain the level of the stored/treated hazardous waste within the containment walls of the unit so that the height of any containment wall is not exceeded? (Ref. 264.1101 (c)(1)(ii))*

The 221-T building containment walls are about 25 feet high above deck level to the crane rails and the walls are a minimum of five feet thick. The waste being stored within the 221-T building will not reach this height. The process cells located below deck level are about 23 feet deep but the ventilation duct is located about 8 feet above the bottom of the cells. Waste must not be placed in such a manner as to obstruct the ventilation inlet duct. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.3)

13. *Are there controls and procedures in place to prevent tracking of hazardous waste out of the unit by personnel or by equipment used in handling the waste, including an area designated for the decontamination of equipment and collection of rinsate? (Ref. 264.1101 (c)(1)(iii))*

Extensive requirements are in place to prevent the tracking out of contamination, including administrative access controls and monitoring. Protective clothing is required for personnel inside the 221-T canyon. Exiting the canyon requires step-off pads to control where the contamination ends, removal of all protective clothing, and monitoring to determine if any contamination has reached the underlying clothing. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.4)

14. *Are there controls and procedures in place to control fugitive dust emissions such that any openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions (see 40 CFR part 60 appendix A, Method 22) and are all associated particulate collection devices (e.g., fabric filter, electrostatic precipitator) operated and maintained with sound air pollution control practices? (see 40 CFR Part 60 subpart 292). This state of no visible emissions must be maintained effectively at all times during routine operating and maintenance conditions, including when vehicles and personnel are entering and exiting the building? (Ref. 264.1101 (c)(1)(iv))*

Fugitive dust emissions are controlled through the use of negative pressure differentials and filters. Contaminated areas are kept at a lower pressure than non-contaminated area, resulting in airflow from less contaminated areas to the contaminated area, and effectively preventing the release of fugitive emissions. The 221-T canyon ventilation system consists of the 291-T exhaust system for exhausting the main canyon and 221-TA supply fans to supply air to the canyon. The HEPA filters on the 291-T exhaust system must each pass dioctyl salicylate aerosol testing requirements of 99.95% efficiency. (Refer to DOE/RL-95-36. Rev. 1, Sec. 4.6.3.5)

15. *Are inspections of "data gathered from monitoring equipment and leak detection equipment as well as the containment building and the area immediately surrounding the containment building performed at least once every seven days to detect signs of releases of hazardous waste? (Ref. 264.1101(c)(4))*

Building differential pressure is monitored on a weekly basis to ensure negative air pressure is maintained within the 221-T building. Daily inspections of the containment building areas to detect releases are executed when waste handling activities are being performed in that area. This practice is in keeping with ALARA principles to prevent higher than necessary radiation exposure to facility personnel.

The area immediately surrounding the 221-T building is inspected once a week to detect signs of release of waste. (Refer to Atomic Energy Act and DOE/RL-95-36, Rev. 1, Sec. 4.6.3.7)

REFERENCES:

Drawings:

W-69332	Concrete Covers
W-69100	Cell Cover Forms
W-69333	Concrete Sections and Details
W-70064	Building 221-T, -U and -B Structural Key Plan
D-60784	Curb Angles
H-2-32246, Rev 2	Concrete Cell Cover Decontn Facility
H-2-32782, Rev 1	Concrete Cell Cover Decontn Facility
H-2-88618, Rev 0	Structural Concrete Cover Blocks
H-2-830348, sht. 1, Rev. 2	Secondary Containment Assembly

Calculations:

HNF-6033	Seismic Evaluation of the T-Plant 221-T Building for Interim Storage of K Basin Sludge, 200 West Area, Hanford Site.
101650-CA40-C-001	Cover Block Load Capacity

Codes:

Building Code Requirements for Structural Concrete (ACI 318-99), American Concrete Institute.

Manual of Steel Construction, (ASD) Ninth Edition, American Institute of Steel Construction.

Uniform Building Code, 1997.

Other Documents:

DOE/RL-95-36	Hanford Facility Dangerous Waste Permit Application, T Plant Complex, Rev. 1
SMA:ROOF:94:008	Roof inspection Results from 221-T and 271-T Buildings
Memo from Scott Brim (5/10/2001)	221-T Roof Leaks: Evaluation and Recommendations, Work Package 2T-00-00324, Repair Roof of 221T Canyon
40 CFR 264 Subpart DD	Containment Building

FIGURES:

T-PLANT COMPLEX

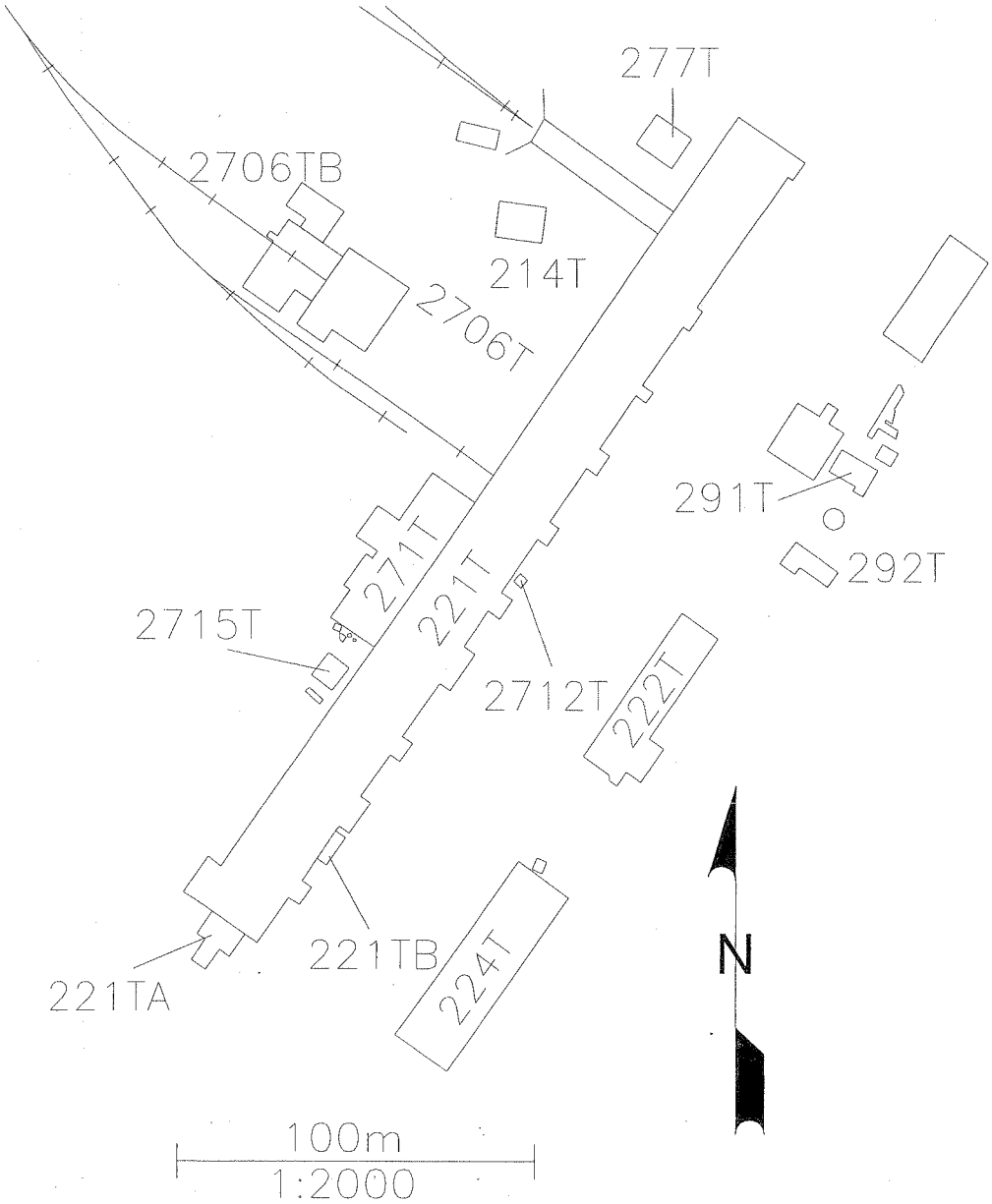

Fig. 1 – Basic T Plant Complex.

T-PLANT SECTION 2:

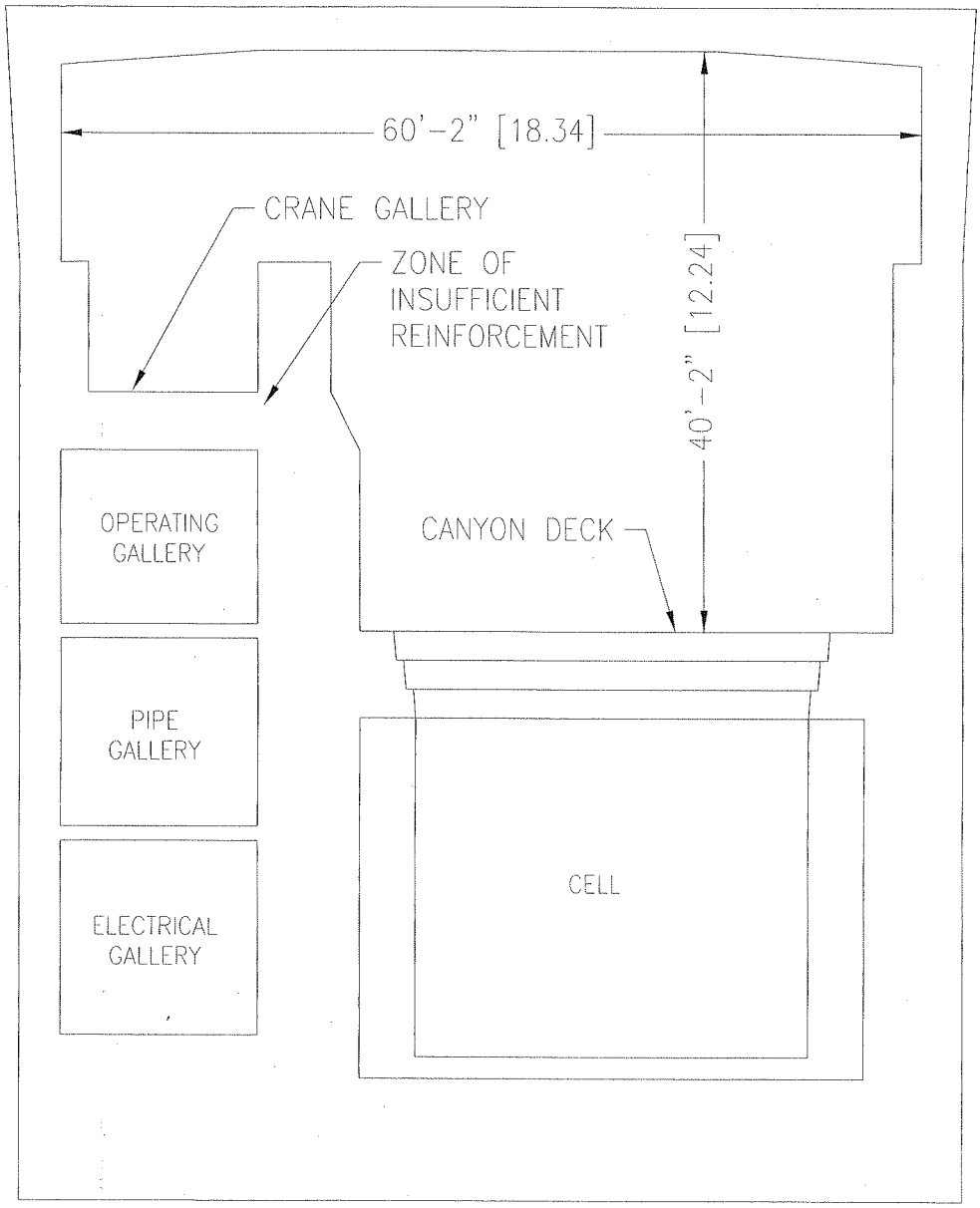

Fig. 2 – Canyon Section Looking North into Section 2.

T-PLANT SECTION 3:

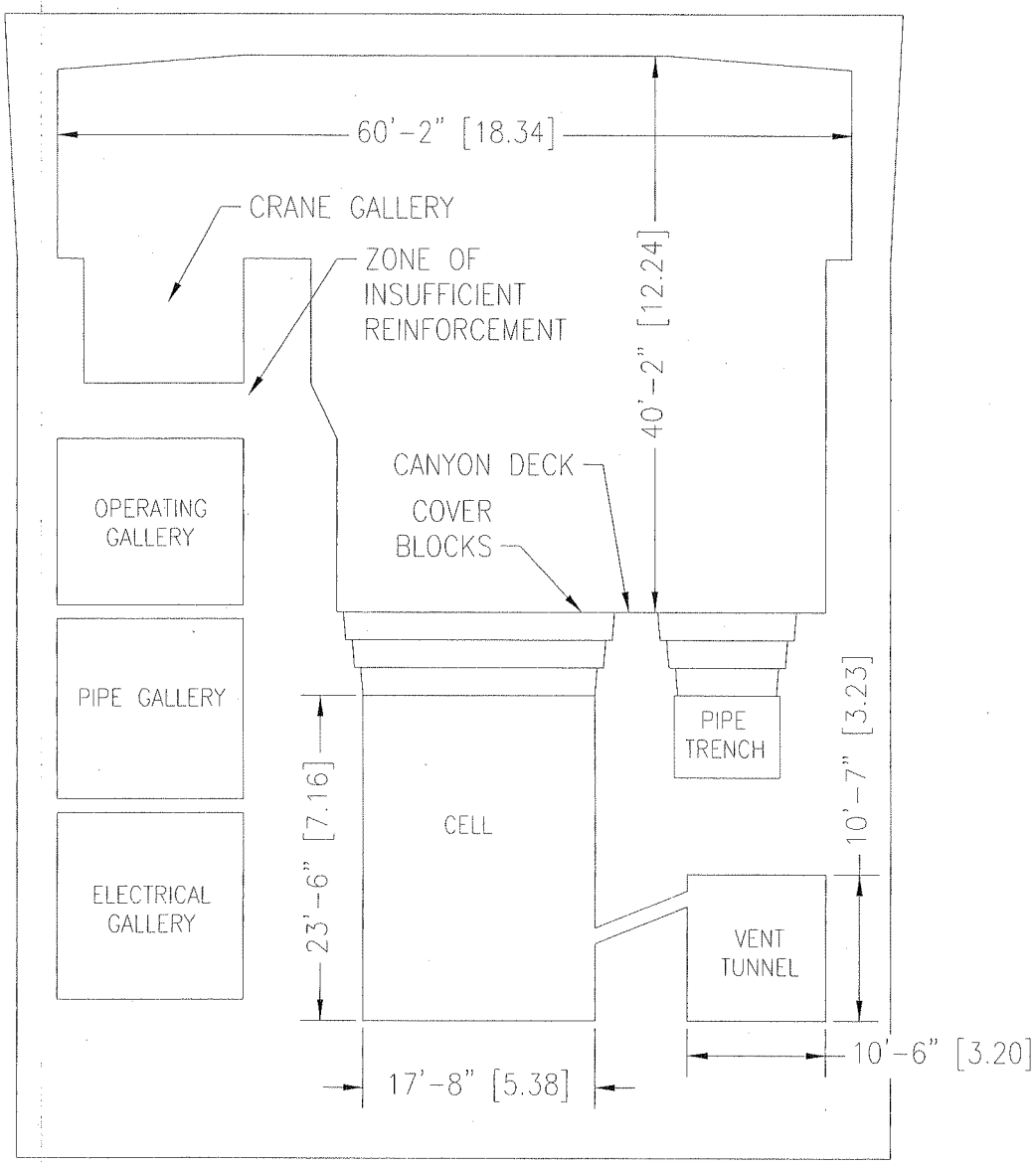

Fig. 3 – Canyon Section Looking North into Section 8.

T-PLANT TUNNEL SECTION:

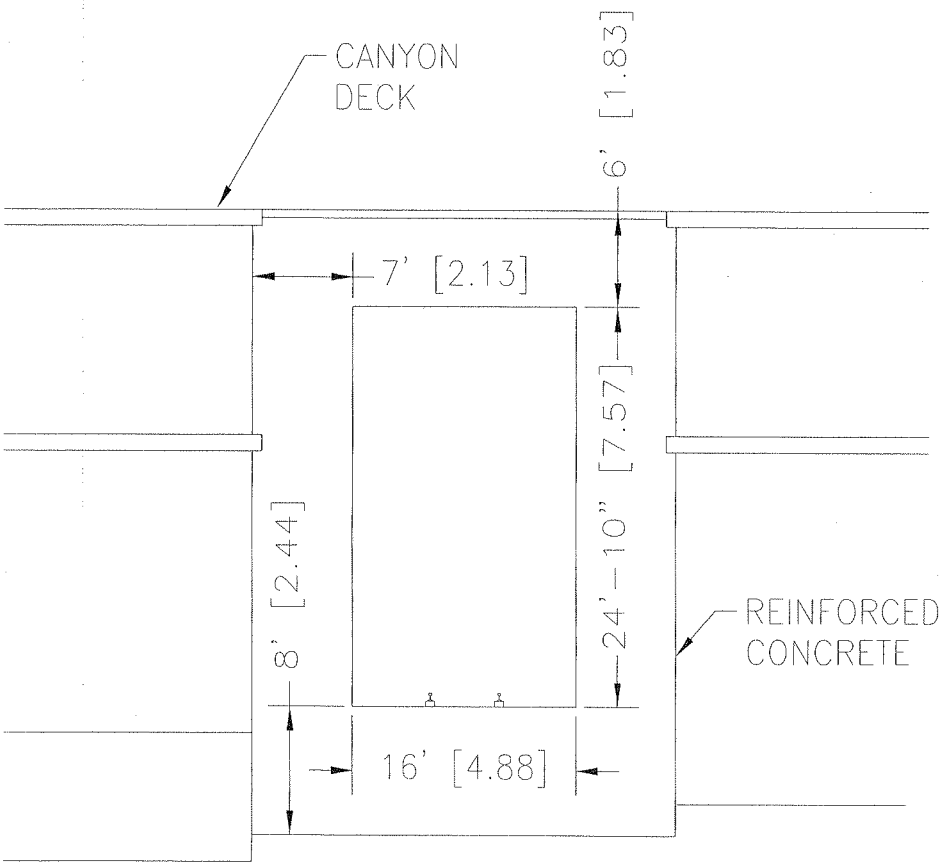

Fig. 4 – Railroad Tunnel Section Looking East into Section 2.

T Plant Complex
Engineering Calculations

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Calculation ECF-200W-15-0029, Revision 1, Maximum Storage Capacity for the 221-T Building Areas

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 11-18-2015

Calculation Title & Description: Maximum Storage Capacity for the 221-T Building Areas

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0029 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
0	Initial Release	11-18-2015	All
			☒

Section 3: Completed by the Responsible Manager

Document Control:

Is the document intended to be controlled within the Document Management Control System (DMCS)? ☒ Yes ☐ No

Does document contain scientific and technical information intended for public use? ☐ Yes ☒ No

Does document contain controlled-use information? ☐ Yes ☒ No

Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
Preparer:	T.B. Salzano, P.E. / ARES Corporation		11-18-2015
Checker:	K.J. Emory, P.E. / ARES Corporation		11-18-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		11-18-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 20 Calculation No: 946412.15-M-010

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for the 221-T Building Areas

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum waste storage capacity of the 221-T Building Areas. Specifically, the building areas covered by this calculation consist of the Canyon Deck; Cells 7L, 13R, 16R, and 17R; Railroad Tunnel; Head End; Operations Gallery Storage; and the BY Storage Area.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	20	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9-8-15	9-8-15

Revision Description (Revision Description/Affected Pages):
Initial Release.

1	20	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	11-18-15	11/18/15	4/18/15

Revision Description (Revision Description/Affected Pages):
Per client direction, the size of the 221-T BY storage area was changed (Section 6.6). In addition, a correction was made in the description of the 221-T Head End (Section 6.4). The pages affected by this revision are 7, 10-12, and 20.

CALCULATION REVIEW CHECKLIST

Project No.	Calculation No.	Rev.	Page No.
946412.15	946412.15-M-010	1	2 of 20

Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.	✓					
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:

None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	11/13/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	11-13-15

Signatures obtained only after discrepancies are corrected and comments are resolved.

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-010	Rev. 1	Page No. 3 of 20
Title: Maximum Storage Capacity for the 221-T Building Areas			
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

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Title: Maximum Storage Capacity for the 221-T Building Areas			
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum waste storage capacity of the 221-T Building Areas. Specifically, the building areas covered by this calculation consist of the Canyon Deck; Cells 7L, 13R, 16R, and 17R; Railroad Tunnel; Head End; Operations Gallery Storage; and the BY Storage Area.

2.0 METHODOLOGY

The 221-T Building is a canyon type containment building constructed of reinforced concrete. The building has the following areas where dangerous and mixed waste can be handled, stored and/or treated:

- 221-T Canyon Deck;
- 221-T Cells 7L, 13R, 16R, and 17R;
- 221-T Railroad Tunnel;
- 221-T Head End;
- 221-T Operations Gallery; and
- 221-T BY Storage Area. (Note: This is an outdoor storage area located northwest of the 221-T Building)

The general layouts of these areas are shown in Drawings H-2-836723 through H-2-836731. The drawings for the Cells are basically identical, therefore, only Drawings H-2-836723, H-2-836724, and H-2-836728 through H-2-836731 are provided in Attachment 1. Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of waste containers that can be stored in each of these areas are determined.

3.0 INPUTS

1. Dimensions for each of the areas are from Drawings H-2-836723, H-2-836724, and H-2-836728 through H-2-836731 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. Drawings produced for General Structure/Area shall be used to calculate maximum storage capacity of interior areas for 221-T structures/areas associated with the canyon building unless otherwise specified. (Reference Contract 57118, Section 8.0 Part B Table 1).

4. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

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5. For 221-T Railroad Tunnel assume pallets on flat portions of area, two tiers high, considering forklift access. Assume a single row of pallets, single tier, is placed on the sloped ramp portion of area. (Reference Contract 57118, Section 8.0 Part B Table 1).

6. For 221-T Head End obtain field measurements of outside portions, combine with drum arrays inside the canyon structure for maximum storage capacity. (Reference Contract 57118, Section 8.0 Part B Table 1).

7. For the 221-T Operations Gallery, assume 1 storage cabinet is located at the transition from canyon section 12 to 13. (Reference Contract 57118, Section 8.0 Part B Table 1). Additional direction requested that 2 cabinets should be assumed in this area. The maximum capacity of each cabinet is taken as one half the volume of the cabinet.

8. For the 221-T Cells, assume the storage capacity is equivalent to filling up the cells with a 3 foot void space at the top (Johansen, Stephanie K., *RE: Waste Storage in 221-T Cells*, email to Tom Salzano, August 26, 2015).

4.0 ASSUMPTIONS

1. For the 221-T Canyon Deck the pallets are assumed to be only one tier high.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 221-T Canyon Deck

From Drawing H-2-836723, the 221-T Canyon Deck available for storage consists of the area above cells 3L through 20R and is approximately 11.3 meters (37 ft) wide by over 180 meters (600 ft) long. The tops of the cell cover blocks serve as the floor surface in much of the 221-T Canyon Deck. Using the criteria indentified in the Design Inputs, a total of 1032 2X2 drum arrays could be staged along the canyon deck as shown in Figure 6-1.

Since the pallets are assumed to be only one tier high, the total storage volume of the 221-T Canyon Deck Area is as follows:

1032 2X2 drum arrays x 4 drums/pallet x 1 pallet high = 4,128 total drums

1 drum = 208-liters (55 gallons), therefore,

4,128 total drums x 208-liters = ~**858,600 liters**

Or, since 1 liter = 0.001 m^3 858,600 liters x 0.001 m^3/liter = ~**858.6 m^3**

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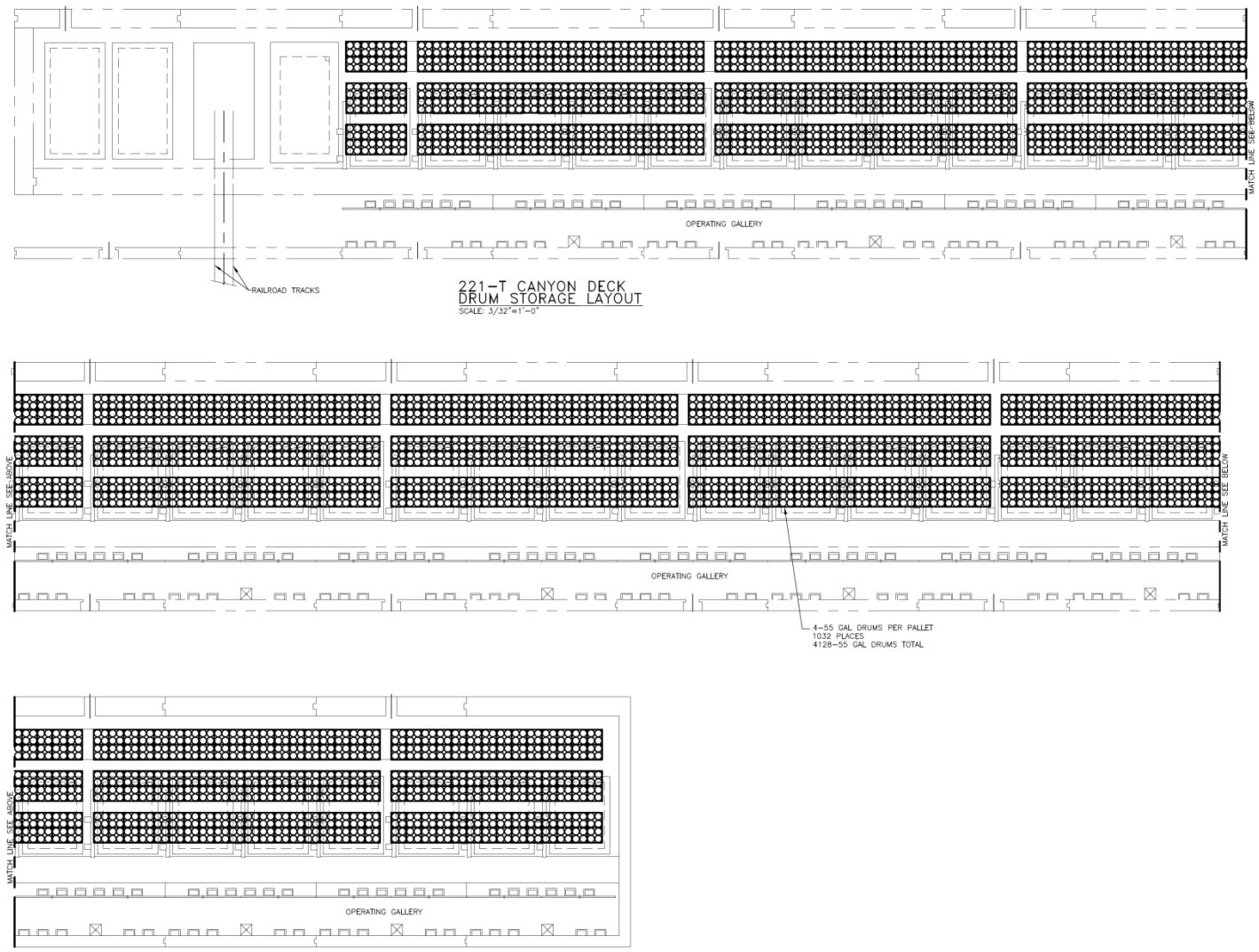

Figure 6-1. 221-T Canyon Deck Area Waste Storage

6.2 221-T Cells 7L, 13R, 16R, and 17R

From Drawing H-2-836724, the 221-T Cells are 5.38 meters (17.67 ft) long by 3.96 meters (13 ft) wide by 6.71 meters (22 ft) deep. Based on the criteria indentified in the Design Inputs, the cells could be filled up to 0.91 meters (3 ft) from the top. Therefore, the storage volume for each of the 221-T Cells would be as follows:

V_{Cell} = [17.67 ft x 13 ft x (22 ft - 3 ft)] = 4,364.5 ft^3

= 4,364.5 ft^3x 0.0283 m^3/ft^3 = **123.5 m^3** x 1000 liter/m^3 = **123,500 liters**

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6.3 221-T Railroad Tunnel

From Drawing H-2-836728, the 221-T Railroad Tunnel enters the 221-T Canyon Building at Cell 2L. The storage area consists of the railroad tunnel that measures 63.7 meters (209 ft) long be 4.9 meters (16 ft) wide, as well as the ramp and asphalt outdoor storage area leading up to the railroad tunnel. Using the criteria indentified in the Design Inputs, a total of 98 2X2 drum arrays could be staged in the railroad tunnel, 82 2X2 drum arrays could be staged in the outdoor storage area leading up to the 221-T Railroad Tunnel, and 55 2X2 drum arrays could be staged along the outdoor ramp as shown in Figure 6-2.

The pallets can be stacked two high in the railroad tunnel and in the outdoor storage area, however, they are only stacked one high along the ramp. Therefore, the total storage volume of the 221-T Railroad Tunnel Area is as follows:

98 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 784 total drums in the railroad tunnel

82 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 656 total drums on the outdoor storage area

55 2X2 drum arrays x 4 drums/pallet x 1 pallet high = 220 total drums along the ramp

784 drums + 656 drums + 220 drums = 1,660 total drums

1 drum = 208-liters (55 gallons), therefore,

1,660 total drums x 208-liters = ~**345,300 liters** x 0.001 m^3/liter = ~**345.3 m^3**

6.4 221-T Head End

From Drawing H-2-836729, the 221-T Head End is located at the north end of the 221-T Canyon Building at all three floor levels and the craneway level. The storage area measures approximately 11.9 meters (39.2 ft) wide by 13.4 meters (44 ft) long. In addition, there is an outdoor storage area in the ramp leading up to the head end. Using the criteria indentified in the Design Inputs, a total of 61 2X2 drum arrays could be staged at the deck level and 70 2X2 drum arrays could be staged on the outdoor ramp as shown in Figure 6-3.

The pallets are only stacked one high inside the along the deck, however, they stacked two high along the ramp. Therefore, the total storage volume of the 221-T Head End Area is as follows:

61 2X2 drum arrays x 4 drums/pallet x 1 pallet high = 244 total drums inside

70 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 560 total drums outside

244 drums + 560 drums = 804 total drums

1 drum = 208-liters (55 gallons), therefore,

804 total drums x 208-liters = ~**167,200 liters** x 0.001 m^3/liter = ~**167.2 m^3**

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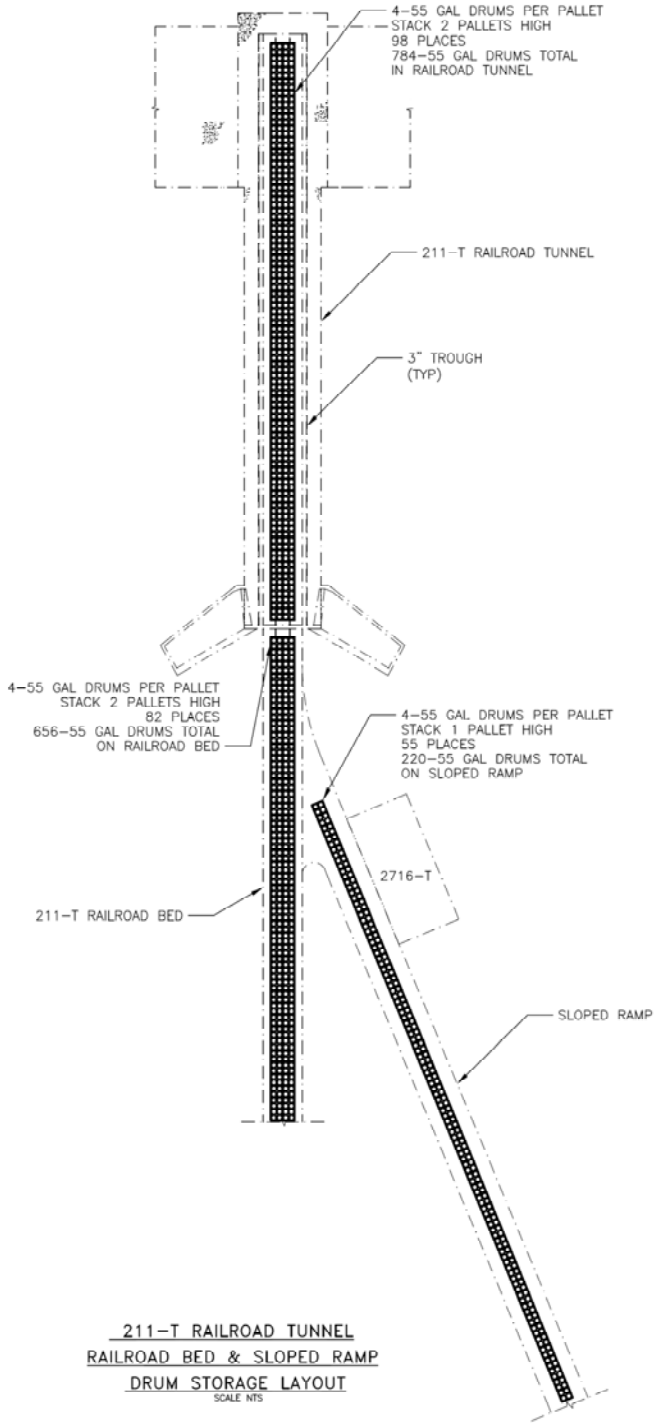

Figure 6-2. 221-T Railroad Tunnel Area Waste Storage

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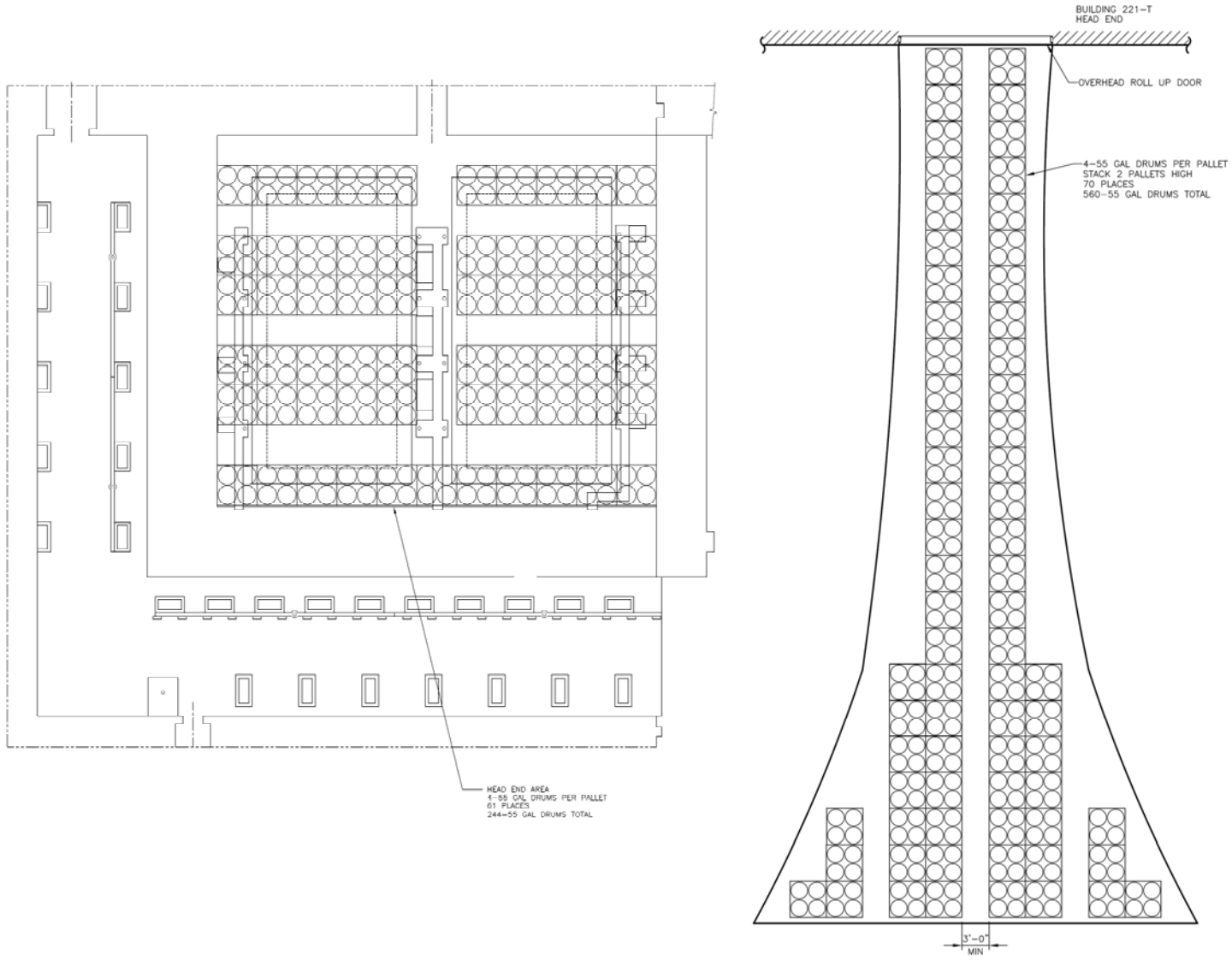

Figure 6-3. 221-T Head End Area Waste Storage

6.5 221-T Operations Gallery

From Drawing H-2-836730, the 221-T Operations Gallery Storage consists of a metal cabinet approximately 2.0 meters (6.5 ft) tall by 0.91 meters (3 ft) wide by 0.46 meters (1.5 ft) deep. The cabinet has multiple shelves for storage of small waste containers. Therefore, the storage volume is assumed to be one half the volume of the cabinet which is as follows:

$$\frac{1}{2} V_{cabinet} = \frac{1}{2} [6.5 \text{ ft} \times 3 \text{ ft} \times 1.5 \text{ ft}] = 14.6 \text{ ft}^3$$

Since two (2) cabinets may be located in this area, the total storage volume is:

$$2 \times \frac{1}{2} V_{cabinet} = 2 \times 14.6 \text{ ft}^3 = 29 \text{ ft}^3 \times 0.0283 \text{ m}^3/\text{ft}^3 = \mathbf{0.82\ m^3} \times 1000 \text{ liter/m}^3 = \mathbf{820\ liters}$$

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6.6 221-T BY Storage Area

From Drawing H-2-836731, the 221-T BY Storage Area is an uncovered, irregular shaped area encompassing asphalt and gravel pads. Storage is assumed to be in an area that is 61 meters (199 ft) long and 37 meters (120 ft) wide. Using the criteria indentified in the Design Inputs, a total of 693 2X2 drum arrays could be staged in the 221-T BY Storage Area as shown in Figure 6-4.

Since the pallets can be stacked two high, the total storage volume of the 221-T BY Storage Area is as follows:

693 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 5,544 total drums

1 drum = 208-liters (55 gallons), therefore,

5,544 drums x 208-liters = ~**1,150,000 liters** x 1/1000 m^3/liter = **1,150 m^3**

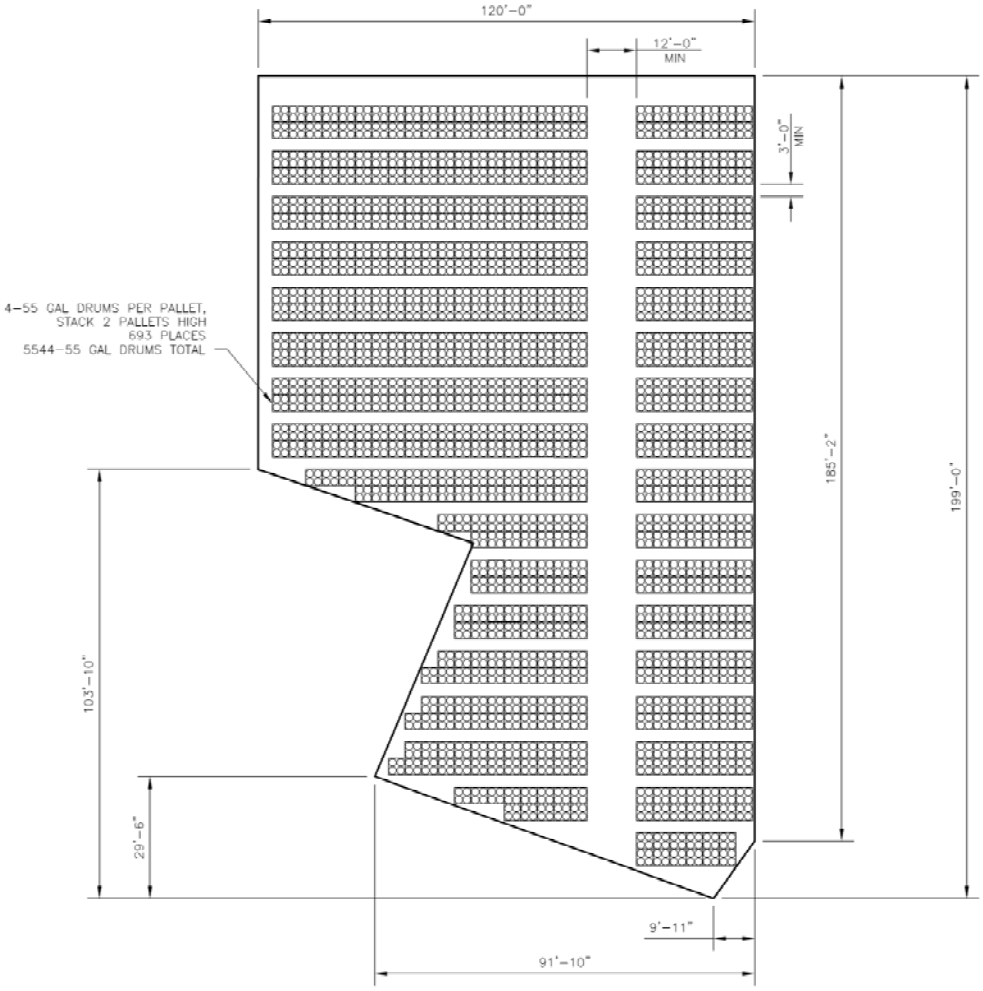

Figure 6-4. 221-T BY Storage Area Waste Storage

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Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

7.0 RESULTS AND CONCLUSIONS

Based on the waste storage arrangements shown in Figures 6-1 through 6-4, the 221-T Building Areas have a waste storage design capacity as indicated in Table 7-1.

Table 7-1. Summary of Maximum Storage Capacities for 221-T Building Areas

Structure/Area	Maximum Waste Storage Capacity m^3 (liters)
221-T Canyon Deck	858.6 m^3 (858,600 liters)
221-T Cells 7L	123.5 m^3 (123,500 liters)
221-T Cells 13R	123.5 m^3 (123,500 liters)
221-T Cells 16R	123.5 m^3 (123,500 liters)
221-T Cells 17R	123.5 m^3 (123,500 liters)
221-T Railroad Tunnel	345.3 m^3 (345,300 liters)
221-T Head End	167.2 m^3 (167,200 liters)
221-T Operations Gallery Storage	0.82 m^3 (820 liters)
221-T BY Storage Area	1,150 m^3 (1,150,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836723, Sheet 1, Revision 0, *Canyon Deck General Structure/Area*.

3. Drawing H-2-836724, Sheet 1, Revision 0, *Cell 16R General Structure/Area*.

4. Drawing H-2-836725, Sheet 1, Revision 0, *Cell 7L General Structure/Area*.

5. Drawing H-2-836726, Sheet 1, Revision 0, *Cell 13R General Structure/Area*.

6. Drawing H-2-836727, Sheet 1, Revision 0, *Cell 17R General Structure/Area*.

7. Drawing H-2-836728, Sheet 1, Revision 0, *Railroad Tunnel General Structure/Area*.

8. Drawing H-2-836729, Sheet 1, Revision 0, *Head End General Structure/Area*.

9. Drawing H-2-836729, Sheet 2, Revision 0, *Head End Outside Concrete Ramp General Structure/Area*.

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Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

10. Drawing H-2-836730, Sheet 1, Revision 0, *Operation Gallery Storage General Structure/Area*.

11. Drawing H-2-836731, Sheet 1, Revision 1, *BY Storage General Structure/Area*.

12. Johansen, Stephanie K., *RE: Waste Storage in 221-T Cells*, email to Tom Salzano, August 26, 2015.

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Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15

ATTACHMENT 1

221-T BUILDING AREAS GENERAL LAYOUT DESIGN DRAWINGS

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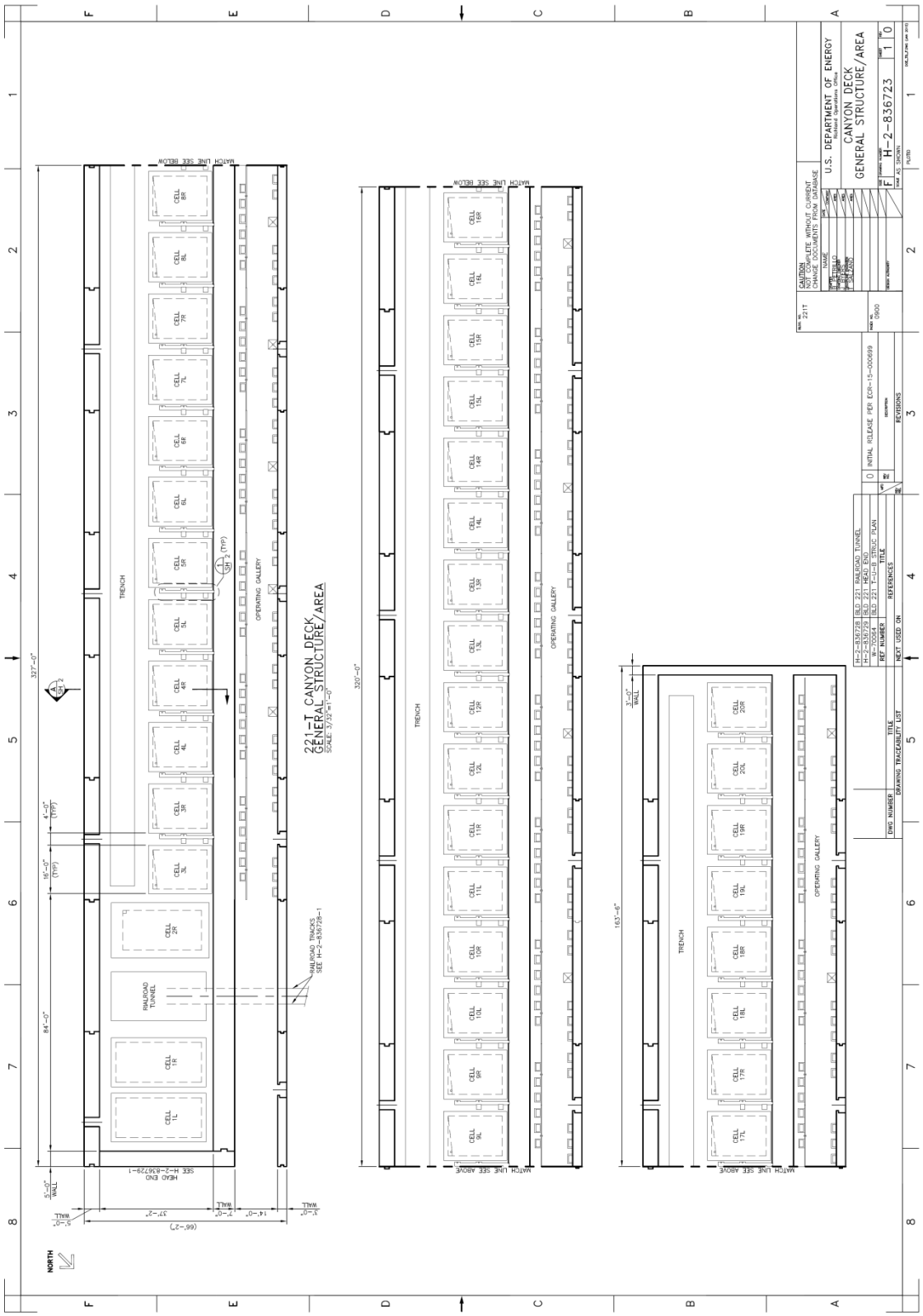
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15



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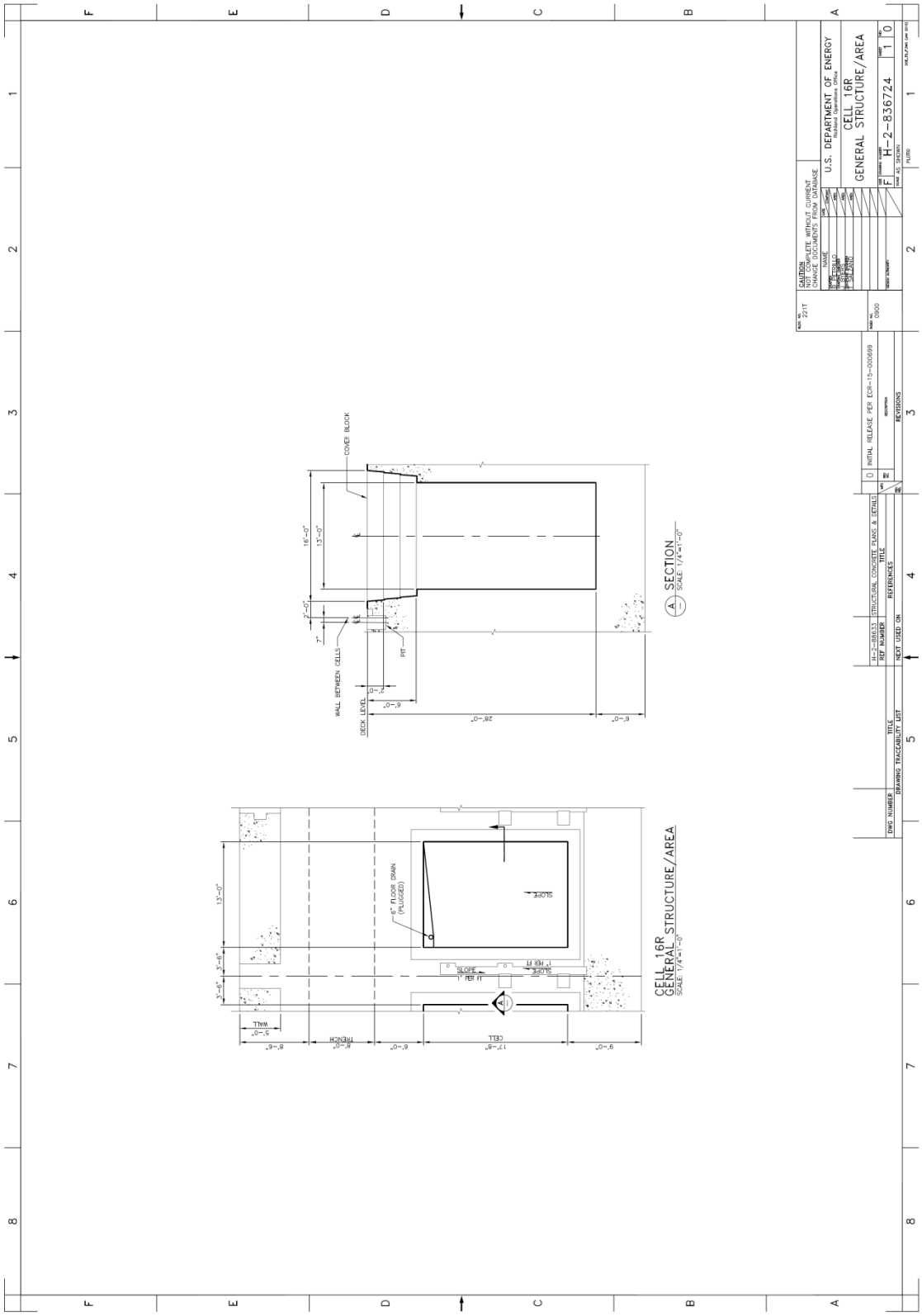
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15



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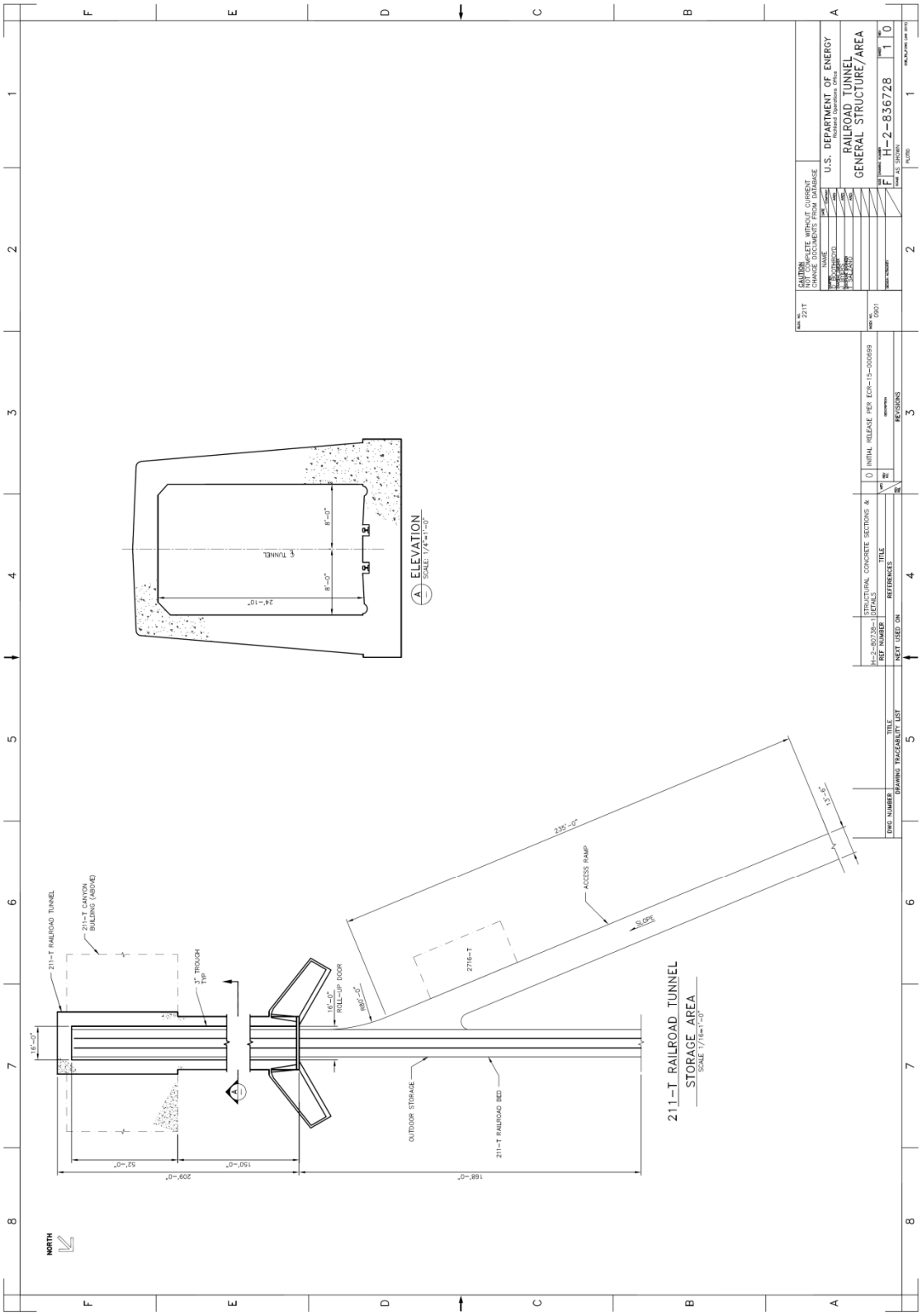
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15



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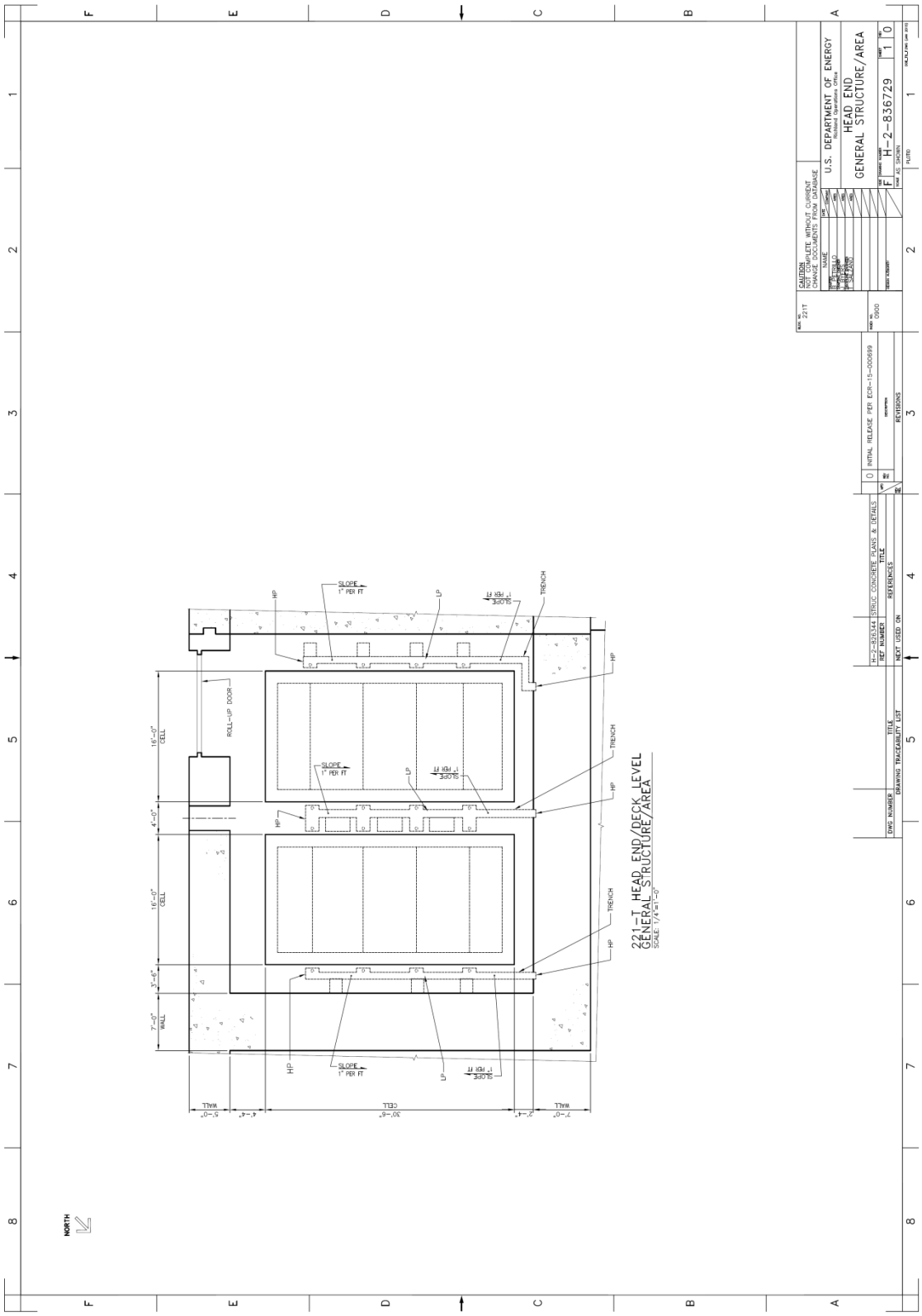
Prepared By: T.B. Salzano, P.E.	Date: 11-18-15	Checked By: K.J. Emory, P.E.	Date: 11-18-15



CALCULATION SHEET

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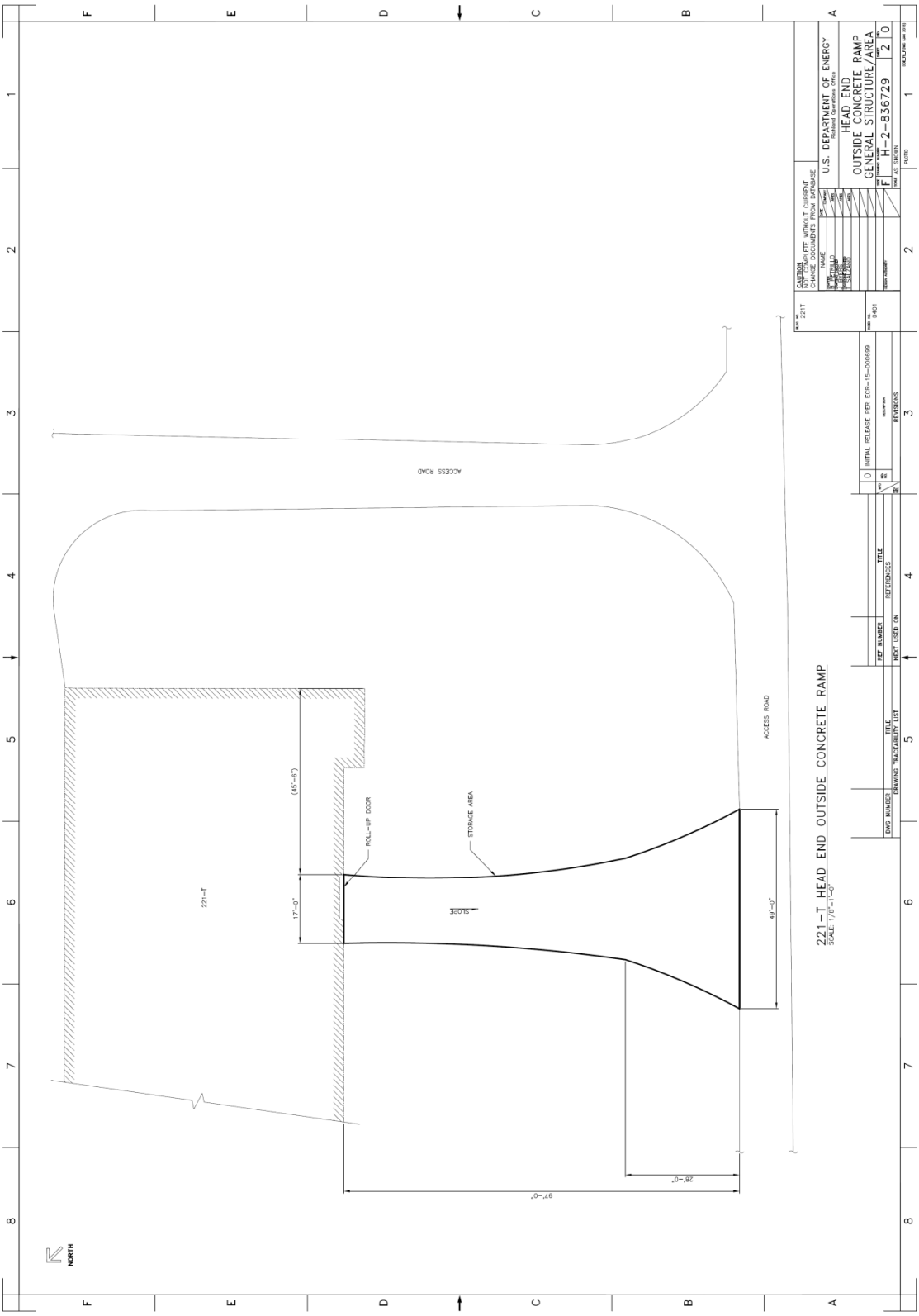

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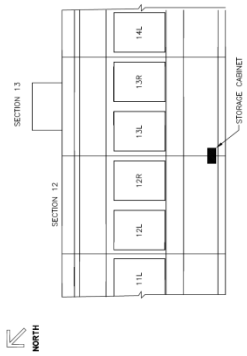

KEY PLAN
SCALE: NTS
H-2-836723-1

OPERATIONS GALLERY
STORAGE CABINET
SCALE: NTS

U.S. DEPARTMENT OF ENERGY
OPERATION GALLERY
STORAGE
GENERAL STRUCTURE/AREA
H-2-836730
F 1 0
221-T
0900
0 INITIAL RELEASE PER ECR-15-000699
H-2-83723
CANYON DECK GENERAL STRUCTURE/AREA
DWG. NUMBER
DRAWING TRACEABILITY LIST
NEXT USED ON
REFERENCES
REVISIONS

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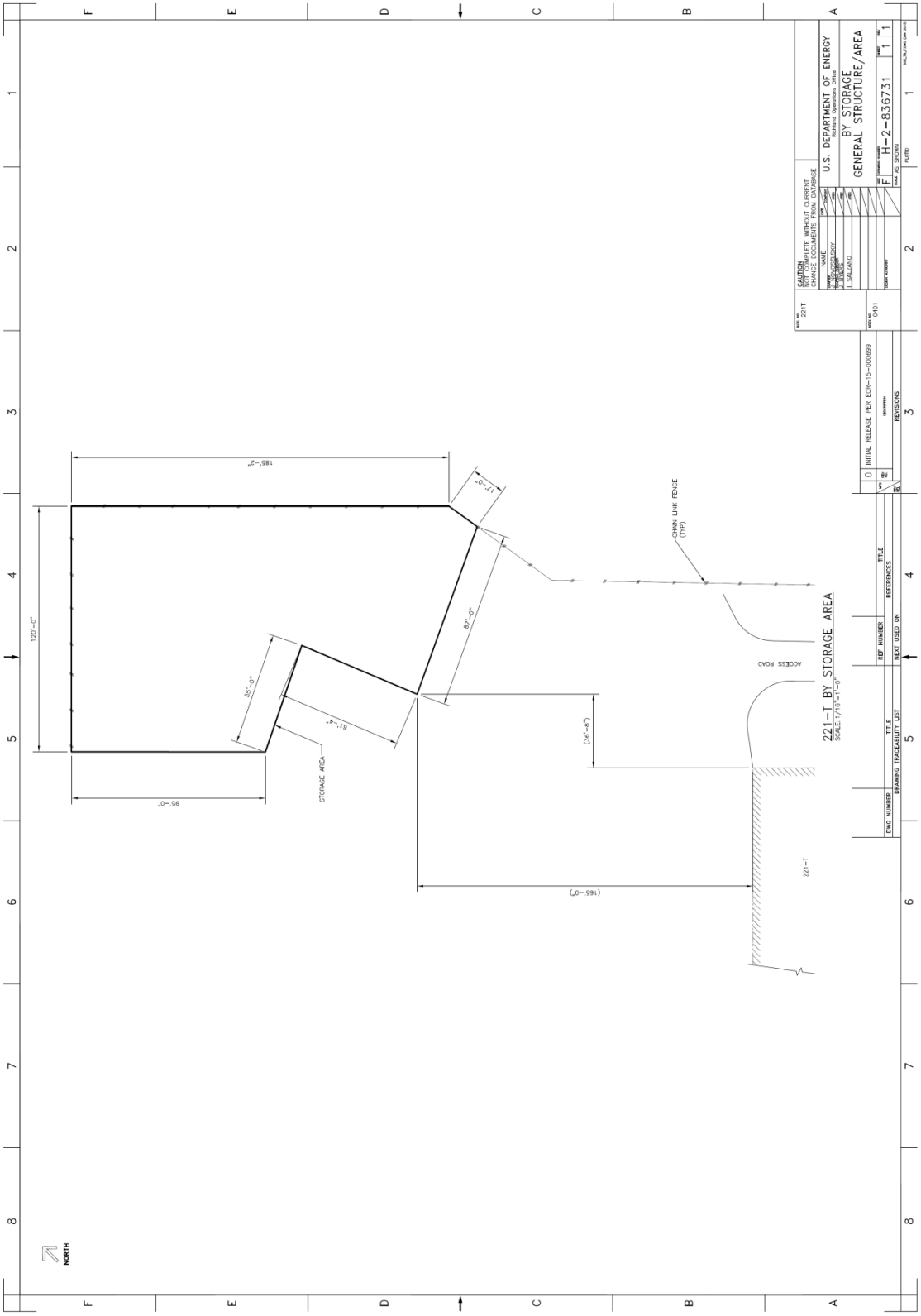

Calculation ECF-200W-15-0030, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2706-T Building

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 2706-T Building

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0030 **Revision No.:** 0

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0	Initial Release	09-08-2015	All
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ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 10 Calculation No: 946412.15-M-011

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 2706-T Building

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2706-T Building.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
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		Date:	9-8-15	9/8/15	9-8-15

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Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	√					
2. Calculation sheet headers complete with calculation number, revision number, etc.	√					
3. Calculation sheet contents complete per format.	√					
4. Listed attachments included.	√					
5. Calculation objective clearly described.	√					
6. Criteria are suitable and properly referenced to task specific documents.	√					
7. Assumptions and input data described and attached or referenced to task documents.	√					
8. Calculation method identified and appropriate for the design activity.	√					
9. Calculation results reasonable and correctly described in results and conclusions.	√					
10. Physical property calculations generated by CAD software verified via hand calculations.			√			
11. Computer program identified with version and revision.			√			
12. Computer input/output provided or referenced.			√			
13. Computer run traceable to calculation (file #, etc.).			√			
14. Computer input data within permissible design input range.			√			
15. Computer program validation/verification addressed.			√			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			√			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	√	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	9-8-15

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2706-T Building.

2.0 METHODOLOGY

The 2706-T Building is a ground level building constructed of prefabricated steel used to store dangerous and/or mixed waste and for decontamination and treatment activities. The general layout and containment design of this building is shown in Drawing H-2-836732 (See Attachment 1). Utilizing the slope of the floor and the sump volume, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in this building.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836732, Sheets 2 and 3 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside the 2706-T structure assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with one tier high stacking allowed. Pallets shall be spaced three feet minimum from outside walls. Assume drum array approximately as shown in Figure 3-1 below. (Reference Contract 57118, Section 8.0 Part B Table 1).

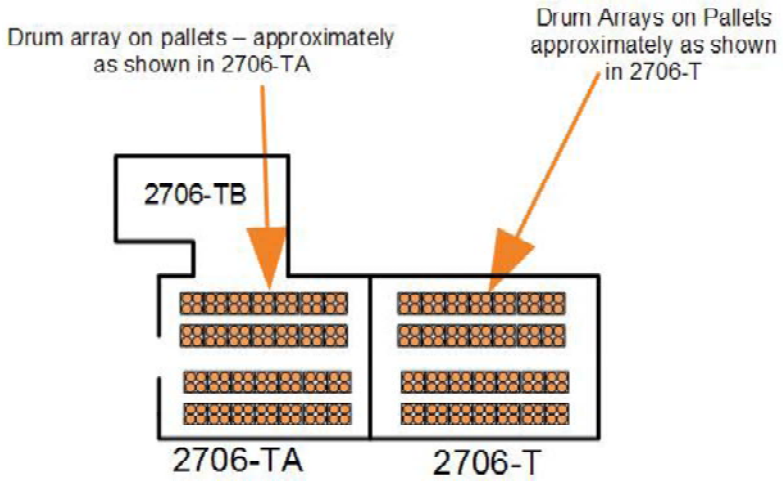

Figure 3-1. 2706-T Building Approximate Drum Array

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4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawing H-2-836732, the main area of the 2706-T Building has a foundation approximately 14.63 meters (48 ft) wide, by 19.51 meters (64 ft) long. The 2706-T Building contains a railroad pit, approximately 16.76 meters (55 ft) long by 5.18 meters (17 ft) wide by 1.52 meters (5 ft) deep. The railroad pit floor is sloped to drain to a below-grade lined sump. This cylindrical rail sump liner is the primary secondary containment and has a diameter of approximately 0.76 meters (2.5 ft) and a depth of approximately 0.99 meters (3.25 ft). Therefore, the containment volume of the rail sump liner is

$V_{rail\ sump}$ = [π x (liner diameter)^2 / 4] x (depth of liner)

$V_{rail\ sump}$ = [π x (2.5 ft)^2 / 4] x (3.25 ft) = 16.0 ft^3

Or, since 1 ft^3 = 0.0283 m^3 16.0 ft^3 x 0.0283 m^3/ft^3 = ~**0.45 m^3**

and, since 1 m^3 = 1,000 liters 0.41 m^3 x 1,000 liters/m^3 = **450 liters**

Since all operational area floors are concrete with an epoxy floor sealant applied, the service trench and railroad pit could provide additional emergency secondary waste containment volume. The service trench is 0.61 meters (2 ft) wide and has the following linear runs:

Main run over the length of the building: (64 ft) - (1 ft) - (10 in) = 62.2 ft
Two small branches off the main run: 2 x (3.42 ft) = ~6.8 ft
End branch off the main run: 5.5 ft
Two branches along south wall: 2 x (6.58 ft) = ~13.2 ft

Therefore, the total length of service trench would be approximately:

(62.2 ft) + (6.8 ft) + (5.5 ft) + (13.2 ft) = 87.7 ft

With a minimum depth of 0.31 meters (1 ft), the service trench would provide a containment volume of

V_{trench} = (87.7 ft long) x (2 ft wide) x (1 ft deep) = 175.4 ft^3 x 0.0283 m^3/ft^3 = ~5 m^3

In addition, the railroad pit containment volume would be the overall pit volume minus the flooring under the train rail and support columns. The two main runs supporting the train rail are 0.86 meters (2.83 ft) wide by 0.61 meters (2 ft) deep and run the length of the pit. The six columns are 0.86 meters (2.83 ft) by 0.61 meters (2 ft) by 0.91 meters (3 ft) tall. Therefore, the railroad pit would provide a containment volume of

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$V_{railroad\ pit}$ = (55 ft x 17 ft x 5 ft) - 2 x (2.83 ft x 2 ft x 55 ft) - 6 x (2.83 ft x 2 ft x 3 ft)

$V_{railroad\ pit}$ = (4,675 ft^3) - (623 ft^3) - (102 ft^3) = 3,950 ft^3 x 0.0283 m^3/ft^3 = 112 m^3

Therefore, the total containment volume including the service trench and railroad pit would be:

$V_{rail\ sump}$ + V_{trench} + $V_{railroad\ pit}$ = 0.45 m^3 + 5 m^3 + 112 m^3 = **117.5 m^3** x 1,000 liters/m^3 = **117,500 liters**

6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, the 2706-T Building has a floor area approximately 14.63 meters (48 ft) wide, by 19.51 meters (64 ft) long. Therefore, the total area available for storage is:

(48 ft) x (64 ft) = 3,072 ft^2

Or, since 1 ft^2 = 0.093 m^2 3,072 ft^2 x 0.093 m^2/ft^2 = 286 m^2

Using the criteria indentified in the Design Inputs, a total of 68 2X2 drum arrays can be placed in the building as shown in Figure 6-1. Since the pallets are only stacked one high, the total storage volume of the 2706-T Building is as follows:

68 2X2 drum arrays x 4 drums/pallet = 272 total drums

1 drum = 208-liters (55 gallons), therefore,

272 drums x 208-liters = ~**56,600 liters** x 1/1000 m^3/liter = **56.6 m^3** x 1/0.0283 ft^3/m^3 = ~2,000 ft^3

7.0 RESULTS AND CONCLUSIONS

The 2706-T Building has a total secondary containment volume of 0.45 m^3 or 450 liters based on the volume of the railroad pit sump. If the volume of the Service Trench and Railroad Pit are considered, the overall secondary containment volume would be 117.5 m^3 or 117,500 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of the building is 56.6 m^3 or 56,600 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2706-T Building

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2706-T	0.45 m^3 or 450 liters [117.5 m^3 or 117,500 liters incl. Service Trench and Railroad Pit]	56.6 m^3 (56,600 liters)

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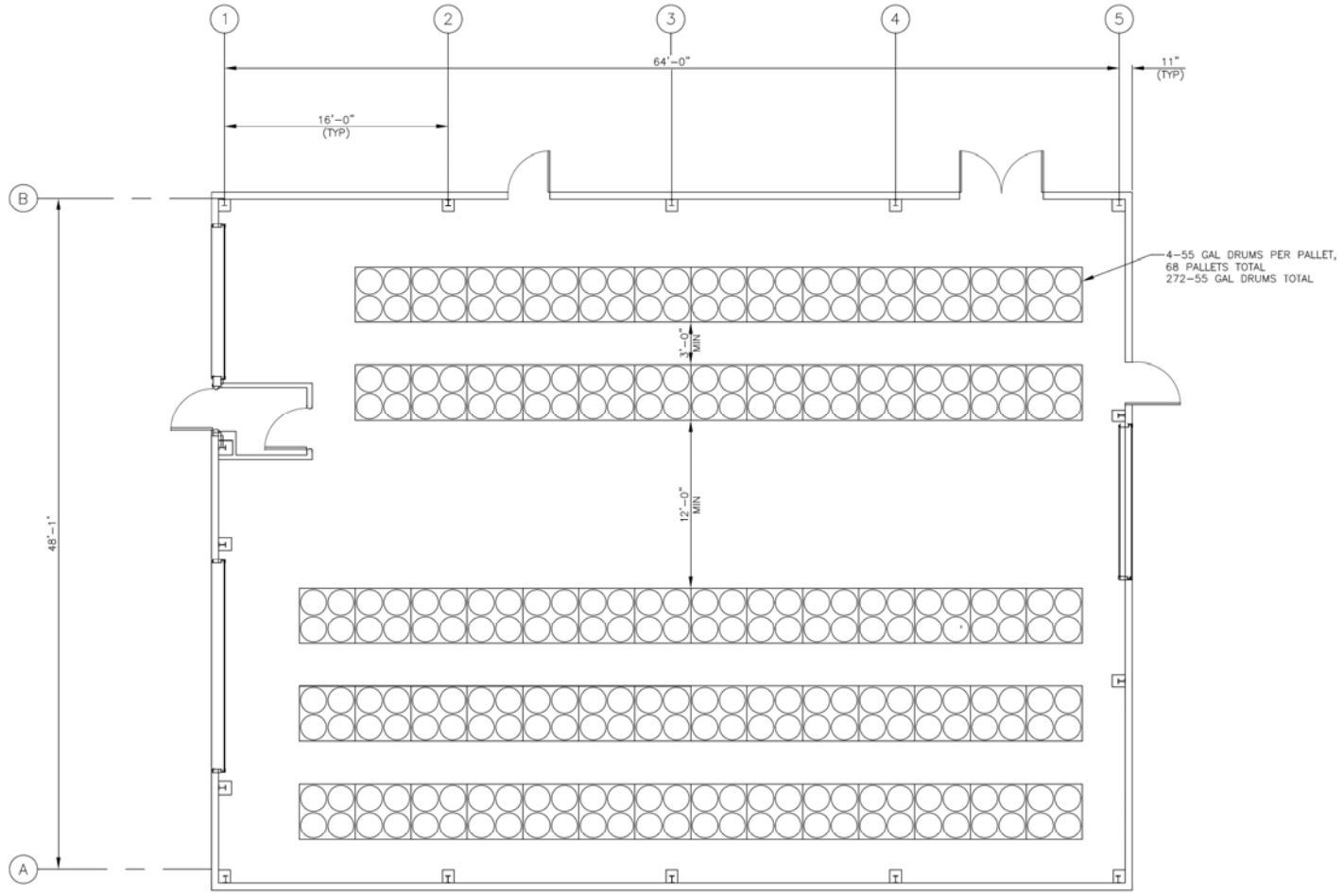

Figure 6-1. 2706-T Building Drum Array

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836732, Sheets 2, Revision 0, *Secondary Containment Design*.

3. Drawing H-2-836732, Sheets 3, Revision 0, *Secondary Containment Design Sections*.

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ATTACHMENT 1

2706-T BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWINGS

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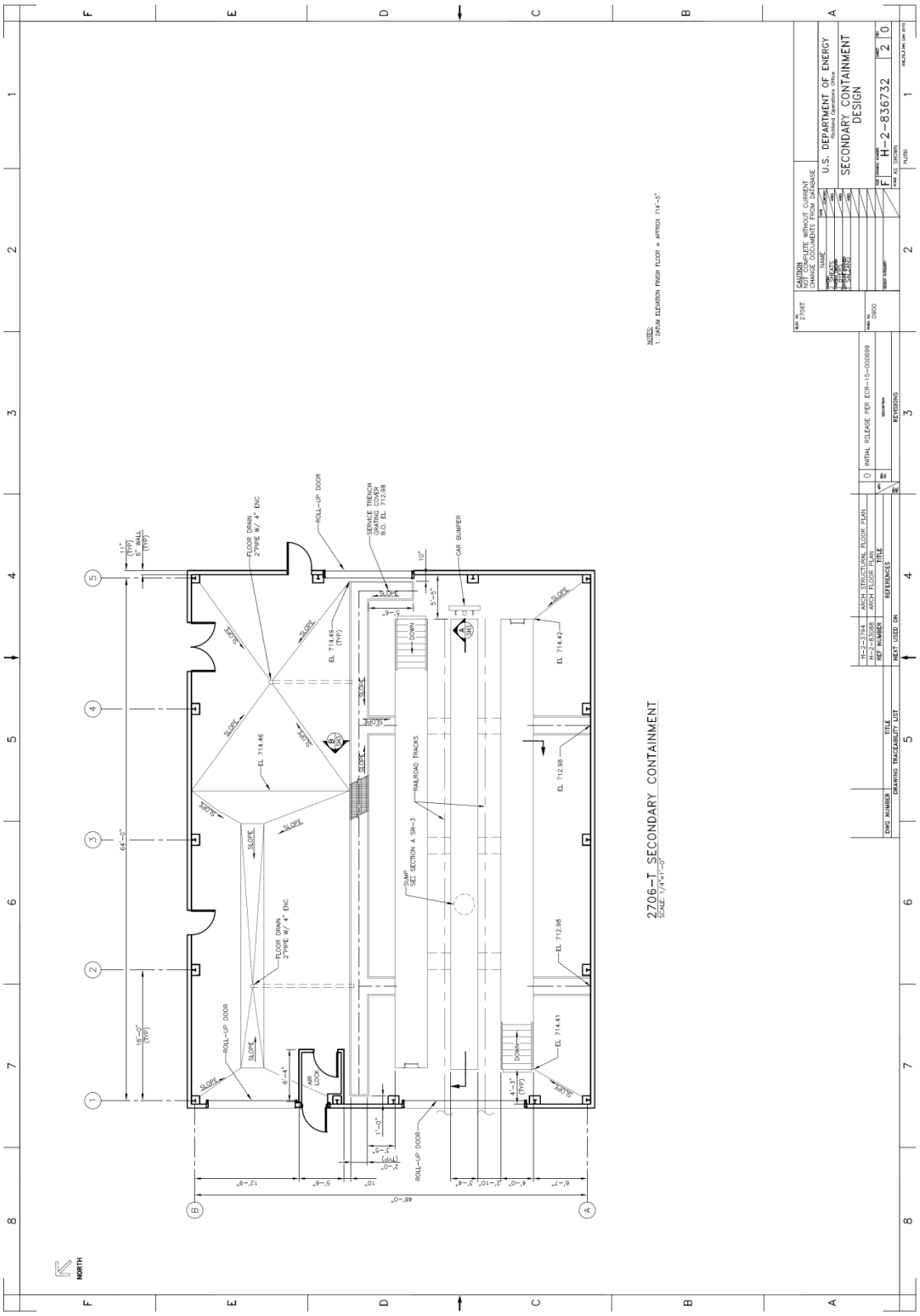

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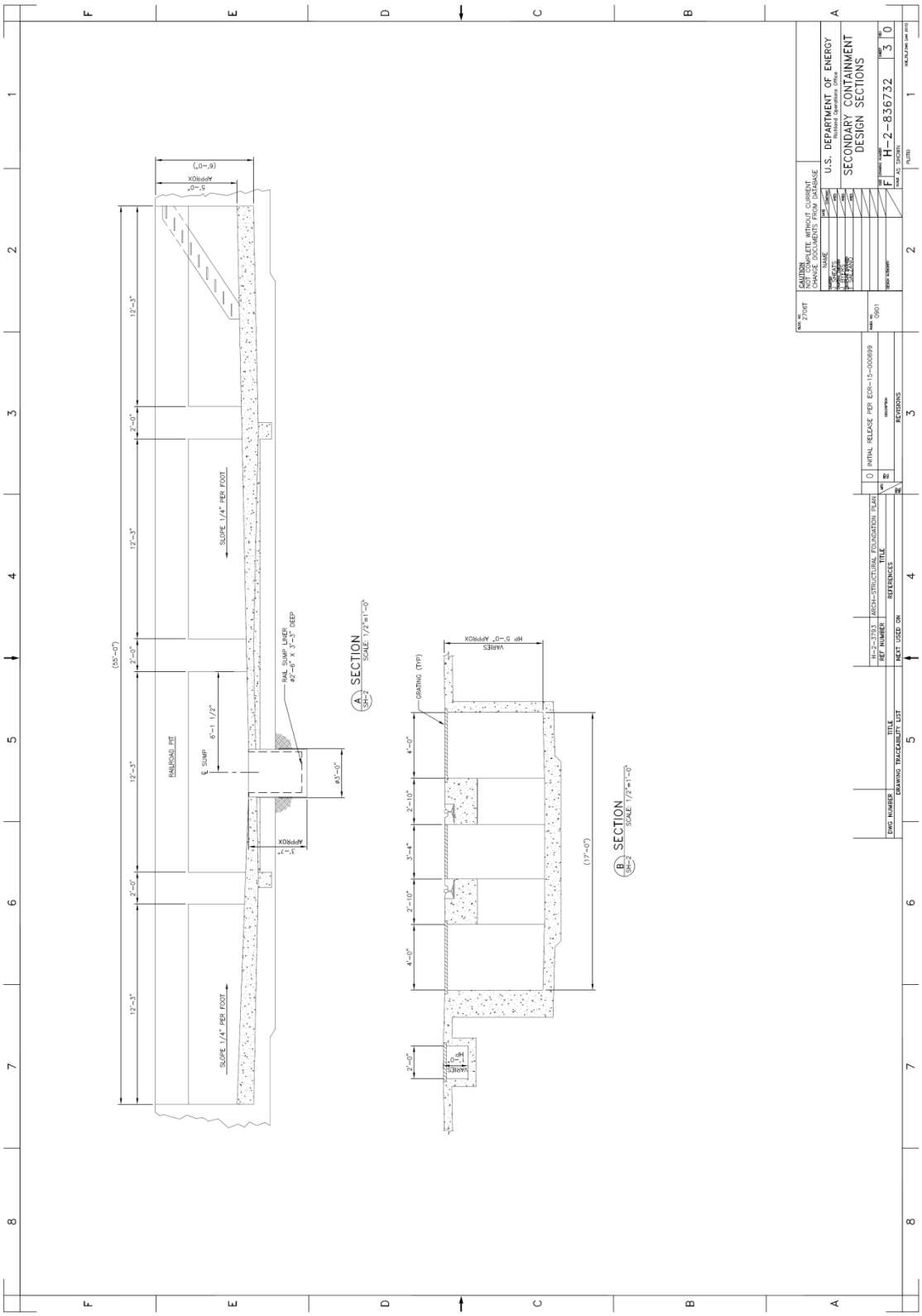

Calculation ECF-200W-15-0031, Revision 0, Secondary Containment and Maximum Storage Capacity for the 2706-TA Building

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

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ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 10 Calculation No: 946412.15-M-012

Project No.	Project Title:	Client:
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Title:
Secondary Containment and Maximum Storage Capacity for the 2706-TA Building

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The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2706-TA Building.

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		Date:	9-8-15	9/8/15	9-8-15

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		Date:			

Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
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7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	9-8-15

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CALCULATION SHEET

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 2706-TA Building.

2.0 METHODOLOGY

The 2706-TA Building was installed over the concrete pad located west of the 2706-T Building and is constructed of prefabricated steel and used to store dangerous and/or mixed waste and for treatment activities. The general layout and containment design of this building is shown in Drawing H-2-836733 (See Attachment 1). Utilizing the slope of the floor and the sump volume, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in this building.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836733, Sheets 2 and 3 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside the 2706-TA structure assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with one tier high stacking allowed. Pallets shall be spaced three feet minimum from outside walls. Assume drum array approximately as shown in Figure 3-1 below. (Reference Contract 57118, Section 8.0 Part B Table 1).

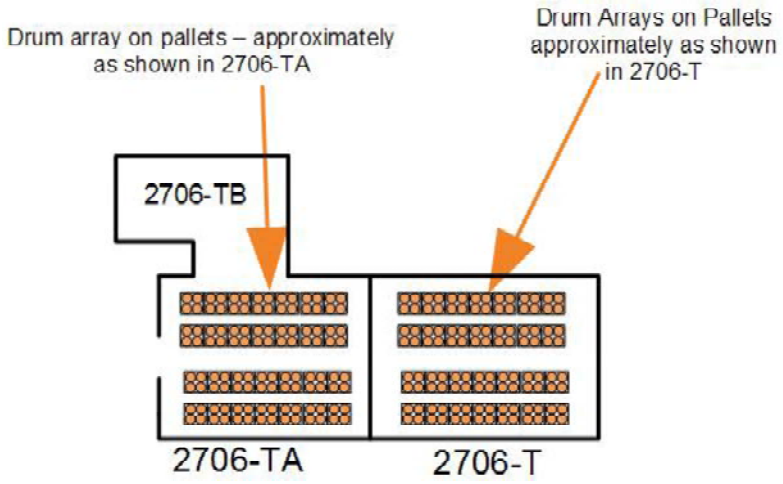

Figure 3-1. 2706-TA Building Approximate Drum Array

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4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawing H-2-836733, the main area of the 2706-TA Building has a foundation approximately 15.24 meters (50 ft) wide, by 18.29 meters (60 ft) long. Modification to the building included the addition of two sumps and corresponding liners. One of the sumps is for condensate from the adjacent HVAC Room, therefore, it is not considered in the secondary containment of the building. The primary building sump includes a 0.61 meters (2 ft) wide trench sloped to a below-grade lined sump. This rectangular sump liner is the primary secondary containment and is 1.13 meters (3.71 ft) wide by 1.99 meters (6.52 ft) long with a depth of approximately 0.97 meters (3.19 ft). Therefore, the containment volume of the primary sump liner is

V_{sump} = (3.71 ft wide) x (6.52 ft long) x (3.19 ft deep) = 77.2 ft^3

Or, since 1 ft^3 = 0.0283 m^3 77.2 ft^3 x 0.0283 m^3/ft^3 = ~**2.2 m^3**

and, since 1 m^3 = 1,000 liters 2.0 m^3 x 1,000 liters/m^3 = **2,200 liters**

The service trench could provide additional emergency secondary waste containment volume. The service trench is 0.61 meters (2 ft) wide and is approximately 4.50 meters (14.75 ft) wide. With a minimum depth of 0.31 meters (1 ft), the service trench would provide a containment volume of

V_{trench} = (14.75 ft long) x (2 ft wide) x (1 ft deep) = 29.5 ft^3 x 0.0283 m^3/ft^3 = ~0.8 m^3

Therefore, the total containment volume including the service trench would be:

$V_{sump} + V_{trench}$ = 2.2 m^3 + 0.8 m^3 = **3.0 m^3** x 1,000 liters/m^3 = **3,000 liters**

6.2 Maximum Waste Storage Capacity

As determined in Section 6.1, the 2706-TA Building has a floor area approximately 15.24 meters (50 ft) wide, by 18.29 meters (60 ft) long. Therefore, the total area available for storage is:

(50 ft) x (60 ft) = 3,000 ft^2

Or, since 1 ft^2 = 0.093 m^2 3,000 ft^2 x 0.093 m^2/ft^2 = 279 m^2

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Using the criteria indentified in the Design Inputs, a total of 58 2X2 drum arrays can be placed in the building as shown in Figure 6-1. Since the pallets are only stacked one high, the total storage volume of the 2706-TA Building is as follows:

58 2X2 drum arrays x 4 drums/pallet = 232 total drums

1 drum = 208-liters (55 gallons), therefore,

232 drums x 208-liters = ~**48,300 liters** x 1/1000 m^3/liter = **48.3 m^3** x 1/0.0283 ft^3/m^3 = ~1,700 ft^3

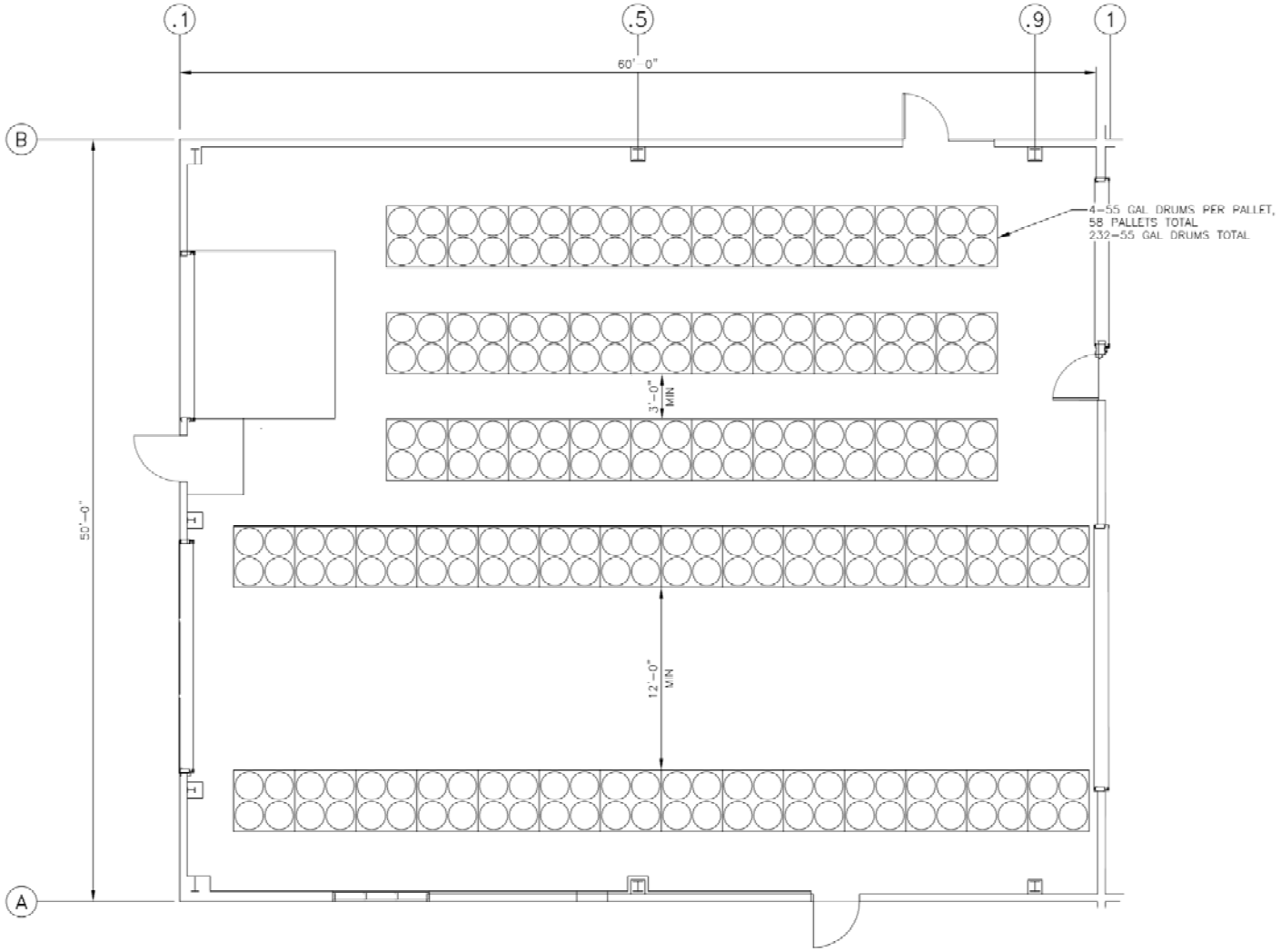

Figure 6-1. 2706-TA Building Drum Array

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7.0 RESULTS AND CONCLUSIONS

The 2706-TA Building has a total secondary containment volume of 2.2 m^3 or 2,200 liters based on the volume of the primary sump. If the volume of the service trench is considered, the overall secondary containment volume would be 3.0 m^3 or 3,000 liters. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of the building is 48.3 m^3 or 48,300 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 2706-TA Building

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
2706-TA	2.2 m^3 or 2,200 liters [3.0 m^3 or 3,000 liters incl. service trench]	48.3 m^3 (48,300 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836733, Sheet 2, Revision 0, *Secondary Containment Design*.

3. Drawing H-2-836733, Sheet 3, Revision 0, *Secondary Containment Section & Details*.

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ATTACHMENT 1

2706-TA BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWINGS

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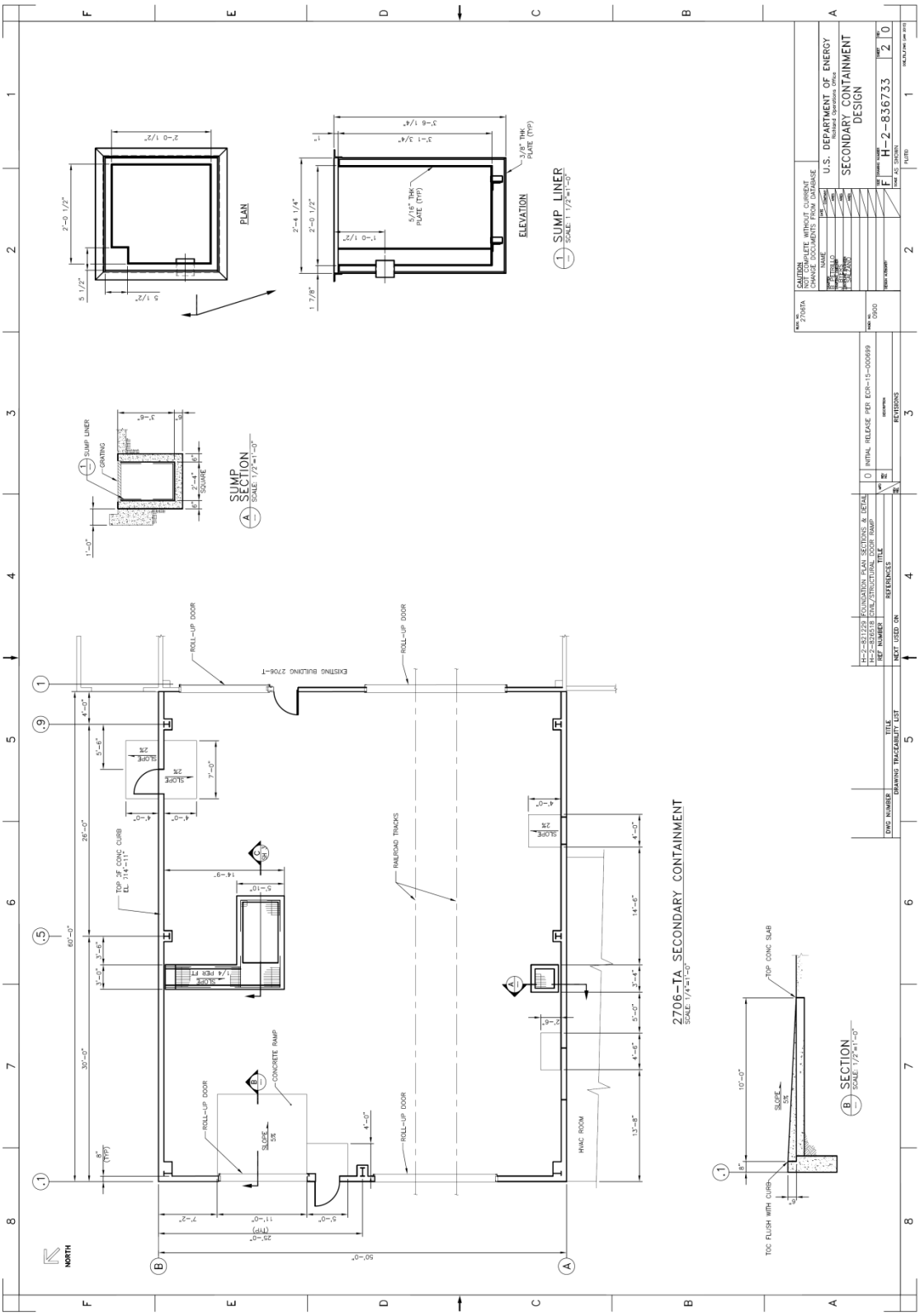

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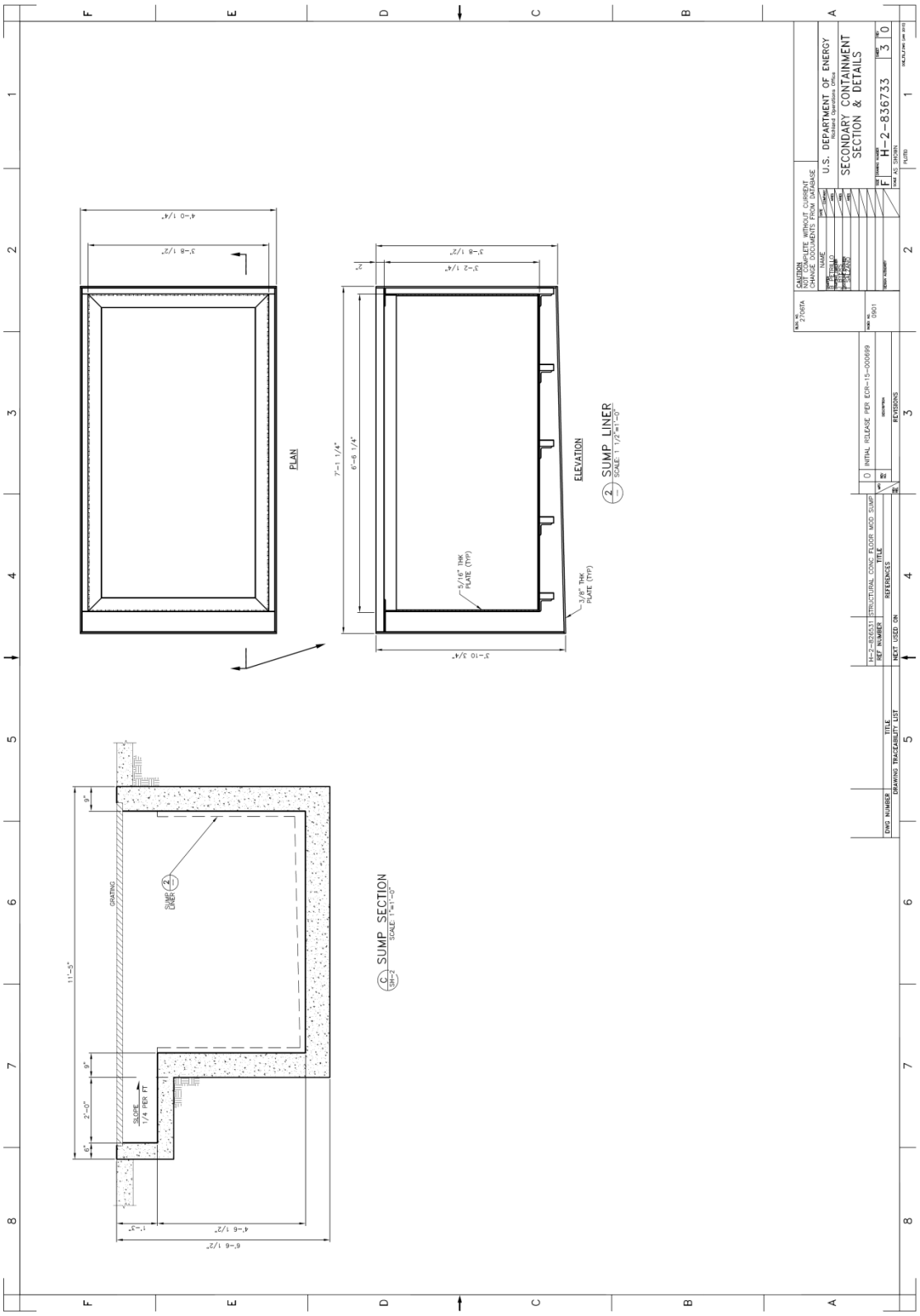

Calculation ECF-200W-15-0032, Revision 0, Maximum Storage Capacity for 2706-T Yard and Asphalt Pad

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Maximum Storage Capacity for the 2706-T Yard and Asphalt Pad

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0032 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
0	Initial Release	09-08-2015	All
			☒

Section 3: Completed by the Responsible Manager

Document Control:

Is the document intended to be controlled within the Document Management Control System (DMCS)? ☒ Yes ☐ No

Does document contain scientific and technical information intended for public use? ☐ Yes ☒ No

Does document contain controlled-use information? ☐ Yes ☒ No

Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
Preparer:	T.B. Salzano, P.E. / ARES Corporation		09-08-2015
Checker:	K.J. Emory, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

Safety Software Approved:

	(Name /Position)	Signature	Date
Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 12 Calculation No: 946412.15-M-013

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for 2706-T Yard and Asphalt Pad

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the 2706-T Yard and Asphalt Pad. For this calculation, the 2706-T Yard consists of three storage areas: the 2706-T Yard, the 2706-TA Outdoor Storage Area, and the 2706-T Outdoor Storage Area.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	12	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9/8/15	9-8-15

Revision Description (Revision Description/Affected Pages):
Initial Release.

		Print Name/ Sign:			
		Date:			

Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
3. Calculation sheet contents complete per format.	✓					
4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
15. Computer program validation/verification addressed.			✓			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
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Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	9-9-15

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2706-T Yard, 2706-TA Outdoor Storage Area, 2706-T Outdoor Storage Area, and 2706-T Asphalt Pad Drawings

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Table 7-1. Summary of Maximum Storage Capacity for 2706-T Yard, 2706-TA Outdoor Storage Area, 2706-T Outdoor Storage Area, and 2706-T Asphalt Pad 9

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1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in the 2706-T Yard and Asphalt Areas. For this calculation, the 2706-T Yard consists of three storage areas: the 2706-T Yard, the 2706-TA Outdoor Storage Area, and the 2706-T Outdoor Storage Area. A general description and location of each of these areas is as follows:

- **2706-T Yard -** The 2706-T Yard area includes an uncovered asphalt paved area located on the northwest side of the 2706-TB Building and includes two engineered metal structures (HS-030 and HS-032).
- **2706-TA Outdoor Storage Area -** The 2706-TA Outdoor Storage Area includes an uncovered asphalt paved area along the northwest side of the 2706-TA Building.
- **2706-T Outdoor Storage Area -** The 2706-T Outdoor Storage Area is an uncovered concrete pad located on the southwest side of the 2706-T Building.
- **2706-T Asphalt Pad -** The 2706-T Asphalt Pad is an uncovered asphalt area located northwest of the 2706-T Yard.

2.0 METHODOLOGY

The 2706-T Yard and Asphalt Areas are used to stage dangerous and/or mixed waste awaiting disposal, however, these areas do not have built-in engineered containment. The HS-030 and HS-032 Storage Modules within the 2706-T Yard are engineered metal storage modules, enclosed completely by walls, roof, and floor to protect containers from precipitation and run-on.

The general layout including overall dimensions of the 2706-T Yard and Asphalt Areas are shown in Drawing H-2-836734, *Yard & Outdoor Storage General Structure/Area* and Drawing H-2-836735, *Asphalt Pad General Structure/Area*, respectively (See Attachment 1). Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of drum pallets that can be stored are determined.

3.0 INPUTS

1. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

2. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For the 2706-T Yard and 2706-T Asphalt Pad assume drum arrays approximately as described in Figure 3-1 below. (Reference Contract 57118, Section 8.0 Part B Table 1). The following

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changes/clarifications to these drum array requirements were provided during a walkdown of these areas:

A. The slope is too steep within the jersey barriers of the 2706-T Yard to store drum arrays southwest of the HS-032 Storage Module.

B. In the 2706-TA Outdoor Storage Area, drum arrays can be stored over the railroad tracks that head into the 2706-TA Building, however, drum arrays cannot be stored on the railroad tracks that run along the southwest side of this area.

C. Drums arrays on the southwest side of the 2706-T and 2706-TA Buildings can only be placed on the concrete pad area that makes up the 2706-T Outdoor Storage Area.

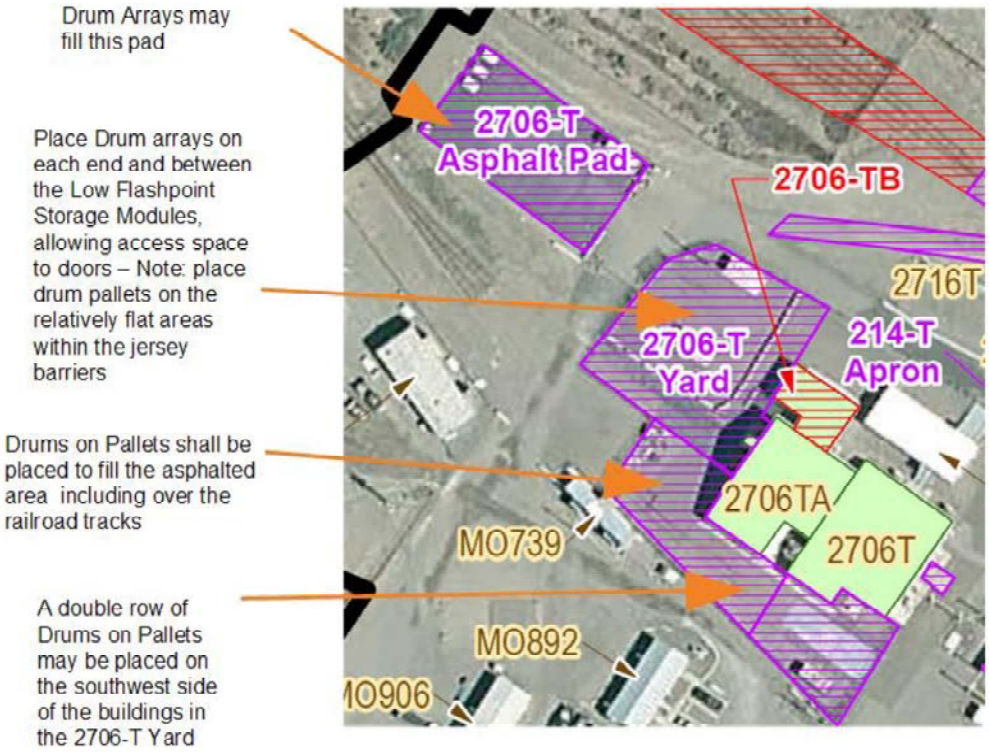

Figure 3-1. 2706-T Asphalt Pad and 2706-T Yard Approximate Drum Array

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

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6.0 CALCULATION

6.1 2706-T Yard

As seen in Drawing H-2-836734, the 2706-T Yard area consists of three main storage areas: 1) The 2706-T Yard that includes HS-030 and HS-032; 2) The 2706-TA Outdoor Storage Area; and 3) The 2706-T Outdoor Storage Area.

Utilizing the drum array storage requirements provided in Section 3.0, Design Inputs, the available storage area of the 2706-T Yard, 2706-TA Outdoor Storage Area, and 2706-T Outdoor Storage Area are as shown in Figure 6-1.

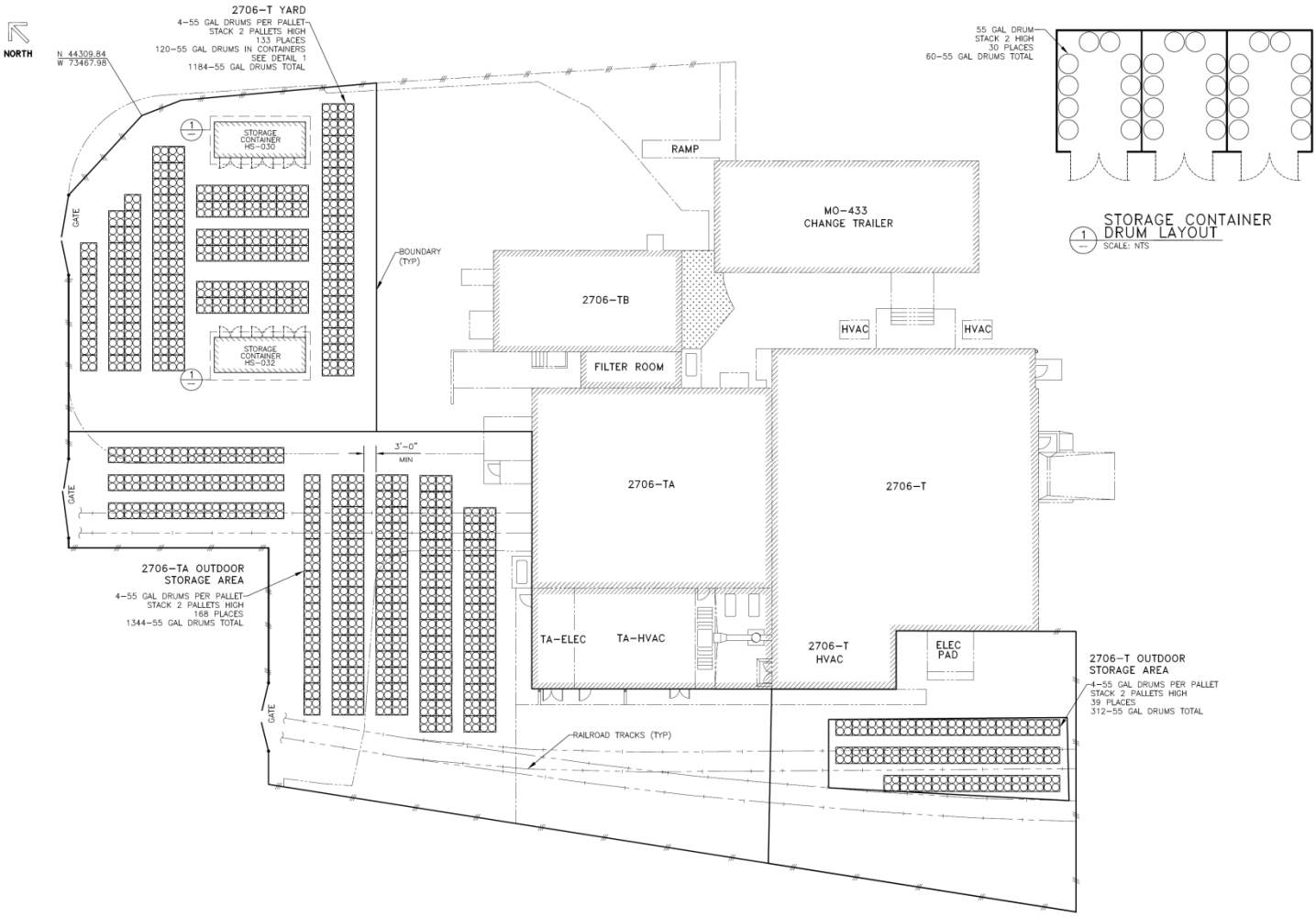

Figure 6-1. 2706-T Yard, 2706-TA Outdoor Storage Area, and 2706-T Outdoor Storage Area Drum Array

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From this figure, the number of drum arrays that can be placed in each area is as follows:

2706-T Yard

A total of 133 2X2 drum arrays can be placed in the 2706-T Yard. Since the pallets can be stacked two high, the total volume from the pallets is as follows:

133 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 1,064 total drums

Also, as seen in Figure 6-1, the two storage modules, HS-030 and HS-032, can each store 60 drums, therefore, the total storage volume of the 2706-T Yard is:

1,064 drums + (60 drums/module x 2 modules) = 1,184 total drums

1 drum = 208-liters (55 gallons), therefore,

1,184 total drums x 208-liters = ~**246,300 liters**

Or, since 1 liter = 0.001 m^3 246,300 liters x 0.001 m^3/liter = **246.3 m^3**

2706-TA Outdoor Storage Area

A total of 168 2X2 drum arrays can be placed in the 2706-TA Outdoor Storage Area. Since the pallets can be stacked two high, the total storage volume of the 2706-TA Outdoor Storage Area is:

168 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 1,344 total drums

1 drum = 208-liters (55 gallons), therefore,

1,344 total drums x 208-liters = ~**279,500 liters** x 0.001 m^3/liter = **279.5 m^3**

2706-T Outdoor Storage Area

A total of 39 2X2 drum arrays can be placed in the 2706-T Outdoor Storage Area. Since the pallets can be stacked two high, the total storage volume of the 2706-T Outdoor Storage Area is:

39 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 312 total drums

1 drum = 208-liters (55 gallons), therefore,

312 total drums x 208-liters = ~**64,900 liters** x 0.001 m^3/liter = **64.9 m^3**

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6.2 2706-T Asphalt Pad

From Drawings H-2-836735, the overall area of the 2706-T Asphalt Pad measures 45.7 meters (150 ft) by 24.4 meters (80 ft). Therefore, as shown in Figure 6-2, a total of 414 2X2 drum arrays can be placed on the 2706-T Asphalt Pad. Since the pallets can be stacked two high, the total storage volume of the area is as follows:

414 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 3,312 total drums

1 drum = 208-liters (55 gallons), therefore,

3,312 total drums x 208-liters = ~**688,900 liters** x 0.001 m^3/liter = **688.9 m^3**

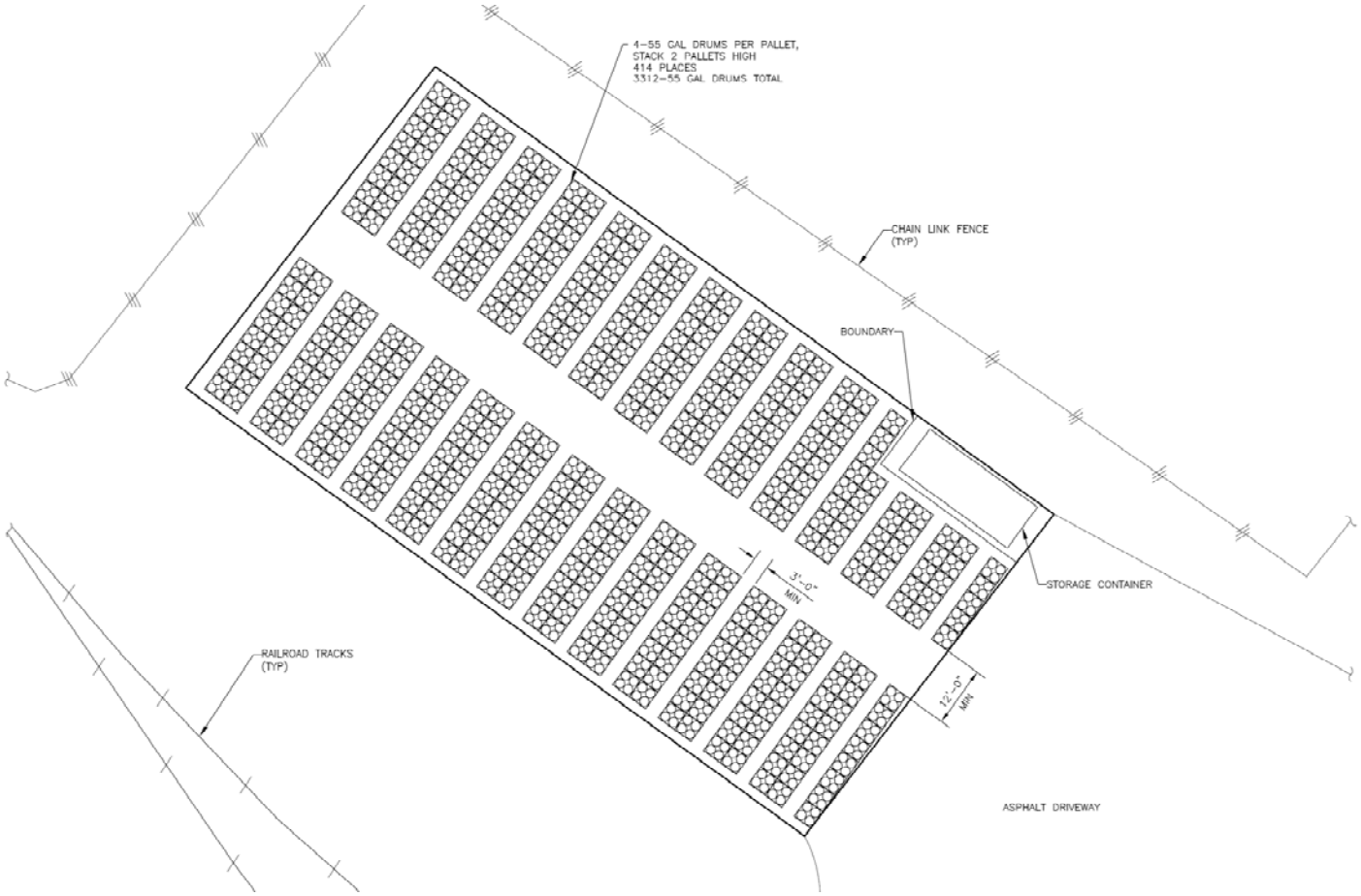

Figure 6-2. 2706-T Asphalt Pad Drum Array

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

7.0 RESULTS AND CONCLUSIONS

Based on the drum arrays shown in Figures 6-1 and 6-2, the waste storage design capacities for the 2706-T Yard, 2706-TA Outdoor Storage Area, 2706-T Outdoor Storage Area, and the 2706-T Asphalt Pad are as summarized in Table 7-1.

Table 7-1. Summary of Maximum Storage Capacity for 2706-T Yard, 2706-TA Outdoor Storage Area, 2706-T Outdoor Storage Area, and 2706-T Asphalt Pad

Structure/Area	Maximum Waste Storage Capacity m^3 (liters)
2706-T Yard	246.3 m^3 (246,300 liters)
2706-TA Outdoor Storage Area	279.5 m^3 (279,500 liters)
2706-T Outdoor Storage Area	64.9 m^3 (64,900 liters)
2706-T Asphalt Pad	688.9 m^3 (688,900 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836734, Revision 0, *Yard & Outdoor Storage General Structure/Area*.

3. Drawing H-2-836735, Revision 0, *Asphalt Pad General Structure/Area*.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

2706-T YARD, 2706-TA OUTDOOR STORAGE AREA, 2706-T OUTDOOR STORAGE AREA, AND 2706-T ASPHALT PAD DRAWINGS

CALCULATION SHEET

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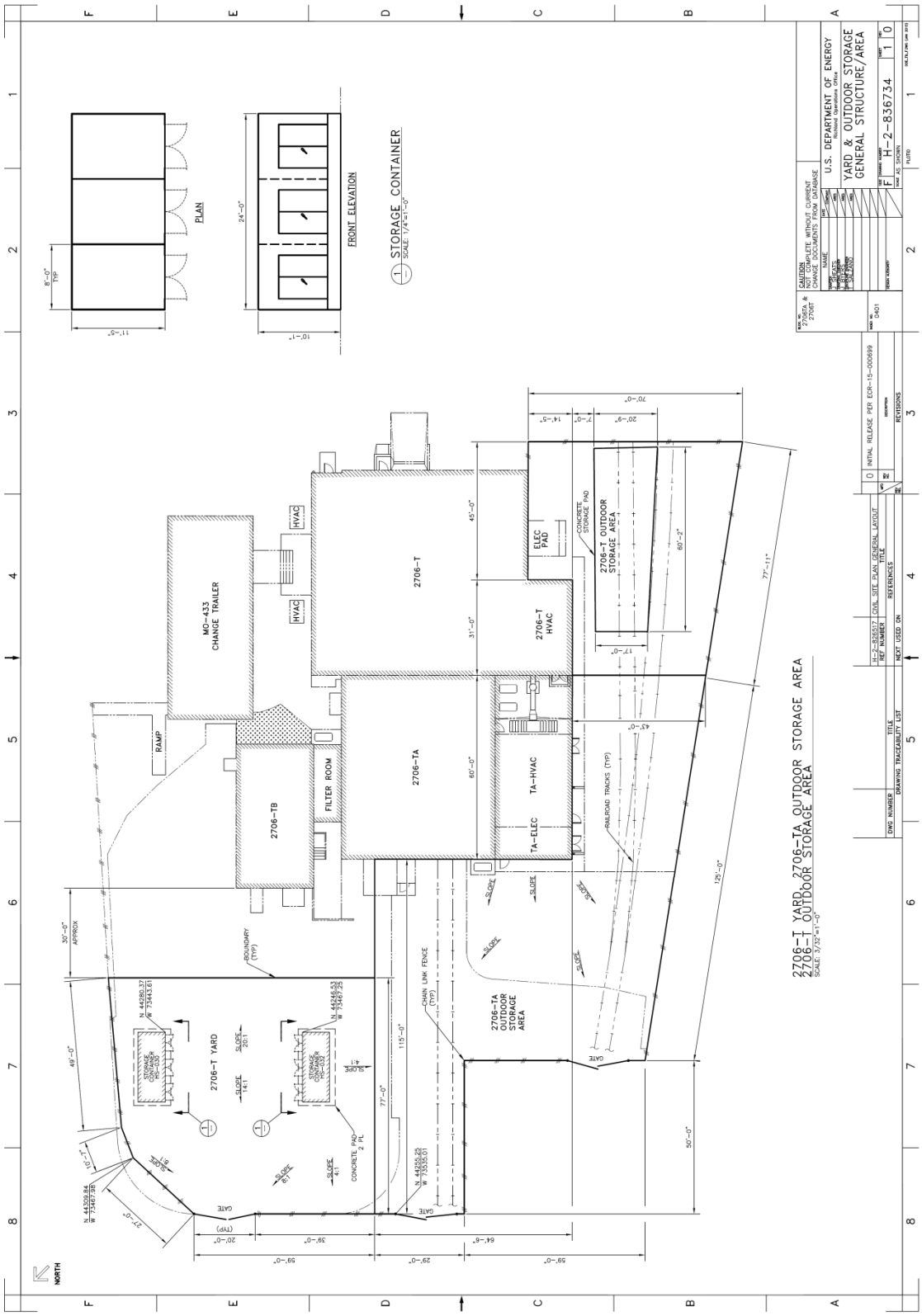
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



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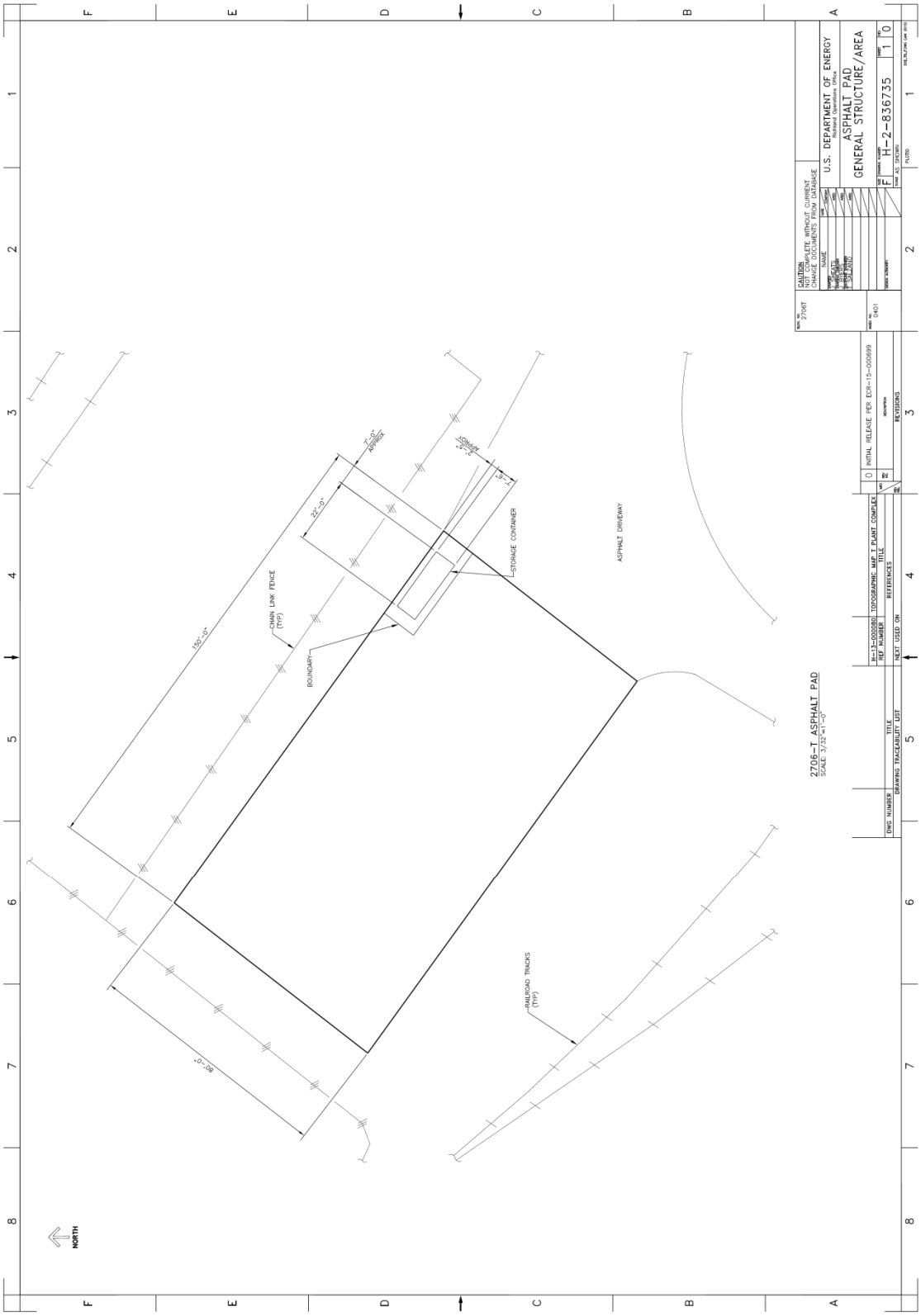
Title: Maximum Storage Capacity for 2706-T Yard and Asphalt Pad			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



Calculation ECF-200W-15-0033, Revision 0, Maximum Storage Capacity for 243-T Covered Storage Pad

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Maximum Storage Capacity for the 243-T Covered Storage Pad

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Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0033 **Revision No.:** 0

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Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

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Integration Lead	N/A		

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Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 8 Calculation No: 946412.15-M-014

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Maximum Storage Capacity for 243-T Covered Storage Pad

Purpose and Objective:

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored on the 243-T Covered Storage Pad.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	8	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
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CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	√					
2. Calculation sheet headers complete with calculation number, revision number, etc.	√					
3. Calculation sheet contents complete per format.	√					
4. Listed attachments included.	√					
5. Calculation objective clearly described.	√					
6. Criteria are suitable and properly referenced to task specific documents.	√					
7. Assumptions and input data described and attached or referenced to task documents.	√					
8. Calculation method identified and appropriate for the design activity.	√					
9. Calculation results reasonable and correctly described in results and conclusions.	√					
10. Physical property calculations generated by CAD software verified via hand calculations.			√			
11. Computer program identified with version and revision.			√			
12. Computer input/output provided or referenced.			√			
13. Computer run traceable to calculation (file #, etc.).			√			
14. Computer input data within permissible design input range.			√			
15. Computer program validation/verification addressed.			√			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			√			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	√	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
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T.B. Salzano, P.E.	9-8-15

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the maximum capacity of waste that can be stored in and around the 243-T Covered Storage Pad. This area is located at the west corner of T-Plant and consists of a covered concrete and asphalt base. The covered structure is constructed with a steel frame, sheet metal roof, and open sides. Forklift access is from the southeast side (parking lot side). The 243-T Covered Storage Pad does not have a constructed secondary containment system

2.0 METHODOLOGY

The 243-T Covered Storage Pad is used to stage dangerous and/or mixed waste awaiting disposal, however, this area does not have built-in engineered containment. The general layout including overall dimensions of this area is shown in Drawing H-2-836736, *Storage Pad General Structure/Area* (See Attachment 1). Utilizing the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), the maximum number of drum pallets that can be stored are determined.

3.0 INPUTS

1. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

2. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift handling shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

From Drawings H-2-836736, the overall area of the 243-T Covered Storage Pad measures 61.0 meters (200 ft) by 22.9 meters (75 ft). In addition, there is an irregular shaped area around the 243-T that is used to stage waste. Using the criteria indentified in the Design Inputs, a total of 1,240 2X2 drum arrays can be placed in and around the 243-T Covered Storage Pad as shown in Figure 6-1.

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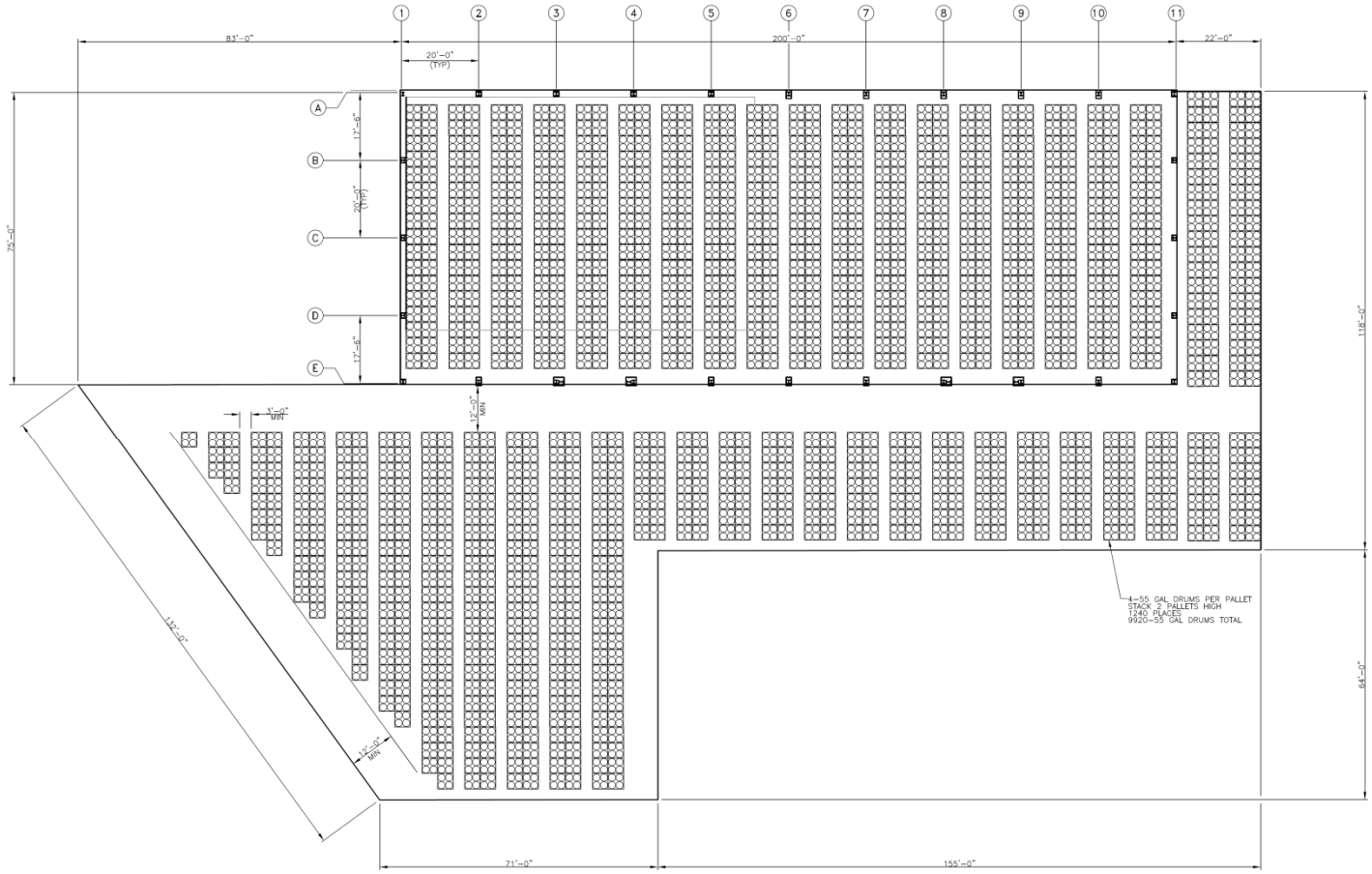

Figure 6-1. 243-T Covered Storage Pad Drum Array

Since the pallets can be stacked two high, the total storage volume of the 243-T Covered Storage Pad Area is as follows:

1,240 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 9,920 total drums

1 drum = 208-liters (55 gallons), therefore,

9,920 total drums x 208-liters = ~**2,063,000 liters**

Or, since 1 liter = 0.001 m^3 2,063,000 liters x 0.001 m^3/liter = **2,063 m^3**

7.0 RESULTS AND CONCLUSIONS

Based on the drum array shown in Figure 6-1, the waste storage design capacity for the area in and around the 243-T Covered Storage Pad is 2,063 m^3 or 2,063,000 liters.

The results are summarized in Table 7-1.

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Table 7-1. Summary of Maximum Storage Capacity for 243-T Covered Storage Pad

Structure/Area	Maximum Waste Storage Capacity m^3 (liters)
243-T Covered Storage Pad	2,063 m^3 (2,063,000 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836736, Revision 0, *Storage Pad General Structure/Area*.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

243-T COVERED STORAGE PAD DRAWING

CALCULATION SHEET

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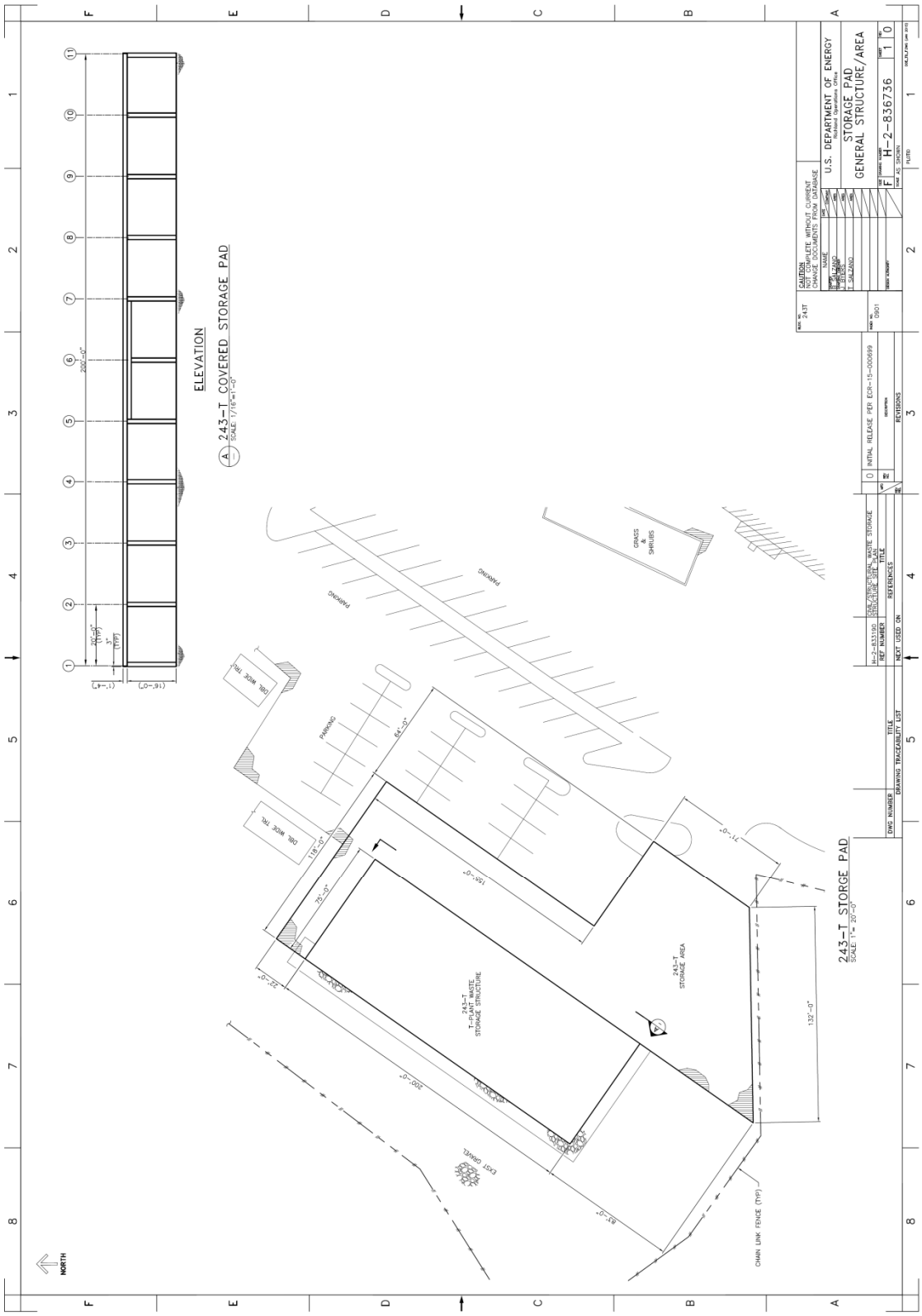
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



Calculation ECF-200W-15-0034, Revision 0, Secondary Containment and Maximum Storage Capacity for the 214-T Building

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Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

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Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 214-T Building

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Section 4: Document Review & Approval

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Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

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Integration Lead	N/A		

Safety Software Approved:

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Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 8 Calculation No: 946412.15-M-015

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 214-T Building

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 214-T Building.

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CALCULATION REVIEW CHECKLIST

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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	✓					
2. Calculation sheet headers complete with calculation number, revision number, etc.	✓					
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4. Listed attachments included.	✓					
5. Calculation objective clearly described.	✓					
6. Criteria are suitable and properly referenced to task specific documents.	✓					
7. Assumptions and input data described and attached or referenced to task documents.	✓					
8. Calculation method identified and appropriate for the design activity.	✓					
9. Calculation results reasonable and correctly described in results and conclusions.	✓					
10. Physical property calculations generated by CAD software verified via hand calculations.			✓			
11. Computer program identified with version and revision.			✓			
12. Computer input/output provided or referenced.			✓			
13. Computer run traceable to calculation (file #, etc.).			✓			
14. Computer input data within permissible design input range.			✓			
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16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			✓			

Calculation Checking Method	✓	Applicable Pages
1. Direct Step-by-Step Check	✓	All
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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

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214-T Building General Layout and Secondary Containment Design Drawing

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Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 214-T Building 6

CALCULATION SHEET

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 214-T Building.

2.0 METHODOLOGY

The 214-T Building is used to store dangerous and/or mixed waste and for treatment activities. The building is located on the west side of the 221-T Building near the Railroad Tunnel. The general layout and containment design of this building is shown in Drawing H-2-836737 (See Attachment 1). The floor area is divided by a raised concrete berm and each area is sloped to a separate floor sump. Utilizing the overall area of the building floor, the slope of the floor, and the sump volumes, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in this building.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836737, Sheet 2 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For drum arrays inside structures assume storage on rows of pallets (2X2 drum array) separated by three feet aisles, with three tier stacking unless otherwise specified. Pallets shall be spaced three feet minimum from outside walls. Access for forklift shall be considered. (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawing H-2-836737, the 214-T Building has a foundation approximately 9.75 meters (32 ft) wide, by 14.63 meters (48 ft) long. The floor area is divided by a raised concrete berm, however, the primary secondary containment is from the sumps in each of these areas.

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The west side sump is 0.51 meters (1.67 ft) wide by 2.48 meters (8.13 ft) long by 0.76 meters (2.5 ft) deep. Therefore, the containment volume of this sump is

$V_{west\ sump}$ = (1.67 ft wide) x (8.13 ft long) x (2.5 ft deep) = 33.9 ft^3

Or, since 1 ft^3 = 0.0283 m^3 33.9 ft^3 x 0.0283 m^3/ft^3 = ~**0.96 m^3**

and, since 1 m^3 = 1,000 liters 0.96 m^3 x 1,000 liters/m^3 = **960 liters**

The east side sump is 0.51 meters (1.67 ft) wide by 1.19 meters (3.92 ft) long by 0.76 meters (2.5 ft) deep. Therefore, the containment volume of this sump is

$V_{east\ sump}$ = (1.67 ft wide) x (3.92 ft long) x (2.5 ft deep) = 16.4 ft^3

Or, since 1 ft^3 = 0.0283 m^3 16.4 ft^3 x 0.0283 m^3/ft^3 = ~**0.46 m^3**

and, since 1 m^3 = 1,000 liters 0.46 m^3 x 1,000 liters/m^3 = **460 liters**

Therefore, the total containment volume would be:

$V_{west\ sump}$ + $V_{east\ sump}$ = 0.96 m^3 + 0.46 m^3 = **1.42 m^3** x 1,000 liters/m^3 = **1,420 liters**

6.2 Maximum Waste Storage Capacity

As detailed in Section 6.1, the 214-T Building has a floor area approximately 9.75 meters (32 ft) wide, by 14.63 meters (48 ft) long. Therefore, the total area available for storage is:

(32 ft) x (48 ft) = 1,536 ft^2

Or, since 1 ft^2 = 0.093 m^2 1,536 ft^2 x 0.093 m^2/ft^2 = 143 m^2

Using the criteria indentified in the Design Inputs, a total of 38 2X2 drum arrays can be placed in the building as shown in Figure 6-1. Since the pallets can be stacked three high, the total storage volume of the 214-T Building is as follows:

38 2X2 drum arrays x 4 drums/pallet x 3 pallets high = 456 total drums

1 drum = 208-liters (55 gallons), therefore,

456 drums x 208-liters = ~**94,800 liters** x 1/1000 m^3/liter = **94.8 m^3**

7.0 RESULTS AND CONCLUSIONS

The 214-T Building has a total secondary containment volume of 1.42 m^3 or 1,420 liters based on the volume of the two sumps. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of the building is 94.8 m^3 or 94,800 liters.

The results are summarized in Table 7-1.

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Title: Secondary Containment and Maximum Storage Capacity for the 214-T Building			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 214-T Building

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
214-T	1.42 m^3 or 1,420 liters	94.8 m^3 (94,800 liters)

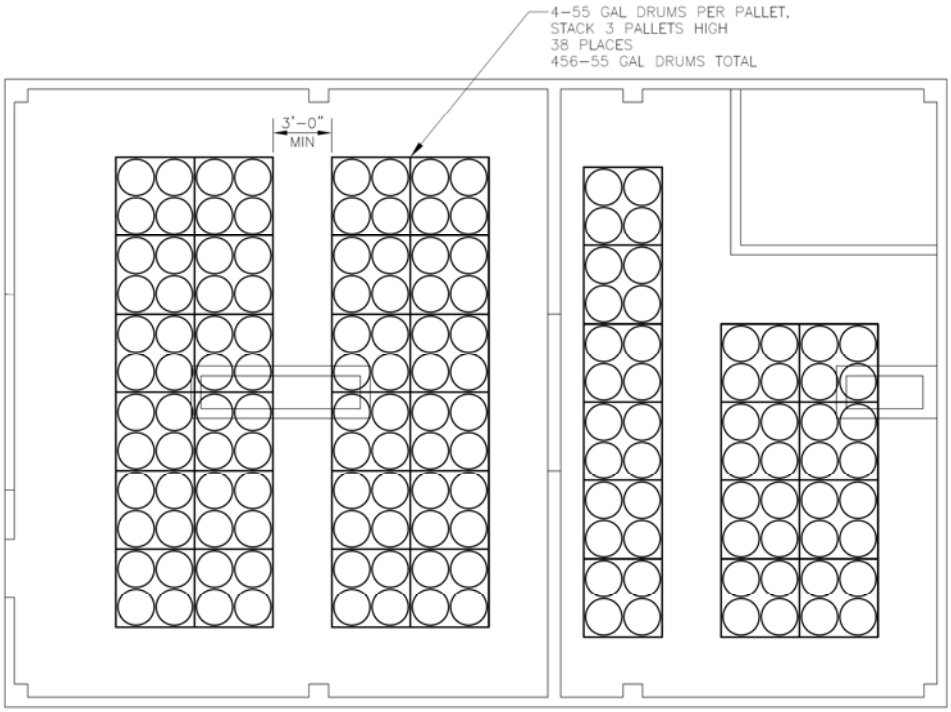

Figure 6-1. 214-T Building Drum Array

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836737, Sheet 1, Revision 0, *Secondary Containment Design*.

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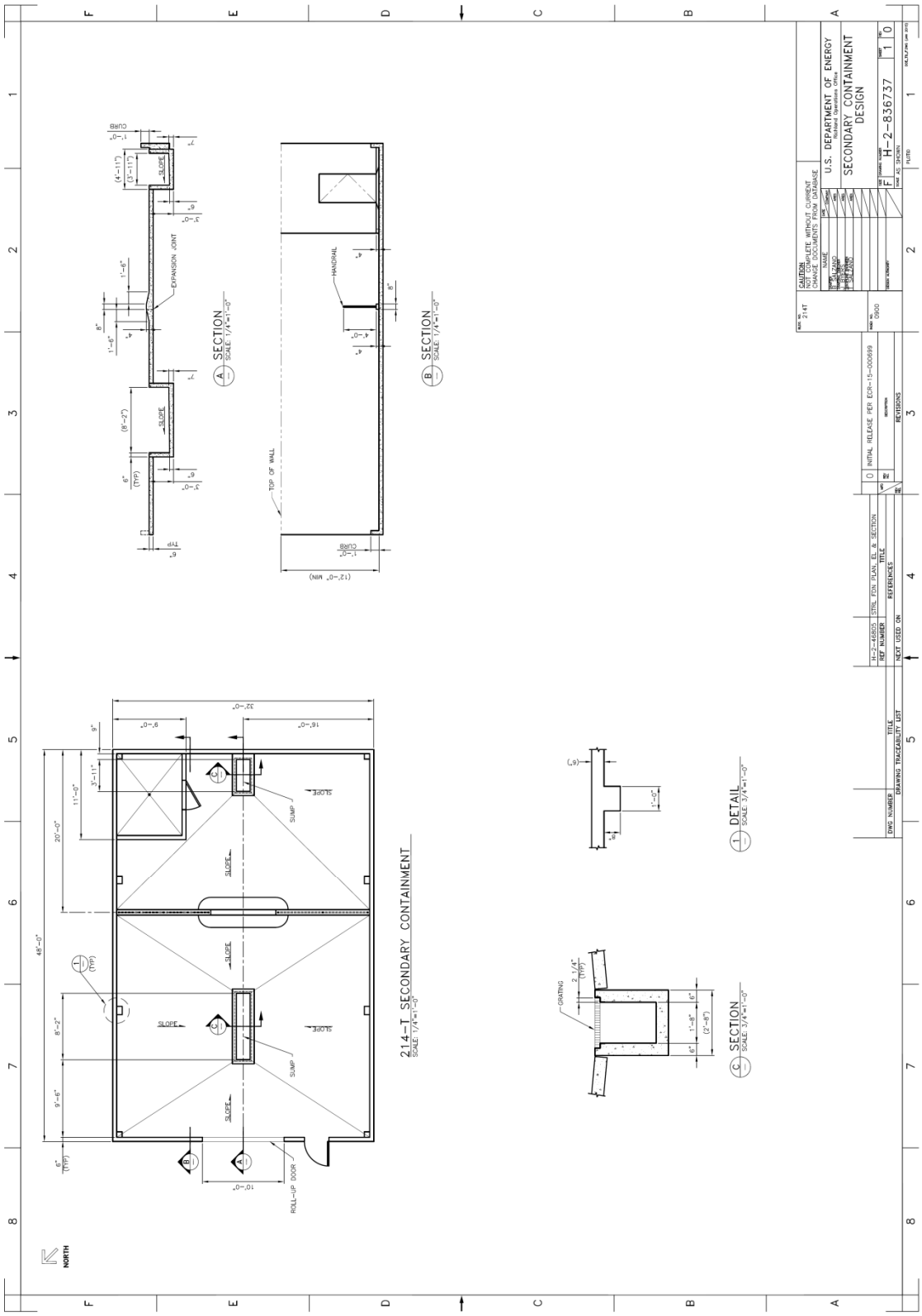
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

214-T BUILDING GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-015	Rev. 0	Page No. 8 of 8
Title: Secondary Containment and Maximum Storage Capacity for the 214-T Building			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



Calculation ECF-200W-15-0035, Revision 0, Secondary Containment and Maximum Storage Capacity for the 211-T Cage

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project: SWOC Part B Permit Engineering Calculations and Drawings

Date: 09-08-2015

Calculation Title & Description: Secondary Containment and Maximum Storage Capacity for the 211-T Cage

RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0035 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
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Does document contain controlled-use information? ☐ Yes ☒ No

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Checker:	K.J. Emory, P.E. / ARES Corporation		09-08-2015
Senior Reviewer:	S.R. Pierce, P.E. / ARES Corporation		09-08-2015
Responsible Manager:	S.K. Johansen / DWF&RS Environmental Manager		

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

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Integration Lead	N/A		

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Integration Lead	N/A		

CALCULATION APPROVED:

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:	N/A		

ARES CORPORATION	CALCULATION COVER SHEET	Page No. 1 of 8 Calculation No: 946412.15-M-016

Project No.	Project Title:	Client:
946412.15	SWOC Part B Permit Engineering Calculations and Drawings	CHPRC

Title:
Secondary Containment and Maximum Storage Capacity for the 211-T Cage

Purpose and Objective:

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 211-T Cage.

Rev. No.	Total Pages		Prepared By	Checked By	PM/TL
0	8	Print Name/ Sign:	T.B. Salzano, P.E.	K.J. Emory, P.E.	S.R. Pierce, P.E.
		Date:	9-8-15	9/8/15	9-8-15

Revision Description (Revision Description/Affected Pages):
Initial Release.

		Print Name/ Sign:			
		Date:			

Revision Description (Revision Description/Affected Pages):

CALCULATION REVIEW CHECKLIST

Project No.	Calculation No.	Rev.	Page No.
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Items Checked	Accept Y	Accept N	Accept N/A	Description of Resolution for Unacceptable Items	Initial	Date
1. Cover sheets properly completed.	√					
2. Calculation sheet headers complete with calculation number, revision number, etc.	√					
3. Calculation sheet contents complete per format.	√					
4. Listed attachments included.	√					
5. Calculation objective clearly described.	√					
6. Criteria are suitable and properly referenced to task specific documents.	√					
7. Assumptions and input data described and attached or referenced to task documents.	√					
8. Calculation method identified and appropriate for the design activity.	√					
9. Calculation results reasonable and correctly described in results and conclusions.	√					
10. Physical property calculations generated by CAD software verified via hand calculations.			√			
11. Computer program identified with version and revision.			√			
12. Computer input/output provided or referenced.			√			
13. Computer run traceable to calculation (file #, etc.).			√			
14. Computer input data within permissible design input range.			√			
15. Computer program validation/verification addressed.			√			
16. Computer operating system in use for calculation preparation is the same as when the software was verified on machine.			√			

Calculation Checking Method	√	Applicable Pages
1. Direct Step-by-Step Check	√	All
2. Reference Chart(s) or Book(s) Comparison (Append Documentation)		
3. Alternate Calculation (Append Documentation)		

Comments:
None

Checker (Print Name and Sign):	Date:
K.J. Emory, P.E.	9/8/15
Originator (Print Name and Sign):	**Date:**
T.B. Salzano, P.E.	9-8-15

Signatures obtained only after discrepancies are corrected and comments are resolved.

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Project No. 946412.15	Calculation No. 946412.15-M-016	Rev. 0	Page No. 3 of 8
Title: Secondary Containment and Maximum Storage Capacity for the 211-T Cage			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

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Title: Secondary Containment and Maximum Storage Capacity for the 211-T Cage			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

1.0 PURPOSE

The purpose and objective of this calculation is to determine the secondary containment capacity and maximum waste storage capacity of the 211-T Cage.

2.0 METHODOLOGY

The 211-T Cage is a fenced outside storage area with a locking gate for storing dangerous and/or mixed waste. The 211-T Cage is located on the northwest side of the 221-T Building in the area between the 2706-T Building. The general layout and containment design of this ares is shown in Drawing H-2-836738 (See Attachment 1). The cage is split into two sections separated by a concrete berm and surrounded by a curb. Each section is sloped to a sump. Utilizing the overall area of the cage floor, the slope of the floor, and the sump volumes, the capacity of the secondary containment is determined. Also, the waste storage requirements provided in CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings* (See Section 3.0, Design Inputs), are used to determine the maximum number of drum pallets that can be stored in this area.

3.0 INPUTS

1. Dimensions for the containment design are all from Drawing H-2-836738, Sheet 1 (See Attachment 1).

2. Drum Pallet dimension is 48" W x 48" L x 4.5" H. Drum height is 34-9/16". Four drums are placed on each pallet. Drum volume is 208-liters (55 gallons). (Reference Contract 57118, Section 8.0 Part B Table 1).

3. For outside area drum arrays assume storage on pallets (2X2 drum array) with aisle spacing of three feet and two drum high stacking allowed. Pallets may be located up to the outside array perimeter unless otherwise specified. Access for forklift shall be considered. For the 211-T Cage assume drums in rows to each side of entry with an aisle in the middle (Reference Contract 57118, Section 8.0 Part B Table 1).

4.0 ASSUMPTIONS

There are no unverified assumptions in this calculation.

5.0 SOFTWARE APPLICATIONS

No software applications are used in this calculation.

6.0 CALCULATION

6.1 Secondary Containment Capacity

From Drawing H-2-836738, the 211-T Cage has a foundation approximately 4.88 meters (16 ft) wide, by 7.62 meters (25 ft) long. The floor area is divided by a raised concrete berm, however, the primary secondary containment is from the sumps in each of these areas.

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Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

Both sumps are 0.84 meters (2.75 ft) square by 0.81 meters (2.67 ft) deep. Therefore, the total secondary containment volume of the 211-T Cage is the volume of the two sumps

V_{sumps} = (2.75 ft wide) x (2.75 ft long) x (2.67 ft deep) x 2 sumps = 40.4 ft^3

Or, since 1 ft^3 = 0.0283 m^3 40.4 ft^3 x 0.0283 m^3/ft^3 = ~**1.14 m^3**

and, since 1 m^3 = 1,000 liters 1.14 m^3 x 1,000 liters/m^3 = **1,140 liters**

6.2 Maximum Waste Storage Capacity

As detailed in Section 6.1, the 211-T Cage has a floor area approximately 4.88 meters (16 ft) wide, by 7.62 meters (25 ft) long. Therefore, the total area available for storage is:

(16 ft) x (25 ft) = 400 ft^2

Or, since 1 ft^2 = 0.093 m^2 400 ft^2 x 0.093 m^2/ft^2 = 37 m^2

Using the criteria indentified in the Design Inputs, a total of 12 2X2 drum arrays can be placed in the building as shown in Figure 6-1. Since the pallets can be stacked two high, the total storage volume of the 211-T Cage is as follows:

12 2X2 drum arrays x 4 drums/pallet x 2 pallets high = 96 total drums

1 drum = 208-liters (55 gallons), therefore,

96 drums x 208-liters = ~**19,970 liters** x 1/1000 m^3/liter = **19.97 m^3**

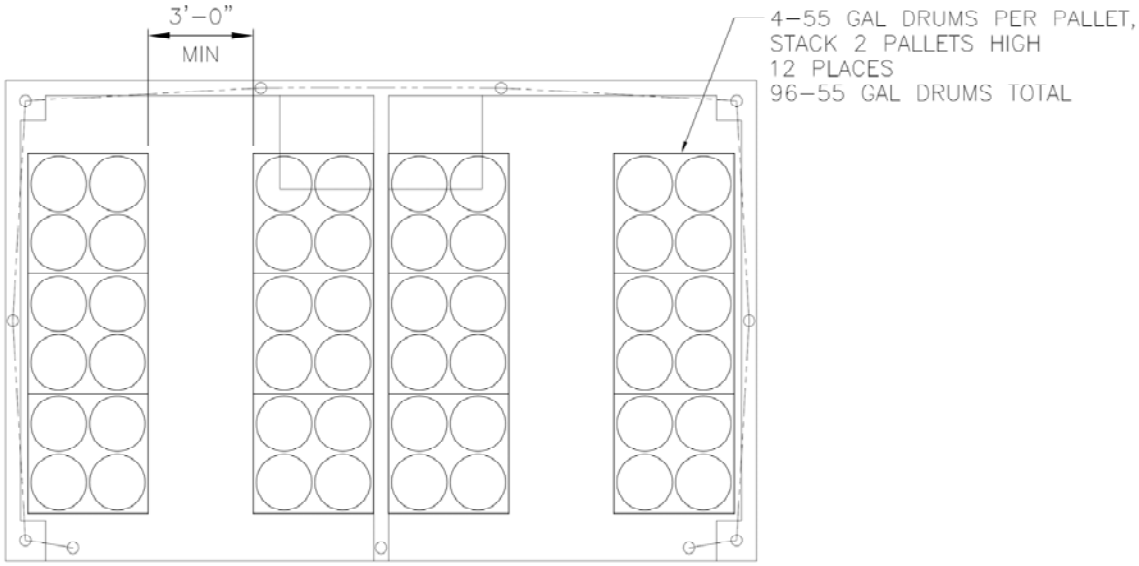

Figure 6-1. 211-T Cage Drum Array

CALCULATION SHEET

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Title: Secondary Containment and Maximum Storage Capacity for the 211-T Cage			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

7.0 RESULTS AND CONCLUSIONS

The 211-T Cage has a total secondary containment volume of 1.14 m^3 or 1,140 liters based on the volume of the two sumps. In addition, based on the drum array shown in Figure 6-1, the waste storage design capacity of the area is 19.97 m^3 or 19,970 liters.

The results are summarized in Table 7-1.

Table 7-1. Summary of Secondary Containment and Maximum Storage Capacities for 211-T Cage

Structure/Area	Secondary Containment Capacity m^3 (liters)	Maximum Waste Storage Capacity m^3 (liters)
211-T Cage	1.14 m^3 or 1,140 liters	19.97 m^3 (19,970 liters)

8.0 REFERENCES

1. CHPRC Contract No. 57118, *SWOC Part B Permit Engineering Calculations and Drawings*, CH2M HILL Plateau Remediation Company, Richland, Washington.

2. Drawing H-2-836738, Sheet 1, Revision 0, *Secondary Containment Design*.

CALCULATION SHEET

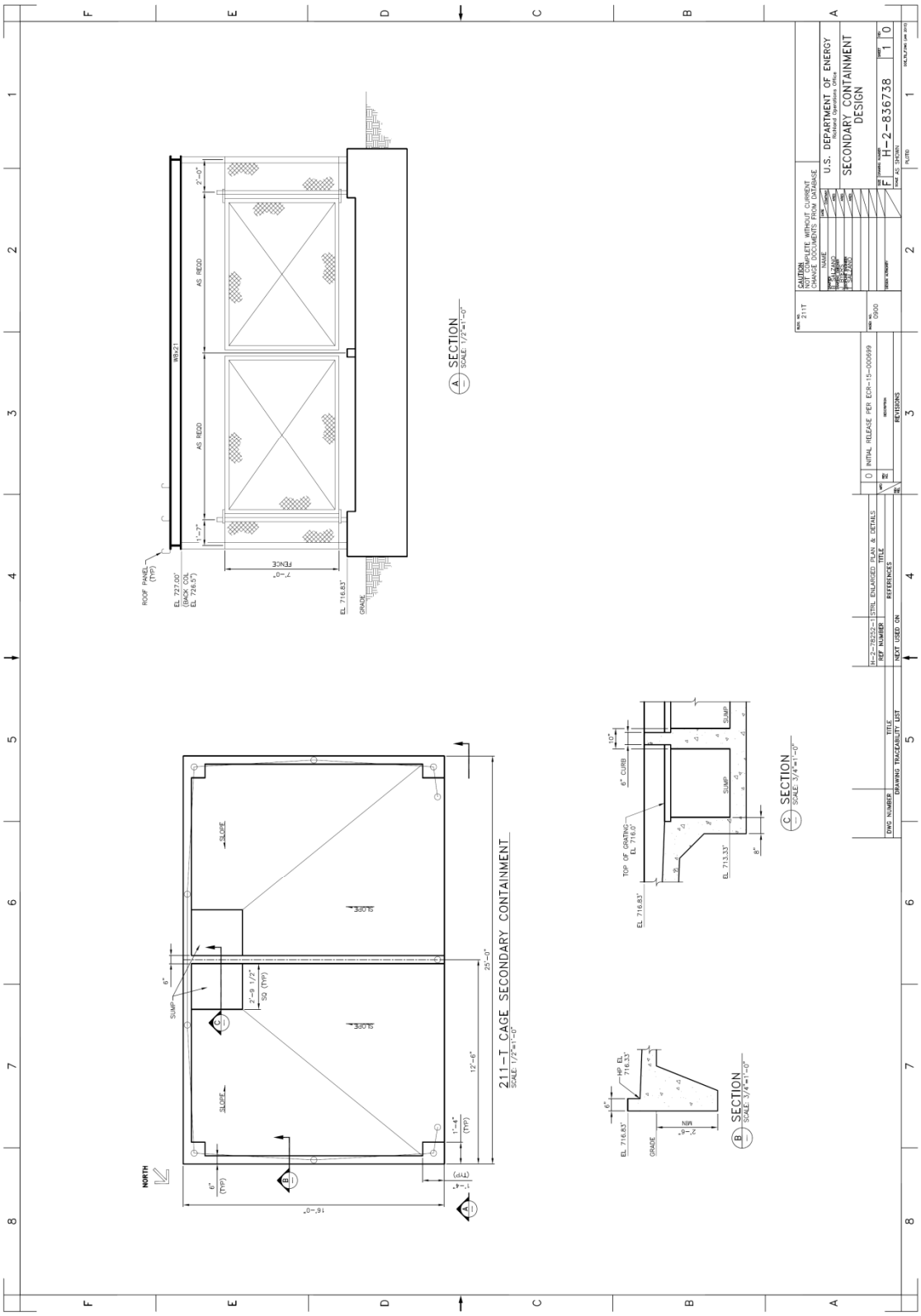
Project No. 946412.15	Calculation No. 946412.15-M-016	Rev. 0	Page No. 7 of 8
Title: Secondary Containment and Maximum Storage Capacity for the 211-T Cage			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15

ATTACHMENT 1

211-T CAGE GENERAL LAYOUT AND SECONDARY CONTAINMENT DESIGN DRAWING

CALCULATION SHEET

Project No. 946412.15	Calculation No. 946412.15-M-016	Rev. 0	Page No. 8 of 8
Title: Secondary Containment and Maximum Storage Capacity for the 211-T Cage			
Prepared By: T.B. Salzano, P.E.	Date: 09-08-15	Checked By: K.J. Emory, P.E.	Date: 09-08-15



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CH2M HILL Plateau Remediation Company Solid Waste Complex Part B Permit Application Treatment Calculations

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

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Date: 12/03/2015

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RELEASE / ISSUE

Section 2: Completed by Preparer

Calculation No.: ECF-200W-15-0126 **Revision No.:** 1

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	(Name /Position)	Signature	Date
Preparer:	Sarah Horn, Environmental Scientist	[signature]	12/03/2015
Checker:	Rene Catlow, Manager - Waste Projects	Rene Catlow	12/3/15
Senior Reviewer:	Dean Nester, Project Manager - Waste Projects	Rene Catlow for Dean Nester	12/3/15

APPLICABLE IF CALCULATION IS A RISK ASSESSMENT OR USES AN ENVIRONMENTAL MODEL

	(Name /Position)	Signature	Date
Risk/Modeling Integration Manager:			
Responsible Manager:	Stephanie Johansen, Environmental Director	[signature]	12/03/15

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CWC-WRAP Treatment Calculations Spreadsheet ..... **i**

1 Purpose

This Environmental Calculation documents the development of treatment capacity in support of the Low-Level Burial Grounds (LLBG) Trenches 31-34-94, the T Plant Complex, and the Central Waste Complex – Waste Receiving and Processing (CWC-WRAP) Part A Forms, Section XII, *Process Codes and Design Capacities*, and Section XIII, *Other Process Codes*.

2 Methodology

The methodology for this environmental calculation is as follows:

1. Determine the number of Active Process Units (APUs). The number of APUs is the number of TSD Process Units that are anticipated to be operational at the same time.
2. Determine the size of the container to be used for the calculation.
3. Develop basic assumptions for the number of processing hours per day and the processing rate per hour.
4. Multiply the various factors as follows:

   (Number of APUs) x (Size of the container) (Number of containers per day) = Treatment Capacity/Day

5. Convert units to metric tons per day and metric tons per year for reporting in the Part A Forms.

3 Assumptions and Input Parameters

1. Treatment may be performed at any of the Process Units identified for the Operating Unit Group (OUG). However, the number of APUs was used to perform the calculations.
2. Annual calculations were based on 250 working days per year.
3. Maximum daily treatment and estimated annual treatment are rounded up to appropriate significant figures.
4. All capacities (weight or volume based) are on a pre-treatment basis.
5. Calculations determine the maximum daily treatment capacity and an estimated annual treatment capacity.
6. The Density of Debris was chosen assuming the processing limits are based on the actual waste weight, not the weight of the parent container. The Density of Debris is the average bulk density for debris based on historical waste management records and is as follows:

$$Density\ of\ Debris\ = 1000\frac{kg}{m^3} \times \frac{1.0mt}{1000kg} = 1.0\frac{mt}{m^3}$$

7. The Density of Soil is the average weight of Hanford Site soil and is a follows:

$$Density\ of\ Soil\ = 1600\frac{kg}{m^3} \times \frac{1.0mt}{1000kg} = 1.6\frac{mt}{m^3}$$

8. The density of liquid waste is assumed to be equivalent to the density of water. The Density of Water is 8.34 lb/gal. (http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html)
9. For Mercury Amalgamation, the container size is assumed to be a 55-gallon drum. The maximum amount of elemental mercury per container is 1 Liter.
   The Relative Density of Mercury is 13.534 kg/L rounded to 14 kg/L.
   (http://en.wikipedia.org/wiki/Mercury_(element)).

4 Software Applications

Microsoft Excel was used to perform the calculations. The Microsoft Excel spreadsheet is attached for each of the OUGs in the appendices.

5 Calculations

5.1 Low-Level Burial Grounds Operating Unit Group

Table 5-1. Treatment Capacity for Trenches 31-34-94 OUG

Line Number	A. Process Codes	B. Process Design Capacity		C. Total Number of Process Units	Active Process Units	Process Description
		1. Amount	2. Unit of Measure			
1	T04	26 metric tons per day	S	2	1	Macroencapsulation/ Microencapsulation/ Sealing

S = metric tons per day

T04 = Other treatment

5.1.1 Macroencapsulation/Microencapsulation/Sealing (includes Radioactive Lead Solids, Debris, and radioactive Lead Acid Batteries.) (T04)

Calculation Assumptions:

1. One (1) Active Process Units (APUs)
2. Container size is 6.4 m^3 (assumes 8 ft x 8 ft x 20 ft macroencapsulation box with contingency
3. Process four (4) containers per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{m^3}{day}) = 1\ (APU) \times 6.4\ \frac{m^3}{cont.} \times 4\frac{cont.}{day} = 26\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 26\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 26\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 26\ \frac{mt}{day} \times 250\ \frac{day}{year} = 6{,}400\,\frac{mt}{year}$$

The Microsoft Excel spreadsheet for the treatment LLBG Trenches 31-34-94 calculations is in Appendix A.

5.2 T Plant Complex Operating Unit Group

Table 5-2. Treatment Capacity T Plant Complex OUG

Line Number	A. Process Codes	B. Process Design Capacity		C. Total Number of Process Units	Active Process Units	Process Description
		1. Amount	2. Unit of Measure			
1	T04	75 metric tons per day	S	5	3	Volume Reduction (includes sorting and segregation)
2	T04	5 metric tons per day	S	5	3	Deactivation (includes neutralization and controlled reaction with water)
3	T04	25 metric tons per day	S	6	1	Extraction Technologies (includes debris washing and physical extraction)
4	T04	2.5 metric tons per day	S	5	3	Deactivation and Recovery of Organics (puncture and decant aerosol cans and/or cylinders)
5	T04	5 metric tons per day	S	5	3	Absorption (free and containerized liquids)
6	T04	31 metric tons per day[1]	S	5	3	Solidification/Stabilization
7	T04	0.042 metric tons per day	S	5	3	Mercury Amalgamation
8	T04	77 metric tons per day	S	6	3	Microencapsulation/ Macroencapsulation/ Sealing
9	T94	25 metric tons per day	S	2	1	Volume Reduction
10	T94	25 metric tons per day	S	3	1	Extraction Technologies
11	T94	25 metric tons per day	S	2	1	Sealing

S = metric tons per day T94 = Treatment – Containment Building
T04 = Other treatment

5.2.1 Volume Reduction (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 25 m^3 (Nominal container size).
3. Process 1 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{m^3}{day}) = 3\ (APU) \times 25\ \frac{m^3}{cont.} \times 1\frac{cont.}{day} = 75\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 75\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 75\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 75\frac{mt}{day} \times 250\ \frac{day}{year} = 18{,}750\frac{mt}{year}$$

5.2.2 Deactivation (Includes Neutralization and Controlled Reaction with Water) (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 55-gallons
3. Process 8 container per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 3\ (APU) \times 55\ \frac{gal}{cont.} \times 8\frac{cont.}{day} = 1{,}320\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 1{,}320.0\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 11{,}000\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 11{,}000\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 5.0\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 5.0\frac{mt}{day} \times 250\ \frac{day}{year} = 1{,}250.0\frac{mt}{year}$$

5.2.3 Extraction Technologies (Includes Debris Washing and Physical Extraction) (T04)

Calculation Assumptions:

1. One (1) Active Process Units (APUs)
2. Container size is 25 m^3 (Large piece of equipment).
3. Process 1 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{m^3}{day}) = 1\ (APU) \times 25\ \frac{m^3}{cont.} \times 1\frac{cont.}{day} = 25\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 25\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 25\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 25\frac{mt}{day} \times 250\ \frac{day}{year} = 6{,}250\frac{mt}{year}$$

5.2.4 Deactivation and Recovery of Organics (Puncture and Decant Aerosol Cans and/or Cylinders) (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size of 55-gallons represents the volume of actual aerosol cans, not the size of the parent container.
3. Process 4 containers per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 3\ (APU) \times 55\ \frac{gal}{cont.} \times 4\frac{cont.}{day} = 660\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 660\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 5500\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 5500\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 2.5\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 2.5\frac{mt}{day} \times 250\ \frac{day}{year} = 620\frac{mt}{year}$$

5.2.1 Absorption (Free and Containerized Liquids) (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 55-gallons
3. Process 8 container per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 3\ (APU) \times 55\ \frac{gal}{cont.} \times 8\frac{cont.}{day} = 1{,}320\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 1{,}320\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 11{,}000\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 11{,}000\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 5.0\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 5.0\frac{mt}{day} \times 250\ \frac{day}{year} = 1{,}250\frac{mt}{year}$$

5.2.2 Solidification/Stabilization (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 6.4 m^3 (Nominal 5’ x 5’ x 9’ DOT Type 7A Box)
3. Process 1 container per day
4. Waste Type is Soil (assumed Density of Soil at $1.6\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ \left(\frac{m^3}{day}\right) = 3\ (APU) \times 6.4\ \frac{m^3}{cont.} \times 1\frac{cont.}{day} = 19\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 19\frac{m^3}{day} \times 1.6\ \frac{mt}{m^3} = 31\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 31\frac{mt}{day} \times 250\ \frac{day}{year} = 7{,}700\frac{mt}{year}$$

5.2.3 Mercury Amalgamation (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 55-gallons. The maximum amount of elemental mercury per 55-gallon container is 14 kg (0.014 metric tons) (1 Liter elemental mercury per 55-gallon container)
3. Process 1 container per day
4. Waste Type is Mercury.

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 3\ (APU) \times 1\frac{cont.}{day} = 3\frac{containers}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 3\frac{containers}{day} \times 0.014\frac{mt}{container} = 0.042\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 0.042\frac{mt}{day} \times 250\ \frac{day}{year} = 11\frac{mt}{year}$$

5.2.4 Microencapsulation/Macroencapsulation/Sealing (Includes Radioactive Lead Solids, Debris, and Radioactive Lead Acid Batteries) (T04)

Calculation Assumptions:

1. Three (3) Active Process Units (APUs)
2. Container size is 6.4 m^3 (assumes 8’ x 8’ x 20’ macro box with small contingency added).
3. Process 4 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{m^3}{day}) = 3\ (APU) \times 6.4\ \frac{m^3}{cont.} \times 4\frac{cont.}{day} = 77\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 77\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 77\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 77\frac{mt}{day} \times 250\ \frac{day}{year} = 19{,}200\frac{mt}{year}$$

5.2.5 Volume Reduction (Includes Sorting and Segregation) (T94)

Calculation Assumptions:

1. One (1) Active Process Unit (APUs)
2. Container size is 25 metric tons (Nominal container size).
3. Process 1 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{mt}{day}) = 1(APU) \times 25\ \frac{mt}{cont.} \times 1\frac{cont.}{day} = 25\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 25\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 25\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 25\frac{mt}{day} \times 250\ \frac{day}{year} = 6{,}250\frac{mt}{year}$$

5.2.6 Extraction Technologies (Includes Debris Washing and Physical Extraction) (T94)

Calculation Assumptions:

1. One (1) Active Process Unit (APUs)
2. Container size is 25 metric tons (Nominal container size).
3. Process 1 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{mt}{day}) = 1(APU) \times 25\ \frac{mt}{cont.} \times 1\frac{cont.}{day} = 25\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 25\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 25\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 25\frac{mt}{day} \times 250\ \frac{day}{year} = 6{,}250\frac{mt}{year}$$

5.2.7 Sealing (T94)

1. One (1) Active Process Unit (APUs)
2. Container size is 25 metric tons (Nominal container size).
3. Process 1 container per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ (\frac{mt}{day}) = 1(APU) \times 25\ \frac{mt}{cont.} \times 1\frac{cont.}{day} = 25\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 25\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 25\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 25\frac{mt}{day} \times 250\ \frac{day}{year} = 6{,}250\frac{mt}{year}$$

The Microsoft Excel spreadsheet for the T Plant Complex treatment calculations is in Appendix B.

5.3 Central Waste Complex – Waste Receiving and Processing Operating Unit Group

Table 5-3. Treatment Capacity for CWC-WRAP Complex OUG

Line Number	A. Process Codes	B. Process Design Capacity		C. Total Number of Process Units	Active Process Units	Process Description
		1. Amount	2. Unit of Measure			
1	T04	185 metric tons per day	S	4	4	Volume Reduction (includes sorting and segregation)
2	T04	5.4 metric tons per day[1]	S	4	4	Deactivation (includes neutralization and controlled reaction with water)
3	T04	75 metric tons per day	S	4	4	Extraction Technologies (includes debris washing and physical extraction)
4	T04	2.7 metric tons per day[2]	S	4	4	Deactivation and Recovery of Organics (puncture and decant aerosol cans and/or cylinders)
5	T04	5.2 metric tons per day	S	4	4	Absorption (free and containerized liquids)
6	T04	31 metric tons per day	S	4	4	Solidification/Stabilization
7	T04	0.056 metric tons per day	S	4	4	Mercury Amalgamation
8	T04	77 metric tons per day	S	4	4	Microencapsulation/ Macroencapsulation/ Sealing

S = metric tons per day

T04 = Other treatment

5.3.1 Volume Reduction (includes sorting and segregation) (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is as follows:
    a. 2404-WC: 50 m^3
    b. 2403-WD: 100 m^3
    c. 2402-WD: 25 m^3
    d. 2336-W: 10 m^3
3. Process 1 container per day per APU
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ \left(\frac{m^3}{day}\right) = \left[\left(1\ (APU) \times 50\ \frac{m^3}{cont.}\right) + \left(1\ (APU) \times 100\ \frac{m^3}{cont.}\right) + \left(1\ (APU) \times 25\ \frac{m^3}{cont.}\right) + \left(1\ (APU) \times 10\ \frac{m^3}{cont.}\right)\right] \times 1\frac{cont.}{day} = 185\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 185\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 185\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 185\frac{mt}{day} \times 250\ \frac{day}{year} = 46{,}300\frac{mt}{year}$$

5.3.2 Deactivation (Includes Neutralization and Controlled Reaction with Water) (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is 55-gallons
3. Process a total of 26 containers per day
    a. 2404-WC: 8 containers per day
    b. 2403-WD: 8 containers per day
    c. 2402-WD: 8 containers per day
    d. 2336-W: 2 containers per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 55\ \frac{gal}{cont.} \times 26\frac{cont.}{day} = 1{,}430\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 1{,}430\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 11{,}900\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 11{,}900\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 5.4\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 5.4\frac{mt}{day} \times 250\ \frac{day}{year} = 1{,}400\frac{mt}{year}$$

5.3.3 Extraction Technologies (includes debris washing and physical extraction)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is as follows:
    a. 2404-WC: 25 m^3
    b. 2403-WD: 25 m^3
    c. 2402-WD: 25 m^3
    d. 2336-W: 85 gallons
3. Process 1 container per day per APU
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ \left(\frac{m^3}{day}\right) = \left[\left(3\ (APU) \times 25\ \frac{m^3}{cont.}\right) + \left(1\ (APU) \times 0.4\ \frac{m^3}{cont.}\right)\right] \times 1\frac{cont.}{day}$$
$$= 75\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 75\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 75\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 75\frac{mt}{day} \times 250\ \frac{day}{year} = 19{,}000\frac{mt}{year}$$

5.3.4 Deactivation and Recovery of Organics (Puncture and Decant Aerosol Cans and/or Cylinders) (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size of 55-gallons represents the volume of actual aerosol cans, not the size of the parent container.
3. Process a total of 13 containers per day
    a. 2404-WC: 4 containers per day
    b. 2403-WD: 4 containers per day
    c. 2402-WD: 4 containers per day
    d. 2336-W: 1 containers per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ \left(\frac{gal}{day}\right) = 55\ \frac{gal}{cont.} \times 13\frac{cont.}{day} = 715\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 715\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 5{,}970\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 5{,}970\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 2.7\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 2.7\frac{mt}{day} \times 250\ \frac{day}{year} = 680\frac{mt}{year}$$

5.3.5 Absorption (free and containerized liquids) (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size of 55-gallons represents the volume of actual aerosol cans, not the size of the parent container.
3. Process a total of 25 containers per day
    a. 2404-WC: 8 containers per day
    b. 2403-WD: 8 containers per day
    c. 2402-WD: 8 containers per day
    d. 2336-W: 1 containers per day
4. Waste Type is Liquid (assumed the weight of water at 8.34 lb/gal)

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 55\ \frac{gal}{cont.} \times 25\frac{cont.}{day} = 1375\frac{gal}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{lb}{day}\right) = 1375\frac{gal}{day} \times 8.34\ \frac{lb}{gal} = 11{,}470\frac{lb}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 11{,}470\frac{lb}{day} \times 0.00045\ \frac{mt}{lb} = 5.2\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 5.2\frac{mt}{day} \times 250\ \frac{day}{year} = 1{,}300\frac{mt}{year}$$

5.3.6 Solidification/Stabilization (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is as follows:
    a. 2404-WC: 6.4 m^3
    b. 2403-WD: 6.4 m^3
    c. 2402-WD: 6.4 m^3
    d. 2336-W: 55 gallons (0.2 m^3)
3. Process 1 container per day per APU
4. Waste Type is Debris (assumed Density of Soil at $1.6\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ \left(\frac{m^3}{day}\right) = \left[\left(3\ (APU) \times 6.4\ \frac{m^3}{cont.}\right) + \left(1\ (APU) \times 0.2\ \frac{m^3}{cont.}\right)\right] \times 1\frac{cont.}{day}$$
$$= 19\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 19\frac{m^3}{day} \times 1.6\ \frac{mt}{m^3} = 31\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 31\frac{mt}{day} \times 250\ \frac{day}{year} = 7{,}800\frac{mt}{year}$$

5.3.7 Mercury Amalgamation (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is 55-gallons. The maximum amount of elemental mercury per 55-gallon container is 14 kg (0.014 metric tons) (1 Liter elemental mercury per 55-gallon container)
3. Process 1 container per day per APU
4. Waste Type is Mercury.

$$Amt\ of\ Treatment\ (\frac{gal}{day}) = 4\ (APU) \times 1\frac{cont.}{day} = 4\frac{cont.}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 4\frac{cont.}{day} \times 0.014\frac{mt}{cont.} = 0.056\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 0.056\frac{mt}{day} \times 250\ \frac{day}{year} = 14\frac{mt}{year}$$

5.3.8 Microencapsulation/Macroencapsulation/Sealing (Includes Radioactive Lead Solids, Debris, and Radioactive Lead Acid Batteries) (T04)

Calculation Assumptions:

1. Four (4) Active Process Units (APUs)
2. Container size is as follows:
    a. 2404-WC: 6.4 m^3
    b. 2403-WD: 6.4 m^3
    c. 2402-WD: 6.4 m^3
    d. 2336-W: 55 gallons (0.2 m^3)
3. Process a total of 13 containers per day
    a. 2404-WC: 4 containers per day
    b. 2403-WD: 4 containers per day
    c. 2402-WD: 4 containers per day
    d. 2336-W: 1 containers per day
4. Waste Type is Debris (assumed Density of Debris at $1\frac{mt}{m^3}$)

$$Amt\ of\ Treatment\ \left(\frac{m^3}{day}\right) = \left[3\ (APU)\left(4\frac{cont.}{day} \times 6.4\ \frac{m^3}{cont.}\right)\right] + \left[1\ (APU)\left(1\frac{cont.}{day} \times 0.2\ \frac{m^3}{cont.}\right)\right]$$
$$= 77\frac{m^3}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{day}\right) = 77\frac{m^3}{day} \times 1.0\ \frac{mt}{m^3} = 77\frac{mt}{day}$$

$$Amt\ of\ Treatment\ \left(\frac{mt}{year}\right) = 77\frac{mt}{day} \times 250\ \frac{day}{year} = 19{,}000\frac{mt}{year}$$

The Microsoft Excel spreadsheet for the CWC-WRAP treatment calculations is in Appendix C.

6 Results/Conclusions

Treatment capacities were developed for the following SWOC TSD units; LLBG Trenches 31-34-94 OUG, T Plant Complex OUG, and CWC-WRAP OUG. Capacities were developed for each treatment process category. These treatment capacities were included in the revised Part A Forms for these SWOC TSD units.

7 References

Washington State Department of Ecology, Addendum A, Part A Form, Form number ECY 030-31 (6/2003)

(http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html)

(http://en.wikipedia.org/wiki/Mercury_(element)

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Appendix A

LLBG Trenches 31-34-94 Treatment Calculations Spreadsheet

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**LLBG Trenches 31-34-94 OUG Part A Dangerous Waste Treatment Calculations**															
2	**T04 Treatment**															
3	Part A Form, Section XIII Line Number	Process Description	Total Number of Process Units	Active Process Units	Nominal Container Size	Unit	Number of Containers per Day	Quantity per Day (24-hrs)	Unit	Conversion Factor		Quantity per Day	Units	Working Days per Year	Estimated Quantity per Year	Units
4	1	Macroencapsulation/ Microencapsulation/Sealing	2	1	6.4	m3	4	26	m3/day	Density of Debris (mt/m^3)	1	26	mt/day	250	6,400	mt/year
5	**KEY**				**Assumed Waste Atributes**											
6	mt = metric tons		L = Liters		Bulk Density of Debris			1000	kg/m^3	=	1	mt/m^3				
7	gal = gallons		hr = hour													
8	lb = pounds		m = meter													

Appendix B

T Plant Complex Treatment Calculations Spreadsheet

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T-Plant Complex Part A Dangerous Waste Treatment Calculations

T04 Treatment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
3	Part A Form, Section XIII Line Number	Process Description	Total Number of Process Units	Active Process Units	Nominal Container Size	Unit	Number of Containers per Day	Hours per Shift	Shifts per Day	Quantity per Day (24-hrs)	Unit	Conversion Factor		Quantity per Day	Units	Working Days per Year	Estimated Quantity per Year	Units
4	1	Volume Reduction (Includes sorting and segregation)	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	25	m3	1	8	2	75.0	m^3/day	Density of Debris (mt/m^3)	1	75	mt/day	250	18,750	mt/year
5	2	Deactivation (Includes neutralization and controlled reaction with water)	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	55	gallons	8	8	2	1,320	gal/day	Weight of Water (lb/gal)	8.34	5	mt/day	250	1,248	mt/year
6	3	Extraction Technologies (includes debris washing and physical extraction)	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 221-T Cells 2706-TA Building 214-T Building	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
7	4	Deactivation and Recovery of Organics (Puncture and Decant Aerosol Cans and/or Cylinders)	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	55	gallons	4	8	2	660	gal/day	Weight of Water (lb/gal)	8.34	2.5	mt/day	250	624	mt/year
8	5	Absorption (free and containerized liquids)	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	55	gallons	8	8	2	1,320	gal/day	Weight of Water (lb/gal)	8.34	5.0	mt/day	250	1,248	mt/year
9	6	Solidification/Stabilization	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	6.4	m^3	1	8	2	19.2	m^3/day	Density of Soil (mt/m^3)	1.6	31	mt/day	250	7,680	mt/year
10	7	Mercury Amalgamation	221T Canyon Deck 221-T Railroad Tunnel 2706-T Building 2706-TA Building 214-T Building	3	55	gallons	1	8	2	165	gal/day	mt Hg per drum	0.014	0.042	mt/day	250	10.50	mt/year
11	8	Microencapsulation/ Macroencapsulation/Sealing (includes Radioactive Lead Solids, Debris, and radioactive lead acid batteries.)	221T Canyon Deck 221-T Railroad Tunnel 221-T Cells 2706-T Building 2706-TA Building 214-T Building	3	6.4	m^3	4	8	2	77	m^3/day	Density of Debris (mt/m^3)	1	77	mt/day	250	19,200	mt/year
12												**Total T04 Treatment**		**220**	**mt/day**		**55,011**	**mt/year**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
13	**T94 Treatment**																	
14	Part A Form, Section XIII Line Number	Process Description	Total Number of Process Units	Active Process Units	Nominal Container Size	Unit	Number of Containers per Day	Hours per Shift	Shifts per Day	Quantity per Day (24-hrs)	Unit	Conversion Factor		Quantity per Day	Units	Working Days per Year	Estimated Quantity per Year	Units
15	1	Volume Reduction (Includes Sorting and segregation)	221T Canyon Deck 221-T Railroad Tunnel	1	25	m3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
16	2	Extraction Technologies (includes debris washing and physical extraction)	221T Canyon Deck 221-T Railroad Tunnel 221-T Cells	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
17	3	Sealing	221T Canyon Deck 221-T Railroad Tunnel	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
18													Total T94 Treatment	**75**	mt/day		**18750**	mt/year

19	**KEY**		**Assumed Waste Atributes**					
20	mt = metric tons	L = Liters	Bulk Density of Debris	1000	kg/m^3	=	1	mt/m^3
21	gal = gallons	hr = hour	Density of Soil	1600	kg/m^3	=	1.6	mt/m^3
22	lb = pounds	m = meter	Density of Mercury	14	g/cm^3	=	0.014	mt/m^3

Appendix C

CWC-WRAP Treatment Calculations Spreadsheet

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CWC-WRAP Part A Dangerous Waste Treatment Calculations

T04 Treatment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
3	Part A Form, Section XIII Line Number	Process Description	Total Number of Process Units	Active Process Units	Nominal Container Size	Unit	Number of Containers per Day	Hours per Shift	Shifts per Day	Quantity per Day (24-hrs)	Unit	Conversion Factor		Quantity per Day	Units	Working Days per Year	Estimated Quantity per Year	Units
4	1	Volume Reduction (Includes sorting and segregation)	1 (2404-WC)	1	50	m^3	1	8	2	50	m^3/day	Density of Debris (mt/m^3)	1	50	mt/day	250	12,500	mt/year
5			1 (2403-WD)	1	100	m^3	1	8	2	100	m^3/day	Density of Debris (mt/m^3)	1	100	mt/day	250	25,000	mt/year
6			1 (2402-WD)	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
7			1 (2336-W)	1	10	m^3	1	8	2	10	m^3/day	Density of Debris (mt/m^3)	1	10	mt/day	250	2,500	mt/year
8										**185**	**m^3/day**			**185**	**mt/day**		**46,250**	**mt/year**
9	2	Deactivation (Includes neutralization and controlled reaction with water)	1 (2404-WC)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
10			1 (2403-WD)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
11			1 (2402-WD)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
12			1 (2336-W)	1	55	gallons	2	8	2	110	gal/day	Weight of Water (lb/gal)	8.34	0.4	mt/day	250	104	mt/year
13										**1,430**	**gal/day**			**5.4**	**mt/day**		**1,352**	**mt/year**
14	3	Extraction Technologies (includes debris washing and physical extraction)	1 (2404-WC)	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
15			1 (2403-WD)	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
16			1 (2402-WD)	1	25	m^3	1	8	2	25	m^3/day	Density of Debris (mt/m^3)	1	25	mt/day	250	6,250	mt/year
17			1 (2336-W)	1	85	gallons	1	8	2	0.4	m^3/day	Density of Debris (mt/m^3)	1	0.4	mt/day	250	100	mt/year
18										**75**	**m^3/day**			**75**	**mt/day**		**18,850**	**mt/year**
19	4	Deactivation and Recovery of Organics (Puncture and Decant Aerosol Cans and/or Cylinders)	1 (2404-WC)	1	55	gallons	4	8	2	220	gal/day	Weight of Water (lb/gal)	8.34	0.8	mt/day	250	208	mt/year
20			1 (2403-WD)	1	55	gallons	4	8	2	220	gal/day	Weight of Water (lb/gal)	8.34	0.8	mt/day	250	208	mt/year
21			1 (2402-WD)	1	55	gallons	4	8	2	220	gal/day	Weight of Water (lb/gal)	8.34	0.8	mt/day	250	208	mt/year
22			1 (2336-W)	1	55	gallons	1	8	2	55	gal/day	Weight of Water (lb/gal)	8.34	0.2	mt/day	250	52	mt/year
23										**715**	**gal/day**			**2.7**	**mt/day**		**676**	**mt/year**
24	5	Absorption (free and containerized liquids)	1 (2404-WC)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
25			1 (2403-WD)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
26			1 (2402-WD)	1	55	gallons	8	8	2	440	gal/day	Weight of Water (lb/gal)	8.34	1.7	mt/day	250	416	mt/year
27			1 (2336-W)	1	55	gallons	1	8	2	55	gal/day	Weight of Water (lb/gal)	8.34	0.2	mt/day	250	52	mt/year
28										**1,375**	**gal/day**			**5.20**	**mt/day**		**1,300**	**mt/year**
29	6	Solidification/Stabilization	1 (2404-WC)	1	6.4	m^3	1	8	2	6.4	m^3/day	Density of Soil (mt/m^3)	1.6	10	mt/day	250	2,560	mt/year
30			1 (2403-WD)	1	6.4	m^3	1	8	2	6.4	m^3/day	Density of Soil (mt/m^3)	1.6	10	mt/day	250	2,560	mt/year
31			1 (2402-WD)	1	6.4	m^3	1	8	2	6.4	m^3/day	Density of Soil (mt/m^3)	1.6	10	mt/day	250	2,560	mt/year
32			1 (2336-W)	1	55	gallons	1	8	2	0.2	m^3/day	Density of Soil (mt/m^3)	1.6	0.3	mt/day	250	83	mt/year
33										**19**	**m^3/day**			**31**	**mt/day**		**7,763**	**mt/year**
34	7	Mercury Amalgamation	1 (2404-WC)	1	55	gallons	1	8	2	55	gal/day	mt Hg per drum	0.014	0.014	mt/day	250	3.50	mt/year
35			1 (2403-WD)	1	55	gallons	1	8	2	55	gal/day	mt Hg per drum	0.014	0.014	mt/day	250	3.50	mt/year
36			1 (2402-WD)	1	55	gallons	1	8	2	55	gal/day	mt Hg per drum	0.014	0.014	mt/day	250	3.50	mt/year
37			1 (2336-W)	1	55	gallons	1	8	2	55	gal/day	mt Hg per drum	0.014	0.014	mt/day	250	3.50	mt/year
38										**220**	**gal/day**			**0.056**	**mt/day**		**14.0**	**mt/year**
39	8	Microencapsulation/ Macroencapsulation/Sealing (includes Radioactive Lead Solids, Debris, and radioactive lead acid batteries.)	1 (2404-WC)	1	6.4	m^3	4	8	2	26	m^3/day	Density of Debris (mt/m^3)	1	26	mt/day	250	6,400	mt/year
40			1 (2403-WD)	1	6.4	m^3	4	8	2	26	m^3/day	Density of Debris (mt/m^3)	1	26	mt/day	250	6,400	mt/year
41			1 (2402-WD)	1	6.4	m^3	4	8	2	26	m^3/day	Density of Debris (mt/m^3)	1	26	mt/day	250	6,400	mt/year
42			1 (2336-W)	1	55	gallons	1	8	2	0.2	m^3/day	Density of Debris (mt/m^3)	1	0.2	mt/day	250	52	mt/year
43										**77**	**m^3/day**			**77**	**mt/day**		**19,252**	**mt/year**
44												**Total T04 Treatment**		**382**	**mt/day**		**95,458**	**mt/year**

45	KEY		Assumed Waste Atributes					
46	mt = metric tons	L = Liters	Bulk Density of Debris	1000	kg/m^3	=	1	mt/m^3
47	gal = gallons	hr = hour	Density of Soil	1600	kg/m^3	=	1.6	mt/m^3
48	lb = pounds	m = meter	Density of Mercury	14	g/cm^3	=	0.014	mt/m^3

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