State of Oregon
Department of
Environmental
Quality

Landfill Design and Operations Plan

For

Chemical Waste Management of the Northwest, Inc.

Arlington Facility • ORD 089 452 353
17629 Cedar Springs Lane
Arlington, Oregon

Standalone Document No. 14

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LANDFILL DESIGN AND OPERATIONS PLAN

1.0 INTRODUCTION

This *Landfill Design and Operations Plan* addresses existing landfill units (L-14 cells 1-4) and permitted but not yet built landfill units (L-14 cells 5-8) at the Chemical Waste Management of the Northwest, Inc. (CWMNW) Arlington Facility. Locations of existing and yet to be built landfills are shown on Permit Figure 1-1 Facility Layout Map (as contained in the Part B Permit). As shown on the figure, facility is comprised of one active landfill and ten inactive landfills (L-1, L-3, L-5, L-6, L-7, L-8, L-9, L-10, L-12 and L-13) which have been completely filled and closed in accordance with an approved closure plan.

Landfill units at the Arlington Facility are used for the permanent disposal of solid hazardous and industrial wastes. Upon reaching design capacity and grades, active landfills are covered by a final cover designed to minimize soil erosion and infiltration of rainwater through the final cover. Final cover design details for the currently active and future landfills are presented in the facility's *Alternative Final Cover Design Modification Report (Standalone Document #17)* that contains the following documents;

- *Alternative Final Cover Design Report, Landfills L-12, L-13 and L-14*, Chemical Waste Management Arlington Facility, Gilliam County, Oregon, Applied Soil Water Technologies, August, 2014.
- *Alternative Final Cover Design Modification Report, Landfills L-13 and L-14*, Chemical Waste Management Arlington Facility, Gilliam County, Oregon, Geo-Logic Associates, Inc., July 2020.

All types of commercial, industrial, and agricultural wastes, including those identified or listed as hazardous wastes in 40 CFR Part 261 and in Section II.C.5.b.i and ii of the permit, are potential candidates for landfill disposal at the Arlington Facility. Wastes that are not accepted at the facility are listed in the permit at Section II.C.5.b.i. In addition, bulk and containerized liquid wastes are not accepted for landfilling, unless:

- The waste has been stabilized so that free liquids no longer are present
- The container is very small (such as an ampule) or is a lab pack,, or
- The container is designed to hold free liquids for use other than storage, such as a battery.

A process flow diagram that illustrates the movement of hazardous wastes into the landfill is shown on Figure 1-1 of this attachment (note: different from Figure 1-1 of the permit described above). Waste analysis procedures, which dictate what wastes will be accepted for landfilling, are presented in the facility's *Waste Analysis Plan (Standalone Document #1)*.

In 2010, CWMNW completed an estimate of needed disposal capacity, which resulted in the decision to expand the disposal capacity of Landfill L-14 by adding Cell 5, which increased the overall capacity from 3.1×10^6 to 6.3×10^6 cubic yards.

As of 2024, the facility has completed construction of L-14 Cells 1-4.

In 2024, due to renewal permit authorization delays, CWMNW requested a permit modification for the following actions:

- make minor changes to the currently approved alignment of Cell 5 reducing the overall capacity of L-14 to $6.2x10^6$ cubic yards.
- the addition of Cells 6-8 to L-14, resulting in a final capacity of $10.1x10^6$ cubic yards.

Please refer to L-14 design drawings (*Standalone #18*) and Final Engineering Design Report contained in the Class III modification application package for more information.

All landfill units are located well above the saturated zone (i.e., the uppermost aquifer). A comprehensive description of the site geology/hydrogeology can be found in the following documents previously submitted to the Oregon Department of Environmental Quality (DEQ):

> *Geologic and Hydrogeologic Site Characterization Report, Part B Permit Application*, prepared for Chem-Security Systems, Inc., by Dames and Moore, dated April 1987
>
> *RCRA Facility Investigation Report for Landfill Units L-9 and L-10*, prepared for Waste Management, Inc. (Arlington, Oregon), by CH2MHill and Rust Environment and Infrastructure, Inc., dated May 20, 1996; and
>
> *Hydrogeologic Investigation and Engineering Design Report for Landfill L-14*, Arlington, Oregon, prepared for Chemical Waste Management of the Northwest, Inc., by Rust Environment and Infrastructure Inc., dated February 1998.

The uppermost aquifer which may potentially be impacted because of the landfill activities is monitored in accordance with the facility's *Groundwater Monitoring Plan (Standalone Document #7)*.

1.1 Active/Approved Landfill Units

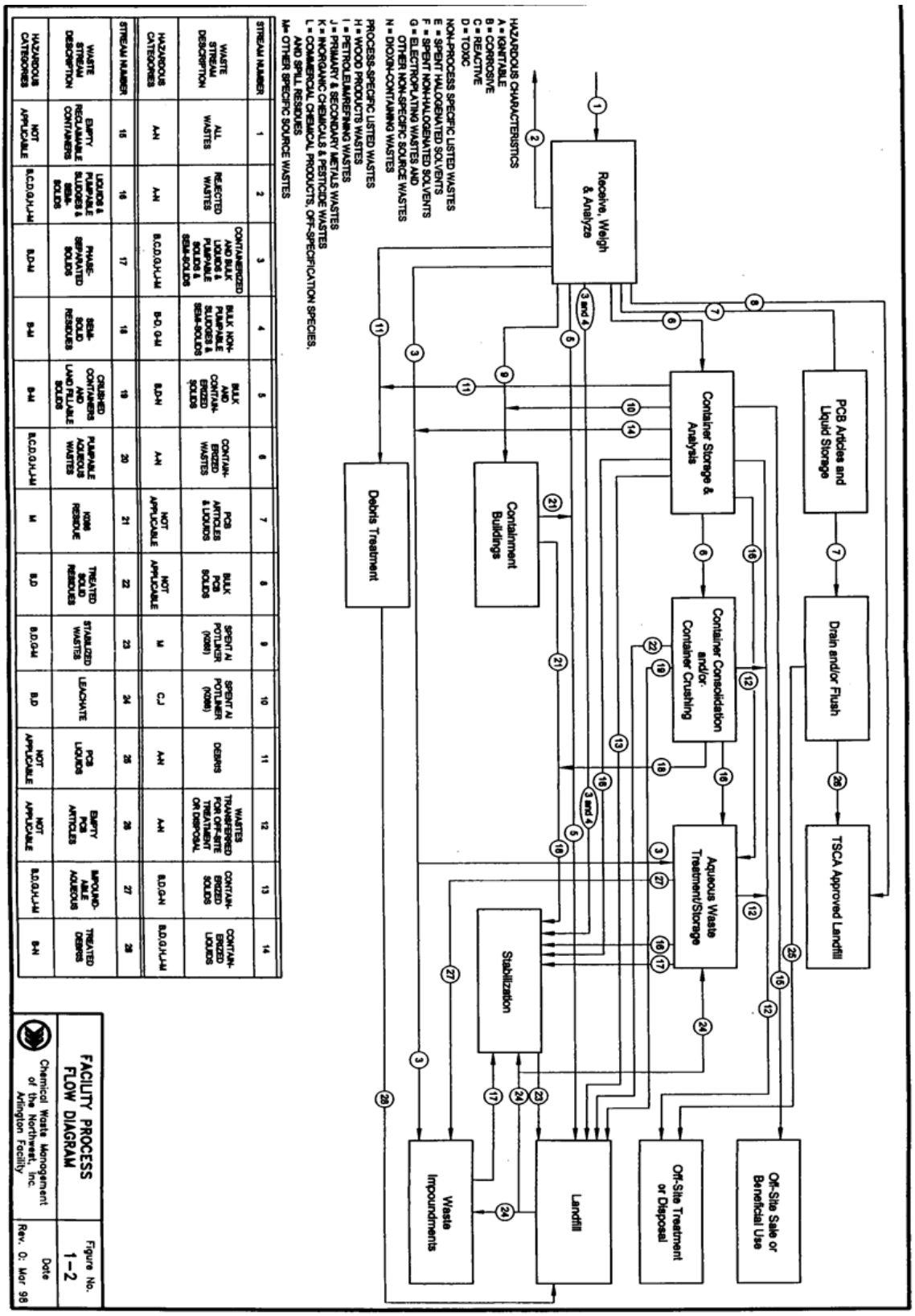
This *Landfill Design and Operations Plan* focuses on design features and landfill operational procedures for currently active and future landfill cells. Supporting geotechnical studies and engineering analyses performed as part of the landfill siting/design have been previously submitted to the DEQ prior to each landfill unit construction. All constructed landfill units were constructed in accordance with approved construction drawings and technical specifications prepared specifically for that phase of construction and include Cells 1, 2, 3 and 4 of L-14. . Landfill L-14 Cells 5, 6, 7 and 8 will be constructed in accordance with the approved construction drawings and technical specifications, and construction quality assurance will be guided by project specific *Construction Quality Assurance Plan (Standalone Document #16)* prepared prior to initiating construction.

Applicable design and construction documents and key design components for the currently active landfills and the remaining unconstructed cells within Landfill L-14 are summarized in Table 1-1. The design and construction documents that demonstrate compliance with 40 CFR 264.301 through 264.304, have been previously submitted to the ODEQ and are incorporated into the permit by reference.

1.2 Closed Landfills

Ten landfill units (L-1, L-3, L-5, L-6, L-7, L-8, L-9, L-10, L-12, and L-13) have been closed, via placement of a final cover, in accordance with approved closure plan specifications at the time of closure. Table 1-2 summarizes the size and capacity of the closed landfill units. Copies of the closure certifications are maintained in the operating record.

Figure 1-1 Process Flow



STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14
WASTE STREAM DESCRIPTION	ALL WASTES	REJECTED WASTES	CONTAINERIZED AND BULK LIQUIDS & PUMPABLE SOLIDS & SEMI-SOLIDS	BULK NON-PUMPABLE SLUDGES & SEMI-SOLIDS	BULK AND CONTAIN-ERIZED SOLIDS	CONTAIN-ERIZED WASTES	PCB ARTICLES & LIQUIDS	BULK PCB SOLIDS	SPENT Al POTLINER (K088)	SPENT Al POTLINER (K088)	DEBRIS	WASTES TRANSFERRED FOR OFF-SITE TREATMENT OR DISPOSAL	CONTAIN-ERIZED SOLIDS	CONTAIN-ERIZED LIQUIDS
HAZARDOUS CATEGORIES	A-N	A-N	B,C,D,G,H,J-M	B,D, G-M	B,D-N	A-N	NOT APPLICABLE	NOT APPLICABLE	B,D,G-M	C,J	A-N	A-N	B,D,G-N	B,D,G,H,J-M
STREAM NUMBER	15	16	17	18	19	20	21	22	23	24	25	26	27	28
WASTE STREAM DESCRIPTION	EMPTY RECLAIMABLE CONTAINERS	LIQUIDS & PUMPABLE SLUDGES & SEMI-SOLIDS	PHASE-SEPARATED SOLIDS	SEMI-SOLID RESIDUES	CRUSHED CONTAINERS AND LAND FILLABLE SOLIDS	PUMPABLE AQUEOUS WASTES	HDMI RESIDUE	TREATED SOLID RESIDUES	STABILIZED WASTE	LEACHATE	PCB LIQUIDS	EMPTY PCB ARTICLES	IMPOUND-ABLE AQUEOUS	TREATED DEBRIS
HAZARDOUS CATEGORIES	NOT APPLICABLE	B,C,D,G,H,J-M	B,D-M	B-M	B-M	B,C,D,G,H,J-M	M	B,D	B,D,G-M	B,D	NOT APPLICABLE	NOT APPLICABLE	B,D,G,H,J-M	B-N

Table 1-1 Applicable Design and Construction Documents

Landfill Unit	Applicable Design and Construction Documents				Description of Key Design Components
	Phase	Documents	Approvals	Response Action Plan	
Landfill L-14	Design/ Construction /CQA/ Closure	Hydrogeologic Investigation and Engineering Report, Proposed Landfill L-14, Rust Environment & Infrastructure, February, 1998	Outstanding modification submitted with Permit Renewal Application (March, 1998)	See facility's Landfill Response Action Plan document	Exceeds Minimum Technology Requirements for Landfills. Utilizes Geosynthetic Clay Liner. Third liner under leachate collection sumps.
Landfills L-12, L-13, & L-14		Revised Closure Cover Design Report, Thiel Engineering, February 2005			Redesign to steepen sideslopes.
Landfill L-14		Cell 1 Construction Drawings and Technical Specifications, Earth Tech, Inc., April 2003			
		Cell 2 Construction Documents and Technical Specifications, Earth Tech, Inc., March 2005			
		Cell 3 Construction Drawings and Technical Specifications, Environmental Information Logistics, LLC, February 2010			
		Cell 4 (A, B and C) Construction Drawings and Technical Specifications Final CQA Report Cell 4A – Aug 2017 Sheppard Engineering Final Construction Quality Assurance Report Landfill 14 Cell 4B – November 2018 Geologic Associates Construction Certification Report Landfill L-14, Cell 4C – June 2021 Peak Geosolutions			
		Part B Permit Modification Application, Environmental Information Logistics, LLC, October 2011		See 2010 modification to Response Action Plan as it relates to the secondary leachate collection and removal system	Exceeds Minimum Technology Requirements for Landfills. Expanded footprint of landfill

Notes:
CQA - Construction Quality Assurance
LCRS/LCS - Leachate Collection and Removal System
LDCRS/LDS - Leachate Detection, Collection, and Removal System
DEQ - Oregon Department of Environmental Quality Permit- RCRA Part B Permit Effective August 21, 2006 through August 21, 2016

Table 1-2 Size and Capacity of Closed Units

Landfill Unit	Size/Capacity	Operating Status
L-1	60' x 500' x 25' (deep)	Completely filled: July 15, 1981 Final closure cover: completed
L-3	65' x500' x 32.5' (av. depth)	Completely filled: December 1, 1981 Final closure cover: completed
L-5	160' x 350' x 34.5' (av. depth) (RCRA wastes) 160' x 150' x 31.75' (av. depth) (non-RCRA wastes)	Completely filled: May 20, 1981 Final closure cover: completed
L-6	175' x 700' x 30' (av. depth)	Completely filled: May 20, 1981 Final closure cover: completed
L-7	255' x 525' x 48' (deep) (RCRA wastes) 187' (av.) X 135' x 42' (deep) (non-RCRA wastes) Capacity 167 acre-feet [(1)]	Completely filled: 1990 Final closure cover: completed
L-8	120' x 600' x 30' (deep) (accepted potlining wastes) Capacity 65 acre-feet [(1)]	Completely filled: 1989 Final closure cover: completed
L-9	200' x 400' x 50' (deep) (RCRA wastes) 200' x 200' x 40' (deep) (non-RCRA wastes) Capacity 101 acre-feet [(1)]	Completely filled: 1990 Final closure cover: completed
L-10	400' x 600 x 66' (deep)Capacity 362 acre-feet	Completely filled: 2002 Final closure cover: completed
L-12	900’ X 440’ X 52’ Capacity 493 acre feet	Final closure March 2018 Final closure cover: completed
L-13	850’ X 900’ X 78’ Capacity 1487 acre feet	Final closure December 2020 Final closure cover: completed

Notes:
[(1)] This is the total capacity of the landfill during its active life and included mounding of waste above grade. The capacity for non-RCRA waste is not included in this amount.

2.0 ACTIVE LANDFILL DESIGN

Landfill L-14 is the facility's currently active landfill has received hazardous wastes since November 19, 1980 (the date when hazardous wastes were first regulated under RCRA). Detailed plans and specifications for construction of the active landfills are included in the facility's *Landfill Design Drawings* (*Standalone Document #18*) document and/or project specific construction drawings and technical specifications. Pertinent design details are summarized in Tables 2-3a through 2-3b.

2.1 Landfill L-14 Design

2.1.1 General Configuration

Landfill L-14 initially designed as a multi-phase unit divided into four hydraulically separated cells (Cells 1-4). With the 2010 permit modification, Landfill L-14 added a fifth hydraulically separated cell (Cell 5) to the landfill for a total capacity of $6.3x10^6$ cubic yards. As of 2024, construction of Cells 1-4 is complete and have been approved for waste acceptance.

The 2024 permit modification proposed minor changes to the approved Cell 5 design and added Cells 6 through 8. and reoriented to a North South orientation. In this configuration L-14 has a permitted planar area of approximately 84.3 acres with a total design capacity of approximately $10.1x10^6$ cubic yards. Supporting geotechnical studies and engineering analyses performed in support of the currently permitted landfill siting/design have been previously submitted to the DEQ in the following documents:

> *Hydrogeologic Investigation and Engineering Design Report for Landfill L-14, Arlington, Oregon*, prepared for Chemical Waste Management of the Northwest, Inc., by Rust Environment and Infrastructure Inc., dated February 1998 - Section 8.0 and Appendix G.
>
> *L-14 Expansion design calculations for Cell 5 (revision 1),* by Environmental Information Logistics, dated December 31, 2013.
>
> *Engineering Design Report for Landfill L-14 Expansion*, by Civil & Environmental Consultants, dated March 30, 2020
>
> *Geotechnical Evaluations for Permit Application of Landfill L-14 Cells 5 Through 8 Expansion,* by Geosyntec, dated January, 2022.
>
> *L-14 Cell 4 Cell 5 Expansion,* by Environmental Information Logistics, dated December 31, 2013.

The overall design concept for L-14 followed the previously constructed landfill units at the Arlington Facility in that the design meets or exceeds the minimum technology requirements for landfill units. General design details for the currently permitted Landfill L-14 are summarized below in Table 2-1a and Table 2-1b.

Cells 1 through 4 of Landfill L-14 were constructed as originally designed in 2003, 2005, 2010-2011, 2017-2021 respectively.

2.2 Landfill L-14 Foundation

Detailed engineering analyses were conducted as part of the original L-14 siting and design to evaluate settlement and heave, bearing capacity, and cut slope stability under static and dynamic loading conditions. The results of these evaluations and other analyses presented in this section have been previously submitted to the DEQ in the following document as part of the design/siting documents required for landfill construction approval:

> *Hydrogeologic Investigation and Engineering Design Report for Landfill L-14, Arlington, Oregon*, prepared for Chemical Waste Management of the Northwest, Inc., by Rust Environment and Infrastructure Inc., dated February, 1998.
>
> *Geotechnical Evaluations for Permit Application of Landfill L-14 Cells 5 Through 8 Expansion,* by Geosyntec, dated January, 2022. The overall geotechnical results for L-14 Cells 5-8 remains similar to previously analysis with the design meets or exceeds the requirements for landfill units.

The overall geotechnical results for L-14 Cells 5-8 were similar to previous analyses with the design meeting or exceeding the requirements for landfill units.

2.2.1 Foundation Settlement and Bearing Capacity

For detailed information on the design aspects of the landfill please refer to the 2020 CEC Engineering Design Report and the 2022 Geosyntec Geotechnical Evaluations which are maintained in the operating record.

Soils beneath L-14 have relatively high strength and low compressibility characteristics. Since the landfill's foundation grades are well above (>100 feet) the groundwater table, most of the anticipated settlement is elastic and will occur as the loads are applied.

Settlement of the soils underlying the landfill (and of the soil/bentonite component of the base liner system, for Cells 1 – 3) was evaluated along a select leachate flowline within each of the current and future cells. The base grade slopes on the floor of L-14 meet the requirement of 40 CFR § 264.301(c)(3)(i) to be constructed at a minimum slope of 1%. Conservative estimates of post-settlement slopes show that all sections will maintain positive drainage. Bearing capacity of the landfill was also re-evaluated to ensure that the base of the landfill would remain stable under the increased load resulting from the landfill expansion. Maximum allowable waste heights were calculated and the results indicate that the soil underlying Landfill L-14 has sufficient bearing capacity to support the expanded landfill under the design conditions. For the 2022 expansion Cells 6-8, L-14 bearing capacity was rechecked. The base of the landfill acts as a footing bearing on the native soil, please refer to previously submitted document *Geotechnical Evaluations for Permit Application of Landfill L-14 Cells 5 Through 8 Expansion,* by Geosyntec, dated January, 2022.

There are no soils at the site susceptible to earthquake induced liquefaction and the static factor of safety is high, separate calculations for earthquake loading were not performed.

2.3 Landfill L-14 Liner and Leachate Collection System Design

The liner system for Landfill L-14 was designed in accordance with applicable regulations and EPA guidance.

Tertiary Sump – Each cell within L-14 has a tertiary sump constructed beneath the primary and secondary leachate collection sump system. The tertiary sump acts as an "engineered vadose zone" in an area of the landfill with the highest likelihood of a potential release (i.e., leachate collection sumps). The tertiary sumps are designed to provide the landfill unit with the earliest possible indication of a release that can be effectively monitored.

L-14 Cells 1 through 3 Liner System – The complete liner system is described in Table 2-1b below. For cells 1-3 the secondary soil liner system was installed using an approved 36" soil/bentonite liner system.

Incorporation of Geosynthetic Clay Liner – The complete liner system is described in Table 2-1a below. The liner system in cells 4 through 8 of L-14 is approved with a geosynthetic clay liner (GCL) system in both the primary and secondary liner systems as an alternate to the soil/bentonite liner system. GCL material for Cells 4 through 8 has been approved with Resistex plus® materials or an approved equivalent. "Resistex®" is a registered trademark name for CETCO GCL materials with chemical- resistant polymers.

An equivalency demonstration was provided as part of the liner system change modification for Landfill L-14 in 2013. The addition of Cells 5 through 8 does not affect this demonstration as the design conditions have not changed. The 2013 evaluation determined that the GCL a suitable replacement to the soil/bentonite layer and will further reduce the possibility of a release from Landfill L-14. Please refer to the 2013 determinations presented in the permit modification maintained in the operating record for more detailed information.

Within each cell, leachate from the primary leachate collection system and the secondary leak detection system is channeled toward the respective collection sumps located at the lowest point of each cell. Each primary, secondary and tertiary sump in Cells 1 – 3 is equipped with sideslope risers to permit sampling and removal of leachate during the operational and post closure periods. The risers are located along the spine of the herringbone pattern of the base grades, runs through the primary leachate collection sump, and up the sideslope (adjacent to the primary sump risers) to daylight at the landfill perimeter. The pipe is perforated along the floor of each cell and solid on the sideslope. See *Engineering Design Report for Landfill L-14 Expansion*, by Civil & Environmental Consultants, dated March 30, 2020.

Equipment which has been approved for sampling monitoring wells pursuant to the RCRA Permit is used for sampling leachate from the secondary leachate collection sumps if the

sampling is being performed to make a determination of whether the liquid is derived from hazardous waste.

Leachate is removed from the primary leachate removal sump when leachate levels are near or above the action level. The leachate is pumped to a relocatable sprinkler system or to vacuum truck and used for dust control within the landfill or transported to the on-site wastewater treatment plant for treatment.

Responses required to address liquids which accumulate in the secondary and tertiary leachate collection sumps are presented in *Response Action Plan for Landfill L-14* (*Standalone Document # 15*) (RAP) document. This includes updates to reflect the changed design conditions due to expansion of the landfill.

2.3.1 Base Grade Configuration

The floors of Cells 1 through 3 are planar and slope from north to south toward a collection sump located along the southern edge of each cell. The floors of Cells5 through 8 are configured in a herringbone pattern and slopes toward the spine of the herringbone, and then to a sump at the toe. Each cell is hydraulically separated from adjacent cells by an intercell berm.

The lined sideslopes of the landfill are at a 3:1 (H:V) slope. Please refer to the Expansion Base Grade Drawings for Cells 5-8 in the *Engineering Design Report for Landfill L-14 Expansion*, by Civil & Environmental Consultants, dated March 30, 2020.

2.3.2 Leachate Collection and Removal System: Geocomposite Flow Capacity

Liner systems for Landfills L-14 were designed in accordance with EPA guidelines to prevent leachate migration. The system design consists of primary and secondary leachate collection layers draining to hydraulically separated sumps including a tertiary leak detection sump underlying the secondary sump. Details of the complete liner system for each cell is described in Tables 2-1a and 2-1b. The primary leachate collection and removal system (LCRS or LCS), located above the primary liner, prevents the buildup of excessive hydraulic pressure head on the surface of the upper synthetic liner. A secondary leachate collection system (also referred to as the leachate [or leak] detection, collection, and removal system [LDCRS or LDS]), located between the primary and secondary liners, provides for the rapid collection of any leachate in the unlikely event that a leak should develop in the primary liner system. Please refer to the December 2013 Environmental Information Logistics and the March 30, 2020 Civil & Environmental Consultants, engineering design reports maintained in the facility's operating record for more detailed information.

2.3.3 Sump Riser Pipe Structural Integrity

The structural integrity of the sump riser pipes was evaluated based on the design waste thickness. These calculations were prepared for the original L-14 Cells 1-3, Cells 4-5 for the 2013 expansion and updated for Cells 6-8 in preparation for the 2024 modification application. The expansion of the landfill did not increase the design waste thickness above the sump riser pipes, so no design modifications were required for Cells 1 – 3. For Cells 4 through 8, the diameter of the sump riser pipes was increased from 18 to 24 inches. The updated calculations

for Cells 4 through 8 demonstrate that the 24-inch diameter riser pipes satisfy the established factor of safety for structural integrity. Sump Riser Pipe Structural Integrity Calculations for Cell 4 was submitted in the 2013 expansion. Cells 5-8 are provided in the *Engineering Design Report for Landfill L-14 Expansion*, by Civil & Environmental Consultants, dated March 30, 2020.

2.3.4 Landfill Stability

Slope stability, foundation, interface friction, static and seismic analyses were performed in the original L-14 design Cells 1-3 and updated for Cells 4 – 5 during the 2013 expansion and revisited for Cells 5-8 permit modification application to document that the design of Landfill L-14 meets the regulatory requirements. Please refer to the January 2022 *Geotechnical Evaluations for Permit Application of Landfill L-14 Cells 5 Through 8 Expansion* document*,* by Geosyntec, maintained in the facility's operating record for more detailed information.

2.4 Landfill L-14 Liner Specifications and Installation

The permittee installed the landfill liner systems for the existing cells of Landfill L-14 in accordance with previously approved versions of this *Landfill Design and Operations Plan,* as well as approved construction drawings and technical specifications prepared for each cell prior to construction. Quality assurance for constructed Cells is conducted during construction as described in Section 3.4 of this document. Construction Quality Assurance (CQA) reports for all active Cells have been previously submitted to the DEQ (see Table 1-1) certifying that the currently active landfills were constructed in accordance with the approved technical specifications at the time of construction.

Drawings, technical specifications, and required quality assurance documents for future Cells to be constructed will be submitted to the Department for review and approval prior to construction. Once approved, construction of future Cells58 will be completed in accordance with approved and finalized construction drawings and technical specifications. Permit drawings are included in *Landfill Design Drawings (Standalone Document # 18*)., and quality assurance manual Construction inspection of L-14 Cells 5 through 8 will be completed in accordance with approved facility Construction Quality Assurance Plan *for CWMNW, Inc*. (*Standalone Document # 16*).

2.5 Landfill L-14 Final Cover

Final cover systems that will be constructed in Landfill L-14 at closure are presented in the following facility documents:

- *Alternative Final Cover Design Report, Landfills L-12, L-13 and L-14*, Chemical Waste Management Arlington Facility, Gilliam County, Oregon, Applied Soil Water Technologies, August 2014.
- *Alternative Final Cover Design Modification Report, Landfills L-13 and L-14*, Chemical Waste Management Arlington Facility, Gilliam County, Oregon, Geo-Logic Associates, Inc., July 2020.

- *Construction Quality Assurance (CQA) Manual For Landfill Closure Construction*, Chemical Waste Management Arlington Facility, Gilliam County, Oregon, Geo-Logic Associates Inc., January, 2022

Landfill closure procedures and post-closure maintenance of the landfill cover are described in the facility's *Closure/Post-Closure Plans*.

2.5.1 Stability of Waste Mass and Final Cover

The permittee re-evaluated the stability of the landfill at final grade was as part of the 2024 permit modification application. The analyses provided indicate that the stability of the final grading plan meets or exceeds the target minimum factors of safety. Please refer to *Geotechnical Evaluations for Permit Application of Landfill L-14 Cells 5 Through 8 Expansion,* by Geosyntec, dated January 2022 contained in the operating record for more detailed information.

2.5.2 Final Cover Soil Erosion

The permittee evaluated the potential erosion of the upper soil layers of the final cover to ensure that the cover will continue to perform as intended over the design period. Please refer to the Alternative Final Cover Design Reports identified above maintained in the Facility's operating record for more detailed information on vegetative cover and erosion prevention.

Table 2-1a Summary of Landfill L-14 Cells 1-3 Design&

Landfill Units	Liner System Design (top to bottom)	Sideslope Design (top to bottom)	Leachate Collection Sumps	Final Cover Design	Approximate Landfill Design Size/Capacity
L-14 (Cells 1-3)	**Upper (Primary) Leachate Collection System** • Primary Protective Soil 18-inches(min.) • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HDPE • Primary GCL **Lower (Secondary) Leachate Collection System** • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary Clay Liner • Subgrade	**Upper (Primary) Leachate Collection System** • Primary Protective Soil 12-inches (min.) • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HPDE **Lower (Secondary) Liner System** • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary Clay Liner Minimum 3-ft ((min.) • Subgrade	**Primary Sump Primary Sump** • Primary Protective Soil 18-inches (min.) • One Primary Leachate Collection Sump Riser 18" HDPE, SDR-11. 3-ft Sump Aggregate with Non-Woven Geotextile wrap. • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HDPE • Primary GCL Two Layers in Sump **Secondary Sump** • One Secondary Leachate Collection Sump Riser 18" HDPE, SDR-11. 2-ft Sump Aggregate with Non-Woven Geotextile wrap. • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary GCL (sump only) • Secondary Clay Liner (sump only) **Tertiary Sump** • One Tertiary Leachate Collection Sump Riser 18" HDPE, SDR-11. 2-ft min. Sump Aggregate or General Soil with Non-Woven Geotextile wrap. • Tertiary Geocomposite LCRS Layer • Tertiary Liner 60-mil HPDE • Tertiary GCL (sump only). • Subgrade	Approved alternative final cover design; 3 feet of onsite soils over daily cover, see Standalone Document No. 17*AlternativeLandfill Final Cover Design Modification Report*	2013 expansion study with Cells 1-5 Size: 1,260' x 1,280' x 104 Cells 1-5 Capacity: Approx. 6.3 x 10^6 cubic yards

Table 2-1b SUMMARY OF LANDFILL L-14 CELLS 4-8 Design

Landfill Units	Liner System Design (top to bottom)	Sideslope Design (top to bottom)	Leachate Collection Sumps	Final Cover Design	Approximate Design Size/Capacity
L-14 Cells 4-8	**Upper (Primary) Leachate Collection System** • Primary Protective Soil 18-inches(min.) • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HDPE • Primary GCL (floor only) **Lower (Secondary) Leachate Collection System** • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary GCL • Subgrade	**Upper (Primary) Leachate Collection System** • Primary Protective Soil 12-inches (min.) • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HPDE **Lower (Secondary) Liner System** • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary GCL • Subgrade	**Primary Sump** • Primary Protective Soil 18-inches (min.) • Two Primary Leachate Collection Sump Riser 24" HDPE, SDR-11. One 8" HDPE, SDR-11 monitoring conduit Cells 5-8. 3-ft (min.) Sump Aggregate with Non-Woven Geotextile wrap. • Primary Geocomposite LCRS Layer • Primary Liner 60-mil HDPE • Primary GCL Two Layers in Sump **Secondary Sump** • Secondary Leachate Collection Sump Riser 24" HDPE, SDR-11. 3-ft Sump Aggregate with Non-Woven Geotextile wrap. • Secondary Geocomposite LCRS Layer • Secondary Liner 60-mil HPDE • Secondary GCL Two Layers in Sump **Tertiary Sump** • One Tertiary Leachate Collection Sump Riser 24" HDPE, SDR-11. 3-ft min. Sump Aggregate or General Soil with Non-Woven Geotextile wrap. • Tertiary Geocomposite LCRS Layer • Tertiary Liner 60-mil HPDE • Tertiary GCL (sump only) • Subgrade	Approved alternative final cover design; 3 feet of onsite soils over daily cover, see Standalone Document No. 17 *Alternative Final Cover Design Modification Report Landfills L-13 and L-14* including modification documents	2013 expansion with Cells 1-5 Size: 1,260' x 1,280' x 104 Cells 1-5 Capacity: Approx. 6.3 x 10^6 cubic yards 2025Is Expansion approval with Cells 1 through 8; Capacity approx. 10.1 x 10^6 Cubic Yards

3.0 LANDFILL OPERATIONS

3.1 Waste Acceptance Procedures

Each load of containerized waste received at the Arlington Facility is analyzed in accordance with the facility's *Waste Analysis Plan*. If the waste is found to be acceptable the load is sent directly to the landfill, unless weather or operating conditions dictate otherwise (in which case the load is delivered to an appropriate storage area, provided the wastes are compatible). Containers are delivered to the landfill for disposal via both offsite and onsite trucks and placed in rows immediately adjacent to each other.

Containers of bulk solid waste material (i.e., wastes having no free liquids) must be at least 90 percent full prior to placement in the landfill. CWMNW personnel have the option of rejecting the load (see *Waste Acceptance Plan*, Standalone Document #1) or filling the containers to the maximum extent possible prior to disposal in the landfill.

The only containers with free liquids that are landfilled are very small containers (i.e., ampules), containers of hazardous waste in overpacked drums (i.e., lab packs), and containers designed to hold free liquids for use other than storage (i.e., batteries). Each lab pack (as defined by U.S. Department of Transportation [DOT] hazardous materials regulations [40 CFR Parts 173, 178, and 179]) must be certified by the generator or packer (through the manifest system and prior approval and instructions from CWMNW) that:

- Hazardous wastes are packaged in non-leaking inside containers
- Inside containers are of a sufficient design and constructed of a material that will not dangerously react, decompose, or ignite with the contained waste
- Inside containers are sealed tightly and securely
- The solidification material within the lab pack is compatible with the contained wastes and will not react, ignite, or decompose on contact with the wastes
- Incompatible wastes are not placed in the same lab pack
- Containers of reactive wastes other than cyanide or sulfide bearing wastes are not placed in the lab packs, unless they have been previously treated or rendered non-reactive

Liquids that are contained in lab packs, small containers, ampules, or batteries may be disposed without stabilization and related testing and verification procedures, provided other restrictions specified in the RCRA Permit or by other laws or regulations, do not prohibit the land disposal of such wastes.

The Arlington Facility does not dispose of any waste which is generated as a liquid and subsequently stabilized by the generator (or another off-site treatment facility) unless CWMNW has conducted testing (in accordance with the *Waste Analysis Plan, Standalone Document #1*) to ensure that the waste has been properly stabilized.

The Arlington Facility does not dispose of any waste which is restricted from land disposal under 40 CFR Part 268 unless the applicable treatment standards as specified in 40 CFR Part 268 have been achieved or an approved treatment variance has been received. In addition, as new wastes are specified for land disposal restriction under 40 CFR Part 268, CWMNW immediately discontinue disposing of such wastes upon the effective date of the 40 CFR Part 268 regulation,

unless the treatment standard as specified in 40 CFR Part 268 has been achieved or an approved treatment variance has been received. CWMNW will accept any Corrective Action Management Units (CAMU)-eligible waste which is in compliance with the requirements contained in 40 CFR 264.555. Prior to placement of CAMU-eligible wastes by the Arlington Facility, the Oregon Department of Environmental Quality must not object to its placement.

3.2 Fill Sequencing

Wastes are placed in the landfill in a series of lifts, with each lift consisting of either a single or double layer of waste material. If containers are part of the disposal material, they are placed in the lower layer; the upper layer consists of bulk waste materials.

The filling sequence for the landfill units starts at the bottom of one cell of the landfill and moves through a series of lifts toward the landfill top, as shown schematically on Figure 3-1. The depth of the lifts will vary, depending on the material being landfilled.

Access to the working face within each landfill is over temporary haul roads constructed on covered, filled waste material. As filling progresses, a terraced embankment is developed, with the highest point near the outer edges (sides) of the landfill. As each lift is completed, the temporary haul road is extended to the next lift. When the capacity of this stage of the landfill is reached, a new series of lifts are placed beginning with the lowest lift and filling upwards and back against the previously filled lifts. The former haul road is filled as each new lift begins.

Landfill L-14 is designed as a multi-phase landfill consisting of eight hydraulically separated cells. This multi-phase design allows CWMNW flexibility with respect to operational considerations, predicted landfill disposal capacity requirements and closure.

3.3 Control of Run-on and Run-off

The run-on prevention system at the Arlington Facility is typical for an arid climate, where the annual average rainfall is less than 10 inches and a high intensity rainfall event such as the 25-year, 24-hour storm would produce only 1.8 inches of rain. Details of the run-on and run-off control features are presented in the facility's *Surface Water Management Plan*. *Surface Water Management Plan* (*Standalone Document #6*) has been removed from the Part B permit.

A series of ditches constructed around the perimeter of the landfills route run-on to one of two on-site surface water basins (see *Figure 1-1 Facility Layout Map* contained in the Part B Permit), where the water will be evaporated. The ditches are typically triangular, unlined earthen channels.. The ditches are sized to convey the 25-year, 24-hour storm event and are designed with freeboard that will allow them to carry at least two times the design flow. Calculations performed as part of the surface water analysis indicate that the freeboard will allow the ditches to handle the 100-year, 24-hour storm event without overtopping. For design details, reference the *Surface Water Management Plan*, Chemical Waste Management of the Northwest, Inc, Arlington, Oregon, Golder Associates, Inc., October 2019.

The berms and run-on ditches are inspected regularly, and after significant rainfall events in accordance with the facility's *Inspection Plan* (*Standalone Document #3*). Signs of

deterioration, clogging, or failure are reported and appropriate repair actions, involving standard soil placement and compaction techniques, are taken to affect the necessary repairs.

To prevent discharge of run-off from the landfills surface onto the adjacent ground during each phase of operation, the following plan is implemented. For the period of time during which waste elevations are below surrounding grade, precipitation is contained within the landfill by the lined sideslopes. During this phase of operation, no run-off can discharge onto the adjacent ground. Any precipitation falling inside the perimeter of the active cells of the landfill is directed to temporary, geomembrane-lined surface water basins within the Landfill L-14 footprint.

The temporary detention basins are located in each cell between the toe of the waste slope and the cell divider berms, or immediately adjacent to each cell. Each area is lined with a geomembrane to prevent infiltration into the waste. The basins are sized to contain run-off from a 25-year, 24--hour storm.

Liquid collected in the temporary basins is removed by vacuum trucks or portable pumps maintained and operated by site personnel and routed to the facility's surface waste impoundments. Precipitation run-off is tested for toxicity in accordance with the procedures established in the facility's *Waste Analysis Plan* and the exclusion in 40 CFR § 261.3(c)(2)(i) and then treated or discharged directly as appropriate.

Once waste elevations within the landfill are above the adjacent perimeter grade, and prior to constructing final cover, precipitation falling on the outer slopes of the landfill is directed to a channel formed by the toe of the slope and the liner, which directs flow to a basin. A berm is maintained around the perimeter of the landfill to prevent overflow.

Precipitation that falls on the landfill areas with final cover in place or into cells that do not contain waste is considered uncontaminated and is discharged without testing. After final cover is in place, no contaminated run-off is allowed to flow onto the adjacent covered areas. No contaminated vehicles are allowed to operate on the final cover, and incident precipitation is directed away from these areas.

Run-off from active slope areas could flow downslope over previously covered areas during placement of subsequent lifts of waste. To prevent this from occurring, a channel is maintained along the toe of the exposed waste slope, adjacent to the cover of the previous lift. All run-off from the active slope areas is collected in the channel, which has the capacity to contain a 25-year, 24-hour storm. To minimize this occurrence, cover is placed over the active areas of the slope as soon as practical.

3.4 Construction Inspection of Landfills

During construction of new landfills or Cells, an independent Construction Quality Assurance firm is on-site to monitor and inspect material quality and installation of the materials for compliance with approved construction drawings and technical specifications.

Detailed construction quality assurance procedures are contained in the facility's *Construction Quality Assurance Plan* (*Standalone Document #16*) and project specific construction quality

assurance manuals. Upon completion of landfill construction activities, a Construction Quality Assurance report is prepared by the independent engineering firm certifying that the landfill was constructed in accordance with the approved construction drawings and technical specifications.

Inspections are conducted during installation of all components of the landfill liners, leachate collection and removal systems, and protective soil and geosynthetic layers. Geomembrane liners and covers are inspected during construction and/or installation for uniformity, damage, proper seaming, and imperfections. Upon completion of installation, the geomembranes are inspected and tested to verify seam integrity, and to verify there are no tears, punctures or blisters. Other routine landfill inspection procedures are described in the facility's *Inspection Plan* (*Standalone Document #3*).

3.5 Final Cover

Final cover systems that will be constructed after waste reaches final design grades are presented in the following facility documents: *Landfill Final Cover Design Plan (Standalone Document #17*) and *Alternative Final Cover Design Report, Landfills L-12, L-13 and L-14* and *Alternative Final Cover Design Modification Report, Landfills L-13 and L-14*. Landfill closure procedures and post-closure maintenance of the landfill cover are described in the facility's *Closure/Post-Closure Plans ((Standalone Document #5*).

3.6 Ignitable and Reactive Wastes

Reactive wastes, as defined by RCRA, are not to be landfilled prior to undergoing approved treatment. All bulk ignitable and reactive wastes accepted by the facility for storage, treatment, and/or disposal are processed to a level such that the resulting material(s) no longer meet(s) the definition of an ignitable or reactive waste under 40 CFR § 261.21 or 261.23. The resulting material(s) are analyzed per the facility's *Waste Analysis Plan* (*Standalone Document #1*) to verify that they are not ignitable or reactive wastes prior to final disposal in the landfill. Containerized solid ignitable wastes are landfilled in compliance with 40 CFR § 264.312(b) including the application of a daily cover of non-combustible wastes or inert soils.

3.7 Incompatible Wastes

Wastes placed in the landfills are assigned to one of three categories (combustibles, TSCA PCBs, and toxics) as a result of testing in accordance with the facility's *Waste Analysis Plan* (*Standalone Document #1*). The Hazardous Waste Compatibility Chart (EPA Document 600/2-80-076) is also used to ensure that no incompatible wastes are grouped in the same category.

The wastes are assigned to a specific area or cell of the landfill based on the classification. The location of each waste load is recorded according to a three-dimensional grid system. Site landfill disposal procedures specify that inert material or neutral wastes are used to segregate cells and prevent the mixing of potentially incompatible wastes.

3.8 Control of Wind Dispersal of Wastes

Potential sources of fugitive dust emissions are: 1) earthmoving activities, such as excavation and transport of material for daily cover, 2) unvegetated active areas of the landfill, such as partially completed final covers or partially excavated trenches, 3) truck traffic on haul roads and ramps, 4) waste unloading operations in the landfills, and 5) exposed waste surface in the landfills.

Fugitive dust can be a problem at the Arlington Facility because of the semi-arid climate and persistent winds. The wind is usually from the west at about 5 to 10 miles per hour (mph); however, there are occasional gusts of 20 to 40 mph. Control of fugitive dust at the landfill is accomplished by surface application of leachate. Leachate is pumped from the leachate detection sumps in an individual landfill unit either to a container located within the lined footprint of the respective landfill or directly to the leachate distribution system (sprinklers or drip hoses) for the respective landfill. No leachate leaves the landfill from which it was pumped and the leachate, at all times, remains over the lined area that collected the leachate. If not applied directly, the leachate is collected in a portable container that serves as a reservoir for times dust control is required. The leachate is piped to drip systems and sprinkler systems for dust control as required. The drip and sprinkler systems are activated during periods before and during dust generation weather. Leachate is not sprinkled on roadways to prevent potential tracking from the landfill. Sprinkler systems are configured and operated so that no leachate is allowed to drift out of the footprint of the respective landfill. Both sprinkler and drip systems are operated to prevent landfill sideslope erosion. Leachate application rates are controlled to prevent puddles, saturated soil conditions, excessive percolation, and runoff.

The wastewater treatment unit operator oversees the application of leachate to the landfill surface. The operator monitors and adjusts the system for appropriate leachate application rates, appropriate spray sizing for wind drift conditions, piping and equipment leaks and ground conditions.

Inspections of the landfill sprinkler and drip systems are conducted regularly. The inspector visually checks the leachate application area for evidence of spray leaving the footprint of the landfill, side slope application, runoff and puddling.

Other dust control measures include:

- Application of clean water from a water truck onto the exposed surface within the landfill; and
- Spraying of clean water from a fire truck hose onto dry bulk wastes during unloading operations.

The water truck spray rate is equivalent to 0.012 inches of rain per year per application. Since the average daily evaporation rate is 0.10 inches per day, it is apparent that clean water applied in this manner will evaporate before it can percolate into the subsoils. Therefore, no groundwater contamination is possible with this method of dust control.

The procedure of spraying water via a water hose is only used when unloading dry bulk wastes such as baghouse dust. Assuming the waste has a moisture content of 5 percent, the amount of

water sprayed is not sufficient to even achieve the normal moisture content (10 percent) of the soil used as clean cover in the landfills. Therefore, the additional water poses no threat to groundwater.

Dust emissions from earthmoving activities and truck haul roads and ramps are minimized on dry, windy days by periodic watering of areas being traveled and maintenance of a prepared roadbed of aggregate material. Dust emissions from the active areas of the landfills are reduced with the compaction of surface materials by heavy equipment traffic.

The off-loading of container wastes in the landfills presents no dust emission problem. Most bulk solid wastes, which are end-dumped from trucks, are typically not dust-generating wastes because of their moisture content, large particles, and/or other physical properties. Stabilized wastes are non-dust generating. However, the unloading of fine particle bulk solids, such as fly ash or baghouse dust, is a potential dust emission problem. The current practice is to unload these wastes in an area of the landfill protected from wind and as close to the final disposal area as possible.

When the final cover is placed on each landfill, vegetation is established to control wind erosion of final cover soils.

3.9 Disposal of Dioxin-Containing Wastes (i.e., F020, F021, F022, F023, F026, F027, and F028)

This management plan contains procedures for disposal of dioxin-containing wastes, which satisfy the special requirements for managing these wastes identified in 40 CFR § 264.317. The following items are addressed in this management plan:

- Exposure control practices;
- Volumes, concentrations of dioxin-containing wastes, and potential to migrate; and
- Disposal procedures for land disposal.

3.9.1 Exposure Control Practices

Existing management standards under 40 CFR § 264 Subpart N are adequate to prevent the dispersion of dioxin-contaminated wastes by wind dispersal. However, as an added precaution these wastes are disposed in sealed impermeable enclosures to eliminate any potential for dispersal of waste.

In instances where waste is transferred and/or stabilized into these enclosures for disposal, personnel are provided adequate personnel protective equipment as is detailed in the facility's exposure monitoring and prevention procedures.

3.9.2 Waste Characteristics

The volumes of dioxin-containing wastes to be managed for landfill varies depending upon the process generating the waste. For example, dioxin-containing waste may be generated at large cleanup sites and transported in lined bulk containers and then landfilled in sealed bulk enclosures. In addition, these wastes may be generated and transported in small containers, such as well investigation samples to be stabilized and landfilled in one or more impermeable

enclosures. The estimated volumes to be received for landfill are identified during the profile approval process for each waste stream.

The concentration of dioxin or furans in the wastes designated as F020, F021, F022, F023, F026, F027, intended to be managed for disposal at the Arlington Facility, are below the regulated levels identified in 40 CFR § 268.40 for wastewaters or non-wastewaters except for debris and wastes intended to be managed for disposal as corrective action management unit (CAMU)-eligible wastes.

Debris contaminated waste can be treated in accordance with the alternative treatment standard in 40 CFR § 268.45 as discussed in Standalone Document No. 11, *Debris Treatment Plan*.

All of these wastes accepted at the Arlington Facility for landfilling are disposed of in impermeable enclosures that are capped and sealed to reduce the possibility of migration of these wastes to groundwater, surface water, or air so as to protect human health and the environment.

3.9.3 Disposal Procedures

As identified above, all dioxin-containing wastes that are disposed of in a landfill will be confined within an impermeable enclosure that is later capped and sealed. These enclosures may be drums, prefabricated HDPE macroencapsulation boxes, super sacks (non-rigid containers consisting of an inner layer of impermeable material (such as polyethelene) and an outer layer of woven fabric capable of withstanding waste loading, transport, and disposal without tearing), or may be constructed of flexible membrane liner (FML) within the landfill. FMLs may be polyethylene (HDPE, LLDPE) or other materials as appropriate. Macroencapsulation enclosures constructed within the landfill will have FML above and below the waste to be encapsulated with the overlying FML seamed to the underlying FML at the edges. All macroencapsulation FML panels will be seamed using either fusion or extrusion methods.

CQA of macroencapsulation enclosures within the landfill will consist of non-destructive testing of the seams in accordance with the Construction Quality Assurance Plan. Other requirements of the Construction Quality Assurance Plan may be implemented at the CQA Engineer's discretion. ‡ Rev. 5

Liquids accepted for disposal in a landfill are solidified prior to being landfilled. All containers, in which these wastes have been removed and where the waste has contacted the container, are triple rinsed to remove any hazardous residue. This rinsate is also stabilized and landfilled in similar enclosures discussed above. See Figure 3-1: Conceptual Fill Sequence

Figure 3-1: Conceptual Fill Sequence