B&L Woodwaste Site
Pierce County, Washington

Engineering Design Report (EDR) Addendum 1

Phase 1 Part 1 Remediation Design Report

Barrier Wall and Interceptor Trench

Tables

FINAL

Table 1.1
Engineering Design Report (EDR) Accordance with the Model Toxics Control Act (MTCA) Requirements— General EDR and Addendum 1

EDR Regulatory Requirements MTCA WAC 173-340-400(a)		Information Location		
		General EDR	Addendum 1	Summary
(i)	Goals of the cleanup action including specific cleanup or performance requirements	Section 1.3		Section 1.3 provides a description of the Remedial Action Objectives and cleanup levels for each Cleanup Action Area (CAA).
(ii)	General information on the facility including a summary of information in the remedial investigation/feasibility study	Sections 2.1, 2.2, 2.4, and 3.4		Sections 2.1, 2.2, and 3.4 provide general site information including physical site description, land use, and development issues. Section 2.4 provides a summary of the site history and previous remedial investigations, feasibility studies, and cleanup activities.
(iii)	Identification of who will own, operate, and maintain the cleanup action during and following construction	Sections 1.4 and 2.3		Section 1.4 describes responsibility for the cleanup action. Section 2.3 describes the property ownership.
(iv)	Facility maps showing existing site conditions and proposed location of the cleanup action	Sections 1.1, 3.2, 4.1, and 4.3	Drawings	EDR Figure 1.1 shows the Site based on the extent of contamination, the CAAs, the interim compliance monitoring network, and other features. EDR Figure 3.2 illustrates contaminant concentration contours. EDR Figure 4.3 illustrates delineated Wetlands areas. Addendum 1 includes detailed drawings showing the specific locations and design of the barrier wall and groundwater management system.
(v)	Characteristics, quantity, and location of materials to be treated or otherwise managed, including groundwater containing hazardous substances	Sections 1.1, 2.1, and 4.1; Appendix A	Drawings	EDR Section 2.1 describes the quantity and characteristics of the wood waste inside the Landfill that is to be contained. EDR Section 4.1 and EDR Appendix A describe the characteristics and location of the groundwater plume to be treated or contained, including the areal extent and thickness of the contaminated aquifer for all CAAs. EDR Section 1.1 includes the estimated volume of groundwater to be treated as part of the Wetlands cleanup. Precise locations of the limits of wood waste, the area of groundwater to be contained, and remedy components to addressed by Addendum 1 are shown in the Addendum 1 Drawings.
(vi)	A schedule for final design and construction	Section 7.3	Section 6.1	EDR Section 7.3 presents a projected implementation schedule for the 2008 CAP. A schedule for final design and construction for Addendum 1 is presented in Addendum Sec. 6.1.
(vii)	A description and conceptual plan of the actions, treatment units, facilities, and processes required to implement the cleanup action including flow diagrams		Section 3.0; Drawings	Addendum 1 Section 3.0 describes the design. The drawings present design details and include a flow diagram for the groundwater management system.
(viii)	Engineering justification for design and operation parameters including:			Refer to specific Sections for (viii)(A) through (viii)(C) below.
(viii)(A)	Design criteria, assumptions and calculations for all components of the cleanup action		Section 2, Appendices 1A and 1B	The design basis, design criteria, and rationale for design features are discussed in Addendum 1, Section 2. Calculations and supporting information are included in Addendum 1 Appendices 1A and 1B.
(viii)(B)	Expected treatment, destruction, immobilization, or containment efficiencies and documentation on how that degree of effectiveness is determined	Appendix B	Sections 2.1and 3.1; Appendix 1A.	Addendum 1 Section 2.1 and Addendum 1 Appendix 1A discuss the predicted effectiveness of the barrier wall with respect to hydraulic containment. Addendum 1 Section 3.1 summarizes slurry wall design, and Appendix B of the EDR documents how the slurry wall mix design was determined.
(viii)(C)	Demonstration that the cleanup action will achieve compliance with cleanup requirements by citing pilot or treatability test data, results from similar operations, or scientific evidence from the literature	Appendix B	Sections 2.1 and 3.1; Appendix 1A; Drawings	Addendum 1 Section 2.1 and Addendum 1 Apppendix 1A discuss the predicted effectiveness of the barrier wall with respect to hydraulic containment. Addendum 1 Section 3.1 and EDR Appendix B provide treatability testing results demonstrating that the barrier wall will be constructed of a material of appropriate hydraulic conductivity to achieve containment. Addendum 1 Drawings show that the barrier wall design achieves the containment system specified in the 2008 CAP.
(ix)	Design features for control of hazardous materials spills and accidental discharges (for example, containment structures, leak detection devices, run-on and run-off controls)		Sections 2.3.2, 3.1.5, and 4.4	Addendum 1 Section 2.3.2 and Addendum 1 Section 3.1.5 describe measures and precautions that will be implemented for environmental protection, including stormwater and spill prevention and containment. Addendum 1 Section 4.4 describes provisions for environmental protection during construction, including prevention of the spread of contaminants beyond the work site.
(x)	Design features to assure long-term safety of workers and local residences (for example, hazardous substance monitoring devices, pressure valves, bypass systems, safety cutoffs)	Appendix E	Sections 3.2, 5.2, and 5.3; Drawing P-1	Addendum 1 Section 3.2 describes the pumping control strategy for the groundwater management system to prevent flooding and overflow from the system and valves to prevent backflow from the infiltration ponds. EDR Appenidx E describes groundwater and surface water monitoring plans. Addendum 1 Section 5.2 describes performance monitoring for the barrier wall. Addendum 1 Section 5.3 describes plans for inspection and maintenance of the remedy components. Drawing P-1 shows the instrumentation and control scheme for the groundwater management system.

EDR Regulatory Requirements MTCA WAC 173-340-400(a)		Information Location		
		General EDR	Addendum 1	Summary
(xi)	A discussion of methods for management or disposal of any treatment residual and other waste materials containing hazardous substances generated as a result of the cleanup action		Sections 2.3.1, 4.2.2 to 4.2.7, and 4.2.9	Addendum 1 Section 2.3.1 describes general management of Landfill materials that will be incorporated into the Landfill, and materials that will be used for fill. Addendum 1 Section 4.2 contains detailed descriptions of how all materials generated during construction will be managed, including reuse of cap material and salvage or on-site disposal of landfill liner materials (Sections 4.2.2 and Section 4.2.7), wood waste located outside the planned alignment (Section 4.2.3), barrier wall excavation spoils (Section 4.2.4), interceptor trench excavation spoils (Section 4.2.5), infiltration pond excavation spoils (Section 4.2.6), and disposal of other excess materials (Section 4.2.9).
(xii)	Facility specific characteristics that may affect design, construction, or operation of the selected cleanup action, including:			Refer to specific Sections for (xii)(A) through (xii)(C) below.
(xii)(A)	Relationship of the proposed cleanup action to existing facility operations	Sections 2.2 and 3.3		EDR Section 2.2 describes current site use. EDR Section 3.3 describes landfill gas production.
(xii)(B)	Probability of flooding, probability of seismic activity, temperature extremes, local planning and development issues	Sections 3.1.2.3, 3.1.3, 3.2, and 3.4		EDR Section 3.1.2.3 describes flooding potential and flooding records. EDR Section 3.1.3 describes area seismicity. EDR Section 3.2 describes site climate. EDR Section 3.4 describes site planning and development issues.
(xii)(C)	Soil characteristics and groundwater system characteristics	Sections 3.1.1 and3.1.2; Appendices B and C		EDR Section 3.1.1 describes local geology and Section 3.1.2 describes local hydrogeology. EDR Appendix C describes the groundwater conceptual model in the context of numerical modeling. EDR Appendix B describes the results of the geotechnical investigation along the barrier wall alignment.
(xiii)	A general description of construction testing that will be used to demonstrate adequate quality control		Section 4.3	Addendum 1 Section 4.4 summarizes the construction quality assurance measures for the planned construction.
(xiv)	A general description of compliance monitoring that will be performed during and after construction to meet the requirements of WAC 173-340-410	Section 5.0	Section 5.4	EDR Section 5.0 summarizes compliance monitoring to address requirements in the Consent Decree and MTCA, describes the ongoing compliance monitoring program and conditional point of compliance, and presents an overview of the groundwater and surface water monitoring network. Addendum 1 Section 5.4 describes the performance monitoring program for the barrier wall and interceptor trench.
(xv)	A general description of construction procedures proposed to assure that the safety and health requirements of WAC 173-340-810 are met		Sections 4.2 and 4.5	Addendum 1 Section 4.2 provides an overview of the construction approach, and includes discussion of the provisions for health and safety of workers. Addendum 1 Section 4.5 specifically addresses health and safety concerns.
(xvi)	Any information not provided in the remedial investigation/feasibility study needed to fulfill the applicable requirements of SEPA (chapter 43.21 RCW).	Section 4.4 and 4.5; Appendix D		A SEPA checklist was prepared for the 2008 CAP, resulting in a determination of non-significance. Tribal comments for the draft CAP requested a cultural resources survey prior to earth disturbance, to which Ecology agreed. The cultural resource findings are summarized in EDR Section 4.5. The cultural resources survey has been submitted to the Department of Archaeological and Historical Preservation and the Puyallup Tribe. Additionally, the U.S.Army Corps of Engineers JARPA process required a Critical Areas Study (CAS) to delineate wetlands in the project area. EDR Section 4.4 summarizes the CAS prepared for the project area. EDR Appendix D presents the CAS report.
(xvii)	Any additional information needed to address the applicable state, federal and local requirements including the substantive requirements for any exempted permits; and property access issues which need to be resolved to implement the cleanup action	Section 7.1 and Table 7.1		Section 7.1 and Table 7.1 outline the applicable state, federal, and local requirements for the cleanup action, including substantive requirements for MTCA exempted permits.
(xviii)	For sites requiring financial assurance and where not already incorporated into the order or decree or other previously submitted document, preliminary cost calculations and financial information describing the basis for the amount and form of financial information describing the basis for the amount and form of financial assurance and, a draft financial assurance document.	Not Applicable		Financial assurance is not required for the Site.
(xix)	For sites using institutional controls as part of the cleanup action and where not already incorporated into the order or decree or other previously submitted documents, copies of draft restrictive covenants and/or other draft documents establishing these institutional controls	Section 6.0		Section 6.0 describes the existing institutional controls and describes additional restrictive covenants that will be developed prior to finalizing the EDR during Phase 2 of the 2008 CAP implementation. As the current work is the first portion of the implementation process, it is premature to prepare comprehensive documentation for institutional controls.
(xx)	Other information as required by the department	Not Applicable		No additional information has been requested.

Table 1.2
Cost Comparison for Different Barrier Wall Depth at Aquitard Discontinuity

Option	Description	Estimated Wet Season Extraction Rate[1] (gpm)	Design Treatment Capacity[2] (gpm)	Estimated Annual Average Flow[3] (gpm)	Estimated Barrier Wall Cost Increase[4,5]	Estimated Capital Cost Savings, Groundwater Treatment System[4,5]	Estimated Annual O&M Cost Savings[4,5]
A	Bottom of barrier wall at 20-ft bgs	54	62	46	-- --	-- --	-- --
B	Extend wall to 35-ft bgs at aquitard discontinuity	49	56	44	$207,000 – $281,000	$147,000 – $245,000	$9,000 – $19,000
C	Extend wall to 50-ft bgs at aquitard discontinuity	49	56	42	$236,000 – $318,000	$17,000 – $29,000	$4,000 – $8,000

Notes:

1 Estimated wet season extraction rates from optimization of groundwater extraction rate using groundwater model (Appendix 1B).

2 Design treatment capacity based on 15% excess capacity over estimated wet season extraction rate for maintaining an inward head differential of 6 inches across the wall.

3 Estimated annual average flow based on maintaining an inward head differential of 6 inches for 3 months, 4 inches for 6 months, and 2 inches for 3 months.

4 Cost increase and cost saving for Option B are the differences between Option A and Option B.

5 Cost increase and cost saving for Option C are the differences between Option B and Option C.

Abbreviations:

bgs Below ground surface
ft Feet
gpm Gallons per minute
O&M Operations and maintenance

Table 1.3
Piezometer Construction Details

Piezometer ID	Drilling Method	Casing Construction	Approximate Total Depth (feet bgs)[1]	Approximate Screened Interval (feet bgs)[1]	Screen Construction	Filter Pack	Surface Completion	Notes
Upper Interval								
PZ-1a	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-6 and H-7.
PZ-1b	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-2a	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-5.
PZ-2b	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-3a	Hollow-stem auger	2" PVC	28	18 - 28	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-3 and H-4.
PZ-3b	Hollow-stem auger	2" PVC	28	18 - 28	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-4a	Hollow-stem auger	2" PVC	30	20 - 30	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-2. Southwestern aquitard gap.
PZ-4b	Hollow-stem auger	2" PVC	30	20 - 30	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-5a	Hollow-stem auger	2" PVC	24	14 - 24	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-15. Southwestern aquitard gap.
PZ-5b	Hollow-stem auger	2" PVC	24	14 - 24	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-6a	Hollow-stem auger	2" PVC	17	7 - 17	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-13.
PZ-6b	Hollow-stem auger	2" PVC	17	7 - 17	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-7a	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-11.
PZ-7b	Hollow-stem auger	2" PVC	22	12 - 22	0.020-slot PVC	1020 silica sand	Flush-mounted	
PZ-8a	Hollow-stem auger	2" PVC	15	5 - 15	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-9 and H-10. Eastern aquitard gap.
PZ-8b	Hollow-stem auger	2" PVC	15	5 - 15	0.020-slot PVC	1020 silica sand	Flush-mounted	
Lower Interval								
PZ-4c	Hollow-stem auger	2" PVC	37	32 - 37	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-2. Southwestern aquitard gap.
PZ-5c	Hollow-stem auger	2" PVC	35	30 - 35	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-15. Southwestern aquitard gap.
PZ-8c	Hollow-stem auger	2" PVC	25	20 - 25	0.020-slot PVC	1020 silica sand	Flush-mounted	Construction based on H-9 and H-10. Eastern aquitard gap.

Notes:

1 Approximate total depth and screened interval depth is based on contact between Upper Sand Aquifer and Lower Silt Aquitard as determined by H-series geotechnical borings. Depths assume installation from elevation of perimeter road (approximately 19 feet NAVD88). Actual total depth and screened interval will typically be based on field confirmation of depth of contact between Upper Sand Aquifer and Lower Silt Aquitard. In locations where the Lower Silt Aquitard is absent, the approximate depth of the contact in nearby borings will be used.

Abbreviations:

bgs Below ground surface
PVC Polyvinyl chloride