



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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December 6, 2018

Kenny Chan
Project Manager
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Solid Waste Division
King Street Center
201 South Jackson Street, Suite 701
Seattle, Washington 98104

**Re: *Vashon Island Closed Landfill Remedial Investigation Report, Agency Draft,*
October 9, 2018**

King County Solid Waste Division (KCSWD) submitted a Draft Remedial Investigation (RI) Report for the Vashon Island Closed Landfill (VLF) to document the investigations that are required when a groundwater protection standard is exceeded (as defined by WAC 173-200) at a landfill under WAC 173-351-440(6). This RI describes independent remedial actions KCSWD is conducting at the VLF under WAC 173-340-515 Independent Remedial Actions. Correspondence about the agreement between Washington State Department of Ecology (Ecology) and KCSWD for Corrective Action at VLF are included in the August 27 and 30th, 2010 letters.

This letter provides Ecology's opinion. We are providing this opinion under the authority of Chapter 173-340 WAC Model Toxics Control Act (MTCA) and Chapter 70.105D RCW. Ecology's opinions for independent remedial actions are advisory only, and are not official comments, endorsements, or approvals of the document's conclusions and recommendations.

This opinion is based on an analysis of whether this RI meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA").



This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with releases of hazardous substances to the environment as presented in hydrogeology, water quality, and environmental investigations conducted to date.

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D0.40 (4). The opinion is advisory only and not binding on Ecology.

This RI is required to satisfy WAC 173-351-440(6) which requires the facility to "initiate an assessment, selection, and implementation of corrective measures" as required by WAC 173-340, MTCA. Ecology and KCSWD determined that the "assessment" RI could be conducted as a separate task. The "selection and implementation of corrective measures," otherwise called the Feasibility Study, and Cleanup Action Plan will follow this RI. Some Interim Actions are taking place now.

This RI helps to define the distribution of contaminants in surface water, groundwater, and landfill gas under/around the Site. The MTCA regulation describes the elements necessary to complete an RI. In this opinion letter, Ecology assesses the work conducted to date and compares it to the requirements to evaluate if sufficient information has been collected to fully characterize the nature and extent of contaminants at the Site.

Ecology's Solid Waste Management Program has reviewed the following information:

1. Phase 1-Vashon Island Closed Landfill, Contract No. E00102E08 Task No. 310.3-D310.3.2, Remedial Investigation Report, Volume I and II, Agency Draft, prepared by Aspect Consulting, LLC, October 9, 2018.

Based on a review of the documents listed above, Ecology is providing the following opinion:

Completeness of Remedial Investigation

Based on Section 8.2 **Ongoing Interim Actions** of this RI and discussions from the KCSWD/Aspect Consulting, LLC. (Aspect) and Ecology presentation and meeting November 7, 2018, Ecology will determine the completeness of the RI after reevaluation of the 3rd Quarter 2019 LFG Evaluation and Recommendations Report and other additions to the RI discussed in the meeting, our Attachment A (response table) or in this letter.

Groundwater

Ecology will determine the completeness of the RI as it relates to groundwater after reevaluation of the 3rd Quarter 2019 LFG Evaluation and Recommendations Report and other additions to the RI discussed in the meeting, in our response table, or in this letter.

Contaminants of Concern - Please see Attachment B for Ecology's comments on Preliminary Cleanup Levels (PCULs) for Contaminants of Concern (COCs).

Delineation of Contaminants of Concern - The RI conclusions Section 8.1.1. 1st bullet states "the extent of vinyl chloride exceedances in Unit Cc2 groundwater south of wells MW-2 and MW-21 and near the west VLF property boundary remains undefined." The section goes on to mention the groundwater COCs (dissolved arsenic and iron, vinyl chloride, benzene, 1, 2-dichloropropane, and TCE) and mentions Figure 8.1 which shows the 2017 horizontal COC delineation. The figure shows the COCs extent is not delineated along the southern property line.

Data are currently being collected from:

- The three new LFG extraction wells.
- Required groundwater, surface water, and LFG sampling locations per the Sampling and Analysis Plan and newly installed wells/LFG probes not included in the SAP on a quarterly basis as well as some monthly LFG data.

This data will be summarized in the 3rd Quarter 2019 LFG Evaluation and Recommendations Report which will allow Ecology to determine if the current delineation of the COCs is adequate, if the COCs have declined to below the PCULs, or if trends indicate they are trending down.

Drinking Water Source Evaluation - The section also identified the Cc2 aquifer as "not a primary drinking water source." Ecology requested a cross-section be extended to include the geology for the 85-Acre water system well south of VLF. This well log was not available therefore Figure 3.6 of the RI is blank south of the landfill except for water system wells DW-SS and 85-Acres (DW-85) location. Following the November 7, 2018 meeting discussions, KCSWD will work on including another adjacent well to the south so the Cc2 aquifer can be further evaluated south of the VLF property line (using existing well logs currently available from other residential well logs in Ecology's Water Resources database or by contacting the water systems and finding well logs) south of the VLF property line.

As suggested in the November 7, 2018 meeting, KCSWD will work to determine if residences south of the VLF property line are connected to Class A/B water systems. This will assist in evaluating if a residential well survey should be conducted south of VLF. Specific attention should be paid to the well mentioned in the RI (WELL ID 190701).

Surface Water

Ecology will determine the completeness of the RI as it relates to surface water after reevaluation of the 3rd Quarter 2019 LFG Evaluation and Recommendations Report and other additions to the RI discussed in the meeting, in our response table, or in this letter.

Contaminants of Concern – Dissolved iron and arsenic, benzene, and vinyl chloride are the surface water COCs. Please see Attachment B for Ecology's comments on PCULs for COCs.

Landfill Gas/Soil Gas Evaluation

Again, Ecology will determine the completeness of the RI as it relates to LFG after reevaluation of the 3rd Quarter 2019 LFG Evaluation and Recommendations Report and other additions to the RI discussed in the meeting, in our response table, or in this letter.

Terrestrial Ecological Evaluation

Ecology is not in agreement with an incomplete pathway in the Terrestrial Ecological Evaluation (TEE). Please see our response in Attachment A.

Public Outreach

Ecology does not direct public outreach in an independent MTCA action; however, we encourage the County to notify the landfill neighbors of the RI and Interim Action work conducted and provide them access to the Final RI.

Ecology's Opinion on the RI

At the November 7, 2018 meeting additional results were reported which indicate that groundwater, surface water, and LFG concentrations are improving at the landfill (the RI only includes data through the end of 2017 and Interim Actions are currently taking place). Once the Interim Actions are reported in the 3rd Quarter 2019 LFG Evaluation and Recommendations Report, the Class A/B water system service is evaluated for residences south of the landfill, and the RI is resubmitted, Ecology will evaluate if the VLF RI is complete enough to proceed to the Feasibility Study (FS).

See Attachment A of this letter for Ecology's response table to specific comments on the RI.

Kenny Chan
December 6, 2018
Page 5

The state, Ecology, its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Please contact us with any questions you have about our comments.

Sincerely,



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Attachments (2)

cc: Darshan Dhillon, Public Health – Seattle & King County
Peter Christiansen, Ecology, Solid Waste Management Program

Attachment A

Deliverable Review Form

Project Name: Vashon Island Closed Landfill Remedial Investigation- MTCA Independent Action Review Date: 10/9/2018
 Contract #: _____ Response Date: 12/6/2018
 Reviewer: Tim O'Connor/Ecology & Madeline Wall/Ecology
 Deliverable Name: Agency Draft Vashon Island Closed Landfill Remedial Investigation Report, Volumes 1 and 2

Deliverable Review					Response		
Comment No.	Reviewer Name	Page, Figure, Specification or Sheet No.	Section / Paragraph	Reviewer's Comment	Responder Name	Response Comment	Resolved?
0				<i>Be as specific as possible. Minimize open ended comments. PM to resolve conflicting or out-of-scope comments</i>		<i>Agreed/Incorporate as stated. Agreed/Describe how comment will be incorporated. Disagree/Describe how comment will be addressed. Disagree/Further discussion warranted</i>	
1	Wall	Pages ES-1 and 1	2nd paragraph on both pages	Please include the Remedial Investigation was conducted due to the exceedance of a groundwater protection standard in the explanation as referenced in Ecology's correspondance letters dated August 27th and 30th, 2010.			
2	T O'Connor/ECY	ES-2	Extent of Impact	Include COC's for surface water in second bullet.			
3	T O'Connor/ECY	ES-3	Extent of Impact	Last sentence, make clear you're discussing surface water; perhaps discuss that the Cc2 aquifer ends to west in the ravine.			
4	T O'Connor/ECY	ES-3	Exposure Pathways	Also state that further evaluation of current Class A/B drinking water connections to residences south of the VLF property will be conducted. Also note the MCL for VC is 2 ug/L but PCUL is .02 ug/L.			
5	T O'Connor/ECY	ES-3	Exposure Pathways	See Attachment B for Ecology's review of PCULs for COCs. Also, the PCUL of 1,000 ug/L for Fe and 2,200 ug/L for Mn are appropriate for protecting health, however MTCA requires using a the lower secondary MCL (300 ug/L for Fe and 50 ug/L for Mn). The Concise Explanatory Statement in the 2001 revision to MTCA (General Question 10.1.8 on e-page 185) indicates that secondary MCLs listed in the DOH regulation are considered ARARs under MTCA. Ecology supports calculating background groundwater levels using upgradient/residential well data for these COCs (aquifer specific) which can be used in place of these secondary MCLs if they are higher. Reevaluation of the extent of contamination should be conducted based on Attachment B.			

6	T O'Connor/ECY	ES-3	Exposure Pathways	<p>Exposed upland soil provides a potential complete pathway for upland ecological receptors. Any areas within the Site with exposed upland soil (with suspected contamination) shallower than a depth of 15 ft bgs should be included in the RI. A conditional point of compliance (as per WAC 173-340-7490(4)) requires an agreed upon institutional control (restrictive covenant). If a conditional point of compliance (and resulting restrictive covenant/institutional control) is agreed upon with Ecology, and all contamination is deeper than the default biologically active zone (6ft bgs), then the final protective values may be adjusted to reflect an exclusion from the Terrestrial Ecological Evaluation (TEE).</p> <p>However, at this Site there appear to be seeps from the West Hillslope area that expose suspected contaminated water to soil at the surface. As a result, it is recommended that a complete exposure pathway exists from surface soil to uplands ecological receptors. Conditional point of compliance at the biologically active zone (0 to 6 ft bgs) does not appear appropriate for this Site, and the RI should include uplands ecological risk towards evaluation of nature and extent of contamination.</p> <p>If subsequent soil sampling indicates that contamination does not exist in the areas discussed above, then a conditional point of compliance may be approved by Ecology (excluding the site from the TEE), providing verification that the conditions listed in WAC 173-340-7490 (4)(a) and WAC 173-340-7491(1)(a) have been met. Until that occurs, protection of upland ecological receptors should remain included in the RI.</p>			
7	Wall	Pg. 10	Section 3.1	Figure 2.1 should show stream leaving site at south end going into tributary of Judd Creak			
8	T O'Connor/ECY	Pg. 15	3.4.2.1	<p>The 85-Acre well is 145' deep and may not be completed in the Unit D aquifer as the report states. I suggest contacting 85 acres and Smith-Shiratori Water District Management for copies of the well logs. There are multiple wells that are shallower and may be completed in Unit C aquifer, please review logs and attempt to locate via information on the well logs. An evaluation of the homes serviced by Class A/B water systems south of the VLF property line was discussed in the November 7, 2018 presentation. This task should be completed and an assessment of next steps conducted. The statement in the 3rd paragraph on page 15 is misleading as D-D' doesn't include any geologic information.</p>			

9	T O'Connor/ECY	Pg. 15	3.4.2.2	In the latest quarterly report (3rd Quarter 2018) the potentiometric surface map for the Cc2 aquifer indicates a northwest/west/southwestern gradient. Other quarterly and annual reports Cc2 also suggest this south-southwest gradient: cross-section C-C' shows the Cc2 aquifer between MW-20 and MW-33. The Berryman 2006a report shows two Cc2 scenarios (Figures 3-8 and 3-9); discuss how the southern gradient in the Cc2 aquifer may vary and any impacts to the extent of contamination of COCs to the south. Add groundwater potentiometric surface maps for Unit Cc3.		
10	Wall	Pg. 26	4.4.1.1, last paragraph	Why was LFG monitoring started in MW-13 and MW-24 in 2010?		
11	Wall	Pg. 26	4.4.1.2, first paragraph	Include explanation of VTP-1D installation when 1S was decommissioned.		
12	Wall	Pg. 32	5.1 7th Bullet	Why call out just the LFG requirements of Subtitle D? Why include subtitle D at all as WA is delegated to implement Subtitle D through our 351 regulation.		
13	Wall	Pg. 32	5.1 last bullet	Should include PSCAA regulations.		
14	T O'Connor/ECY	Table 5.1	Pg 1-6	See Attachment B for Ecology's review of PCUL's for COCs. Evaluate the protectiveness of the MCL for cis-1,2-DCE and adjust it down to HQ=1 (MTCA equation 720-1). This will produce a value of 16 ug/L. Consider renaming the column labeled "Modified MTCA Method B" for both ground water and surface water "Risk of 1E-5". "Modified Method B" could be confused with WAC 173-340-720(4)(c) and WAC 173-340-730(3)(c), neither of which allows adjusting the risk to 1E-5.		
15	Wall	Pg. 36	5.5.1 last paragraph	What about carcinogenic effects of TCE, and what is the Method B non-carcinogenic level?		
16	Wall	Pg. 38	6.1.1 second to last paragraph	Please add the date of the one time nitrate exceeded the PCUL.		
17	Wall	Pg. 41	6.1.2.1, Last bullet	Explain the process of considering a data point as an outlier. Reference the SAP or Unified Guidance.		
18	Wall	Pg. 43	6.1.2.3 last paragraph	The TCP detection in MW-12: when did that occur?		
19	T O'Connor/ECY	Pg. 44	6.1.3	Please lower your MDL's for 1,2-dibromomethane and 1,2-dibromo-3-chloropropane as well as all other analysis to meet WAC 173-200 groundwater quality criteria.		
20	T O'Connor/ECY	Pg. 45	6.2.1	Please rescreen and update PCULs in Table 6.4 and update Figure 8.1 with the COC's, their levels, and the extent of contamination based on Attachment B.		
21	T O'Connor/ECY	46	6.2.2	Discuss the question remaining from the 3/2/06 Environmental Evaluation section 4.1.2 where it discusses how impacted groundwater from Cc2 would discharge to Unit Cc3 at some points and then can discharge to the regional aquifer.		

22	T O'Connor/ECY	50	7.1.1	There is not a well that supports the statement in the third paragraph "Unit Cc2 was not observed in borings southeast...of VLF." Cc2 exists in MW-20 and MW-2 and may have a southwesterly gradient. Please rescreen data for all aquifers against Ecology's proposed PCULs to evaluate if groundwater with COCs is limited to Cc2.			
23	T O'Connor/ECY	61-62	7.4.5.1	See Comment 6			
24	T O'Connor/ECY	Vol 2 Table C-1		Put geologic information from Kurt Monier, Dave Nestor, and 112441 wells in cross-sections.			
25	T O'Connor/ECY	Vol 2 Table C-1		Well 112441 is on the map but not on the table.			
26	T O'Connor/ECY	63	8.1.1	Mention domestic water samples from DW-PA and DW-85 are still routinely collected and no evidence of contamination originating from the VLF has been found.			
27	T O'Connor/ECY	63	8.1.1	The site is not fully delineated as stated in this Section. The 3rd Quarter 2019 LFG Evaluations and Recommendations Report and other additions to the RI discussed in the November 7, 2018 meeting, in this response table, or in Ecology's attached Opinion letter will need to be incorporated into this RI. Ecology will determine the completeness of the RI once these steps are completed. This review of groundwater, surface water, soil, sediment, and LFG analytical data results will determine if further delineation will be necessary.			

Attachment B

Deliverable Review Form

Project Name: Vashon Island Closed Landfill Remedial Investigation- MTCA Independent Action Review Date: 10/9/2018
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 Reviewer: Tim O'Connor/Ecology & Madeline Wall/Ecology
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Deliverable Review					Response		
Comment No.	Chemical	KCSWD Proposed (ug/L)	Ecology Proposed (ug/L)	Basis for Value	Responder Name	Responses Comment	Resolved?
1	Antimony	6	5.6	Surface water (NRWQC-human health)			
2	Arsenic	5	8	Natural background			
3	Barium	2,000	1,000	Surface water (NRWQC-human health)			
4	Cadmium	1.32	0.72	Surface water (NRWQC-aquatic life)			
5	Chromium	100	74	Surface water (NRWQC-aquatic life)			
6	Cobalt	--	4.8	Drinking water (MTCA eq. 720-1)			
7	Lead	5.98	2.5	Surface water (NRWQC-aquatic life)			
8	Iron	1000	300	Secondary MCL			
9	Manganese	2,200	50	Secondary MCL (NRWQC-human health)			
10	Nickel	80	52	Surface water (NRWQC-aquatic life)			
11	Silver	12.88	3.2	Surface water (NRWQC-aquatic life)			
12	Zinc	207	120	Surface water (NRWQC-aquatic life)			
13	Methoxychlor	0.03	0.02	Surface water (NRWQC-human health)			
14	cis-1,2-DCE	70	16	Drinking water (MCL adjusted to HQ=1)			