



King County

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April 3, 2015

Krystyna Kowalik, L.G., L.H., L.E.G.
Washington State Department of Ecology
Waste 2 Resources Program
3190 160th Avenue SE
Bellevue, WA 98008

RE: Response to Ecology's Comments on Cedar Hills Regional Landfill
Draft East Perched Zones Remedial Investigation and Feasibility Study
Work Plan - December 2014

Dear Ms. Kowalik:

I am grateful for Washington State Department of Ecology's (Ecology) time and effort to review the above-referenced document and provide comments on March 3, 2015. The King County Solid Waste Division (KCSWD) and its consultants have reviewed Ecology's comments and this letter provides our response to your comments. The organization of this response is such that Ecology's comments are numbered in normal text, followed by KCSWD's response in *italic* text.

Work Plan Text, Tables, and Figures

1. Pg 8, 3.1.4.2 Northeast Shallow Perched Zone, third sentence: It looks, from Figure 6, that Stream 3 moves east-southeast.

Response: *The Work Plan text will be corrected to indicate that the Northeast Shallow Perched Zone moves east-southeast into Stream 3.*

2. Pg 11, 3.3.4 Other Utilities, second sentence: For clarity, because "Passage Point" is the current name of the facility, we suggest editing the sentence to read "it was associated with the facility currently known as "Passage Point."

Response: *The Work Plan text will be revised to clarify the Passage Point facility name.*

3. Pg 15, 5.1.1 Groundwater, second sentence: The number 38 seems low for a 28 year time span. Even if routine quarterly sampling only occurred for half of the time span, the number of sampling events should be 76.

Response: This was an error. The actual number of groundwater sampling events is 283. During the course of those groundwater sampling events, 55 field duplicates were collected as QA/QC samples.

4. Pg 17, 5.1.4 Soil Gas: Use of "soil gas" and "landfill gas" is confusing. It seems the work plan uses the term "soil gas" when analyzed for VOCs and "landfill gas" when analyzed for methane, CO₂, and O₂, yet it's the same gas at the same locations. We suggest the document define how these terms are being used.

Response: The Work Plan text will be revised to define "Soil gas" in accordance with Ecology's guidance document (Ecology, 2009). Soil gas refers to presence of vapors in subsurface soil (from a variety of sources) having the potential to impact indoor air quality. For this project, soil gas will be evaluated for vapor intrusion potential near the Passage Point facility and therefore is focused on just VOCs.

5. Pg 18, first full sentence at top of page starting "Because...": Please explain why MH-46N is more representative of east side leachate than P2. What mixed inflows are present at P2?

Response: The Work Plan text will be revised to explain that historical data from MH-46N is more representative of raw leachate from the Main Hill than PS-2 (the other routine Main Hill leachate sampling point with existing data) because PS-2 historically received other inflows, such as extracted groundwater in addition to leachate. This indicates the results of the leachate samples collected at PS-2 would be dilute and not actually representative of raw leachate.

6. Pg 21, last bullet: Should it be "North" or "Northeast" instead of "East"? In addition to the perimeter collector, the utility drawings indicate perforated leachate collection pipes between the landfill and the North Perimeter Collector at CO11 and CO12B, passing through native soil. The potential for leachate releases from these perforated pipes should also be considered.

Response: The notation will be changed to "North Perimeter Collector – East Branch" as it refers to the highlighted section of perforated pipe on Figure E-2. The potential for leachate releases and/or a landfill gas pathway into the adjacent soils has been identified as a data gap. The investigation of this potential data gap is identified in Table 10 of the RI Work Plan. The RI will include analyzing samples from select wells down gradient of the perforated pipe for leachate indicating parameters.

7. Pg 22, 6.2.1 Landfill Gas, third paragraph, third sentence: The reference to Figure 13 when discussing VOCs in landfill gas is confusing because that figure shows groundwater VOC concentrations and not LFG VOC concentrations.

Response: This sentence should not be referring to Figure 13. The reference to Figure 13 will be removed from the text.

8. Pg 23, second full sentence at top of page: Could stable chloride concentrations indicate there is a continuing source? The historic source could be gone, yet elevated chloride continues at lower levels because of an ongoing source.

Response: We acknowledge your keen observation. However, it is our hypothesis that stable chloride concentrations observed in the NESPZ are not indicative of a continuing source. Concentrations of chloride in fresh groundwater in many areas of Washington contain less than 10 mg/L (USGS, 2000). The chloride concentrations in MW-29, MW-30A, and MW-47 have all stabilized at less than 10 mg/L concentrations. These low concentrations of chloride appear to represent fresh un-impacted groundwater. If an ongoing source were occurring, it would suggest that the stable concentrations of chloride would be elevated above fresh groundwater concentrations of chloride. We will further examine the veracity of our hypothesis once the upcoming rounds of groundwater sampling are completed for the comprehensive RI report.

9. Pg 23, first full paragraph, second sentence: If leachate impacts have dissipated in the MW-47 vicinity, what is the explanation for the slightly elevated chloride at EW-14 and -15? How much is "slightly"?

Response: The sentence on page 23 that this comment is referring to is misleading and will be deleted from the text. Chloride data for EW-14 and EW-15 is sparse and sporadic as we only have two chloride data points for EW-14 and only one chloride data point for EW-15. The results for EW-14 are 14 mg/L and 16 mg/L while the detection for EW-15 was 11 mg/L. These detections are higher than the average chloride concentration (10 mg/L) in fresh groundwater referenced above. Because there are so few data for the extraction wells, we feel it is premature to draw a conclusion about the chloride concentrations at this time. The upcoming RI results from sampling the extraction wells will provide more clarity on the existing chloride concentrations in the vicinity of EW-14 and EW-15 and will provide sufficient data to evaluate the potential leachate impacts to this area.

10. Pg 23, 6.2.2.1 North Perimeter Leachate Collector – East Branch Source and Pathways, first paragraph: Please provide more information about the original purpose of this collector. If its purpose was to control shallow groundwater, was that because the groundwater was suspected or known to be contaminated with leachate?

Response: The Main Hill perimeter collector and side-slope leachate collectors (which includes the North perimeter collector- East Branch) were installed to convey liquids occurring either in the shallow native soils adjacent to the unlined Main Hill or within the refuse of the Main Hill. The Main Hill perimeter collector receives groundwater from the side-slope collectors and groundwater flowing beneath the liner from the north (CH2MHill and UES, 2004b). Because the Main Hill is unlined, it was assumed that any groundwater flow generated in proximity to the Main Hill perimeter collector was leachate or had the potential to become leachate. Therefore, the intent of the Main Hill perimeter collector was to collect the associated groundwater and convey it for treatment as leachate.

11. Pg 23, 6.2.2.1 North Perimeter Leachate Collector – East Branch Source and Pathways, second paragraph, item 1: What is meant by "3-foot trench liner"? The paragraph above item 1 says the liner went 1.5 feet up the sidewalls.

Response: The paragraph above item 1 is correct. The mention of a 3-foot trench liner was an error and should have read "1.5-foot trench liner." This will be corrected in the Work Plan text.

12. Pg 27, last paragraph, last two sentences: Were the constituents for which MDLs exceeded corresponding PSLs added to the list of preliminary COPCs?

Response: No, the constituents for which MDLs exceeded corresponding PSLs weren't added to the COPC list unless there were detections exceeding PSLs. This issue will be further addressed in the RI/FS Report by identifying specifically the non-detect constituents with current laboratory analytical MDLs that exceed PSLs and evaluating whether there is justification for these constituents to be retained as COPCs.

13. Pg 32, RI Activity table, first row ("Wellhead ..."): The Activity Duration column is blank. Is this item included in the 2 weeks duration for the activities listed above it on the previous page?

Response: Yes, the wellhead reconfiguration activity is included in the 2 weeks duration for the activities listed above. This table will be reformatted in the Work Plan.

14. Pg 32-33, 8.2.1.1 Groundwater: One sampling event might not provide sufficient data for 'groundwater quality. Wet and dry season sampling might be a better alternative.

Response: We agree that only one sampling event will not provide sufficient data to evaluate groundwater quality. As such, a total of 4 groundwater sampling events are planned during the RI, as indicated in the last paragraph of 8.2.1.1 on page 33.

15. Pg 35, second and third bullets: Ecology recommends sampling the shallow screen interval at the two ATC gas probes. These probes are nearest to the Passage Point facility where women and children are housed. If VOCs are present in the area of Passage Point, shallow gas data is better than using deep data and applying an attenuation factor.

Response: We agree that shallow soil gas is important for evaluating the potential for vapor intrusion at Passage Point facility. However, we are concerned that the shallow screened intervals at GP-ATC-5 and GP-ATC-7 probes are too shallow for representative sampling. As indicated in the footnote on the bottom of page 3, the top-of-screen depth for the shallow-screened probes at GP-ATC-5 and GP-ATC-7 is less than the 5 feet bgs, which does not meet the minimum depth recommended in Ecology guidance. This minimum top-of-screen depth is essential for minimizing the likelihood of diluting the soil gas sample with ambient air.

16. Pg 36, sentence near top of page beginning, "A soil gas sample will be collected ...": Consider using a smaller Summa canister. According to Blayne Hartman, Ph.D., the volume of soil gas withdrawn is an important issue influencing the integrity and composition of soil gas samples. "The larger the quantity of soil gas withdrawn, the greater the uncertainty about the exact location from which the soil vapor came.... In addition, large purge volumes can create vacuum conditions that cause contaminant partitioning from the soil into the soil gas.... Lastly, the larger the sample volume required, the larger and more complex the sample collection system required (e.g., vacuum pumps, larger sample containers)." (Hartman, 2002) According to Hartman, laboratories can get detection limits for VOCs of 0.2 to 0.5 ppbv with only 300 cc of sample using method T0-15. (Hartman, 2004)

Hartman, 2002, Blayne Hartman, Ph.D., *How to Collect Reliable Soil-Gas Data for Risk-Based Applications, Part I : Active Soil-Gas Method*, LUSTLine Bulletin 42, October 2002. <http://www.hartmaneg.com/wp-content/uploads/2013/11/L142.Soil-Vapor-Methods.pdf>

Hartman, 2004, Blayne Hartman, Ph.D., How to Collect Reliable Soil-Gas Data for Risk Based Applications – Specifically Vapor Intrusion, Part 3 -Answers to Frequently Asked Questions, LUSTLine Bulletin 48, November 2004. <http://www.hartmaneg.com/wp-content/uploads/2013/11/LL48-Soil-Vapor-Methods-Part-.pdf>

Response: We have carefully examined the merits of using 1-L versus 6-L Summa canisters for soil gas sampling and found the 6-L canisters more suitable for our use, primarily because the local laboratory that will perform the gas sample analysis (Fremont Analytical) indicated that they can only perform a single analysis on the 1-L canisters. The use of a 6-L canister allows for sufficient sample volume for reanalysis in case a dilution is needed.

We have also noted the potential disadvantages of a larger sample size cited by Dr. Hartman due to air dilution. However, we have safe guarded against ambient air intrusion into the sample by avoiding the wells/probes that have shallow screen intervals. The sampling procedure calls for purging and sample collection to be conducted at controlled flow rates and controlled negative pressure in order to minimize potential stripping of VOCs and prevent ambient air intrusion.

17. Pg 36, 8.2.1.5 Leachate, first sentence: This is the first time MH-17N and FS-3 are mentioned. Please provide a description of these sampling locations, including where they are located (refer to a figure) and what drains into them.

Response: The Work Plan text will be revised to provide additional clarification regarding these stations.

18. Pg 36, 8.2.1.5 Leachate, fourth bullet: Please explain the "truncated list". Table A-5 seems to indicate the list of analyses for water and leachate samples is the same.

Response: Table A-5 will be revised to reflect the difference between water and leachate analytical parameters.

19. Pg 38, 9.1.5 Develop and Screen Cleanup Alternatives, second sentence: Ecology has not made this determination. A landfill owner going through the MTCA process must develop and evaluate cleanup alternatives. While the result may be that it is impractical to move or treat the contents of a landfill, each site needs to be evaluated in accordance with the MTCA process.

Response: This sentence in the Work Plan text will be revised. We will include treatment and removal as alternatives during the alternatives development process of the FS.

20. Pg 38, 9.1.5 Develop and Screen Cleanup Alternatives, third sentence: Chapter 173-304 WAC is an ARAR for landfill closure. It is not a model remedy or presumptive remedy. Also, note that chapter 173-304 WAC is the minimum required for closure, if closure is part of the cleanup action.

Response: The Work Plan text will be revised to reflect accordingly.

21. Pg 39, 9.1.S.2 Detailed Screening and Analysis of Alternatives, second paragraph, second sentence: WAC 173-340-710(7)(c) says, "For solid waste landfills, the solid waste closure requirements in chapter 173-304 WAC shall be minimum requirements for cleanup actions conducted under this chapter." The closure requirements in chapter 173-304 WAC are found in WAC 173-304-460(3)(e) and pertain to the final cover design.

The starting point for the alternatives development and screening should be the remedial action objectives that come from the RI findings. A reasonable range of cleanup action alternatives should be developed that address the remedial action objectives. If the alternatives include cover improvement, it may be appropriate to use WAC 173-304- 460(3)(e) as an ARAR.

Response: The comment is acknowledged and will be reflected in the RI/FS.

22. Pg 40, 10.1 Schedule, second paragraph: What is the standard turn-around time for the TO-15 analysis laboratory?

Response: Standard turn-around-time for an air laboratory is 5 business days. The Work Plan text will be revised to provide additional clarification regarding the TO-15 turn-around-time.

23. Table 1 Summary of EPZ Explorations: MW-23 is a dry well and should be decommission and replaced.

Response: According to Table 1, MW-23 was decommissioned in January 2009. At this time, no new or replacement monitoring wells are proposed for the RI. However, if during the data evaluation process of the RI we identify a groundwater data gap that could be addressed by additional well installation, a new replacement well will be proposed for Ecology's approval.

24. Table 7 Preliminary Groundwater Screening Criteria and Method Detection Limits: We could not confirm some of the criteria listed in the column for WAC 246-290-310 MCLs. Please provide a citation for the values listed for:

- Bromodichloromethane
- Bromoform
- Chloroform
- Dibromochloromethane
- Methylene chloride

Response: The MCL value for bromodichloromethane had a unit error and should have been 80 µg/L. The reference for these MCL values is Ecology's CLARC database. They are noted as Washington MCLs. Under WAC 246-290-310, bromodichloromethane, bromoform, chloroform, dibromochloromethane are grouped together as Total Trihalomethanes.

25. Table 9 Preliminary COPCs, Landfill Gas column: Is the "s" a typo?

Response: Yes, this is a typo and it will be corrected in the table.

26. Table 10 Data Gaps and RI Work Element Cross-Reference: Data gap for Groundwater should include abandonment of dry wells and drilling new wells. Also cleaning and purging some of EW series wells.

Response: We acknowledges Ecology's comment about abandonment and replacement of dry wells as a data gap. However, at this time well abandonment and new well installation will not be addressed as part of the RI. During RI groundwater sample collection from the EW series wells, the condition of the wells will be carefully evaluated. If during sample collection significant drawdown is encountered and the determinations in the RI include additional sampling of EW series wells, then rehabilitation will be proposed for your consideration. If, during the data evaluation process of the RI we identify a groundwater data gap that could be addressed by additional well installation, this will also be proposed for Ecology's approval.

27. Figure 2: The four blue patches extending from Area 6 to the South Solid Waste Area are not current features and for clarity, should be removed.

Response: These old water features will be removed from Figure 2.

28. 5a; 5b; 5c requires corrections - namely an explanation to the occurrence of groundwater table. 5a should be divided in segments for clarity.

Response: The legend on the figures provides an explanation for the groundwater levels. The two groundwater level markers for each well indicate the range in water level for the period of record. Dividing the series 5 figures into segments for clarity will be examined after collecting new data for the RI report.

29. Figure 6, does not have a date and year when the contours were compiled. Elevation values for the wells that were measured for groundwater levels should also be given on the map. That also pertains for figure 7; wells monitoring regional aquifer should have elevation values and date.

Response: The note in the legend on both figures explains that the groundwater elevation contours are from December 2006, with the exception of MW-102, MW-103, and MW-104 which are from June 2009. These figures are for preliminary planning purposes. Groundwater elevation values for each well will be added on the groundwater potentiometric figures developed for the RI report.

30. Figure 8: The additional Groundwater Extraction wells that were not dry should be included in the site model. The dates of sampling are 2009; 2013 data from the same year will be better evidence of methane concentration and occurrence. The screen elevation for each well should be added. The same applies for figure 10.

Response: We interpreted the comment to be referring to Figures 8, 9, and 10. An extraction well will be added to the conceptual site model on Figure 8. For Figures 9 and 10, a mix of 2009 and 2013 data was used because the dataset contains sporadic data (not all the gas probes were sampled in 2013). These figures are developed for preliminary planning purposes and the upcoming sampling that is planned for the RI will provide a more comprehensive dataset. We will add a footnote to these figures that references Table A-3 in Appendix A, which contains the monitoring well screen depth data. Further updates to the figures will be made during the RI report.

31. Figure 11: It is not clear what are dates from which data was obtained in all wells except EW7 (2007). Screen elevation should be included (top of the screen and length). The same comment applies to Figure 12.

Response: The figures are already separated into shallow and regional aquifers to separate data by the two distinct groundwater bodies. We will add a footnote to Figures 11 and 12 that references Table A-3 in Appendix A that contains the screen depth data. Table A-3 will be revised to include the screen depth for all the wells during the RI report, including those where only water levels will be measured.

32. Figure 13: the dates differ for data included on the map, see comment 4. Screen elevations need to be added. Groundwater Extraction wells screen elevation varies from north to east. The same comments apply to figure 14 and in figure 15. Why were extraction wells EW9;10;11;12;13 not sampled for VOC's.

Response: The dates for data differ due to the sporadic data in existing dataset. The figures include the most recent data available for each of the wells in order to present a more comprehensive evaluation of existing conditions at the site. Completing the upcoming work proposed for the RI will provide a current and comprehensive groundwater dataset based on all wells using data collected from the same timeframe. We will add a footnote to Figures 14 and 15 that references Table A-3 in Appendix A that contains the screen depth data. Table A-3 will also be revised to include the screen depth data for all of the wells for the RI.

EW-9 through EW-13 do not have any corresponding water level or groundwater sampling data. These wells were not included in King County's groundwater sampling program. Some of these wells were either seasonally dry or dry at the time of drilling, or even when they did contain water, the water column did not yield sufficient volume for collecting a representative groundwater sample.

33. Figure 16: The map for metals in the regional aquifer includes data from year 2014 which is 7 years later than data for metals in perched zones. Screen elevations for each well should be added on the map.

Response: Figure 15 included data from 2007, 2009, and 2014, depending on what the most current data available for each well. For Figure 16, all of the regional wells were sampled in 2014. Since not all of the shallow perched wells have been sampled in the last 7 years, presenting the most recent data from each well is more representative as it presents the last known groundwater quality condition in each well. If the dataset was limited just to 2014, then a complete picture of groundwater conditions across the entire EPZ could not be depicted. The intent of these figures is to provide a preliminary evaluation of existing data. Completing the upcoming work proposed for the RI will provide a current and comprehensive groundwater quality dataset that will be evaluated for all of the wells using data from the same sample period timeframe.

We will add a footnote to Figure 16 that references Table A-3 in Appendix A that contains the screen depth data. Table A-3 will also be revised to include the screen depth data for all of the wells included in the RI.

Appendix A – Sampling and Analysis Plan

1. Please number the pages.

Response: The final Sampling and Analysis Plan will have page numbers.

2. 2.1.2.1 Passive Diffusion Sampling: Please include a brief discussion in the SAP or the Work Plan about passive diffusion sampling – what it is, its advantages, and why you are trying it.

Response: We will revise the Work Plan text to include a description and rationale for the passive diffusion sampling.

3. Soil Gas Sampling: See comment 16 above about the Summa canister size.

Response: Please see response to Work Plan comment #16.

4. Page 3 Groundwater Monitoring Parameters; At which point background values for metals As; Fe; Mg; Chl; will be established.

Response: We acknowledge your comment and background levels will be evaluated during the RI.

5. Page 6 Well Inspection: Groundwater Extraction well EW series should be inspected to determine if cleaning or additional renovation is needed before sampling.

Response: During the upcoming RI groundwater sample collection from the EW series wells, the condition and response of the well to sample purging will be evaluated. If during sample collection significant drawdown is encountered and the determinations in the RI include additional sampling of EW series wells, then rehabilitation will be proposed for your consideration.

6. Table A-4: For soil gas, the table lists a 1-L Summa canister. This is not consistent with other parts of this work plan.

Response: The Summa canister size specified in this table will be changed to 6-L.

7. Figure A-2: Where is the secondary water level locations discussed in the text?

Response: The secondary water level locations are discussed on page 33 of the Work Plan. The text states that: "Water level measurements will be taken at locations south of the project area as a contingency. These data may be used if this area is found to be impacted during the RI or additional data are necessary to evaluate flow paths and the site conceptual model." We will clarify this statement so that it refers to the secondary water level locations identified on Figure 17 and A-2.

8. Figure A-3; Wells: EW -9, EW-10, EW-11, EW-12, and EW13 excluded, add explanation why. Add screen elevations for each well that will be sampled. The same for the figure A-4.

Response: EW-9 through EW-13 have historically been seasonally dry, were dry at the time of drilling, or even when they did contain water, the water column did not yield a sufficient quantity of groundwater for collecting a representative sample. This is why they are not included in the groundwater sampling program. However, the RI includes a task to measure water levels at all of these extraction wells. If there is sufficient water present at these wells at the time of the RI field effort, then low-flow groundwater samples will be collected.

Screen elevations for each well that will be sampled are presented on Table A-3. The figures will be updated to include a footnote that references Table A-3 in Appendix A that contains the screen depth data.

Appendix C: Individual Constituent Extent Maps

1. Figure C-1; Wells with detection are mostly EW series, sampled in 2007, except EB-6 data from 2014. It is not clear in what year the remaining wells on the map (non-detect) were sampled.

Response: Since these figures have to be updated after the upcoming RI sampling event, we do not plan on revising these figures for the Work Plan at this time. However, these comments will be incorporated in figures for the RI Report. Your consideration for our lean practice is greatly appreciated.

2. Figures: C-1 to C- 19 should have screen elevations included for the wells shown on the figures. The date of sampling should be added on the map for each well, some are missing, for example: not detect wells.

Response: Please see our response to above comments.

3. Figure C-3; Some monitoring wells date is from "below the screen" orange circle, no value is given. Date of sampling event is not indicated either. Include missing information on the map at each figure where it is missing.

Response: We acknowledge your comment about omitted information for detections below screening levels; however, these figures were meant for preliminary evaluation to observe the spatial extent of exceedances. It is most important to include the results for the wells that had exceedances, since that is what drives the selection of COPCs. We feel that adding additional data to these maps, such as the results for the detections below screening levels, will clutter the figures and distract from the main objective of the figure.

4. Figure C-15, repetitious of Figure 13. Figure C-16 is the same data as in Figure 14.

Response: Figure C-15 depicts the extent only of vinyl chloride in shallow perched groundwater for the most recent sampling year for each well. This figure is distinct from Figure 13 because Figure 13 presents all of the VOC data combined for the shallow perched groundwater. As such, some of the wells identified as red on Figure 13 are not red on Figure C-15 because vinyl chloride was not detected (e.g. MW-30A and EW-27). The intent of the individual extent maps in Appendix C was to visually present the spatial variation among the individual COPCs. The same logic follows for Figures C-16 and Figure 14. For the RI report we all add footnote on each figure to clearly explain the intent of the figures.

Appendix D: Time Series Concentration Plots for Selected Monitoring Wells

1. Figure 1 and 2; Explain why MW-27 is compared to MW-29 and MW-30, also why Alkalinity values are average.

Response: Please note that the figure titles incorrectly identified the wells used to develop the graphs. Figure D-1 presented data for MW-47 and Figure D-2 presented data for MW-30A. We apologize for any confusion this may have caused. The alkalinity time series concentration plots for MW-47 and MW-30A were compared to the average MW-29 alkalinity concentration because MW-29 is located in an area of the NESFZ that is not impacted by the landfill and is thus the closest to "background" that is available. Showing this comparison provides context for the elevated nature of alkalinity in these wells. The Work Plan text will be revised to include an explanation to this effect. These plots will be revised to include the average alkalinity concentration for MW-29 using the entire data record, rather than limiting it to just 2013-2014 data.

Appendix E: Existing Infrastructure

1. Figure E-2, Leachate System Map: Several of the leachate lines are shown with long dashes, which, according to the legend, means the line type (solid or perforated) is not specified. It is concerning that King County does not know if leachate lines, such as the forcemain from PS- 2 to MH-15 or the line from MHL to PS2, are solid or perforated. Please show these as solid or perforated. If there is doubt, a task to determine their status should be added to the RI.

Response: For inclusion in the RI, Figure E-2, Leachate System Map, will be modified to indicate the existing condition of leachate lines (i.e. solid or perforated). As indicated in Table 10 – Data Gap 8, a camera inspection is planned to be performed to verify if the associated lines are solid or perforated.

References

CH2M Hill and Udaloy Environmental Services (UES), 2004b, Cedar Hills Regional Landfill, Evaluation of Perched Saturated Zones Adjacent to the Unlined Portion of the Main Hill, Prepared for King County Department of Natural Resources and Parks, Solid Waste Division, May 2004.

Ecology, 2009. Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, October 2009

USGS, 2000, Is Seawater Intrusion Affecting Ground Water On Lopez Island, Washington USGS Fact Sheet 057-00, April 2000

Krystyna Kowalik
April 3, 2015
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Below, please find a copy of our proposed schedule.

RI Activity	Activity Duration	Target Start Date
Groundwater level monitoring; stream gaging	1 week	May 18, 2015
Deployment of PDB and RPP samplers		
Required PDB and RPP sampler equilibration	2 weeks	---
Collection of PDB and RPP samplers; collection of low-flow groundwater samples	2 weeks	June 8, 2015
Stream sampling and gaging		
Leachate sampling		
Wellhead reconfiguration for soil gas sampling		
Leachate system evaluation and camera work	1 week	June 22, 2015
Required wellhead gas equilibration	2 weeks	---
Soil vapor sampling	2 weeks (weather-dependent)	July 6, 2015
LFG system evaluation	2 weeks	July 20, 2015
2 nd Groundwater Sampling Event	2 weeks	September 7, 2015
Submit Draft RI/FS Report	---	October 19, 2015
3 rd Groundwater Sampling Event	2 weeks	December 7, 2015
4 th Groundwater Sampling Event	2 weeks	March 7, 2016

If you have any questions, please call me at 206-477-5221.

Sincerely,

Toraj Ghofrani, P.E.
Project Manager

TG:er
Kowalik – Response RI-FS Work Plan – Final 040315

cc: Neil Fujii, Managing Engineer, Solid Waste Division