STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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November 18, 2014

Mr. Dan Swope
King County Solid Waste Division
Department of Natural Resources and Parks
King Street Center
201 South Street, Suite 701
Seattle, WA 98104-3855

Re: Vashon Island Closed landfill Demonstration to End Annual Appendix III Sampling

Dear Mr. Swope:

As discussed at the meeting on October 16, 2014, The Department of Ecology (Ecology) provides in this letter, the review, and comments of the Demonstration Report. The Demonstration Report could be finalized and submitted as a basis to end sampling requirements for Appendix III at Vashon Landfill. Demonstration should be guided by WAC 173-351- 440(3)(4);(5);(6);(7) which include requirements that address demonstration document content.

A concise groundwater quality description for Vashon Island landfill should be included for better understanding the changes in concentration that occurred over time. The chemical data that is taken for comparison between chlorides and Appendix III constituents should be taken from the same years during which the Appendix III sampling was conducted. Table 2 in the report presents data that was selected randomly from different years.

The detection limits have changed during the years of groundwater sampling at Vashon Island landfill, dates should be included in the report when the changes occurred. WAC 173-200 should be used for groundwater quality standards.

It is also apparent that, there were no five consecutive years, during which groundwater in designated wells was sampled for Appendix III constituents. Data collected over longer period provides better evidence of any chemical detection in the groundwater.

Since sampling was conducted in 2003, 2011, and 2012, Demonstration Report should provide explanation of why sampling for the Appendix III constituents was limited only to those three years and why there was 7-year brake in sampling.
The detailed comments are included below, following chapters in the Demonstration Report.

Purpose:

The purpose is to demonstrate that sufficient data was collected to terminate Appendix III sampling at Vashon Island landfill. The exceedances of Vinyl Chloride triggered assessment-monitoring program.

High concentration of Vinyl chloride in the groundwater samples continue for many years at Vashon Island landfill. The corrective action is implemented at this time to achieve compliance status and limit impact to groundwater from the landfill.

WAC 173- 351- 440(3) t requires that analysis of groundwater samples will be tested for all constituents in Appendix III (annually thereafter). It should be stated in this section what precisely King County Solid Waste Division is requesting: to cease sampling for appendix III, for what period of time. Specify the beginning date and the ending year. It also would be useful to mention how many years, and how many wells were actually sampled for appendix III Expanded analytes list within an aquifer Cc2. For example, three wells in 2003.

The organics of the expanded list Appendix III do not have background value established for Vashon Island landfill. If the concentration values of organics in the samples obtained from up gradient well were used in statistical analysis to be compared to concentrations from down gradient wells that does not establish background values for organics in the groundwater. It should also be mentioned in this section that there are two sources which contribute of VOC' in the groundwater beneath Vashon Island landfill, one is leachate and the second is landfill gas.

Sampling and Analysis Plan for Vashon Island landfill should discuss the reason the landfill is in the Assessment Monitoring Program and the history of Appendix III testing at the landfill.

Introduction:

1. Include groundwater quality chemistry characteristic description, and discuss the Cc2 unit wells groundwater quality changes over last 5 years period.
2. Describe preferential pathway for leachate migration from the landfill to groundwater.
3. Provide history of landfill gas monitoring at the Vashon Island landfill.
4. Describe briefly groundwater fluctuation and correlation to changes in concentrations of VOCS such as Vinyl Chloride.

Demonstration to End Appendix III Sampling in Cc2 hydrogeologic unit.

1. Provide data supporting first sentence for example, in all three years of sampling there were no detection of App. III analytes in all wells within Unit Cc2. Washington State Groundwater Standards WAC 173-200 should be used in all evaluations groundwater quality.
2. Include map that shows leachate testing locations at the Vashon Island landfill
   Table 3 should refer to the map.
3. In addition to rationale of the Chloride in leachate versus Appendix III constituents detection, include discussion of groundwater quality data changes in the Cc2 unit
4. The statements that, chloride minimize the impacts of leachate are not correct.
5. List "contaminants of concern" include Vinyl Chloride in discussion.
6. Explain statement about "additional means to assess potential impact to groundwater" groundwater impact is documented, based on exceedances of Vinyl Chloride over last 28 years.
7. In last paragraph, during what period of time did concentration of Chlorides decreased? Provide dates and indicate in what season data was collected, wet, or dry.

8. Did chloride concentration in leachate decreased in the same time as chloride concentration in groundwater.
9. Table 1, Presents Chloride concentrations for 2013 only. Based on time series plots from annual report the concentration value fluctuate, which most probably correlates with precipitation and seasonal groundwater fluctuations. Historical maximum values do not represent overall groundwater quality. The comparison is random and it is difficult to draw a definite conclusion from one number per sampling point.
10. Table 2 and Table 3 plot location on the map, which will be included in new submittal.
11. For Table 2 provide some illustration for the meaning of data. The years of sampling do not correspond to Appendix III sampling year; data is chosen randomly.

Conclusions

1. The sampling for Appendix III constituents was not conducted for last two years from 2012 to2014.
2. The detection of Appendix III constituents is poorly documented. Data from 2003 is not consistent with data from 2011 and 2012; there is a seven year break of no testing. There is a good chance that detection of other Appendix III constituents might occurred based on detection of Dichlorodiflоromethane, if sampling was conducted for 5 consecutive years. In addition, change of detection limits might account for no detection of Appendix III constituents.
3. Contaminants of concern should be listed. One prominent indicator is VOC Vinyl Chloride, which might indicate presence of Appendix III constituents.
4. If an increase in concentration of VOCs would occur in the next three years Ecology will require testing for Appendix III constituents immediately upon occurrence. The statistical increase of VOC's concentration will also cause testing quarterly for Appendix III constituents.
5. In 2018 if assessment monitoring is not completed the annual sampling for Appendix III will resume and will be conducted quarterly until corrective action is implemented.

If you have any questions, please call me at (425) 649-7051.

Sincerely,

K. Kowal

Krystyna Kowalik
Regional Hydrogeologist.

cc: Anne Holmes, King County Solid Waste division
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