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Environmental Health Division

August 28, 2015

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DEPARTMENT OF ECOLOGY

Georgia Baxter, Chief Executive Officer
JH Baxter & Company
PO Box 5902
San Mateo, CA 94402

Subject: Request for Revision to Groundwater Monitoring Plan; Baxter North and Baxter South Woodwaste Landfills located in Arlington, Washington

Dear Ms. Baxter:

We have reviewed your letter of April 2, 2015 and technical memorandums from Water Solutions, Inc. dated March 31, 2015 requesting a reduction of monitoring at the Baxter Landfills. Snohomish Health District (SHD) cannot consider your proposal until it can be shown to meet the requirements of the *Minimum Functional Standards for Solid Waste Handling* (MFS) WAC 173-304-490 and the Washington State Department of Ecology (DOE) publication titled *Preparing for Termination of Post-Closure Activities at Landfills Closed Under Chapter 173-304 WAC* (Termination Document), including the addendum to this document last revised January 2012. The following issues need to be addressed:

1. We noted that arsenic levels are trending upward at Baxter North landfill (down-gradient monitoring well BXN-1) where arsenic is currently 2.5 times the drinking water standard Maximum Contaminant Level (MCL) and 10 times over background. Arsenic levels are also trending upward at Baxter South landfill (down-gradient monitoring well BXS-3) where arsenic is currently 16 times the MCL and 25 times over background. We understand the hypothesis included in your technical memorandum, where it was explained that recent increase in arsenic levels are the result of a reduction/oxidation (redox) condition. Nonetheless, WAC 173-304-490 (2) j requires us to consider corrective actions in this situation, such as landfill cover improvements. Therefore, more information about any potential risk will be needed that includes a map showing estimated size of the plume and locations of neighboring wells.
2. We cannot support a reduction of sampling to annually. As you know, WAC 173-304-490 (2) (g) requires the owner to determine groundwater quality at each monitoring well at least quarterly. However, the addendum to the DOE Termination Document suggests that semi-annual would be acceptable as a minimum. After reviewing some of the trend graphs provided, several of the chemical parameters appear to have seasonal fluctuation that may provide inaccurate results if collected less frequently. More analysis of this issue would have to be done before we could support less frequent sampling.
3. After reviewing the data from the Baxter North Landfill we agree that the background well appears to be impacted by offsite contamination. The MFS rule WAC 173-304-490 (2) (f) requires the owner to test each well to see if a significant change over background has occurred. According to the *Statistical Analysis of Groundwater monitoring Data RCRA Facilities; Unified Guidance 2009*, section 5.2.5 "If upgradient well background becomes contaminated, intrawell testing may be needed to avoid inappropriate comparisons." An intrawell statistical test is described in section 6.3.2 of the *Unified Guidance*.

4. We agree with your proposal to eliminate chemical parameters from the monitoring program that are found to be below the regulatory levels. The DOE Termination Document considers evidence of insignificant leachate production as a chemical parameter that has had no recent, or ongoing exceedances, of Chapter 173-200 WAC criteria. SHD would expect a parameter that is candidate for elimination to have the maximum concentrations, in all down-gradient wells, over the past 5 years, to be below regulatory level as defined in WAC 173-304-9901 and table 9.1 in the *Implementation Guidance of the Ground Water Quality Standards* revise 2005.
5. If a chemical parameter being monitored has no regulatory level, then down-gradient well must not exceed background levels when that chemical is found in the waste, i.e. tanning and lignin, or when that chemical is a risk, i.e. ammonia, following WAC 173-304-100 (16) (c). In addition, if the parameter already exceeds a regulatory level in the background well, it cannot be significantly higher in the down-gradient level, and this determination must be made using statistics, such as prediction limits or intrawell data.

Although you provided graphed concentrations of chemical parameters in the proposal, where it was possible to compare background wells to down-gradient wells, in some cases the scale of these plotted diagrams are such that there was no visual way to determine if they are below background data. For example, the zinc values are low, but are above the laboratory detection levels and should be evaluated statistically before eliminated.

6. In addition, a chemical parameter that is a candidate for elimination must be trending down or stable. We noted that your report includes statistical trend analysis as required by WAC 173-304-490 (2) g. As you know, the DOE Termination Document also requires this trend analysis, where the slope needs to be zero, or less, to provide evidence of stability. Although the DOE Termination Document didn't include what confidence level that was needed, SHD would only consider parameter for elimination if there were within a +95% confidence level with low variability, using the last 5 years of data. Therefore, chemical parameters that are designated as "probably decreasing", "increasing trend", or "no trend", using the Mann-Kendall test results you provided will not be a considered for elimination.
7. A monitoring plan will be needed for our review before we can consider changes, which includes the issues outlined above and the following miscellaneous issues below:
 - a. We noted that several parameters will change from laboratory analysis to field tests. Please provide standards and quality control measures that will be used.
 - b. Total coliforms testing can be eliminated at both landfills, include an explanation that may include sampling complications and well construction problems.
 - c. BXN-3, and perhaps other wells, could be eliminated from the monitoring plan if a data analysis shows can show that other down-gradient wells are just as representative in showing impacts in each parameter monitored.

Please have the revised monitoring plans submitted within 90 days of the date of this letter for our review. If you have any questions about this matter, please contact me at 425.339.5250.

Sincerely,



Mike Young, RS
Environmental Health Specialist

MY:jg