



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

October 26, 2009

REPLY TO THE ATTENTION OF:
SR-6J

Gary L. Kelterborn
Project Coordinator
CMS Energy
1945 W. Parnall Road
Jackson MI 49201

Re: Administrative Order on Consent for Removal Action, Docket No. VW-05-C-810
Little Traverse Bay Cement Kiln Dust Release Site : EPA Review of Development
RI/AE (*Removal Action Investigation/Remedial Investigation Report Volumes 1, 2
and 3 for West, Seep 2 and Seep 1 CKD and the Alternatives Evaluation Report
Revision 0.0 for West, Seep 2 and Seep 1 CKD Areas (Development RI/AE) for the
Little Traverse Bay Cement Kiln Dust Release Site (July 31, 2009)*).

Dear Mr. Kelterborn,

The United States Environmental Protection Agency (EPA) has reviewed CMS' Development RI/AE. EPA was assisted in its review by the Michigan Department of Environmental Quality (MDEQ) and the Little Traverse Bay Band of Odawa Indians (Tribe).

EPA appreciates the extensive work that CMS has conducted to date on this effort. We look forward to working with you closely in the coming months to complete this work. We have formulated a number of comments and requirements for additional work which are provided in the enclosure to this letter. As you will see, several major themes dominate these comments:

- Additional field investigation work is necessary to develop a full understanding of the nature and extent of contamination at the site. Significantly, efforts to date do not fully evaluate the potential impact of site contaminants on the drinking water aquifer which supplies municipal wells located to the south of the site;
- Additional field investigation work is necessary to better understand the dynamics of perched leachate formation and migration in the development area. A thorough understanding of perched leachate will enable the evaluation of those engineering controls will most effectively control generation of leachate. In turn, this will inform development of remedial options to achieve optimization of reduction of mercury loadings to Lake Michigan; and
- Additional field investigation is necessary to complete the characterization of several additional site parameters besides mercury, along the lakeshore.

Other deficiencies noted in the draft document relate to the conceptual site model (CSM), calculations of mercury flux in the development area, failure to submit a Mixing Zone Request for MDEQ review as part of the RI/AE, and cost optimization estimates.

EPA acknowledges receipt of a TI Demonstration document from CMS. However, the protocol for applying for a Rule 716 variance requires that the request be submitted initially to the MDEQ once data collection necessary to prepare such a request has been completed.. CMS should submit a revised Technical Impracticability (TI) Demonstration document to MDEQ if it seeks regulatory consideration of technological impracticability for venting groundwater. The revised TI Demonstration shall incorporate the additional data generated as requested in this letter.

Additional monitoring wells are required to fill data gaps. Details for the locations, number and depths of the additional required monitoring wells are specified in the attached comments. CMS shall submit a workplan no later than November 16, 2009 for completion of these wells.

CMS shall submit a revised RI/AE for the development area to EPA within 30 days of completion of the first round of quarterly sampling of the new data gap wells prescribed in the attachment.

EPA's comments on section 2.4.1.3 Leachate Management Response Actions of the RI/AE for the development will be transmitted to you under separate cover within the near future.

Your cooperation on this matter is appreciated. If you have any questions or would like to schedule a meeting to discuss our comments, please feel free to contact me. I can be reached at 312-886-6195.

Sincerely,



Ross del Rosario
Remedial Project Manager

Enclosures

Cc: Ralph Dollhopf, OSC
Joan Tanaka
Bob Wagner, MDEQ
Elaine Pelc, MDEQ
Kevin Adler, RPM
Rachel Smolinski, Odawa Tribe
Scott Kendzierski, Northwest Health Agency

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Following are the compiled comments from the EPA, MDEQ, and Tribe on the Draft Development RI/AE for the Little Traverse Bay Cement Kiln Dust (CKD) Release Site, submitted in August 2009. The comments on the RI/AE are framed within the following categories: RI Site Characterization/Data Gaps, Conceptual Site Model, Alternatives Evaluation, Mercury Flux Calculations, Mixing Zone Request and Cost Estimates.

RI Site Characterization/Data Gap Comments:

1. In the Executive Summary of the RI, Page xx, bottom paragraph, it is premature to conclude in this paragraph and elsewhere in the document that surface water does not represent a significant exposure to potential contaminants of concern (COCs), other than pH; and that the interim response measures are effectively mitigating the release of potential COCs to the lake. The site baseline ecological evaluation is still under review, and the mixing zone analysis for the COCs with the exception of mercury has not been submitted, reviewed, or accepted. These documents must be reviewed and approved before such statements can be considered for final RI/AE acceptance .
2. Section 2, Page 42, middle paragraph. There is no substantiation at this time that the occasional, low-level pH exceedances do not pose any threat to public health, safety, or the environment. Please remove this statement from the text.
3. Section 4.3.2 - Water Cycle Monitoring. The RI shall discuss in more detail the role that infiltration from precipitation and irrigation potentially plays versus evapo-transpiration and runoff in the overall water cycle for the development. EPA and MDEQ recommend that a water cycle modeling program be considered, such as the Army Corps of Engineers Hydrologic Evaluation of Landfill Performance (HELP) model to fully evaluate the water cycle balance.
4. The COC exceedances discussed in the RI are focused on surface water as the sole receptor for the groundwater contamination. Evaluation of the data generated along the south side of the site shall also consider the effects of COCs upon the drinking water aquifer and drinking water sources. Drinking water sources as a receptor shall also be discussed in the conceptual site model for each of the CKD areas.
5. Groundwater elevation contour maps in deeper portions of the regional aquifer are not presented in the report. Evaluation of groundwater flow in deeper regions in the aquifer relative to the municipal well shall be presented. Additionally, groundwater contour elevation maps for perched groundwater shall also be presented in the report.
6. Section 1.2, Investigation Completeness, Page 2. The first sentence of the first paragraph states the "The Site RI investigation activities met the objective of generating the data

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necessary to complete the Site Characterization in order to evaluate final remedy alternatives....” This statement, upon review of site specific boring logs, field logs, maps, and cross sections and other data provided in the RI, appears to be inaccurate for the following reasons:

The extent of groundwater contamination along the south boundary of the development at the Seep 2 and West CKD areas is not defined as it pertains to drinking water COC exceedances. This is especially significant given that there are municipal wells located south of the development in these areas with incomplete COC characterization. The fractured limestone aquifer south of the site is considered a drinking water aquifer. The National Contingency Plan (NCP) sets the expectation that contaminated, usable groundwater at remedial sites be returned to beneficial use within a reasonable timeframe [40 C.F.R. 300.430 (a) (1) (iii) (F)]. Therefore, the nature and extent of contamination in the fractured limestone drinking water aquifer south of the West CKD, Seep 2, and Seep 1 piles needs to be further characterized. The following additional data gap wells are necessary to further characterize the extent of contamination along the south side of the development. The locations for each of these additional wells are shown for each seep area in figures included in Attachment 2.

- South of West CKD pile: additional well cluster B30XX (4 well screens denoted as W31XX, W32XX, W33XX, and W34XX), additional well cluster B30YY (4 well screens denoted as W31YY, W32YY, W33YY, & W34YY).
- South of Seep 2 pile: additional well cluster B20XX (4 well screens denoted as W21XX, W22XX, W23XX, W24XX), additional well cluster B20YY (4 well screens denoted as W21YY, W22YY, W23YY, W24YY), additional well cluster B20ZZ (4 well screens denoted as W21ZZ, W22ZZ, W23ZZ, W24ZZ), and 3 additional well screens at B2044 (denoted as W2444, W2544, & W2644).
- South of Seep 1 pile: additional well cluster B10WW (4 well screens denoted as W11WW, W12WW, W13WW, W14WW).

Well screen depths and location coordinates are provided in Attachment 1. The list of required target COCs provided in Attachment 3 shall be analyzed at each of the wells listed above. For all data gap wells installed, EPA will require four quarters of sampling at each well (assume January/February, April/May, July/August, and September/October 2010).

7. Section 1.2, Investigation Completeness, Page 2. The first sentence of the second paragraph states the “the extent of CKD leachate impacts at Little Traverse Bay have been defined.” This statement is incorrect. Although the current data suggest that much

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of the contamination has been identified, numerous COCs, including mercury, have not been fully defined. The recent mercury flux data gap evaluation performed by EPA and MDEQ to identify mercury venting to the surface water along the lakeshore clearly demonstrates that the CKD impacts have not been fully defined. Furthermore, following our review of other COCs we have determined that the CKD leachate impacts along the lakeshore have not been fully defined. In addition to the data gap wells that CMS is currently installing for determination of mercury flux, additional data gaps and required corrective actions are identified at the following well locations:

West CKD:

- W3118: Chloride concentrations exceed groundwater/surface water interface (GSI) criteria; additional horizontal delineation is required to the west. The proposed mercury data gap well cluster B3076 is adequately located for collection of additional groundwater samples to delineate COCs to the west. This well cluster shall also be sampled for the target COCs listed in Attachment 3.
- W3419: Chloride, Total Dissolved Solids, pH, Chromium, Selenium, Silver, and Vanadium concentrations exceed GSI criteria. The proposed mercury data gap well W3519 is adequately located for collection of additional groundwater samples to delineate COCs below W3419. This well shall also be sampled for the target COCs listed in Attachment 3.
- W3474: pH measurements exceed GSI criteria; additional vertical delineation is required. The proposed mercury data gap well W3574 is adequately located for collection of additional groundwater samples to delineate COCs below W3474. This well shall also be sampled for the target COCs listed in Attachment 3.
- B3074: Additional groundwater sampling and analysis shall be conducted in this well cluster for the target COCs in Attachment 3.
- B3075: Additional groundwater sampling and analysis shall be conducted in this newly proposed mercury data gap well cluster for the target COCs in Attachment 3.

Seep 2:

- W2453: Chloride, Total Dissolved Solids, pH, and Vanadium concentrations exceed GSI criteria. The proposed mercury data gap well W2553 is adequately located for collection of additional groundwater samples to delineate COCs below W2453. This well shall also be sampled for the target COCs listed in Attachment 3.
- B2053: Chloride, Copper, Nitrogen, Total Dissolved Solids, pH, Selenium, Silver, and Vanadium concentrations exceed GSI criteria. Adjacent well clusters west of B2053 were not sampled for these COC exceedances. Therefore, additional groundwater sampling and analysis shall be conducted in well clusters B2095 and B2096 for the target COCs listed in Attachment 3.

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- W2441: Chloride, Total Dissolved Solids, Silver, and Vanadium concentrations exceed GSI criteria. The proposed mercury data gap well W2541 is adequately located for collection of additional groundwater samples to delineate COCs below W2441. This well shall also be sampled for the target COCs listed in Attachment 3.

Seep 1:

- W1313: Chloride and Total Dissolved Solids concentrations exceed GSI criteria. The proposed mercury data gap well cluster B2099 is adequately located for collection of additional groundwater samples to delineate COCs west of W1313. This well cluster shall also be sampled for the target COCs listed in Attachment 3.
- W1345: Chloride, Total Dissolved Solids, pH, Arsenic, Copper, Nickel, Selenium, and Vanadium concentrations exceed GSI criteria. No analytical data information is provided in RI for existing wells W1445 and W1545. Therefore the analysis cannot be completed regarding extent of COCs at this location. Additional sampling is required for the target COCs listed in Attachment 3 at W1455 and W1545.

The following additional data gap well cluster is necessary to further characterize the extent of contamination along the north side of the site. The location of this well cluster is shown on the figures provided in Attachment 2.

- Shoreline Seep 2 Area: additional well cluster B20WW (4 wells screens denoted as W21WW, W22WW, W23WW, W24WW).

Well screen depths and location coordinates are provided in Attachment 1. A list of required target COCs is provided in Attachment 3. For all additional data gap wells installed, the EPA will require four quarters of sampling at each well (assume January/February, April/May, July/August, and September/October 2010).

Note: mercury GSI exceedances have been identified in the recently issued EPA/MDEQ Development Area data gap well analysis and are not listed herein, although 27 additional shoreline well screens were identified and are being constructed for the purpose of mercury flux determination and mercury delineation.

8. The nature and extent of perched groundwater contamination above the marker shale in several areas at Seep 1, Seep 2, and West CKD areas have not been fully evaluated. Additional wells are required to fully evaluate the following: the mechanism by which leachate is generated above the marker shale, the location where CKD and perched groundwater intersect, the perched groundwater flow direction, and whether the COCs in the perched groundwater exist at concentrations exceeding drinking water standards. The

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following additional wells are necessary to fully characterize the nature, extent, and flow direction of perched groundwater above the marker shale. The locations of the wells are shown for each seep area on the figures in Attachment 2.

- West CKD Area: W3S03, W3S10, W3S12, & W3S09
- Seep 2 Area: W2S26, W2S24, W2S14, W2S19, W2S20
- Seep 1 Area: W1S01, W1S19, W1S29, W1SXX, W1SYY, & W1SZZ

Well screen depths and location coordinates are provided in Attachment 1. A list of required target COCs is provided in Attachment 3. For all additional data gap wells installed, the EPA will require four quarters of sampling at each well (assume January/February, April/May, July/August, and September/October 2010).

Conceptual Site Model Comments:

1. The CSM is overly simplified and does not adequately address/visualize all potential receptors for the site. The CSM does not address whether or not there is concern for impact to drinking water in the fractured limestone drinking water aquifer south of the site. A more comprehensive, complete visual representation of the CSM shall be prepared that accounts for the drinking water receptor as well as the surface water receptor at the sites' northern perimeter (Lake Michigan). Consideration should be given to preparing a 3D visual CSM for each of the areas.
2. The CSM does not discuss the important role that attenuation processes are assumed to have in controlling/impacting leachate derived groundwater COC concentrations, nor the probable continuing discharge of low concentrations of these materials to surface water (e.g., beneath the shore collection drains). Please provide a revised CSM which discusses and depicts the above attenuation processes.
3. The CSM does not show any discharge/venting of leachate or leachate mixed with groundwater to the lake at any location other than Pine Court. Assuming there is some level of one or more COC discharging to the lake at all locations, the CSM shall be revised to depict this venting.
4. With regard to attenuation, the CSM should clearly acknowledge that:
 - the actual attenuation mechanisms have not been conclusively demonstrated, to date;
 - the degree of reduction in groundwater COC concentrations by attenuation processes is variable across the site; and,

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- reduction in groundwater COC by attenuation relies strongly on complex horizontal and downward vertical groundwater flow patterns at the site induced by seasonally varying, large groundwater withdrawals from nearby City of Petoskey municipal wells which are screened in the same bedrock aquifer.

The effect that the municipal pumping wells have on attenuation of COCs across the site shall be discussed in the CSM. It should be further stated that the CSM is based on the assumed continuation of existing pumping conditions at the site, and that any significant change in the pumping conditions will require additional site evaluation and/or consideration of additional site remediation alternatives.

5. In addition to the above comments, the narrative CSM description for Pine Court presented in this subsection fails to mention the probable contribution made by leachate and/or leachate in groundwater that is inferred to originate elsewhere beneath the Seep 2 pile and migrate to this location, particularly in regards to the deeper impacts identified at Pine Court. Please provide a revised CSM which discusses the above contributions from leachate and/or leachate in groundwater.
6. The CSM for the Seep 1 area does not include a depiction and discussion of seasonal fluctuations associated with the pumping of the municipal well south of the Seep 1 pile. Please provide seasonal CSMs for the Seep 1 area, as was provided for Seep 2 and West CKD.
7. The CSM shall be updated after at least one round of data has been gathered from the new mercury flux and RI data gap wells and presented in a revised development RI report. This shall include geologic, contaminant, and hydrogeologic information. CMS must also update the CSM quarterly as additional rounds of data from the new wells in the development area are gathered.
8. The CSM depictions for the seep areas do not reflect the seasonal fluctuations in the water cycle, such as the lack of irrigation through the winter months, and evapotranspiration during the summer months. The revised CSM depictions shall address these seasonal fluctuations and the seasonal water cycle changes shall be discussed in the text.

Alternatives Evaluation Comments:

1. Section 1, Page 1, second paragraph. The first sentence should be edited to read, "The purpose of this AE Report is to evaluate an array of remedial action alternatives that provide protection of human health and the environment." Protection of human health

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and the environment is a threshold criterion that every CERCLA remedial action must provide. Other CERCLA evaluation criteria (eg. long-term effectiveness, implementability, short-term effectiveness) are part of the process for selecting the best protective remedy.

2. Section 2.2, Page 30. The Remedial Action Objectives outlined in the AE should also include the following objective:
 - Protection/restoration of the drinking water aquifer adjacent to the site from COCs above Safe Drinking Water Act criteria.
3. Section 2.2.6, Page 40, third sentence. The State of Michigan's GSI criteria cannot be waived under CERCLA. The criteria may be waived by the State of Michigan with a Rule 716 wavier. Please edit this section accordingly.
4. EPA has determined that until 1) a revised mercury flux analysis document is complete, including data from the additional shoreline wells currently being installed, 2) the RI Report revised to evaluate the drinking water receptor pathway south of the site, 3) the perched leachate above shale formations are evaluated and 4) the outstanding COC analyses have been conducted, the AE document cannot be considered complete. The data generated from these sources above may significantly influence the alternatives assembly and evaluation for the development side. Therefore, EPA, MDEQ and the Tribe are not able to provide CMS with comprehensive and final comments concerning the AE at this time.
5. The AE Report shall be restructured in the following manner:
 - Remove Section 2.5, all of Section 3, and all of Section 4. The EPA and MDEQ believe that the screening, assemblies of remedial alternatives and evaluation reported in these sections cannot be properly completed until the data gaps and RI deficiencies described above are resolved. The revised AE should provide for a detailed evaluation of technology types and process options for each of the areas against the evaluation criteria of effectiveness, implementability, and cost. However, the full developing and detailed analysis of remedial alternative assemblies is premature in the AE process at this time for the reason explained in paragraph 4 above.

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Mercury Flux Calculations Comments:

1. The discrete mercury flux analysis document (Appendix A of the AE) is incomplete. The development of the mercury flux analysis for each area does not follow the previously agreed upon Mercury Flux Protocol developed for East Park, as follows:
 - The existing K value calculations for each well were based primarily on slug test data, not mini-pump test data as prescribed in the mercury flux protocol document approved by EPA on April 16, 2009. CMS shall recalculate the mercury flux utilizing mini-pump test data from each of the shoreline wells.
2. The letter submitted to CMS by EPA on September 10, 2009 indicated deficiencies in the shoreline monitoring well network along the development side (Seep 1, Seep 2, and West CKD). The letter requested the installation and sampling of additional well screens along the development shoreline to enhance the monitoring of mercury flux at the shoreline. EPA and MDEQ consider data from these additional wells essential for mercury flux calculations on the development side. A revised mercury flux determination document shall be prepared with analytical data and mini-pump test data from the additional shoreline wells included.
3. In the revised mercury flux determination document, EPA/MDEQ requests that CMS provide a 3D graphic representation of the mercury flux along the lakeshore, similar to the depiction presented in the CMS PowerPoint Presentation dated 8-26-09.
4. The revised mercury flux determination document shall contain a discussion or provide estimates of the leachate collection rates at each of the IR collection drain areas (Seep 1, Seep 2/Guard Rail, Pine Court, and West CKD) at the time the monitoring well samples were collected for mercury flux determination.

Mixing Zone Request Comments:

1. A significant deficiency in the Development RI/AE is the failure of CMS to formally submit a Mixing Zone Request to the MDEQ as part of the RI/AE document, pursuant to previous communications to CMS by EPA and MDEQ. EPA and MDEQ are hereby notifying CMS that failure to submit the Mixing Zone Request as part of the revised RI/AE document will delay the entire remedy selection process. The revised Development RI/AE shall include a formal Mixing Zone Request to the MDEQ for all COCs, with the exception of mercury, that will exceed GSI criteria.
2. It is expected that the Mixing Zone Request be submitted as a stand alone document with all information necessary to evaluate the request, including but not limited to the

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narrative, site specific figures, cross sections, well logs and analytical tables. A submittal of this nature allows the Remediation and Redevelopment Division of the MDEQ to review the information for completeness and accuracy prior to forwarding the request to the MDEQ's Water Bureau for a final determination.

Cost Estimate Comments:

While remedial options assembly for cost optimization cannot occur until completion of RI data gap work, at that time the mercury reduction and total cost optimization curves prepared as part of the AE (Figures 6-1 through 6-4) need to be revised to show the relative optimization for remedial alternatives at each area and should **not** reflect the costs associated with removal actions completed to date as part of the optimization curve figures for final remedy.

In addition to comments above, here are some prescriptive comments for CMS to address in its response:

1. The Appendix 1-2c reference on page 5, line 1, paragraph 3 appears to be incorrect
2. Page 14, Section 1.4.2.2, line 1, paragraph 2: It is not noted here whether the perched ground water is contributed to and, if so to what extent, by watering of the golf course.
3. In section 1.4.3, Potential Receptors, there is no discussion in the text about native wildlife as potential receptors for damage along the shoreline or in the water. This raises the concern that only human health has been considered, not other environmental impacts. Other organism studies should be briefly addressed.
4. The final disposition of the "road seep" is not clear in section 2.1.5.
5. Section 2.2.3, Augmentation. It would be helpful to see actual quantification of improvements with each change in the ILRS systems, going from 'no system' to the current condition. This quantification could address percent leachate capture, changes in total volume capture, overall pH reduction in terms of hydroxyl concentrations, mercury capture improvements, etc. An estimate of the total mass of these contaminant materials that can be expected to eventually react out of the CKD piles would be useful for assessing the required longevity of treatment alternatives.
6. In Section 2.2.3, Augmentation, was the actual cost of removal and disposal of the downgradient soil and CKD mixture in the West CKD area used to refine the costs of removal and/or targeted removal that is addressed in the AE?

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7. In Section 2.2.4.7, effectiveness monitoring of the lakeshore pH is discussed with regard to requiring the wave condition to be two inches or less in height, which is “not usual.” Has any effort or thought been put into monitoring stations to overcome this limitation, as was discussed during Horizon’s last site visit?

8. In Section 2.2.6, 1st paragraph, please clarify the statement, “As the laboratory analytical results from the sampling events do not factor into the ILRS effectiveness, they are discussed in subsequent sections of the report.” Why would these results not factor into ILRS effectiveness/performance monitoring? Properly done field measurements of pH, for example, can actually be more reliable than measurement after transport to a laboratory.

9. In paragraph 3 of the same section, was not the frequency of surface monitoring events recently increased by U.S. EPA, i.e., since July 31, 2007? If so, this does not seem to be reflected in this paragraph. Additionally, with regard to monitoring when “conditions permit,” earlier in the RAI it notes that pH is higher in the winter. If that is so, isn't it possible or likely that shoreline pH values are at their highest values during the winter when the ice covers the leachate seepage into Lake Michigan?

10. In the text table of Section 3.1.2, Contaminant Source Investigations, page 46, it would be useful to have a metric that indicates the number of monitoring wells and borings relative to the area in square feet; or ft² monitored per well. This would provide a better understanding of monitoring point density and how it relates to what might typically be recommended under MDEQ Part 201 sampling guidance

11. Section 5.5, Groundwater, page 133, presents an incomprehensible listing of wells that exceeded various Part 201 criteria in the West, Seep 2 and Seep 1 areas. A far better understanding of the site and the plumes of these constituents in the ground water could be derived from having these data in a three-dimensional GIS representation; this would also help assist with the understanding of what needs to be remediated and where, and what type of remediation approaches would be most efficient. The current emphasis seems to be on pH, with somewhat less consideration of mercury, and almost no consideration of these other constituents that exceed criteria. This should be corrected

12. In Section 2.2.5.1, pages 38 and 39, in association with Appendix C, Tables 1 through 3, it does not appear that the pH exceedance has been properly highlighted with regard to the tables or a mixing zone determination. The text states, “All the maximum concentrations that exceed the criteria are highlighted in yellow and those overall maximum concentrations that are over 10 times greater than the criterion are highlighted in green. The mercury GSI criterion was exceeded by over 10 fold and the criteria for TDS, pH, selenium, and vanadium were exceeded at all three areas.” In that Table 1, in the column “Overall Maximum for Seep 1,” any pH over 9.0 is an exceedance; the maximum pH is given as 12.1, but is highlighted in yellow, indicating that it is

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an exceedance, but less than 10 times greater than the criterion (i.e., 9.0). This is an error. A pH of 12 is 1000 times lower in hydrogen ion concentration than a pH of 9.0 and 1000 times higher in concentration of hydroxyl radical. Therefore the pH of 12.1 greatly exceeds the factor of 10 required for a green label in the table or for the mixing zone factor. A one unit increase in pH is a concentration factor of 10.