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LETTER OF TRANSMITTAL AND U S NAVY RESPONSES TO BRUNSWICK AREA CITIZENS
FOR A SAFE ENVIRONMENT COMMENTS ON DRAFT HIPOX PILOT STUDY REPORT
GROUNDWATER EXTRACTION AND TREATMENT SYSTEM NAS BRUNSWICK ME
4/5/2011
BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE NORTHEAST



DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE, NORTHEAST
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PHILADELPHIA, PA 19112-1303

BPMO NE/TB
Ser 11-069
April 5, 2011

Ms. Carolyn A. Lepage, C.G.
President
Lepage Environmental Services, Inc.
P. O. Box 1195
Auburn, ME 04211-1195

Dear Ms. Lepage:

Enclosed please find the responses to your comments on the Draft HiPOx Pilot Study Report, Groundwater Extraction and Treatment System. If you have any questions or comments, please contact the undersigned at (215) 897-4915.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul F. Burgio".

Paul F. Burgio
BRAC Environmental Coordinator
By direction of BRAC PMO

Enclosure:

Response to Comments from the Brunswick Area Citizens for a Safe Environment (BACSE) on the *Draft HiPOx Pilot Study Report, Groundwater Extraction and Treatment System, April 2010*. NAS Brunswick, Maine

Copy to:

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Response to Comments from the Brunswick Area Citizens for a Safe Environment (BACSE) on the Draft HiPOx Pilot Study Report, Groundwater Extraction and Treatment System, April 2010
Naval Air Station Brunswick, Brunswick, Maine

A. COMMENTS REGARDING THE “HiPOx” INSTALLATION

Comment 1. Page 1-1, Section 1.1 Project Identification. The title of the report is a bit misleading. The purpose of the HiPOx system, according to Section 1.1 is to “provide treatment of 1,4-dioxane in groundwater recovered from the Eastern Plume”, and, as expected, the report does document the design, installation, testing, and performance of the HiPOx unit.

However, the report covers more than a pilot test of the HiPOx system. It also includes an evaluation of significant changes in the configuration of the GWETS (groundwater extraction and treatment system), and concludes on page 4-2 with the recommendation that *“The Navy and project stakeholders should begin evaluating a less energy-intensive, long-term remedy for the Eastern Plume as the limits of technological effectiveness of GWETS appear to be nearly reached.”*

BACSE and the public have waited a long time for treatment of 1,4-dioxane to be added to GWETS, and for the new extraction wells to come on line as well. Therefore, BACSE welcomes the information presented in the report that the HiPOx treatment system can, indeed, successfully treat 1,4-dioxane. However, just when it looks like, for the first time, the GWETS will be able to remove 1,4-dioxane from groundwater, the Navy recommends finding a new remedy.

BACSE considers this expansion of a pilot study to an evaluation of the GWETS not appropriate and not justified by the monitoring data.

Response: Comment noted. It must be re-emphasized that the Navy has never indicated it intended to shut down the GWETS. Indeed, as the remedy in place for the Eastern Plume, the Navy cannot change the remedy without MEDEP and EPA approval. As BACSE is aware, the Navy has also made significant investments to the existing remedy that included modification of the GWETS treatment system and the addition of new extraction wells to further reduce Eastern Plume ground water contaminant concentrations and to improve overall containment of the plume in the vicinity of Merriconeag and Mere Brook confluence. The Navy will continue to evaluate and optimize the performance of the remedy to ensure that it continues to perform cost-effectively and efficiently. The Navy will continue to keep BACSE and the local community informed on the progress of the Eastern Plume and other remedies at NASB.

Comment 2. Page 1-3, Section 1.2.2 HiPOx System Installation and Pilot Testing. Please add the rationale for selecting 10 µg/L as the pilot study treatment goal.

The end-products of the treatment are described as “benign”, and consisting of carbon dioxide, water, and salts. Please add information about the chemical nature of the salts produced, and their management and disposition.

Response: At the time of the pilot study, the treatment goal was the Maine Department of Environmental Protection (MEDEP) Maximum Exposure Guideline (MEG) of 32 ug/L. That standard has now been reduced to 3.5 ug/L, which will be the new treatment goal.

The oxidation products of chlorinated volatile organic compounds (CVOCs) are hydrochloric acid (HCl) and carbon dioxide (CO₂). The HCl will react very quickly with the natural alkalinity of the water to form salts such as sodium chloride and calcium chloride. This is an acid base reaction and the rate is diffusion limited (i.e., very fast). The < 50 ug/l of CVOCs would make < 50 ug/l of HCl which would not affect the pH even if it did not react with the natural alkalinity.

B. COMMENTS REGARDING THE MODIFIED GWETS FOR THE EASTERN PLUME AND SITES 1 & 3.

1. Pages 1-1 & 1-2, Section 1.2 Background Information. Initially, the GWETS also treated groundwater extracted from beneath the landfill cap at Sites 1 and 3, and included a UV-oxidation system as part of the treatment train. Please include in the Background section an explanation of why the system was modified.

Please assess the capability of the GWETS to handle additional contaminated groundwater from Sites 1 and 3, should it become necessary to remove groundwater from beneath the landfill cap again.

Response: Comment noted; it should be noted that there is a brief description in Section 1.2.1. Future updates to the report will include a background section to provide a brief description of historic information.

The Navy continues to monitor the influent and effluent concentrations on a monthly basis and will modify the operations of the GWETS as required.

2. Page 1-1, Section 1.2 Background Information. *“Historically, the concentrations of 1,4-dioxane in the GWETS influent has been less than the corresponding State of Maine Maximum Exposure Guidelines (MEG) of 32 µg/L.”*

BACSE considers it essential that evaluation of the GWETS should also consider replacement of EW-01 and EW-04. These wells have long screens that tap uncontaminated parts of the aquifer, resulting in a significant amount of “clean” water that dilutes contaminant concentrations in the influent to the GWETS, rendering statements in the report about relatively low influent concentrations unreliable. BACSE concurs with MEDEP comment number 5a that replacement of EW-01 and EW-04 with two wells with shorter screens that target only the contaminated portion of the aquifer should result in a more efficient GWETS operation.

Response: Comment noted. The Navy will discuss the optimization of the monitoring well network with the stakeholders in the near future. It should be emphasized that VOC

concentrations across the plume are very low, and that the extracted water will be in the low ppb level, regardless of the extraction well's screen length. Furthermore, a key objective of the current remedy is effective hydraulic containment of the plume, which requires extraction wells that are designed to affect adequate hydraulic capture.

3. Page 2-1, Section 2.1 Overview. What is the purpose of the sand filters – what material do the filters remove from the influent? Has the material trapped by the filter been tested? What are the results? Is it sludge? How is it disposed of?

Response: Sand filters remove suspended solids from the influent water. This optimizes HiPOx treatment and reduces the potential for clogging carbon filtration units – i.e., organic material included with the solids would increase oxidant demand; and the solids would collect in the carbon units and plug them. The sand filter has not been replaced for many years. When the sand filter has reached its treatment capacity, the sand filter unit will be sampled to determine disposal requirements.

4. Page 4-2, Section 4.2 GWETS Operations. *“Using this alternative treatment train [HiPOx and liquid-phase GAC vessels] residual chlorinated ethanes (including TCA and 1,1,-DCA) are likely to be present in the GWETS effluent, although at concentrations well below the Federal MCL and Maine MEGs.”*

Throughout the HiPOx report, (and illustrated by the quote above) the concentrations of chlorinated ethanes that are not successfully treated by the revised GWETS, are dismissed by the Navy as unimportant. How will the Navy meet the Record of Decision goal of restoring the aquifer if the proposed changes to the GWETS result in contaminants of concern (that used to be removed from the effluent) being discharged to the aquifer?

BACSE considers discharge of partially treated chlorinated ethanes back into the groundwater unacceptable.

Response: Effluent from all treatment systems contains some minor concentrations of contaminants or by products of contaminants. In this instance, the residual chlorinated ethanes are below the detection levels of the analysis and/or below regulatory thresholds, and thus can be discharged in accordance with applicable rules and regulations.