



JENNIFER M. GRANHOLM
GOVERNOR

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Alex Rothchild
STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



12636,
DEQ
STEVEN E. CHESTER
DIRECTOR

September 25, 2003

Ms. Cheryl Hiatt
REALM GM WFG - Remediation
Troy Technology Park South - Building A
Mail Code: 483-619-356
1996 Technology Drive
Troy, MI 48083

Dear Ms. Hiatt:

SUBJECT: Groundwater Not In An Aquifer (GWNIAA) Evaluation Report
Former Peregrine (US) Inc. Coldwater Road Facility;
MIR 000 020 743

The Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), has completed its review of the Groundwater Not In An Aquifer (GWNIAA) Evaluation Report (Report) for the Former Peregrine (US) Inc. Coldwater Road Facility dated April 2003, and prepared by Conestoga-Rovers & Associates. The purpose of the Report is to provide the documentation necessary to classify groundwater in the "shallow overburden" at the facility as GWNIAA. Based on WHMD review, the GWNIAA demonstration unacceptable due for the following reasons listed below.

- 1) **Section 5.1, Stratigraphic Conditions** – Further clarification is required regarding what stratigraphic units constitute the perched unit that the facility is attempting to designate GWNIAA. Based on the stratigraphy presented in this section, it appears that the perched unit is composed of both fill and glacial till material. If it is comprised of both fill and glacial till material, the contact between the upper perched unit and the clay till aquitard must be defined. In addition, the hydraulic conductivity data provided in the Report must be revised to clarify whether it is from the fill material or the clay till; it is important that both types of material are represented in the data provided. Although the fill material is not considered a geological formation, it is a material in which the Areas of Interest (AOI) are in potential contact, and it does have the potential to transmit any contaminated groundwater present.
- 2) **Section 5.3, Hydrogeologic Characteristics** – The report does not provide any sort of overall conceptual flow model for the site that clearly illustrates the hydrogeological dynamics at the site. In order to support the GWNIAA designation, the additional information listed below must be provided:
 - a) The flow dynamics and fate of infiltrated precipitation must be provided. If downward migration of groundwater in the perched unit is limited by the clay till as claimed by the Report, then, presumably, the shallow groundwater must be moving in a primarily horizontal direction. This does not appear to have been

- demonstrated, but if it is occurring, and given the lack of off-site information presented (or available), providing the degree of certainty required for a GWNIAA designation regarding potential interconnection to groundwater in an aquifer will be extremely difficult.
- b) The potential for utility corridors at the site acting as a flow conduit must be investigated and evaluated. This is especially important with respect to foundations, sumps, etc. related to the basement of the former building given the closer proximity to the drift aquifer in this area.
 - c) The potential for increased infiltration, elevated water levels, and changing hydrogeological dynamics at the site as a result of the site demolition must be investigated and evaluated. It is recommended that the facility conduct water level surveys on a representative well network in the perched zone and the drift aquifer on a periodic basis for some time into the future to collect the information necessary.
 - d) Minimal site-specific information is provided regarding the contact between the glacial till and the drift aquifer, since the borings conducted during the RFI and previous investigations were limited to the near surface. Based on the cross-sections provided in the Report, only one boring from the site was conducted to the depth necessary to penetrate the drift aquifer (PFW-1), making the contact and the integrity of the glacial till aquitard provided in the cross sections largely inferred. It is recognized that geologic information from two deep monitoring wells presented as part of the groundwater monitoring system for the General Motors Landfill directly north of the site is pertinent and applicable; however, it does not change the fact that there is a lack of data from the site itself. Given the notoriously heterogeneous nature of glacial till material, this lack of information is problematic and additional information must be provided.
- 3) **Section 5.4.2, Drift Aquifer Levels** - Very minimal information exists regarding water levels in the drift aquifer, most of that presented in the Report is from monitoring data from the groundwater monitoring system for the General Motors Landfill directly north of the site. The fact that water levels in the one on-site well screened in the drift aquifer appear to be unconfined, demonstrates that there is some variability in the drift aquifer with respect to water levels and flow conditions, and underscores the need to collect additional on-site water level and flow information from the drift aquifer. In addition, the fact that water levels in the drift aquifer on-site appear to be unconfined does not necessarily support GWNIAA as claimed. In order for the perched unit to be GWNIAA, it must be shown that it is not in connection to groundwater in an aquifer either vertically or horizontally, as discussed in Comment #2a above. In addition, the fact that the drift aquifer is unconfined illustrates that it may be in direct connection to and recharged by the till zone above it.
- 4) **Section 5.4.3, Pumping Test Results**
- a) The step-drawdown test was conducted at a maximum pumping rate of approximately 4.5 gallons per minute (gpm), therefore, it is likely that the pumping test well was not adequately stressed and the test was not completed.

This is confirmed by the maximum drawdown of less than 1.5 feet in the pumping well at the maximum pumping rate, and the fact that the water supply wells screened in the drift aquifer from the nearby Beecher Metropolitan District are pumped at rates ranging from approximately 500-1000 gpm.

- b) The constant rate pumping test was conducted at a pumping rate of approximately 5 gpm, which also resulted in minimal drawdown at the pumping well. The theoretical maximum pumping rate calculated from the (inadequate) step-drawdown test was 15.8 gpm, which is considerably higher than the 5 gpm pumping rate used. Because the pumping well was not pumped at a rate necessary to stress the drift aquifer, the results of the test are not appropriate to be used to evaluate the potential interconnection between the drift aquifer and the perched unit.
 - c) Because there were no other nearby monitoring wells in the drift aquifer, the radius of influence of the pumping well was not determined. Therefore, it is not clear that the observation wells used in the pump test were appropriately located.
 - d) The actual purpose or hypothesis of GM's pump test for this GWNIAA demonstration is not clearly understood. Many observation wells were set in clay. No other deep observation wells were included to verify radius of the drawdown. How does this prove/disprove interconnection?
 - e) The WHMD does not agree with the facility's conclusion that the results of the pump test "clearly indicate that with the exception of the pumped well (PFW-1), no response to pumping was observed during the testing." The hydrographs from the four perched unit monitoring wells located closest to the monitoring well (MW-1-02, MW-2-02, MW-3-02, and MW-4-02) show minor drawdown at the initiation of pumping as well as general declining water level during the course of the constant rate pumping test, which could be potentially due to interconnection between the two units. The fact that the drawdown is minor might be explained by the relatively low pumping rate of the pumping well which resulted in an initial drawdown in the pumping well of only approximately 1.1 feet. The greatest degree of initial drawdown was seen in MW-4-02 at 0.06 feet, which, according to Figure 5.3, was also the closest perched aquifer monitoring well to the pumping well.
 - f) The facility should be reminded that even if the pumping test conclusively demonstrated a lack of interconnection between the perched and drift aquifers was demonstrated, the test would only be representative of the area affected by the pump test. Given the variable and heterogeneous nature of glacial till material, such a demonstration may not provide conclusive evidence of a lack of interconnection for the entire site.
- 5) **Section 5.5.2, Input From Local Health Department** – The WHMD was able to contact the Genesee County Health Department (GCHD) to discuss their potential concerns regarding the facility being granted a GWNIAA designation. The GCHD stated that, to their knowledge, crock wells are unlikely in this area due to the availability of other relatively shallow groundwater resources, but that their existence is possible and it would be difficult to ascertain and/or document their potential existence for certain. They also confirmed use of both the drift aquifer and bedrock

aquifer locally. Therefore, they stated that they would have some concern regarding potential offsite migration of groundwater contamination above drinking water protection criteria due to the use of the resource locally. The GCHD was also concerned that there was the potential for a significant amount of groundwater use locally that is not documented and therefore unaccounted for. This fact was also documented by the facility in their Response to Comments on the RFI Report dated March 28, 2002. In the response to WHMD Comment #8, it was stated that "In addition to the 216 addresses for which a water well record was found (within a 1.5 mile radius of the facility), 111 additional addresses that are not connected to a city/township water supply and/or do not receive a water bill were encountered". Based on the above comments, it can be stated that the GCHD has some potential concerns regarding a GWNIAA designation at the site.

- 6) **Section 5.5.3, Well Head Protection Areas** - Participation in the Local Wellhead Protection Area (LWPA) program is voluntary for the local units of government, and it appears that a LWPA has not been conducted for the Beecher Metropolitan District. Given the relatively close location of the Beecher Metropolitan District's well fields to the facility, definition of a LWPA for the area appears to be warranted in order for a GWNIAA determination to be possible. Therefore, if the facility wishes to continue to pursue the GWNIAA, it is recommended that it conduct a wellhead protection assessment for the Beecher Metropolitan District to define the LWPA for the existing and/or potential future well fields.
- 7) **General** - The results of the groundwater sampling activities conducted during the RFI and previous investigations was summarized in the facility's April 24, 2003 Report (RCRA Facility Investigation – Second Round Groundwater Sampling) to WHMD. Based on the results of this report, it appears that several of the wells where previous exceedances were noted were either lost and/or destroyed. As discussed further in Comment #8 below, this is not acceptable. Re-sampling of current wells and the replacement and sampling of lost or destroyed wells is recommended due to the previous exceedances noted in the lost or destroyed wells, the potential change in hydraulics since the factory was demolished, and the known use of groundwater in the vicinity of the site. In addition, monitoring wells previously noted as dry must also be re-checked to confirm that they are still dry and have not been impacted by increased water levels since the factory was demolished. If groundwater is determined to be present in any of these previously dry monitoring wells, then they should be sampled for applicable parameters.
- 8) **General** - A significant number of monitoring wells have been installed at the facility over the course of several investigations, only a subset of which were sampled as part of the RFI. Based on the results reported in the RFI, it appears that several of these monitoring wells have been lost or destroyed. Although these were not RCRA monitoring wells, they still should have been abandoned appropriately in accordance with the procedures specified in R 299.9612(1)(b). Without proper abandonment procedures implemented, the lost or destroyed monitoring wells represent a potential conduit for the migration of contamination to the drift aquifer which eliminates any

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potential for GWNIAA designation for the perched unit. The facility must determine if any of the destroyed or lost wells were drift aquifer wells, and if so, these wells must be located and abandoned in accordance with the procedures specified in R 299.9612(1)(b). In addition, the facility must locate all remaining wells at the facility and insure that they are properly marked and recorded if required for additional investigation purposes, or properly abandoned as specified above if they are no longer useful. Please provide a summary report of the above determination to the WHMD within 60 days of receipt of this letter.

- 9) **General** – Due to the potential impacts to off-site receptors, GWNIAA determinations must always be cautiously granted. GWNIAA should not be viewed as simply a remediation option, but a matter of resource preservation and human health protection. As summarized in the comments above, the Report does not provide a reliable demonstration that groundwater in the shallow overburden meets either of the two main criteria required for a GWNIAA (i.e. insignificant yield and hydraulic isolation). Given these questions regarding the adequacy of GWNIAA demonstration, and with extensive drift aquifer usage in area, it appears that other remediation options would be more reliable for this site. These options would include deed restrictions for resource usage, soil removal restrictions and possible monitoring in association with an active groundwater remediation waiver petition. Otherwise a far more thorough demonstration must be made to document and justify the elimination of this important pathway.

If you have any questions or would like to schedule a meeting regarding the issue, please do not hesitate to contact me by e-mail at holdwick@michigan.gov, or at the telephone number below.

Sincerely,

Kevin Holdwick
Environmental Engineer
Waste and Hazardous Materials Division
517-241-2108

cc: Mr. Steve Buda, DEQ
Ms. Delores Montgomery, DEQ
Mr. John McCabe, DEQ
Mr. Bill Yocum, DEQ - Lansing Office
Mr. Joe Rogers, DEQ
HWP Corrective Action File