



JENNIFER M. GRANHOLM  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



December 16, 2003

Ms. Cheryl Hiatt, Project Manager  
REALM, Inc.  
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 (Report);  
Former Peregrine (US) Inc., Coldwater Road Facility (Facility);  
MIR 000 020 743

The Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division (WHMD), has completed its review of the initial Report for the Facility, dated April 2003, and prepared by Conestoga-Rovers & Associates (CRA). The purpose of the Report is to provide the documentation necessary to classify groundwater in the "shallow overburden" at the Facility as GWNIAA. In addition, the WHMD met with General Motors (GM) and its consultant, CRA, on Monday, October 6, 2003, to discuss the Report and the applicability of GWNIAA at the site.

The Report and subsequent meeting highlighted several areas of significant disagreement between GM and MDEQ staff regarding the intent of the GWNIAA designation and its potential applicability or nonapplicability to this site. The purpose of this letter is to clarify the MDEQ's position regarding the nature of sites for which a GWNIAA designation is intended and to apply that discussion to the Facility. We believe that such clarification can benefit the ultimate resolution of corrective action issues at this site. In addition, attached are MDEQ technical comments on the Report that were provided to GM in draft form in advance of the October 6, 2003, meeting.

Administrative Rule 299.5710(1) promulgated pursuant to Part 201, Environmental Remediation, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), states that the drinking water pathway is applicable for all remedial actions if: "(a) The groundwater is in an aquifer" or "(b) The groundwater is not in an aquifer, but can reasonably be expected to transport a hazardous substance into an aquifer . . . ." This rule allows for the concept of groundwater not being in or interconnected to an aquifer and, therefore, the drinking water pathway not being applicable. Based on this approach, the MDEQ developed a process for the GWNIAA designation to apply to those situations in which groundwater cannot be used as a drinking water resource and it can be very confidently demonstrated to have no hydraulic connection to an aquifer as defined by Part 201. Typically, these situations have been in areas where the geology is uniform (which is rare in most glacial settings), this uniformity covers a broad geographic area and,

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essentially, no potable water is available. This last condition would also require that no crock wells were authorized by the local health department.

Given the general specifications of the rule, the state's complex surficial geology, and the state's voluminous groundwater resources, a complete and conclusive site-specific determination is required for a GWNIAA approval. Practically speaking, it is very difficult to reliably and conclusively demonstrate that any groundwater present is not in an aquifer and not hydraulically connected to an aquifer. Ideal geological/hydrogeological settings that are consistent with the intent of the rule include a geological regime where no groundwater or aquifer is present or a minimal shallow surficial groundwater system totally discharges to a surface water body that is not recharging an aquifer. In these types of geological/hydrogeological settings, hydraulic isolation can be more reliably and conclusively demonstrated so as to ensure that contamination left on-site without any engineered controls or deed restrictions will not affect the drinking water pathway. At the present time the WHMD has had 14 sites submit a GWNIAA proposal. Of those 14, only four have been approved to date. All of the sites with approved GWNIAA determinations are consistent with one of the geological settings described above. In addition, all of the approved determinations have been accompanied by very thorough and conclusive demonstration reports that reliably document all the requirements to meet a GWNIAA have been met. Interestingly, all four of these sites have or intend to use a deed restriction in addition to the pathway elimination demonstration.

As discussed during the October 6, 2003, meeting, the WHMD does not believe that the Facility is located in an appropriate geological setting for a GWNIAA determination.

This is primarily because the Facility is underlain by a usable glacial drift aquifer and the lack of hydraulic interconnection of this drift aquifer to the shallow groundwater system present is very difficult to reliably demonstrate. The drift aquifer is overlain primarily by approximately 50 feet of clay glacial till material; however, there are saturated sand seams and lenses present in the till, as well as permeable and saturated nonnaturally occurring sediments (fill, utility conduits, etc.) present in the near surface. The degree to which the saturated portions of the till may or may not be interconnected to the drift aquifer is extremely difficult to reliably and conclusively demonstrate to the certainty required for a GWNIAA demonstration. Without proper resource restrictions on this property, future usage of the drift aquifer could potentially draw down contamination into lower, saturated portions. In addition, without drilling and well construction specifications identified on a deed, contaminants could be introduced into the lower drift aquifer.

As also discussed during the meeting and detailed in the attached WHMD technical comments on the Report, the WHMD does not believe that the Report provides reliable and conclusive documentation that all of the technical requirements of a GWNIAA determination have been met. Therefore, based on the above information and the applicable rules of Part 201 and Part 111, Hazardous Waste Management, of Act 451, GWNIAA guidance, the request for GWNIAA is denied. Additional review of GM's October 13, 2003, submission to the WHMD following the October 6, 2003, meeting,

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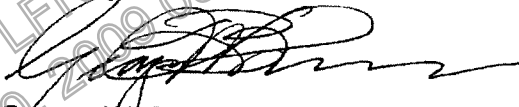
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proposing additional work to be completed toward a GWNIAA determination at the site will not be conducted. The WHMD believes that other remediation options are more appropriate to provide long-term drinking water pathway protection for the ongoing corrective action activities at this site. These options might include, but are not limited to, any one or a combination of the following: source removal; deed and/or local ordinance restrictions for resource usage; soil removal restrictions; and/or possible groundwater monitoring in association with an active groundwater remediation waiver petition.

It should be noted that the current WHMD guidance for GWNIAA is under review. In discussions with MDEQ executive staff and other division staff, it has become clear that an MDEQ-wide guidance document for GWNIAA needs to be developed to provide consistency and a better understanding for staff and the regulated community with respect to when GWNIAA is and is not appropriate, the technical demonstration necessary for its approval, and how it should be implemented. It is expected this guidance will be completed within the next several months. Staff will keep GM updated with respect to its development.

If you have any questions, please do not hesitate to contact Mr. Kevin Holdwick, Hazardous Waste and Radiological Protection Section, WHMD, at 517-241-2108, or you may contact me.

Sincerely,

  
George W. Bruchmann, Chief  
Waste and Hazardous Materials Division  
517-373-9523**Attachment**

cc/att: Mr. Hak Cho, United States Environmental Protection Agency, Region 5  
Mr. George Hamper, United States Environmental Protection Agency, Region 5  
Mr. Gerald Phillips, United States Environmental Protection Agency, Region 5  
Mr. Frank Ruswick, MDEQ  
Ms. Liane Shekter Smith, MDEQ  
Mr. Steve Buda, MDEQ  
Ms. Delores Montgomery, MDEQ/EPA Reporting  
Mr. Kevin Holdwick, MDEQ  
Mr. John McCabe, MDEQ  
Mr. Bill Yocum, MDEQ - Lansing Office  
Mr. Joe Rogers, MDEQ  
HWP Corrective Action File

**Michigan Department of Environmental Quality  
Waste and Hazardous Materials Division**

**Technical Comments Regarding Groundwater Not in an Aquifer (GWNIAA)  
Evaluation Report (Report), April 2003**

Based on a review by staff of the Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division (WHMD), of the Report for the former Peregrine (US) Inc., Coldwater Road facility (Facility), the GWNIAA demonstration is unacceptable due to the 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 comprised 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, it is not differentiated whether the hydraulic conductivity data provided in the Report 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 are in potential contact, and it does have the potential to transmit any contaminated groundwater.
- 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. Information lacking includes the following:
  - 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 flow conduits 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 are not adequately investigated and evaluated. The Facility would need to 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 necessary information.

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- d) Minimal site-specific information is provided regarding the contact between the glacial till and the drift aquifer, since the borings conducted during the Resource Conservation and Recovery Act of 1976 (RCRA) Facility Investigation (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 (GM) 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.
- 3) **Section 5.4.2, Drift Aquifer Levels** – Very minimal information exists regarding water levels in the drift aquifer. Most of that information presented in the Report is from monitoring data from the groundwater monitoring system for the GM 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. Often, this is supported by a demonstration of horizontal flow toward a zone of surface water venting (thus lessening the vertical gradient component). 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 500-1,000 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

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- 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 the radius of the drawdown. It is not clear how this proves or disproves 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, 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 off-site 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

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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 an 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 an LWPA for the area appears to be warranted in order for a GWNIAA determination to be possible.
- 7) **General** – The results of the groundwater sampling activities conducted during the RFI and previous investigations were summarized in the Facility's April 24, 2003, RCRA Facility Investigation – Second Round Groundwater Sampling report to the 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. Resampling 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 rechecked 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 that eliminates any 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.

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- 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 as 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 the 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 groundwater monitoring in association with an active groundwater remediation waiver petition.

Confidential under FOIA  
Alex Rothchild  
LFR  
Sep 30, 2009 09:19