MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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               Jackson District Office

FROM: Jim Coger, Geologist
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DATE: March 7, 2006

SUBJECT: Pall Life Science (PLS) – Washtenaw County
               Review of Performance Monitoring Plan (PMP) for Wagner Road Extraction
               Dated, December 22, 2005

The December 2005 PLS submittal is a revised PMP for the Wagner Road extraction system. The revised PMP was submitted in response to our November 16, 2005 request for additional information addressing the Wagner Road interim response.

The December PMP provides a revised list of monitor wells to be used for performance monitoring and a monitoring schedule. This PMP proposes to install two additional monitor wells in the Wagner Road area. New wells are proposed for the area east/northeast of TW-18, and south of TW-18.

The "Performance Standards" section of the December 2005 PMP states that it will take at least three to five years before a decline in 1,4-Dioxane is observed in MW-71. MW-71 is located approximately 2,000 feet downgradient and east/northeast from TW-18.

The following are my comments on the PMP:

The EPA document "Methods for Monitoring Pump-and-Treat Performance" (EPA/600/R-94/123, June 1994) states that a combination of hydraulic and contaminant performance elements must be evaluated to assess pump and treat performance. To demonstrate pump and treat effectiveness, a reduction of dissolved phase contamination must be documented for the area downgradient of the capture zone.

It cannot be determined, based on static water level measurements alone, to what extent the 1,4-Dioxane exceeding 85 ug/l along Wagner Road is being captured. Observed drawdown in a specific monitor well does not necessarily reflect that contamination is being hydraulically contained by the purge system.

Pre-pumping hydrogeological and chemical baseline conditions were not established for the area between TW-18 and MW-71. Contaminant isoconcentration data has not been provided, establishing where MW-71 is located in relation to the plume centerline. The extent of TW-18's hydraulic containment cannot be evaluated without hydraulic gradient, flow path, and chemical data for the area east/northeast of TW-18. Monitor wells downgradient and outside the capture zone are required for chemical monitoring and verification of pump and treat performance.

Recommendations:

The nested monitor well proposed for the area east/northeast of TW-18 should be installed as soon as possible. The Rhea Street area may provide an accessible location.

The east end of Rhea Street appears to be downgradient and outside of the modeled 200 gpm capture zone, as depicted in Figure 3 of the Work Plan for Groundwater Extraction Wagner Road. After installation of the nested wells, hydraulic gradient and chemical monitoring should be performed to determine if this location is within or outside of TW-18's capture zone. Hydraulic gradient analysis should include hydraulic head measurements, determination of groundwater flow gradients and velocity, purge well pumping rates, purge well influent water quality, and contaminant distributions in the aquifer. The wells should be installed as soon as possible to establish groundwater flow and chemical baselines.

The Rhea Street location is depicted as being proximal to the Unit E plume centerline. If the gradient analysis indicates that the Rhea Street location is downgradient from the TW-18 capture zone, the flow velocity data can be used to predict a timeline for when contaminant levels should begin to decline. Contaminant levels should demonstrate a steady downward trend at Rhea Street if TW-18 is effectively capturing Unit E contamination in that area.

A single nested well location in the Rhea Street area may not be sufficient for evaluating purge well capture northeast of monitor well MW-94d. Depending on the capture zone and monitoring data analysis, additional Unit E nested monitor wells may be needed in the Porter Street area, and possibly north of monitor well MW-30d.

It is unclear how the 1,4-Dioxane 85 ug/l isoconcentration line, and plume centerline, as depicted in the most recent PLS quarterly report, was determined for the area northeast of the MW-94 nest. The Unit E plume has not been defined to 85 ug/l north and east of MW-30d. The PMP does not address and/or establish performance standards for the area proximal to MW-30d. Assumptions regarding hydraulic capture between TW-18 and MW-94d must be supported with monitoring data that verifies capture. Rule 299.5540(2)(a) of Part 201 requires that the monitoring plan must demonstrate that the response activity is controlling migration. Additional hydraulic containment may be required for the area northeast of TW-18's capture zone, if the purge system evaluation does not reflect that all 1,4-Dioxane, above 85 ug/l, is being captured at Wagner Road.

PLS has indicated that they are currently reviewing and modifying performance factors for existing purge wells. While reviewing purge system optimization, PLS should evaluate the feasibility of installing an additional purge well(s), that have the capability of capturing shallow and deep contamination for the north Wagner Road area. A purge system that captures the shallow (D2) contamination, closer to the source, may prove to be more efficient and cost effective than the current Evergreen system.

The proposed "Southern Well Site" should provide data for determining Unit E contaminant isoconcentration contours south of TW-18. Currently, there are no Unit E wells between MW-95 and the MW-65 nest. Chemical and hydrogeological data from this location should be evaluated to establish what the Unit E 1,4-Dioxane levels are in this area, and to determine how far TW-18's capture zone extends in this direction.

Purge rates in TW-12 may have to be adjusted to demonstrate hydraulic contaminant for the area between MW-95 and MW-65. Hydraulic containment assumptions must be supported with downgradient chemical monitoring data.

The PMP did not address two other Unit E purge wells; TW-11 and TW-17. The operation of all Unit E purge wells should be evaluated when assessing the performance of the Wagner Road Interim Response.

The proposed sampling frequency of the wells to be used in the PMP (Attachment 1) is not clear. The Groundwater Quality Frequency column does not propose a sampling schedule. All monitoring wells listed in Attachment 1, including MW-72s and MW-72d, should be sampled quarterly, except the extraction wells and new monitoring wells, which should be sampled monthly during extraction. Modifications to the chemical monitoring schedule will be contingent on the data trend analysis. Per the EPA Guidance referenced above, during system startup, hydraulic and chemical monitoring should progress from weekly, to monthly while the capture zone develops, and the purge system achieves steady state. As the system has been running for two months, it cannot be determined at this time, what the hydraulic and chemical impact has been to the proposed new Wagner Road well locations (Rhea Street and Southern well).

I recommend that groundwater elevations should be measured weekly in the new monitoring wells for at least six weeks after installation. The frequency of water level monitoring may be reduced to monthly or quarterly upon demonstrating that water levels are stable.

The PMP does not incorporate a contingency plan that specifically outlines what actions will be taken if 1,4-Dioxane, above 85 ug/l, continues to migrate past Wagner Road. Monitor wells located three to five years downgradient from Wagner Road are not suitable as compliance points for demonstrating the remedial objective is being met. Additional information is needed to address what the contingency plan is, and what hydrogeological or chemical monitoring data will be used to trigger initiation of the contingency plan.

If you have any questions or comments, please let me know.

JC/KJ

cc: Mitch Adelman, RRD/File
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