MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

OPERATIONAL MEMO GEN-11
Revision 2

January 3, 2001

TO: All Waste Management Division Supervisors

FROM: Jim Sygo, Chief, Waste Management Division

SUBJECT: Termination of Groundwater Purge Systems

This operational memo provides guidance on the number and frequency of groundwater samples necessary to determine the appropriateness of terminating the operation of purge wells.

First and most importantly, there is no universal answer to this situation. The appropriate time frame should be based on the site-specific flow regime, purge system design, nature of contaminants, and should be determined and approved as part of a Remedial Action Plan (RAP) or Corrective Measures Implementation (CMI). There are, however, some basic criteria to consider when approving termination of a purge system, which must include a post-purge monitoring program.

A. Initial Shut-Off

1. It is necessary to adequately sample and fully characterize the entire plume for all parameters and the breakdown products that have been historically present before considering the initial shut-off of the purge system. Once the facility demonstrates that all parameters from all purge well(s) and monitoring wells are below Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, target cleanup standards, the purge system should still continue to operate for a demonstration period at the normal pumping rate. The demonstration period must be based on aquifer and contaminant characteristics. During this period, the purge well(s) should be sampled monthly and the monitoring wells sampled at least quarterly.

   For example, if six months was an appropriate clean purge demonstration period, and all purge wells and monitoring wells are still below the target cleanup levels after that time, the purge system may be shut off. For the

six-month example, this would, at a minimum, mean at least seven consecutive monthly purge well samples, and three quarterly monitoring well samplings have met the target cleanup standards.

2. Target cleanup standards would include all relevant groundwater pathways (drinking water, utility worker direct contact, indoor air, and groundwater/ surface water interface [GSI]). The criteria must be met for any and all of these that are applicable to a given site, based on the specific land-use (residential, commercial, or industrial). Any deed restrictions or institutional controls must remain in place unless residential standards are met and the post-purge monitoring confirms residential standards are maintained. On-site purging (within property boundaries) can meet commercial or industrial standards, but the off-site criteria are residential unless a groundwater waiver (for remediation) is obtained or the appropriate deed restrictions or institutional controls are in place.

B. Post-purge Monitoring

1. For a period of three years after purging has ceased, quarterly or semi-annual groundwater monitoring sampling events should continue. All wells located within the historic boundary of the plume, and all parameters of concern must be included. The monitoring could be less than three years, depending on the aquifer and/or contaminant characteristics.

   Caution must be exercised when considering any commitment releasing the facility from future monitoring or purging responsibilities (less than three years), as conditions may change when the aquifer recovers to its pre-purge conditions. Contaminants may dissolve and/or mobilize from portions of the aquifer which were previously dewatered due to purging, resulting in concentrations in the groundwater that may exceed the target cleanup levels. In addition, a stagnation point will usually develop in the flow field downgradient of the purge well(s), which may contain groundwater with elevated contaminant levels relative to the water being purged. The water, which was stagnant during purging, would be incorporated into the groundwater flow system following the end of purging. If on-site criteria are commercial or industrial, it must be demonstrated that residential criteria will not be exceeded off-site due to continued groundwater migration.

2. When determining whether less than three years of monitoring is required, at least the following must be taken into account: groundwater flow velocity, contaminant flow velocity and attenuation, degradation products, distance of

the monitoring wells from the source of contamination, adjacent property with more restrictive land uses (residential versus industrial), and other site specific conditions.

3. If, at anytime during the post-purge monitoring evaluation, any relevant parameter exceeds the target cleanup levels, the purge system must be reactivated. Once restarted, the system should only be shut down following the procedure outlined in this memo in its entirety. Additional studies may be needed if the system has exceedances of relevant parameters after the initial shutdown. This study should determine the cause and whether other remediation methods should be combined with the purge system.

C. Well Abandonment

1. A workplan should be included in the RAP for well abandonment. Once the post-purge monitoring is complete, and accepted by the state, well abandonment should not take place without the written consent of the appropriate state program agency.

2. Well abandonment must be documented and submitted to the appropriate state program agency.