

SITE SOIL AND GROUND WATER ANALYTICAL DATA EVALUATION

Volatile Organic Contamination including methyl tertiary butyl ether (MTBE) and tertiary butyl alcohol (TBA) derived from discharges of Petroleum Mixtures

Due to biodegradability of petroleum mixture-derived volatile organic contamination (i.e. gasoline, diesel, fuel oil etc.) and the mobility and solubility of MTBE and TBA in the environment, ground water monitoring may be used as an indication that contaminants in soil have undergone natural attenuation.

At sites where the treatment or removal of contaminated soil was impracticable during implementation of a remedial action, the Department may issue a No Further Action determination for unsaturated soils for the Impact to Ground Water Soil Remediation Exposure Pathway following the successful implementation of a natural ground water remediation program conducted in accordance with the Technical Requirements for Site Remediation (N.J.A.C. 7:26E-6.3(d) and (e)). Low and decreasing contaminant concentrations in ground water are sufficient evidence to demonstrate that attenuation of contamination in unsaturated soil has occurred. This eliminates the need to collect post-remedial unsaturated soil analytical data (following successful implementation of the natural ground water remediation program) to demonstrate that unsaturated soil is in compliance with the Impact to Ground Water Soil Remediation Criteria.

All of the following conditions must be met in order for the Department to approve of No Further Action for petroleum mixture-derived volatile organic contamination including MTBE and TBA in unsaturated soil following monitored natural ground water remediation:

- Soil contamination has been fully delineated to the site specific Impact to Ground Water Soil Remediation Criteria pursuant to NJAC 7:26E-4.1;
- Soil contamination exceeding the site specific Impact to Ground Water Soil Remediation Criteria has been treated or removed to the extent practicable and concentrations remaining in soil are low and limited to a small aerial extent;
- The greatest levels of soil contamination that remains is located at a depth that is between the seasonally high and low water table;
- Free and residual product has been removed, pursuant to N.J.A.C. 7:26E-6.1(d);
- Ground water contamination has been delineated to the ground water remediation standards, pursuant to N.J.A.C. 7:26E-4.4 and N.J.A.C 7:26D-2;
- Contaminants detected in ground water are below the Department's Ground Water Remediation Standards (N.J.A.C. 7:26D) or are relatively low and decreasing trends are demonstrated using the Mann Whitney U Test in accordance

with N.J.A.C. 7:26E-6.3(e). Decreasing contaminant trends must not be related to water table fluctuations.

The Department will require additional remedial action for petroleum mixture-derived volatile organic contamination including MTBE and TBA in soil if a decreasing trend in contaminant concentrations has not been established in relation to all ground water levels elevations measured over the duration of the case. Non-decreasing ground water contaminant concentrations associated with rise or fall of the water table can be an indication that residual contaminant mass is present in either the saturated or unsaturated zone. For example, if the greatest concentration of ground water contamination was detected when the elevation of ground water was low, as the result of a drought or very low precipitation recharge, and concentrations of contaminants in ground water have decreased with a rise in water table elevation then the Department will require additional remedial action;

- All potential receptors pursuant to N.J.A.C. 7:26E-4.4(h)3 including, but not limited to, all potable and irrigation wells, structures for potential vapor intrusion including subsurface utilities, and surface water and wetlands have been evaluated and there is no risk to these receptors;
- If ground water contamination above the Ground Water Quality Standards (GWQS) is present at the time of case closure, a Classification Exception Area (CEA) must be established by the Department. Ground water sampling required at the end of the timeframe established by the CEA must demonstrate that ground water has been remediated to the ground water quality standard; and
- Any soil contamination detected above the most restrictive Direct Contact Soil Remediation Standard has been remediated and resampled to determine compliance with the direct contact soil remediation standards pursuant to N.J.A.C. 7:26D.

Submission Requirements

- A scaled map indicating the locations of all soil samples, including post-excavation and delineation samples, and monitoring wells;
- A table of historical soil sample results indicating the sample number, date collected, sample depth interval, and the analytical results;
- A table of historical ground water sample results indicating the monitoring well number, sampling date, depth to ground water, elevation of ground water and the analytical results;
- Graphs for each monitoring well depicting depth to ground water and contaminant concentrations vs. time to establish decreasing trends over all depth to ground

water intervals. The data must demonstrate no correlation between depth to water and contaminant concentrations;

- A discussion of the presence and location of any potential receptors in relation to the ground water contaminant plume. A map showing the location of all potential receptors must be provided if not previously submitted;
- If ground water contamination remains or if an existing CEA needs to be updated, a proposed CEA in accordance with N.J.A.C. 7:26E-8.3; and
- A discussion of the ground water contaminant concentrations decreasing trend including the following:

1) A discussion of the results of the Mann-Whitney U-Test conducted pursuant to N.J.A.C. 7:26E-6.7(e);

2) A review of all water table elevation information and ground water quality data; and

3) For the water table elevation(s) that were associated with the highest ground water contaminant concentrations, an evaluation on whether a decreasing trend(s) in contaminant concentrations has been established at this water table elevation(s).