

TPH Soil Testing at Underground Storage Tank Sites

Background

Total petroleum hydrocarbon (TPH) analysis is a fundamental requirement of the Cleanup Rules for Leaking Petroleum Underground Storage Tank Systems (USTs). In the late 1980s and early 1990s, most cleanup completion decisions were based upon TPH testing results. Beginning in 1995, the DEQ began investigating and encouraging the use of petroleum constituent analysis in assessing human health and environmental risk.

In September 1999 (revised 2003), the DEQ issued the guidance document *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*, which describes how petroleum constituent analyses can be used to determine whether or not risks to human health and the environment exist. This factsheet helps to clarify when TPH testing is required despite the numerous other analytical options available for demonstrating that site cleanup is complete.

When is TPH testing necessary?

TPH testing is required when decommissioning a petroleum UST and when investigating the magnitude and extent of petroleum contamination. TPH testing is needed to obtain a "no further action" determination from DEQ. The site closure options for leaking UST cleanup projects such as low-impact sites (OAR 340-122-0243), risk-based concentrations (OAR 340-122-0244), generic remedies (OAR 340-122-0252, and soil matrix cleanup options (OAR 340-122-0320) require TPH testing in order to define the full magnitude and extent of quantifiable petroleum contamination.

Why is TPH testing necessary?

TPH testing to determine the magnitude and extent of contamination is necessary even when planning a risk-based closure because petroleum hydrocarbons encompass compounds for which the risk to human health has not been fully established. TPH testing can also indicate other concerns, such as nuisance conditions and ecological risks. TPH quantification provides an overall indication of the magnitude and mobility of remaining contamination. This data is also used by the DEQ to provide information to the public about contamination levels at sites they are interested in.

The use of petroleum constituent data (e.g., benzene, naphthalene, etc.) is not acceptable as the sole means of defining magnitude and extent.

What TPH concentration is needed to define the extent of contamination?

The DEQ will always accept definition of the extent of contamination by TPH concentrations that are less than the Level I numeric soil cleanup standards of 40 parts per million (ppm) for gasoline and 100 ppm for diesel or heavier petroleum. The DEQ may accept definition of the extent of contamination by Level II or Level III numeric soil cleanup standards if a soil matrix score sheet is completed that shows that the higher standards are applicable for the site. Please note that this standard can apply to soil issues at groundwater cleanup sites as described in the *UST Cleanup Manual* (Section 3.5, How to Handle Sites with Multiple Cleanup Options).

Can TPH-HCID be used to define the extent of contamination?

No, TPH-HCID may only be used for hydrocarbon identification when initially screening for contamination. After determining the type of petroleum leak, subsequent testing for gasoline range hydrocarbons requires method NWTPH-Gx and diesel/lube-oil range hydrocarbons requires method NWTPH-Dx. TPH-HCID is not an approved method for quantification of petroleum contamination. If a site contains both gasoline- and diesel-range hydrocarbons, then both analytical methods should be used.

For more details regarding the TPH analytical method application, please refer to page 77 of the *UST Cleanup Manual*.

Additional information

Two important documents are:

- *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*, DEQ 1999 (revised September 22, 2003)
- *UST Cleanup Manual*, DEQ 2000

Both are available at our web page:
<http://www.deq.state.or.us/pubs/reports.htm#UST>

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