

State Water Resources Control Board (SWRCB)**Letter No. 012****Subject:** Total Petroleum Hydrocarbon (TPH) Analytes**Date:** April 26, 2002**Overview:**The issue:

The LUFT and UST monitoring and permitting programs in the State of California require routine soil and groundwater analyses. In accordance with guidance found in the *Leaking Underground Fuel Tank (LUFT) Field Manual, October 1989*, soil and water samples are analyzed for TPH gasoline and diesel. It is at the discretion of the laboratories, based on their internal quantification techniques and requirements from their clients, how these analytes are detected and reported (i.e., which carbon ranges are used to demarcate gasoline or diesel). Without standardization regarding these analytes, data uploaded to a central database repository may not be comparable. Standardization of the TPH analytes for gasoline and diesel within the data uploaded to the centralized database will allow comparison of like constituents across multiple purposes of data collection represented in the AB 2886 implementation, ensuring maximum use of the data by multiple parties.

In October 1999, the Petroleum Hydrocarbon Method Committee issued guidance on the determination of total petroleum hydrocarbon analysis focusing on (1) quantitation ranges and product identification and (2) cleanup of sample extracts to remove polar interferences. The SWRCB recommends that the analysis of TPH be consistent with the *October 1999 Guidance for Petroleum Hydrocarbon Analysis* provided by the Petroleum Hydrocarbon Method Committee.

Background: Currently, requests are made for analysis of TPH gasoline range and diesel range analytical determinations. Laboratories are providing analytical data in a manner consistent with their internal calibration practices or as specified by their clients. One lab may quantify diesel as C9 to C22, while another lab may quantify diesel as C12 to C24, leading to incomparable data from one laboratory to another, and/or in the central database, from one site or facility to another. This situation leads to the inability to confidently query the compiled database, being certain that all data requested in the query is being returned.

Standardization of quantitation and nomenclature for the implementation of TPH methods for gasoline and diesel within the LUFT and UST programs, as implemented in the AB 2886 program, will :

1. allow the comparison of results of like analytes;
2. simplify the data retrieval and summary process within the centralized database; and
3. simplify the retrieval of data by end users, thus increasing the usability of the database.

AB 2886 Policy: With the current AB 2886 implementation, soil and water samples are analyzed for TPH gasoline and diesel in accordance with guidance found in the *Leaking Underground Fuel Tank (LUFT) Field Manual, October 1989*. For data comparability purposes the SWRCB recommends that the TPH gasoline and diesel analytes be quantified as follows per the *October 1999 Guidance for Petroleum Hydrocarbon Analysis*:

Quantitation Ranges:

| | | |
|-----------------|----------------------------------|---|
| <i>PARLABEL</i> | | |
| TPHC6C12 | Volatile Range Organics | n-C6 to n-C12 [n-hexane to n-dodecane] |
| TPHC10C28 | Extractable Range Organics | n-C10 to n-C28 [n-decane to n-octacosane] |
| TPHC28C40 | Heavy Extractable Range Organics | n-C28 to n-C40 |

VRO and ERO are used to designate the ranges, instead of labeling the ranges “gasoline range organics” and “diesel range organics” because other refinery products, such as jet fuel or Stoddard solvent may wholly or partly elute in the same chromatographic range. VRO and ERO ranges overlap (C10-C12); the two results should not be combined to yield a “total” hydrocarbon result. Oxygenates are to be included in the VRO if they elute in the VRO retention window. Any deviation from these ranges should be explained in the laboratory report, and if appropriate the project plan.

Extract Cleanup:

Polar, biogenic compounds such as carboxylic acids can be significant interferences in hydrocarbon chromatography and may be present due to biodegradation of the petroleum contamination (degradation by-products). If the objective is to measure only non-polar compounds in the sample, cleanup should be performed. If the objective is to measure all organic compounds, no cleanup should be performed. See *October 1999 Guidance for Petroleum Hydrocarbon Analysis*.

Special Conditions:

This applies to all sample matrices.

Areas of Impact:

Field(s): *PARLABEL*, *ANMCODE*

Entry: *PARLABEL* = "TPHC6C12" for Volatile Range Organics , "TPHC10C28" for Extractable Range Organics and "TPHC28C40" for Heavy Extractable Range Organics
Entry: *ANMCODE* = "CATPH-G" and, "CATPH-D"

Policy:

- a) Scenario 1 – Sample analyzed for TPH Volatile Range Organics by CA LUFT Method for Gasoline Range Organics
Code use: *PARLABEL* = "TPHC6C12-"
ANMCODE = "CATPH-G"
- b) Scenario 2 – Sample analyzed for TPH Extractable Range Organics by CA LUFT Method for Diesel Range Organics
Code use: *PARLABEL* = "TPHC10C28"
ANMCODE = "CATPH-D"
- c) Scenario 3 – Sample analyzed for TPH Heavy Extractable Range Organics by CA LUFT Method for Diesel Range Organics
Code use: *PARLABEL* = "TPHC28C40"
ANMCODE = "CATPH-D"