A.6 TPH Fractionation Methods

TPH Fractionation Methods Fact Sheet				
What Is TPH Fractionation?	Partitioning of the TPH mixture into aliphatic and aromatic fractions			
	Fractions can be further separated by equivalent carbon ranges			
Why Fractionate?	For risk assessment purposes because different classes of compounds have different fate, transport, and toxicity characteristics			
	To provide data for a refined risk assessment and to decrease uncertainty			
	Most useful for soils and water, not typically done for air samples			
Trade-offs of Fractionatio	More manual steps than bulk TPH			
	Fractionation is not perfect (potential loss of material through additional sample preparation or different extraction medium; see Section 4.2.5, Limitations of Fractionation Approach)			
	Nonhydrocarbons are retained on silica gel and will not be detected			
	Cost will be higher			
Comparison of TPH Fractionation Methods				
Evaluation Parameter	**TX1005/TX1006**	**WADOE VPH/EPH**	**MassDEP VPH/EPH**	**Implications/Biases**
Motivation/Evolution of Method	Characterization methods for petroleum and petroleum products in the exploration, refining, and blending processes, and those were deemed to be best for these types of mixtures.	Split into volatiles/ purgeables and semivolatiles/ extractables; adaptation from 8021/8260 and 8270-type methods. 8270 is a method for phenolics, aromatics including PAHs, phthalates, organochlorine compounds, etc., and a wide-range solubility solvent was used for extraction.	Split into volatiles/ purgeables and semivolatiles/ extractables; adaptation from 8021/8260 and 8270-type methods. 8270 is a method for phenolics, aromatics including PAHs, phthalates, organochlorine compounds, etc., and a wide-range solubility solvent was used for extraction.	Methods developed for looking at many different types of compounds at low levels in soil and groundwater were simply used to develop methods for mixtures of hydrocarbons for VPH/EPH methods and not necessarily focused on hydrocarbons alone. TX1005 method is currently being revised; TX1006 method is in draft form. NOTE: TPH is a method-defined parameter.

A.6 TPH Fractionation Methods *continued*

TPH Fractionation Methods Fact Sheet				
Number of Carbon Ranges Quantified and Reported	13 specified ranges: C6 aliphatics, >C6–C8 aliphatics, >C7–C8 aromatics, and five ranges covering >C8–C35 for both aliphatics and aromatics TPHCWG method and TX can report for each individual equivalent carbon range and the user can add whatever ranges they choose. Because TX has its tox ranges, the method was written to serve the TX Risk Reduction program. TPH is defined by this method in that program.	VPH: C5–C12 saturates and aromatics; EPH: 3–6 equivalent carbon ranges over C8–C36	VPH: 2 aliphatic and 1 aromatic carbon ranges over C5–C12 EPH: 2 aliphatic and 1 aromatic carbon ranges over C9–C36. Carbon ranges are not equivalent carbon (EC) in this approach.	Carbon ranges can easily be modified upon request. The use of different analytical methods for volatiles and extractables will result in carbon number overlap.
Cost	About 2–5x the cost of USEPA method 8015	About 2–5x the cost of USEPA method 8015	About 2–5x the cost of USEPA method 8015	

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