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Characterizing Risks Posed by Petroleum Contaminated Sites:

Implementation of the MADEP VPH/EPH Approach

FINAL POLICY

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Policy #WSC-02-411

This Policy provides guidance for parties conducting response actions under the Massachusetts Contingency Plan (MCP) on the use and application of the Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) methods to characterize risks posed by releases of petroleum products to the environment. This Policy updates and replaces draft documents that were issued on October 31, 1997 and June 2001. Parties who are currently using criteria and guidance contained in the June 2001 draft document may do so until May 1, 2003. A summary of significant changes between these earlier drafts and this Final Policy is provided in Appendix 6.

The information contained in this document is intended solely as guidance. This Policy does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. This Policy provides recommendations and guidance on approaches the Department considers acceptable for meeting the performance standards set forth in the MCP and discussed in this document. These performance standards include, but are not limited to, the Response Action Performance Standards of section 310 CMR 40.0191 of the MCP. Parties using this guidance should be aware that there may be other acceptable alternatives for achieving and documenting compliance with the general regulatory requirements and performance standards of the MCP, including those of 310 CMR 40.0191. The regulatory citations in this document should not be relied upon as a complete list of the applicable regulatory requirements.

This Policy and further information on the development and application of the aliphatic/aromatic hydrocarbon evaluative technique employed by the Department, referred to as the "VPH/EPH" approach, may be obtained at http://www.state.ma.us/dep/bwsc/vph_eph.htm

10/31/02
Date

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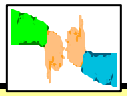
4.2.2 Target Analytes

Target Analytes are those constituents of petroleum which have traditionally been used to characterize environmental pollution, and for which MADEP has specific Method 1 cleanup standards: benzene, toluene, ethylbenzene, xylenes, MtBE, lead, Ethylene Dibromide, and the 17 "priority pollutant" PAHs. *By definition, Target Analytes are not counted within the VPH and EPH Aliphatic and Aromatic hydrocarbon fractions.*

It is not necessary to test all media and all petroleum releases for all Target Analytes; this decision is site-specific, based upon (1) the type (chemistry) of the petroleum product(s) released, (2) fate and transport considerations, and (3) the sensitivity of area receptors. Guidance and *Rules of Thumb* on the most commonly released petroleum products, based upon Total Organic Vapor (TOV) headspace screening and/or TPH data, are provided in Table 4-3.

Table 4-3: Recommended Target Analyte List for Petroleum Products



Petroleum Product	Media	Headspace TOV	TPH	Recommended Target Analytes
Gasoline	soil	------	-----	benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and appropriate additives (e.g., MtBE, lead, and/or EDB).
	gw	-----	-----	benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and appropriate additives (e.g., MtBE, lead, and/or EDB).
#2 Fuel/Diesel	soil	≥100 ppmv	-----	benzene, toluene, ethylbenzene, xylenes, naphthalene
		-----	>500 µg/g	acenaphthene, naphthalene, 2-methylnaphthalene, phenanthrene
	gw	------	-----	acenaphthene, naphthalene, 2-methylnaphthalene, phenanthrene; in GW-1, test also for BTEX, MtBE[1]
#3-#6 Fuel Jet Fuels Kerosene Lube Oils Hydraulic Oils	soil	≥100 ppmv	-------	benzene, toluene, ethylbenzene, xylenes, naphthalene
		--------	------	17 priority pollutant PAHs, unless justification not to
	gw	------	-----	If in GW-1 area, test for BTEX and 17 priority pollutant PAHs
Waste Oils	soil	≥ 10 ppmv	-----	BTEX/VOCs, PAHs, PCBs, heavy metals
		-----	-----	PAHs, PCBs, heavy metals
	gw	-----	-----	BTEX/VOCs, PAHs, PCBs, heavy metals

[1]While MtBE is not an additive in fuel oils, it may become present during the transport and distribution process due to mixing of residue product

4.2.2.1 Petroleum Product Additives

The topic of petroleum product additives warrants special consideration with respect to the selection of Target Analytes.

Since 1923, organic, inorganic, and/or organo-metallic compounds have been added to petroleum products to enhance performance characteristics or address operational or air pollution concerns. While additives of this nature have been numerous – and often proprietary – the list of common additives with significant environmental concerns is relatively small. Details in this regard are presented in Table 4-4.