Off-Gas Treatment of Point-Source Remedial Air Emissions (Policy #WSC-25-150)

Significant Changes/Issues and External Comments

The most important changes to this document, from both the original 1994 version and the May 2025 Public Comment draft, are discussed below:

- **Contaminant Grouping** – Air modeling undertaken in 1994 established acceptable receptor endpoint concentrations, and then "reversed engineered" what level of emission flux (mass/time) would not exceed these acceptable levels at a given distance from the discharge point. To minimize the extent of modeling, various VOCs were placed in 1 of 4 Groups, based upon the commonality of acceptable receptor impacts (i.e., HQ $\leq$ 0.2, ELCR $\leq$ 1 x 10^{-6}, 50th percentile odor recognition threshold). Using conservative exposure assumptions, four receptor endpoints were established: 1.08 µg/m^3, 13.2 µg/m^3, 32 µg/m^3, and 118 µg/m^3, corresponding to Groups 1 through 4. Because additional air modeling was not undertaken, this grouping concept was maintained in the 2023 and 2025 revisions, though a new Group 1 (with lower acceptable receptor concentrations than the 1994 Group 1) was developed through an extrapolation process. Moreover, as part of the final revisions to this guidance, the latest (2024) residential indoor air Short Form was used to make final adjustments for group assignments (i.e., to ensure HQ $\leq$ 0.2 and ELCR $\leq$ 1 x 10-6 for each contaminant). This resulted in 6 contaminants being moved to a higher Group than in 1994, and thus having a more stringent receptor exposure endpoint (TCE, PCE, Benzene, Naphthalene, cis 1,2-DCE, Chlorobenzene), and 4 contaminants being moved to a less stringent receptor exposure endpoint (Toluene, 1,1-DCA, Methylene Chloride, MEK).
- **TCE-** None of the emission-distance graphs from the 1994 document were conservative enough to address the updated TCE toxicity value. Without conducting new air modeling, the May 2025 revision simply removed TCE from the list of chemicals addressed in this guidance (i.e., site-specific evaluations would be required). Commenters provided valid points about sites where TCE was present as a relatively low-level breakdown product. MassDEP was able to create a new emission-distance graph for TCE (receptor concentration of 0.4 µg/m^3), based upon a mathematical evaluation/extrapolation of the existing modeling data and emission-distance equations. This new graph is now contained in the final document for "Group 1" chemicals (with the existing Groups 1 through 4 changed to 2 through 5). In addition to TCE, benzene and naphthalene were also moved to this new group 1, as their HQ and ELCR values (based upon the 2024 Short Form) were somewhat above allowable limits for the 1.08 µg/m^3 endpoint that constituted the 1994 Group 1.
- **Mandatory Initial Controls on SVE emissions** – The original 1994 document noted the high mass emission rate of SVE discharges, and indicated off-gas controls should be installed on all such installation for at least 1500 hours (about 2 months). This was presented as a RAPS issue (i.e., BRAMA at the time). The wording remained unchanged in the August 2023 and May 2025 revisions and is consistent with the long-standing MCP mandate to install off-gas controls on remedial air emissions, absent compelling arguments to the contrary. Given the uncertainties in predicting SVE emissions, and long-standing premise that cleaning up soil by transferring contaminants into the air is environmentally unsound, such a position is justifiable, and should be strengthened, as reflected in this final draft by citing the regulatory provisions of 40.0049(3), which allows MassDEP to specify, in writing, necessary off-gas treatment actions.
- **Mandated use of GC/MS Methods –** The 1994 original, and 2023 and May 2025 revisions, allowed the sole use of PIDs to determine compliance with the 95% removal mandate for off-gas controls. The final document now requires the use of TO-15 and/or APH method for the initial (Day 1) monitoring.

However, it also allows the subsequent use of PIDs if there is a correlation can be shown with the GC/MS data (which should be the case). MassDEP also worked in another longstanding concern – not ruling out chlorinated hydrocarbons at petroleum contaminated sites (by an initial/focused analysis of groundwater by a GC/MS method).

Relatedly, the final document contains a provision that untreated emissions from a groundwater air stripping system must also be tested using a GC/MS method, to verify projected mass emission rates.

- **Gasoline Sites –** The original 1994 document contained a "Group 5" emission-distance graph to address gasoline contaminated groundwater. As this pre-dated VPH/EPH, this graph looked at the summation of BTEX and MtBE. This separate grouping was eliminated in the May 2025 update, and gasoline sites are now addressed by the individual BTEX and MtBE contaminants (in various groups), as well as by newly added C_5-C_8 Aliphatic, C_9-C_{12} Aliphatic, and C_9-C_{10} Aromatic Hydrocarbon parameters.
- **Simplified Methodology** – A statement has been added in Section 7, similar to the statement in the Simplified Methodology in the LNAPL guidance: Using this approach is not required, but if it is used then no modifications can be made.

Attached as Table 1 is a tabulation of changes made to the contaminant groupings, and Table 2, summarizing and responding to external comments.

Table 1 – Summary of Protectiveness of Contaminant Endpoint Exposure (30-year residential exposure) 2024 Short Forms						
2025 Group #	Contaminant Name	Modeled Endpoint Exposure-µg/m^3		2025 Exposure concentration		Comment
		2025	1994	HQ	ELCR	
1	Trichloroethylene	0.4	32	0.2	9.7 E-07	New more stringent emission-distance graph extrapolated from previous modeling; 3 contaminants moved into this new Group 1
1	Benzene	0.4	1.08	0.13	1.3 E-06	
1	Naphthalene	0.4	13.2	0.13	N/A	
2	Bis (2-ethylhexyl) phthalate	-		--	--	Eliminated (not volatile)
2	1,2-Dichloroethylene (cis)	1.08	118	0.15	N/A	More stringent endpoint than 1994
2	Carbon Tetrachloride	1.08	1.08	0.01	2.8 E-06	
2	Chlorobenzene	1.08	32	0.02	N/A	More stringent endpoint than 1994
2	1,2-Dichloroethane	1.08	1.08	0.15	1.2 E-05	2.0 E-06 for 5-year exposure
2	Tetrachloroethylene	1.08	32	0.03	1.4 E-06	More stringent endpoint than 1994
2	Vinyl Chloride	1.08	1.08	0.01	6.7 E-06	
2	C_9-C_{10} Aromatic Hydrocarbons	1.08	NS	0.02	N/A	Added to address petroleum
3	Phenol	13.2	13.2	0.05	N/A	Odor threshold = 15 µg/m^3
3	Xylenes	13.2	13.2	0.13	N/A	Odor Threshold = 13 µg/m^3
4	C_5-C_8 Aliphatic Hydrocarbons	32	NS	0.16	N/A	Added to address petroleum
4	C_9-C_{12} Aliphatic Hydrocarbons	32	NS	0.15	N/A	Added to address petroleum
5	Acetone	118	118	0.15	N/A	
5	Toluene	118	13.2	0.02	N/A	Less stringent endpoint than 1994
5	Ethylbenzene	118	118	0.12	N/A	
5	1,1-Dichloroethane	118	1.08	0.15	N/A	Less stringent endpoint than 1994
5	1,1,1-Trichloroethane	118	118	0.02	N/A	
5	Methylene Chloride	118	13.2	0.2	1.3 E-06	Less stringent endpoint than 1994
5	Methyl Ethyl Ketone	118	32	0.04	N/A	Less stringent endpoint than 1994
5	Methyl Tertiary Butyl Ether	118	118	0.04	N/A	
N/A = Not applicable (chemical is not a carcinogen) NS = Not specified (i.e., not included in 1994 document)						

Table 2 – External Comments

Commenter	Comment(s)	Response
Matt Hackman, LSP	Retain TCE	New emission-distance graph provided for TCE; benzene and naphthalene also moved to this graph based on toxicity
LSPA	Reference section 3.4.5 pf VI guidance	Provided reference to 310 CMR 40.0049(3)(a)
	Explain how sites with TCE (among other VOCs) should be handled	New emission-distance graph provided for TCE; benzene and naphthalene also moved to this graph based on toxicity
	Change SSDS to AEPMM	Change was made
	Reference MassDEP Hazardous Waste guidance on classification of spent activated carbon	Reference was made
	How is ambient air background established?	This is already specified in the last paragraph of Section 4.3.
	Can Method 3 be used "to compare exposures to risk standards of HI 1.0 and ELCR 10-5"?	Method 3 can be used at all sites, but parties who choose to use the simplified approach and emission-distance graphs in this guidance must not make any modifications
	Include background exemption for ambient odors in Section 4.2, as provided in Section 4.3	Not needed – already in Section 4.3
	Recommend greater alignment with related regs and policies, including VI guidance and hazardous waste regs/policies	No details on where contradictions exist. Will reference VPH guidance and hazardous waste policy.
	What is an acceptable noise condition?	Reference added on need to comply with MassDEP regulations and local ordinances
	What is continuing exposure?	Reference added: more than 60 consecutive minutes
	Explain logic for "overly protective" SVE requirements	Logic is explained in document.
Deborah Zucker. citizen	Remove general SSDS exemption from policy if less than 100 pounds/year.	SSDS exemption is in MCP at 40.0049(3)(a). Guidance cannot overrule a regulation. Note that non-remedial air emissions (e.g., from a business) below 2000 pounds/ year are generally exempt from treatment.
	Provide guidance on noise issues	Reference added on need to comply with MassDEP regulations and local ordinances