SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

SOIL VAPOR EXTRACTION – EMISSIONS EXCEEDANCE FOLLOW-UP REPORT

PERMIT NUMBER (S): _____

SOIL VAPOR EXTRACTION EMISSIONS EXCEEDANCE FOLLOW-UP RESULTS

Sample Date	Hours of Operation	Influent							Effluent							Calculated VOC Control Efficiency (C)
		Flow Rate	Sample Start & End Times	Hour Meter Reading	Summa Canister Serial No.	Pollutant	Lab Results – Maximum Influent Concentration	Calculated Maximum Influent Mass Emission Rate (A) (B)	Flow Rate	Sample Start & End Times	Hour Meter Reading	Summa Canister Serial No.	Pollutant	Lab Results – Maximum Effluent Concentration	Calculated Maximum Effluent Mass Emission Rate (A) (B)	
	Hours	SCFM		Hours		(specify)	(specify units)	lb/day	SCFM		Hours		(specify)	(specify units)	lb/day	%

(A) For effluent samples that have pollutant concentrations below the laboratory detection limit, the laboratory detection limit must be used as the pollutant concentration when calculating the system mass emission rate.

(B) Effluent mass emission rate calculations shall use the applicable EMISSION RATE CALCULATION EQUATION listed below.

(C) VOC control efficiency shall be calculated as follows:

$$\text{VOC Control Efficiency} = \left[\frac{\left(\text{Influent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right) - \text{Effluent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right)\right)}{\text{Influent Mass Emission Rate } \left(\frac{\text{lb}}{\text{day}}\right)}\right] \times 100$$

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INCLUDE THE FOLLOWING AS ATTACHMENTS:

☐ **Emissions Exceedance Statement**, to include: 1. Date(s) of exceeded emissions 2. Date exceedance was reported to the SMAQMD 3. Estimated lbs/day emitted for each pollutant sampled 4. Estimated VOC control efficiency 5. Description of any procedure that was implemented to stop the emissions from exceeding the permitted limits 6. Date returned to compliance
☐ Applicable Field Data Sheets
☐ Laboratory analysis reports with laboratory detection limits listed for each pollutant sampled
☐ Applicable Chain of Custody (COC) documents
☐ SOIL VAPOR EXTRACTION – CARBON BREAKTHROUGH MONITORING FORM ***(applicable only for carbon adsorption systems)***

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EMISSION RATE CALCULATION EQUATION (to convert from PPM to lb/day):

$$Q_c = \frac{(C_c) * (F) * (MW_c) * (60 \text{ minutes/hour}) * (24 \text{ hours/day})}{(10^6) * (V)}$$

where:

Q_c = Mass Emission Rate of Contaminant c, lbs/day
C_c = Concentration of Contaminant c, ppm
1×10^6 = Conversion from parts per million to parts per unit volume
F = Vapor Volume Flow Rate, scfm
V = Molar Volume = 385.3 ft^3/lb-mole (based on Ideal Gas Law for a gas at standard conditions of 68 °F and 1 atm)
MW_c = Molecular Weight of Contaminant c
= 100 lb/lb-mol for TPHg (weathered gasoline)
= 78.11 lb/lb-mol for Benzene
= 88.15 lb/lb-mol for MtBE
= 131.4 lb/lb-mol for Trichloroethylene (TCE)
= 98.96 lb/lb-mol for Ethylene Dichloride (1,2 Dichloroethane)
= 165.8 lb/lb-mol for Tetrachloroethylene (Perchloroethylene, PCE)
= 119.4 lb/lb-mol for Chloroform
= 62.5 lb/lb-mol for Vinyl Chloride
= 84.93 lb/lb-mol for Methylene Chloride

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EMISSION RATE CALCULATION EQUATION (to convert from mg/m^3 to lb/day):

$$Q_c = (C_c) * (F) * (0.02832\ m^3/ft^3) * (0.000002205\ lb/mg) * (60\ minutes/hour) * (24\ hours/day)$$

where:

Q_c	= Mass Emission Rate of Contaminant c, lbs/day
C_c	= Concentration of Contaminant c, mg/m^3
F	= Vapor Volume Flow Rate, scfm
0.02832	= Conversion from ft^3 to m^3
0.00000220	= Conversion from mg to lb

EMISSION RATE CALCULATION EQUATION (to convert from μg/L to lb/day):

$$Q_c = \frac{(C_c) * (F) * (0.02832\ m^3/ft^3) * (60\ minutes/hour) * (24\ hours/day) * (2.2\ lb/kg)}{(1{,}000{,}000\ \mu g\text{-}m^3/L\text{-}kg)}$$

where:

Q_c	= Mass Emission Rate of Contaminant c, lbs/day
C_c	= Concentration of Contaminant c, μg/L
F	= Vapor Volume Flow Rate, scfm
0.02832	= Conversion from ft^3 to m^3
1,000,000	= Conversion from L-kg to μg-m^3