

**Engineering Evaluation  
Hazelwood SVE Plant  
110 Hazelwood Drive, South San Francisco, California 94080  
Facility ID 202925  
Application No. 672680  
Project Description: Soil Vapor Extraction System**

**Background**

On behalf of ARCO/Kenwood Limited, Trinity Source Group, Inc. (Trinity) has applied for an Authority to Construct for the following equipment:

**S-1 Soil Vapor Extraction System  
Blower: Roots, URAI 56, Maximum 464 SCFM**

*Abated by A-1 and A-2, arranged in series*

**A-1 Activated Carbon Vessels  
Two (2) 1,000-LBS Activated Carbon Vessels, arranged in series  
Mako, VF-1000, 1,000-LBS Carbon Capacity each**

**A-2 Potassium Permanganate Vessel  
One (1) 330-LBS Potassium Permanganate Vessel  
ERE Inc, UltraSorber 90-023-55M, 330-LBS Potassium Permanganate capacity**

The proposed equipment will be located in an Overburdened Community (OBC) of South San Francisco, CA. The site is a dry-cleaning business that is part of a multi-tenant commercial building. Environmental investigations conducted at the site show the presence of various volatile organic compounds (VOC) in the soil gas beneath the site, due to releases from the dry-cleaner. These VOCs include petroleum hydrocarbons and chlorinated VOCs, with tetrachloroethene (PCE) and trichloroethene (TCE) as the primary contaminants of concern. The contaminated soil at this site presents a risk to indoor air quality of the dry-cleaning business as well as the adjacent commercial properties. Remediation of this site comes at the direction of San Mateo County's Groundwater Protection Program, a division of the County's Environmental Health Department. To remediate the contaminated soil, Trinity has proposed the installation and operation of S-1, Soil Vapor Extraction system (SVE).

Soil vapor will be extracted with a vacuum blower with a maximum flow rate of 464 standard cubic feet per minute (SCFM) and will be routed through a series of adsorption vessels, including two (2) 1,000-lbs activated carbon vessels followed by one (1) potassium permanganate (KMnO<sub>4</sub>) vessel to reduce emissions to the atmosphere. Emission rates from S-1 are based on laboratory results of soil vapor samples and from a pilot test that was performed at the site.

Procedures are outlined in the conditions found below. Effluent volatile organic compound (VOC) concentrations will be monitored with a flame-ionization detector (FID) on a schedule reflecting current loading rates and predicted carbon capacity. Monitoring schedule changes will be allowed based on monitoring data collected.

### **Emission Calculations**

Soil vapor data will be used to estimate precursor organic compound (POC), non-precursor organic compound (NPOC), and toxic air contaminant (TAC) emissions. The following are assumptions used to estimate emissions.

- The system will operate for 24 hours/day and 365 days/year.
- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C; 1 mole occupies 24.15 Liters (or 386.8 ft<sup>3</sup>/lb-mol)
- The assumed inlet concentrations of individual compounds are the maximum concentration found in the lab analysis of soil vapor or the influent of the SVE pilot test. Using the maximum concentrations is a conservative estimate because influent concentrations will decline as mass is removed from the soil. For most compounds, soil vapor data was preferred over pilot test data because the analytical lab's method detection limits (MDL) of several common dry-cleaning compounds not detected in the pilot test samples were very high. The MDLs in the soil vapor lab analysis were much lower, and some of these dry-cleaning compounds that were not detected in the pilot test were detected in the soil vapor. See references in Tables 1A & 1B for compound-specific details.
- POC/NPOC emissions will be abated by two (2) 1,000-lb minimum activated carbon vessels followed by one (1) potassium permanganate vessel, all arranged in series. The changeout threshold for the last carbon vessel will be limited to 15.6 ppmv (as methane).
- Total Organics cumulative emissions are based on the 15.6 ppmv (as methane) effluent concentration limit.
  - POC cumulative emissions are based on a sum of abated emissions of all POCs, which corresponds to a maximum outlet POC concentration of 6.7 ppmv (as methane).
  - NPOC cumulative emissions are based on a sum of all NPOC emissions, which corresponds to a maximum outlet NPOC concentration of 8.9 ppmv (as methane).
- An abatement efficiency of 98.5% will be assumed for POC.
- Abated emission rates of NPOC are based on the effluent NPOC limit of 8.9 ppmv (measured as methane). This corresponds to an abatement efficiency of 99.872% for NPOC.
- The maximum flow rate of the blower was calculated to be 464 scfm. The blower's specifications listed the maximum flow rate under actual conditions of 580 cfm at 6 "HgV. Using Boyle's Law and assuming constant temperature, this corresponds to a maximum flow rate under standard conditions of 464 scfm.

Tables 1A & 1B below summarize the list of applicable compounds and their associated CAS numbers, pollutant designations, assumed inlet concentrations, unabated emission factors, unabated emission rates, abatement efficiencies, and abated emission rates.

**Table 1A. Emissions Review for Soil Vapor Extraction System (S-1)**

Individual Compounds	CAS	Pollutant Designation			Inlet Conc. ( $\mu\text{g}/\text{m}^3$ )	Unabated Emission Factor (lbs/scf)	Unabated Emission Rates		
		POC	NPOC	TAC			Hourly (lbs/hr)	Daily (lbs/day)	Annual (lbs/yr)
1,1-Dichloroethene <sup>1</sup>	75-35-4	X		X	350	2.18E-08	6.08E-04	1.46E-02	5.32
Benzene <sup>1</sup>	71-43-2	X		X	3,800	2.37E-07	6.60E-03	0.16	57.80
cis-1,2-Dichloroethene <sup>1</sup>	156-59-2	X			120,000	7.48E-06	0.21	5.00	1,825.34
Ethylbenzene <sup>1</sup>	100-41-4	X		X	160	9.98E-09	2.78E-04	6.67E-03	2.43
Methylene Chloride <sup>3</sup>	75-09-2		X	X	50	3.12E-09	8.68E-05	2.08E-03	0.76
n-Hexane <sup>1</sup>	110-54-3	X		X	40,000	2.49E-06	6.95E-02	1.67	608.45
Tetrachloroethene <sup>1</sup>	127-18-4		X	X	4,600,000	2.87E-04	7.99	191.70	69,971.28
Toluene <sup>1</sup>	108-88-3	X		X	190	1.19E-08	3.30E-04	7.92E-03	2.89
trans-1,2-Dichloroethene <sup>1</sup>	156-60-5		X		1,800	1.12E-07	3.13E-03	7.50E-02	27.38
Trichloroethene <sup>2</sup>	79-01-6	X		X	130,000	8.11E-06	0.23	5.42	1,977.45
Vinyl Chloride <sup>1</sup>	75-01-4	X		X	860	5.36E-08	1.49E-03	3.58E-02	13.08
Xylenes (Total) <sup>1,4</sup>	1330-20-7	X		X	360	2.25E-08	6.25E-04	1.50E-02	5.48

**Table 1B. Emissions Review for Soil Vapor Extraction System (S-1)**

Individual Compounds	CAS	Pollutant Designation			Abatement Efficiency (% w/w)	Abated Emission Rates			
		POC	NPOC	TAC		Hourly (lbs/hr)	Daily (lbs/day)	Annual (lbs/yr)	Annual (tons/yr)
1,1-Dichloroethene <sup>1</sup>	75-35-4	X		X	98.5%	9.12E-06	2.19E-04	7.99E-02	3.99E-05
Benzene <sup>1</sup>	71-43-2	X		X	98.5%	9.90E-05	2.38E-03	0.87	4.34E-04
cis-1,2-Dichloroethene <sup>1</sup>	156-59-2	X			98.5%	3.13E-03	7.50E-02	27.38	0.014
Ethylbenzene <sup>1</sup>	100-41-4	X		X	98.5%	4.17E-06	1.00E-04	3.65E-02	1.83E-05
Methylene Chloride <sup>3</sup>	75-09-2		X	X	99.872%	1.11E-07	2.67E-06	9.74E-04	4.87E-07
n-Hexane <sup>1</sup>	110-54-3	X		X	98.5%	1.04E-03	2.50E-02	9.13	4.56E-03
Tetrachloroethene <sup>1</sup>	127-18-4		X	X	99.872%	1.02E-02	0.25	89.56	0.045
Toluene <sup>1</sup>	108-88-3	X		X	98.5%	4.95E-06	1.19E-04	4.34E-02	2.17E-05
trans-1,2-Dichloroethene <sup>1</sup>	156-60-5		X		99.872%	4.00E-06	9.60E-05	3.50E-02	1.75E-05
Trichloroethene <sup>2</sup>	79-01-6	X		X	98.5%	3.39E-03	8.13E-02	29.66	0.015
Vinyl Chloride <sup>1</sup>	75-01-4	X		X	98.5%	2.24E-05	5.38E-04	0.20	9.81E-05
Xylenes (Total) <sup>1</sup>	1330-20-7	X		X	98.5%	9.38E-06	2.25E-04	8.21E-02	4.11E-05

**Tables 1A & 1B References:**

1. Influent concentrations correspond to the maximum concentration found in soil vapor samples for these compounds.
2. Influent concentration of Trichloroethene is the maximum concentration found in the pilot test conducted at the site.
3. Methylene Chloride is a common dry-cleaning compound that was not detected in soil vapor or in the pilot test. Half of the lowest MDL was used as the influent concentration for this compound.

<b>Table 2. Organic Emissions Review –Soil Vapor Extraction System (S-1)</b>					
<b>Pollutant</b>	<b>Effluent Volumetric Concentration (ppmv)</b>	<b>Hourly Emission Rate (lb/hr)</b>	<b>Daily Emission Rate (lb/day)</b>	<b>Annual Emission Rate (lb/yr)</b>	<b>Annual Emission Rate (ton/yr)</b>
POC	6.7	7.74E-03	0.19	67.8	0.034
NPOC	8.9	1.03E-02	0.25	90.0	0.045
Total Organics	15.6	1.80E-02	0.43	157.8	0.079

### Cumulative Increase

<b>Table 3. Cumulative Increase</b>			
<b>Pollutant</b>	<b>Current Permitted Emissions, Post 4/5/1991 (ton/yr)</b>	<b>Application New Emissions Increase (ton/yr)</b>	<b>New Cumulative Increase (ton/yr)</b>
POC	0.000	0.034	0.034

### Toxic Risk Screening

A project is subject to Regulation 2, Rule 5 if emissions of toxic air contaminants (TAC) exceed any acute or chronic trigger levels in Table 2-5-1 of Regulation 2-5. A project shall include emissions from all new or modified sources within a 5-year lookback period. There are no related sources at this facility within the lookback period. therefore the TAC emissions will include only the emissions from S-1. Tables 4 and 5 below provide a summary of the project TAC emissions compared to their respective acute and/or chronic trigger levels from Table 2-5-1.

<b>Table 4. Project Acute Toxic Air Contaminant Emissions</b>				
<b>Pollutant</b>	<b>CAS #</b>	<b>Hourly Emission Rate (lb/hr)</b>	<b>Acute Trigger Level (lb/hr)</b>	<b>Exceeds Acute Trigger Level?</b>
1,1-Dichloroethene	75-35-4	9.12E-06	-	-
Benzene	71-43-2	9.90E-05	1.20E-02	No
Ethylbenzene	100-41-4	4.17E-06	-	-
Methylene Chloride	75-09-2	1.11E-07	6.20E+00	No
n-Hexane	110-54-3	1.04E-03	-	-
Tetrachloroethene (PCE)	127-18-4	1.02E-02	8.80E+00	No
Toluene	108-88-3	4.95E-06	2.20E+00	No
Trichloroethene (TCE)	79-01-6	3.39E-03	-	-
Vinyl Chloride	75-01-4	2.24E-05	8.00E+01	No
Xylenes (Total)	1330-20-7	9.38E-06	9.70E+00	No

<b>Table 5. Project Chronic Toxic Air Contaminant Emissions</b>				
<b>Pollutant</b>	<b>CAS #</b>	<b>Annual Emission Rate (lb/yr)</b>	<b>Chronic Trigger Level (lb/yr)</b>	<b>Exceeds Chronic Trigger Level?</b>
1,1-Dichloroethene	75-35-4	7.99E-02	2.70E+03	No
Benzene	71-43-2	8.67E-01	2.90E+00	No
Ethylbenzene	100-41-4	3.65E-02	3.30E+01	No
Methylene Chloride	75-09-2	9.74E-04	8.20E+01	No
n-Hexane	110-54-3	9.13E+00	2.70E+05	No
Tetrachloroethene (PCE)	127-18-4	8.96E+01	1.40E+01	<b>Yes</b>
Toluene	108-88-3	4.34E-02	1.60E+04	No
Trichloroethene (TCE)	79-01-6	2.97E+01	4.10E+01	No
Vinyl Chloride	75-01-4	1.96E-01	1.10E+00	No
Xylenes (Total)	1330-20-7	8.21E-02	2.70E+04	No

This project is expected to exceed the chronic trigger level for PCE and is therefore subject to the requirements of Regulation 2-5. A Health Risk Assessment (HRA) was conducted to assess the risk to surrounding receptors. Because S-1 will be located in an OBC, the cancer risk is limited to 6 in million, per Regulation 2-5-301.1. The results of HRA are summarized in Table 6 below.

<b>Table 6. Health Risk Assessment Results</b>			
<b>Receptor</b>	<b>Cancer Risk</b>	<b>Chronic Hazard Index</b>	<b>Acute Hazard Index</b>
Resident	5.9 in a million	0.010	N/A
Worker	1.2 in a million	0.025	N/A
PMI	N/A	N/A	0.0040

The results from the HRA indicate that the maximum project cancer risk (resident) is estimated at **5.9 in a million**, the maximum project chronic hazard index (worker) is estimated at **0.025**, and the project acute hazard index at the point of maximum impact (PMI) is **0.0040**. These risk values are contingent on the following limitations:

- The stack design must be “open” or a “hinged rain flap” rather than a “fixed rain cap”.
- Annual PCE emissions cannot exceed 89.56 lbs/year.
- Annual TCE emissions cannot exceed 29.66 lbs/year

The risk values comply with the Regulation 2-5-302 project risk requirements. To ensure compliance with the project risk limitation, S-1 will be required to operate with an open or hinged rain flap stack design and will be required to limit PCE and TCE emissions to no more than 89.5 and 29.6 lbs/year<sup>1</sup>, respectively. These requirements will be reflected in the permit conditions.

<sup>1</sup> The chronic trigger level for TCE is 41 lbs/year, which exceeds the implemented limit of 29.6 lbs/year. This limit is required because the TCE emissions make up approximately 10% of the cancer risk from S-1. An increase in TCE emissions above 29.6 lbs/year could potentially increase the project risk above the Regulation 2-5-302 project risk limitations.

### **Best Available Control Technology for Toxics (TBACT)**

Pursuant to Regulation 2-5-301, a new or modified source is subject to TBACT if the source cancer risk exceeds 1.0 in a million and/or if the chronic hazard index exceeds 0.20.

The estimated cancer risk for S-1 exceeds 1.0 in a million and therefore the source is subject to TBACT for emissions of POC and NPOC. Section 9 of the Bay Area Air Quality Management District (BAAQMD) BACT/TBACT Workbook has guidelines for Soil Vapor Extraction operations (SVEs). For SVEs, TBACT for POC requires the effluent volumetric concentration of POC to be less than or equal to 10 ppmv (as methane); or POC must be abated with a capture/destruction efficiency of at least 98.5%. The typical technology to achieve this requirement is by at least two (2) activated carbon vessels in series or a thermal oxidizer. The TBACT requirement for NPOC requires the effluent volumetric concentration of NPOC to be less than or equal to 10 ppmv (as methane). The typical technology to achieve this requirement is at least two (2) activated carbon vessels in series. To determine if more stringent emission controls for SVEs have been achieved elsewhere, results and regulatory requirements were reviewed from the CARB Clearinghouse, EPA Clearinghouse, South Coast Air Quality Management District (SCAQMD), San Joaquin Valley Air Pollution Control District (SJVAPCD), Santa Barbara County Air Pollution Control District (SBCAPCD), and Sacramento Metro Air Quality Management District (SMAQMD). Additionally, control requirements implemented on SVEs permitted within BAAQMD were reviewed.

CARB Clearinghouse, SCAQMD, SJVAPCD, and SBCAPCD do not have any listed BACT or TBACT requirements for VOC emissions from SVEs. SMAQMD's BACT/TBACT guidelines for SVEs are the same as the "Achieved in Practice" guidelines from BAAQMD's BACT/TBACT Workbook. Two (2) similar sources were found in the EPA Clearinghouse database, however the emission control requirements were either no more stringent or less stringent than BAAQMD's BACT/TBACT Workbook requirements. Furthermore, a review of BAAQMD permitted SVEs was conducted to determine if any more stringent source test verified controls have been implemented. Several SVE sources were found with submitted abatement efficiencies exceeding 98.5%, however a review of the engineering evaluations of these sources found that the requirements implemented in the permit conditions were either less stringent or no more stringent than the BACT/TBACT Workbook requirements. However, there are a few examples of SVEs permitted with BAAQMD within the last year that have some more stringent control requirements than those in Section 9 of BAAQMD's BACT/TBACT Workbook. The results of these findings for POC and NPOC will be discussed below.

#### **Precursor Organic Compounds (POC)**

The minimum abatement efficiency requirement for POC for these SVEs is no more stringent than the BAAQMD BACT/TBACT Workbook guideline of 98.5%. However, the effluent volumetric concentration threshold for waiving the minimum abatement efficiency requirement is as low as 2 ppmv (as methane), rather than 10 ppmv. Furthermore, these SVEs use similar control devices (adsorption vessels). The use of at least two (2) activated carbon vessels to achieve at least 98.5% abatement efficiency of POC, with a provision that the abatement efficiency requirement can be waived with an effluent POC volumetric concentration no higher than 2 ppmv (as methane) is therefore achieved in practice, and is considered TBACT for S-1.

#### **Non-Precursor Organic Compounds (NPOC)**

Review of the NPOC control requirements for these SVEs showed that there is an SVE for which an implemented effluent NPOC volumetric concentration threshold limit is 6.05 ppmv (as methane). This SVE is S-1 from Plant #25121 and was approved under Application #31494. Although the SVE from Plant #25121 also has PCE (which is an NPOC) as one of the primary contaminants of concern, and uses similar control devices, the site-specific conditions at which the SVE at Plant #25121 operates is comparatively very different from the proposed S-1 in this application. The influent concentration for the SVE at Plant #25121 is 40,000  $\mu\text{g}/\text{m}^3$ , while the influent concentration for S-1 in this application is over 100 times higher

at 4,600,000  $\mu\text{g}/\text{m}^3$ . Therefore, implementing the same limit of 6.05 ppmv would be significantly more stringent for the SVE in this application. Furthermore, implementing an effluent NPOC limit less than 10 ppmv for the SVE at Plant #25121 was to ensure that the corresponding annual emissions of PCE do not increase the cancer risk to the surrounding receptors. Similarly in this application, an effluent NPOC limit of 8.9 ppmv (as methane) must be implemented to ensure compliance with the project risk requirements of Regulation 2, Rule 5. Therefore, the use of activated carbon vessels to achieve an effluent NPOC limit of 8.9 ppmv (as methane) is considered TBACT for this proposed S-1.

This proposed S-1 will use a series of two (2) activated carbon vessels and one (1) potassium permanganate vessel to achieve the TBACT control requirements described in this section. The applicant has agreed to these requirements and they will be reflected in the permit conditions. Compliance

The review of other agency's databases yielded no more stringent requirements and/or results than the TBACT requirements in BAAQMD's BACT/TBACT Workbook for SVEs. The applicant satisfies the TBACT technology requirement with the proposed use of two (2) activated carbon vessels, arranged in series. Furthermore, the applicant has agreed to the "Technologically Feasible" emission control requirements for POC and NPOC. The proposed S-1 meets TBACT and the associated requirements will be reflected in the permit conditions below.

### **Offsets**

Pursuant to Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits, or is permitted to emit, more than 10 tons per year of precursor organic compounds (POCs) or nitrogen oxides ( $\text{NO}_x$ ). Furthermore, pursuant to Regulation 2-2-303 offsets must be provided for any new or modified source at a major facility with a cumulative increase that exceeds 1.0 ton per year of  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$ , or sulfur dioxide ( $\text{SO}_2$ ).

The facility is not expected to have a PTE greater than 10 tons per year of POC or  $\text{NO}_x$ , nor is the facility a major facility of  $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$ , and  $\text{SO}_2$ . Therefore, the requirements of Regulations 2-2-302 and 2-2-303 do not apply.

### **Best Available Control Technology (BACT)**

In accordance with Regulation 2-2-301, Best Available Control Technology (BACT) is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, nitrogen oxides ( $\text{NO}_x$ ), carbon monoxide (CO), sulfur dioxides ( $\text{SO}_2$ ), particulate matter less than 10 micrometer ( $\text{PM}_{10}$ ) and particulate matter less than 2.5 micrometer ( $\text{PM}_{2.5}$ ).

NPOC and POC emissions are expected to be below 10 lb/day. Therefore, a BACT review is not required.

### **California Environmental Quality Act (CEQA)**

Remediation of the contaminated soil at this site comes at the direction of the San Mateo County Department of Environmental Health, pursuant to their Groundwater Protection Program (GPP).

The goal of the GPP is to protect underground water supplies and surface waters from chemical pollution. Soil contaminated with toxic chemicals, such as the soil at this project site, presents a risk to contamination of groundwater. Additionally, the VOCs in the soil present a human health risk due to the potential for toxic VOCs that may intrude into the indoor air of the occupied buildings located above the contaminated soil. The remediation of this site will assure the restoration, enhancement, and/or protection of the local groundwater and indoor air quality at the affected area.

The Air District received a completed, signed, and dated preliminary environmental study from the applicant as required by Regulation 2-1-426.1, with information equivalent to that contained in Appendix H of the State CEQA Guidelines. Therefore, the application was deemed complete for CEQA purposes.

The installation and operation of S-1, Soil Vapor Extraction System is for the purpose of remediating contaminated soil at the project site. Because the proposed SVE is subject to TBACT, the Air District does not consider project approval to be ministerial. However, this permit application approval is categorically exempt from CEQA because the project has no potential for causing a significant adverse environmental impact, and the application is categorically exempt from CEQA under CEQA Guidelines Section 15308 of the 2023 CEQA Statutes and Guidelines, since the installation and operation of S-1 is exempt from CEQA requirements because it is an action taken by a regulatory agency for protection of the environment. In making the determination that this application is categorically exempt: 1) the Air District reviewed the CEQA-related information from the applicant (Regulation 2-1-426.1) indicating that there is no potential for a significant adverse environmental impact from the project; 2) a formal health risk assessment was approved by the Air District; and 3) the Air District determined there are no unusual circumstances, or that the cumulative impacts from successive projects of the same type in the same place do not result in significant adverse environmental impacts. Therefore, CEQA review is not required for this project.

### **Statement of Compliance**

#### **Regulation 8, Rule 47 – Air Stripping & Soil Vapor Extraction Operations**

Based on the information submitted, this operation is expected to meet the 90% control requirement of Regulations 8-47-301 and 8-47-302. Emissions will be vented through a carbon adsorption system at all times of operation.

Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS) are not triggered.

#### **Public Notification (Regulation 2-1-412)**

S-1 is not located within 1,000 feet of a K-12 school, however it is located in an OBC of South San Francisco and an HRA was required. Therefore, the project is subject to the public notification requirements of Regulation 2-1-412. A public notice will be sent to all addresses within 1,000 feet of the facility and there will be a 30-day public comment period.

### **Permit Conditions**

#### **Permit Condition #100140 Applies to S-1**

1. The owner/operator shall abate the precursor organic compound (POC)/non-precursor organic compound (NPOC) emissions from the soil vapor extraction system (S-1) with the Activated Carbon Vessels (A-1), and the Potassium Permanganate Vessel (A-2), during all periods of operation. A-1 and A-2 shall consist of a of a minimum of two (2) 1,000 lbs activated carbon vessels, and a minimum of one (1) 330-lbs potassium permanganate vessel, arranged in series. [Basis: Regulation 8, Rule 47, and Toxics].
2. The owner/operator of S-1 shall not exceed an influent vapor flow rate of 464 standard cubic feet per minute.



[Basis: Cumulative Increase and Toxics]

3. The owner/operator shall operate S-1 and A-1 in a manner such that the abatement efficiency of POC shall be maintained at a minimum of 98.5% by weight. The minimum POC abatement efficiency shall be waived if outlet POC concentrations are shown to be less than or equal to 2 ppmv (adjusted to methane).

[Basis: TBACT, Toxics]

4. The owner/operator shall operate S-1 and A-1 in a manner in a manner such that the outlet concentration of NPOC does not exceed 8.9 ppmv (adjusted to methane).

[Basis: TBACT, Toxics]

5. The owner/operator of S-1 and A-1 shall not exceed the following toxic air contaminant emissions limits:

Toxic Air Contaminant	Emission Limit
Tetrachloroethene (PCE)	89.5 lbs/year
Trichloroethene (TCE)	29.6 lbs/year

[Basis: TBACT, Toxics]

6. Except as provided in Part 5 of this condition, in no event shall the toxic air contaminant (TAC) emissions from S-1 exceed the trigger levels listed in Table 2-5-1 of Regulation 2, Rule 5.

[Basis: TBACT, Toxics]

7. The owner/operator shall operate S-1 with either an open or hinged rain flap stack outlet design. Operation of S-1 with a fixed rain cap is prohibited.

[Basis: Toxics, Regulation 2-1-403]

8. Upon initial start-up, the owner/operator shall take air samples from S-1 for laboratory analysis using EPA Method TO-15. The air samples shall be taken at the following locations:

- At the inlet to the first carbon vessel in series.
- At the outlet of the carbon vessel that is last in series, prior to venting to the potassium permanganate vessel.
- At the outlet of the potassium permanganate vessel, prior to venting to the atmosphere.

The owner/operator shall use the results from the laboratory report to calculate TAC emissions emitted to the atmosphere, using the maximum design flowrate of S-1. The owner/operator shall submit the laboratory report and calculated TAC emissions within 21 days of the initial startup, to demonstrate compliance with Parts 3, 4, 5, and 6 of this condition.

[Basis: Regulation 2-1-403]

9. During operation of A-1, the owner/operator shall monitor with a flame-ionization detector (FID) or other method approved in writing by the District's Source Test Manager at the following locations:

- At the inlet to the second to last carbon vessel in series.
- At the inlet to the last carbon vessel in series.
- At the outlet of the last carbon vessel in series, prior to venting to the atmosphere.

[Basis: Regulations 1-523 and 2-1-403]

10. The owner/operator shall conduct monitoring on a daily basis in accordance with Part 9 of this condition. The owner/operator shall record these monitor readings in a monitoring log at the time they are taken. The owner/operator shall use the monitoring results to estimate the frequency of carbon change-out necessary to maintain compliance with Parts 3, 4, 5, 6, 11, and 12 of this condition.
  - a. If the owner/operator can demonstrate two (2) weeks of consecutive daily monitoring readings lower than 7.8 ppmv (measured as methane) at the outlet of the last vessel in series, the monitoring frequency may be reduced to weekly.
  - b. After the monitoring frequency has been reduced to weekly, if the owner/operator can demonstrate one (1) month of consecutive weekly monitoring readings lower than 7.8 ppmv (measured as methane) at the outlet of the last vessel in series, the monitoring frequency may be reduced to once every two (2) weeks.
  - c. After the monitoring frequency has been reduced to once every two (2) weeks, if the owner/operator can demonstrate one (1) month of consecutive bi-weekly readings lower than 7.8 ppmv (measured as methane) at the outlet of the last vessel in series, the monitoring frequency may be reduced to monthly.
  - d. If any subsequent results from monitoring exceed 7.8 ppmv (measured as methane) at the outlet of the last vessel in series, the owner/operator shall revert to daily monitoring. If monitoring reverts back to daily, the owner/operator may reduce the monitoring frequency in accordance with Parts 10a through 10c of this condition.  
[Basis: Cumulative Increase, Toxics, and Regulations 1-523 and 2-1-403]
11. The second to last carbon vessel shall be immediately changed out with unspent carbon upon breakthrough, defined as the detection at its outlet in excess of the higher of the following limits:
  - a. 10 % of the inlet stream concentration to the carbon bed.
  - b. 10 ppmv (measured as methane).[Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]
12. The last carbon vessel shall be immediately changed out with unspent carbon upon detection at its outlet of 15.6 ppmv or greater (measured as methane).  
[Basis: Cumulative Increase and Regulations 1-523 and 2-1-403]
13. The owner/operator shall maintain the following information for each month of operation:
  - a. Hours and time of operation.
  - b. Each emission test, analysis, or monitoring results logged in for the day of operation they were taken.
  - c. The number of carbon vessels removed from service.
  - d. Total throughput of soil vapor from source S-1 in standard cubic feet.

Such records shall be retained and made available for inspection by the District for two (2) years following the date the data is recorded.  
[Basis: Recordkeeping]
14. The owner/operator shall report any noncompliance with these conditions to the Compliance and Enforcement Division at the time that it is first discovered. The owner/operator shall detail the corrective action taken and include the data showing the exceedance as well as the time of occurrence in the submittal.

[Basis: Regulation 2-1-403]

15. The owner/operator shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the various provisions of this condition. All measurements, records and data required to be maintained by the operator shall be retained for at least two (2) years following the date the data is recorded.

[Basis: Regulation 1-523]

16. Upon final completion of the remediation project, the operator shall notify the Engineering Division within two weeks of decommissioning the operation.

[Basis: Regulation 2-1-403]

### **Recommendation**

The Air District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located in an overburdened community and is subject to a public notice per Air District Regulation 2-1-412. After the comments are received and reviewed, the Air District will make a final determination on the permit.

I recommend that the Air District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct/Permit to Operate for the following equipment:

- S-1 Soil Vapor Extraction System**  
**Blower: Roots, URAI 56, Maximum 464 SCFM**

*Abated by A-1 and A-2, arranged in series*

- A-1 Activated Carbon Vessels**  
**Two (2) 1,000-LBS Activated Carbon Vessels, arranged in series**  
**Mako, VF-1000, 1,000-LBS Carbon Capacity each**

- A-2 Potassium Permanganate Vessel**  
**One (1) 330-LBS Potassium Permanganate Vessel**  
**ERE Inc, UltraSorber 90-023-55M, 330-LBS Potassium Permanganate capacity**

By: \_\_\_\_\_



Date: 8/1/23

Cameron Fee  
Air Quality Engineer I