

# Engineering Evaluation

Chevron Environmental Management Company  
Plant Number: 22186  
Application Number: 25846  
2799 Middlefield Road, Palo Alto, CA 94036

## Background

- S-1 Soil Vapor Extraction Unit**  
**Sutrobilt 4MQ positive displacement blower, 10 HP, 150 cfm max**
- A-1 Electric Catalytic Oxidizer**  
**Falmouth Products, Falco 300**

Chevron Environmental Management Company has applied for an Authority to Construct for a Soil Vapor Extraction Unit. Soil vapor extraction (SVE) will be accomplished by means of a vacuum blower S-1 with a maximum operating capacity of 150 scfm. Soil vapor will be extracted and treated by A-1, Electric Catalytic convertor, the abatement unit influent and effluent VOC concentrations will be monitored with a portable flame-ionization detector (FID) or photon-ionization detector (PID) on a schedule reflecting current loading rates and emissions. To ensure proper operation of equipment and verify attainment of steady-state conditions, Carbon performance will be monitored daily for the first five day, and the owner/operator may then elect to change their monitoring schedule based on measured influent concentrations and calculated carbon loading. Monitoring schedule changes will be allowed only after District review of concentration measurements and subsequent receipt of District approval. Emission monitoring for operation of the equipment will be conducted according to established Source Test methodology.

## Emission Calculations

- For a conservative estimate of POC emissions we assume that the combined system will be operated for the entire year based on the maximum capacity of the equipment. Generalized assumptions follow:
- Standard conditions: Pressure = 1 Atm; Temperature = 70°F; 1 mole occupies 24.15 Liter.
- Molecular weight of Total Petroleum Hydrocarbon (TPH) is 100 g/mole (value for "weathered gasoline"). Molecular weight of benzene is 78 g/mole, Molecular weight of ethylbenzene is 106 g/mole, Molecular weight of Xylene (all isomers) is 106 g/mole, Molecular weight of Toluene = 92 g/mole,
- Effluent concentration is from the Analytical Lab Report from the applicant, benzene and toluene concentrations are assumed to be 5% of the total TPH
- Abatement Efficiency is assumed to be 98.5%.
- Influent values based on operational parameters of equipment: influent rate = 150 scfm (maximum);
- The annual emissions are calculated assuming 24 hr per day and 365 days per year of operation

**Table 1- Estimated Emissions from S-1**

	<b>Effluent Concentration (ug/m<sup>3</sup>)</b>	<b>Effluent Concentration (ppmv)</b>	<b>Abated Effluent Concentration (ppmv)</b>	<b>Emissions (lb/hr)</b>	<b>Emissions (lb/yr)</b>
<b>TPH</b>	30000	7.244	1.09E-01	3.71E-04	3.25
<b>Benzene</b>	12300	3.802	5.70E-02	1.52E-04	1.33
<b>Ethylbenzene</b>	10800	2.457	3.68E-02	1.33E-04	1.17
<b>Xylene</b>	10000	2.275	3.41E-02	1.24E-04	1.08
<b>Toluene</b>	60000	15.724	2.36E-01	7.42E-04	6.50

**Toxics Health Risk Screening Analysis (HRSA)****Table 3- Estimated Toxics Emissions compared with Toxics Trigger Levels**

	<b>Emissions (lb/hr)</b>	<b>Emissions (lb/yr)</b>	<b>Acute Trigger Levels (lb/hr)</b>	<b>Chronic Trigger Levels (lb/yr)</b>	<b>HRSA Required?</b>
<b>TPH as Hexane</b>	3.71E-04	3.25	N/A	270000	no
<b>Benzene</b>	1.52E-04	1.33	2.9	3.8	no
<b>Ethylbenzene</b>	1.33E-04	1.17	N/A	43	no
<b>Xylene</b>	1.24E-04	1.08	49	27000	no
<b>Toluene</b>	7.42E-04	6.50	82	12000	no

A Toxic Risk Screen need not be prepared as the applicant has agreed to monitor emissions of toxics emissions and determine the cumulative annual emissions. From the table above, the emissions are expected to be less than the toxics trigger levels specified under Regulation 2-5, Table 2-5-1.

**Best Available Control Technology (BACT)**

This proposed project is expected to emit in less than 10 pounds per highest day. Abatement devices are required in order to reduce the emissions below 10 lbs per day in the process. The requirement to use abatement devices were reflected in the permit conditions below. Offsets need not be provided, as annual emissions are not in excess of 10 tons per year.

**CEQA**

The project is considered to be ministerial under the District's proposed CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA.

**Statement of Compliance**

Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds. The POC emissions will be vented through a Thermal/Catalytic Oxidizer and/or Activated Carbon Vessels at all times of operation. Operating conditions have been worded to ensure that the equipment meets the criteria regarding portability as per Regulation 2-1-220. Criteria pollutants are not expected to exceed 10 tons per year, and emissions of toxic substances shall be below the trigger levels found in Table 2-5-1.

This project is within 1,000 ft from the nearest public school and is therefore subject to the public notification requirements of Regulation 2-1-412. A public notice will be distribute to all resident and business within 1000 ft from the source, as well as the parents and guardians of the students attending the following school:

Keys School  
2890 Middlefield Rd  
Palo Alto, CA 94306

PSD, NSPS, and NESHAPS are not triggered.

**Permit Conditions**

*Condition #25699*

Chevron Environmental Management Company  
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Application 25846 (Nov 2013)

## S-1 SVE Operation

1. Precursor Organic Compound (POC) emissions from Source S-1 shall be abated by abatement device A-1, electric catalytic oxidizer during all periods of operation. Soil vapor flow rate shall not exceed 150scfm. [Basis: Reg. 8-47-301.1,2]
2. The POC abatement efficiency of abatement device A-1 shall be maintained at a minimum of 98.5% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as C<sub>6</sub>). For inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as C<sub>6</sub>). [Basis: BACT; Regulation 2-5]
3. To determine compliance with part 2 of the condition, the owner/operator of this source shall monitor with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the Air Pollution Control Officer at the following locations:
  - a. At the inlet to A-1 electric catalytic or thermal oxidizer
  - b. At the outlet from A-1 electric catalytic or thermal oxidizer[Basis: Cumulative Increase, Regulation 2-5, TBACT]
4. The owner/operator shall not operate A-1 electric catalytic oxidizer, below a minimum operating temperature of 600 degrees Fahrenheit. The owner/operator may elect to use a thermal oxidizer, and the owner/operator shall not operate the thermal oxidizer below a minimum operating temperature of less than 1400 degrees Fahrenheit. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
5. To determine compliance part 4 of the condition, the thermal/electric catalytic oxidizer shall be equipped with continuous measuring and temperature recording instrumentation. The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded. [Basis: Regulation 2-1-403]
6. The owner/operator of this source shall maintain the following records for each month of operation of the source:
  - a. Days and hours of operation.
  - b. Each monitor reading or analysis result for the day of operation they are taken.Such records shall be retained and made available for inspection by the District for at least two years following the date that data is recorded. [Basis: Regulation 1-523]
7. The owner/operator shall report any non-compliance with parts 2 to the Director of the Compliance & 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 at the time of occurrence in the submittal. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
8. Upon final completion of the remediation project, the owner/operator of Source S-1 shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

**Recommendation:**

The 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 for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412.6. After the comments are received and reviewed, the District will make a final determination on the permit.

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

- S-1     Soil Vapor Extraction Unit**  
**Sutrobilt 4MQ positive displacement blower, 10 HP, 150 cfm max**
- A-1     Electric Catalytic Oxidizer**  
**Falmouth Products, Falco 300**

by \_\_\_\_\_  
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