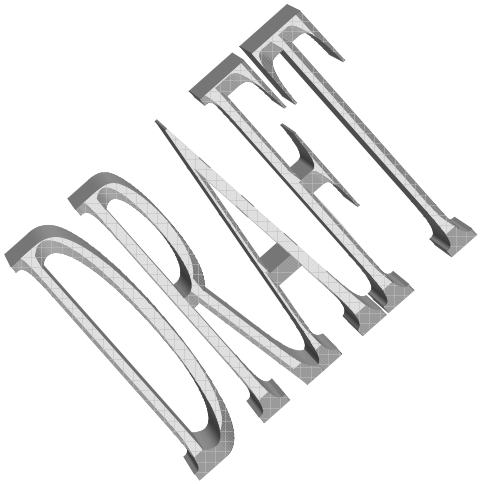
Engineering Evaluation
Tesoro Companies Inc.
Plant # 18730
Application Number 16816



Background

On behalf of the Tesoro Companies Inc, Horizon Environmental Inc., has applied for an AC/PO for soil remediation at the site located at 4321 Clayton Road, CA. Soil vapor extraction (SVE) will be accomplished by means of a regenerative vacuum blower (S-1) with a maximum operating capacity of 200 scfm. The vacuum unit is also equipped with a water knockout vessel, inlet filter, dilution air valve, recirculation valve, and flow indicators. Vapor abatement will be achieved by Carbon Adsorption (Carbon). The Carbon adsorption system will consist of two 200 pounds minimum capacity activated carbon vessels connected in series. The condensate from the SVE unit will be transferred to a 55 gallon metal drum that will contain less than 1 percent by weight of organic compounds. The drums will be transferred offsite for proper treatment at a wastewater treatment facility. These drums containing wasterwater will be exempt per 2-1-123.1 (capacity less than 260 gallons).

The Carbon unit influent and effluent VOC concentrations will be monitored with a portable flame-ionization detector (OVA-FID) on a schedule reflecting current loading rates and predicted Carbon capacity. To ensure proper operation of equipment and verify attainment of steady-state conditions, Carbon performance will be monitored daily for the first five days. Horizon Environmental Inc. 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.

This source is located within 1,000 feet of the outer boundary of a school and as such, this application requires Public Notification via Reg. 2-1-412. A Public Notice has been prepared and sent out to the home address of the students of the school and to each address within a radius of 1,000 feet of the source. This Evaluation Report will be posted on the District Webpage along with the Public Notice. A phone line is set-up at the District to receive public comments.

Emission Calculations

For a conservative estimate of yearly emissions, we shall assume that the carbon unit is operated for the entire year with an inlet concentration corresponding to the initial soil concentration level. Generalized assumptions follow:

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21^{o}C; (V/n =RT/P) 387 ft^3.
- Molecular weight of TPHg = 102 g/mole (value for "weathered gasoline"). Molecular weight of Benzene = 78.11 g/mole
- Influent values based on operational parameters of equipment and applicant supplied soil vapor test results: influent rate 200 scfm throughout; maximum influent concentration = 1000 ppmv TPH(g), and Benzene 4 ppm(v), Toluene 3.3 ppm(v), Ethylbenzene 0.97 ppm (v), MTBE 3.4 ppm (v), Xylene 4.4 ppm(v); destruction efficiency = 98.5 % throughout.

Emissions of Precursor Organic Compounds: TPH (g)

$$1000E\text{-}6 * \frac{200\ ft^3}{min} * \frac{1440\ min}{1\ day} * \frac{lb\ mole}{387\ ft^3} * \frac{102\ lb}{lb\ mole} * (1 - 0.985) = \textbf{1.52 lbm/day}\ \text{(abated)}$$

Emissions of Benzene Organic Compounds:

$$4E\text{-}6 * \frac{200\ ft^3}{min} * \frac{1440\ min}{1\ day} * \frac{lb\ mole}{387\ ft^3} * \frac{78.11\ lb}{lb\ mole} * (1 - 0.985) = \textbf{0.0045 lbm/day}\ \text{(abated)}$$

Efficiency	98.50%
Air flow rate CFM	200
Days/yr	365

Compound	MW	ppm (v)	unabated lbm/day	abated lbm/day	abated lbs/yr	abated tons/yr
TPH	102	1000	75.91	1.138605	415.5907	0.207795
Benzene	78.11	4	0.23	0.003488	1.273011	0.000637
Toluene	92.1402	3.3	0.23	0.003394	1.238879	0.000619
Ethyl benzene	106.167	0.97	0.08	0.00115	0.419592	0.00021
Xylene	106.167	4.4	0.35	0.005215	1.903303	0.000952
MTBE	88.1492	3.4	0.22	0.003346	1.221133	0.000611

Toxics

Emissions of these toxic compounds do not warrant a Toxic Risk Screen Analysis, as the emissions are below the trigger level from Regulation 2 Rule 5 Table 2-5-1. Therefore, the Toxics Section has recommended the issuing of this A/C with a benzene emission limit of 0.0175 lbm/day.

New Source Review

This proposed project will emit over 10 lbs per highest day and is therefore required to implement BACT. The facility will be in compliance with TBACT. For Soil Vapor Extraction operations, BACT is defined as attainment of set destruction efficiencies corresponding to set influent concentration values. Operation of the Carbon vessels will be conditioned to ensure attainment of the following required destruction efficiencies: $\geq$98.5% if inlet POC $\geq$2000; $\geq$97% if inlet POC $\leq$2000 to >200 ppmv; $\geq$90% if inlet POC <200 ppmv. Offsets need not be imposed as annual emissions will not exceed 10 tons.

Offsets, PSD, NSPS, and NESHAPS are not triggered.

CEQA

The project is considered to be ministerial under the Districts 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. This project is in compliance with Chapter 9.2 of the permit handbook.

Compliance/Exemption

Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds, and 8-47-302, Organic compounds. The POC emissions will be vented through a Carbon adsorption system at all times of operation. In addition, the condensate that is collected from the SVE unit will be stored in 55 gallon drums and will be disposed of offsite. This source is exempt per 2-1-123.1

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.

Recommendation

Recommend that a Certificate of Exemption be issued for source:

S-2 Collection of wastewater from SVE unit into 55 gallon drums - exempt per 2-1-123.1

Recommend that a conditional Authority to Construct be issued for source:

S-1: Soil Vapor Extraction System consisting of a 200 max scfm blower, and ancillary equipment, abated by A-1 SVE Abatement System, consisting of two (200 lb minimum capacity) activated carbon vessels arranged in series.

Conditions

1. The owner/operator shall vent Source S-1 at all times to Abatement device A-1, two (200 lb minimum capacity) activated carbon vessels arranged in series. Influent vapor flow shall not exceed 200 scfm. (basis: Regulation 8-47-301 and 302.2, Cumulative Increase, BACT/TBACT)

2. 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 the second to last carbon vessel in series.
   b. At the inlet to the last carbon vessel in series.
   c. At the outlet of the carbon vessel that is last in series prior to venting to the atmosphere.

   When using an FID to monitor breakthrough, readings may be taken with and without a carbon filter tip fitted on the FID probe. Concentrations measured with the carbon filter tip in place shall be considered methane for the purposes of these permit conditions. (basis: Cumulative Increase, BACT/TBACT)

3. The owner/operator shall record these monitor readings in a monitoring log at the time they are taken. The monitoring results shall be used to estimate the frequency of carbon change-out necessary to maintain compliance with conditions number 4 and 5, and shall be conducted on a daily basis. The owner/operator of this source may propose for District review, based on actual measurements taken at the site during operation of the source, that the monitoring schedule be changed based on the decline in organic emissions and/or the demonstrated breakthrough rates of the carbon vessels. Written approval by the District's Permit Services Division must be received by the owner/operator prior to a change to the monitoring schedule. In no event shall the owner/operator emit benzene emissions to the atmosphere exceeding 0.0175 pounds per day. (basis: Cumulative Increase, Regulation 2-5, BACT/TBACT)

4. The owner/operator shall change out the second to last carbon vessel with unspent carbon upon breakthrough, defined as the detection at its outlet of the higher of the following:

   a. 10 % of the inlet stream concentration to the Carbon vessel.
   b. 10 ppmv or greater (measured as C1).
   (basis: Cumulative Increase, BACT/TBACT)

5. The owner/operator shall change out the last carbon vessel with unspent carbon upon detection at its outlet of 10 ppmv or greater (measured as C1). (basis: Cumulative Increase, BACT/TBACT)

6. The owner/operator of this source shall maintain the following records for each month of operation of the source:

   a. The hours and times of operation.
   b. Each monitor reading or analysis result for the day of operation they are taken.
   c. The number of carbon beds removed from service.

   All measurements, records and data required to be maintained by the owner/operator shall be retained and made available for inspection by the District for at least two years [Note: This is five years for Title V facilities] following the date the data is recorded.
   (basis: Cumulative Increase, BACT/TBACT)

7. The owner/operator shall report any non-compliance with parts 4 and/or 5 to the Director of the Compliance & Enforcement Division at the time that it is discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well at the time of occurrence. (basis: Cumulative Increase, BACT/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]

by_____ dated: December 6, 2007

Irma Salinas
Senior Air Quality Engineer