

DRAFT
Engineering Evaluation
Former Mobil Service Station 99-272; Plant Number 18573
Application Number 16427

Background

On behalf of Exxon Mobil Corporation, Environmental Resolutions, Inc. (ERI) is applying for an Authority to Construct for equipment necessary for soil remediation at a site located at 565 Sebastopol Road in Santa Rosa. Soil vapor extraction will be accomplished by means of a regenerative vacuum blower (S-1) with a maximum operating capacity of 150 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 system will consist of two 150 pound capacity activated carbon vessels connected in series.

The applicant will be conditioned to provide written notification at the start of operation. 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. ERI 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 Roseland Elementary School, and as such this application requires Public Notification via Reg. 2-1-412. Roseland University Prep, and YouthBuild Santa Rosa are within ¼ mile of the source. A Public Notice was prepared and sent out to the home address of the students of the schools and to each address within a radius of 1,000 feet of the source. This evaluation report was posted on the District webpage along with the Public Notice. A phone line was set-up at the District to receive public comments and ?? were received. A summary of correspondence is attached to this report.

Attached to this report is a copy of the Public Notice. The total cost of the Public Notification amounted to \$???.00. This amount exceeded the \$2,000.00 Public Notice fee. All fees including the standard AC/PO fees of \$2,780.00 have been paid.

Emission Calculations

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

- * Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C; 1 mole occupies 24.15 l.
- * Molecular weight of TPHg = 100 g/mole (value for "weathered gasoline"). Molecular weight of Benzene = 78 g/mole.
- * Influent values based on operational parameters of equipment and applicant supplied soil vapor test results: influent rate = 150 scfm throughout; maximum influent concentration = 3700 ppmv VOC; 25 ppmv benzene; destruction efficiency = 99% throughout (90% per carbon vessel or 99% aggregate).

Emissions of Precursor Organics:

$$3700E-6 * \frac{150 \text{ ft}^3}{\text{min}} * \frac{1440 \text{ min}}{1 \text{ day}} * \frac{28.32 \text{ l}}{1 \text{ ft}^3} * \frac{1 \text{ mole}}{24.15 \text{ l}} * \frac{100 \text{ g}}{\text{mole}} * \frac{1 \#}{454 \text{ g}} * (1 - 0.99) = \mathbf{2.06 \#/\text{day}} \text{ (abated)}$$

Emissions of Toxic Compounds (benzene):

$$25\text{E-}6 * \frac{150 \text{ ft}^3}{\text{min}} * \frac{1440 \text{ min}}{1 \text{ day}} * \frac{28.32 \text{ l}}{1 \text{ ft}^3} * \frac{1 \text{ mole}}{24.15 \text{ l}} * \frac{78 \text{ g}}{\text{mole}} * \frac{1 \#}{454 \text{ g}} * (1 - 0.99) = \mathbf{1.0\text{E-}2 \#/\text{day}} \text{ (abated)}$$

Highest Daily Emissions	=	2.06 #/day
Annual Average	=	2.06 #/day
RFP	=	3.8E-1 t/yr

Toxics

Under the trigger levels as per Regulation 2-5, table 2-5-1, the emissions of toxic substances (Benzene) are not considered sufficient to warrant a Risk Screen Analysis. Benzene trigger = 0.018 #/day. In accordance with the exemption in section 2-5-111, the source is not subject to the provisions of the Regulation. Therefore, the Toxics Evaluation Section has recommended the issuing of this A/C with standard permit conditions for carbon abatement.

New Source Review

This proposed project will not emit over 10 lbs per highest day and is therefore not required to implement BACT. Nevertheless, it will be achieved in practice. For Soil Vapor Extraction operations, BACT is defined as attainment of set destruction efficiencies corresponding to set influent concentration values or an outlet concentration not to exceed 10 ppmv. Operation of the carbon vessels will be conditioned to ensure attainment of an outlet concentration not to exceed 10 ppmv POC.

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.

Compliance

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. The application triggered Public Notification as required by Regulation 2-1-412. Public Notification was performed by the District and ERI was invoiced for the services required. Fees in the amount of \$?,00.00 (including the standard A/C and P/O fees) have been paid in full.

Recommendation

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

- S-1: Soil Vapor Extraction System consisting of a 150 max scfm vacuum blower, and ancillary equipment, abated by A-1, at least two (180 lb minimum capacity) Carbon Adsorption Vessels arranged in series.

Conditions

1. Source S-1 shall be vented at all times to A-1, at least two (180 lb minimum capacity) activated carbon vessels arranged in series. Influent vapor flow shall not exceed 150 scfm. [basis: Reg. 8-47-301,2]
2. The operator of this source shall monitor with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test Manager 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 purpose of these permit conditions.

3. These monitor readings shall be recorded 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 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 operator prior to a change to the monitoring schedule.
4. The second to last Carbon vessel shall be immediately changed out 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 (expressed as C6, hexane).
5. The last Carbon vessel shall be immediately changed out with unspent Carbon upon detection at its outlet of 10 ppmv (expressed as C6, hexane).
6. The 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 operator shall be retained and made available for inspection by the District for at least two years following the date the data is recorded. [basis: Reg. 1-523]

7. Any non-compliance of these conditions shall be reported to the Compliance and Enforcement Division at the time that it is first discovered. **The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well as the time of occurrence.**
8. Upon final completion of the remediation project, the operator of Source S-1 shall notify the Permit Services Division within two weeks of decommissioning the operation.

by _____ date 9/19/07

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