

Engineering Evaluation
7200 Bancroft
7200 Bancroft Avenue, Oakland, CA 94605
Plant No. 203007
Application No. 675430
Project Description: Sub-Slab Depressurization System

Background

Geokinetics on behalf of 7200 Bancroft (former Sparkle Cleaners) has applied for an Authority to Construct for the following equipment:

S-1 Sub-Slab Depressurization System
Airtech Vacuum Blower 3BA1800, Maximum 360 CFM
Abated by:

A-1 Two (2) 500 lbs of Granulated Activated Carbon vessels in series.

S-1 will operate at 7200 Bancroft Avenue, Oakland, CA 94605. This is not considered an Overburdened Community.

The applicant has proposed to use the Sub-Slab Depressurization System to remediate a former dry cleaner's site contaminated with chlorinated and petroleum hydrocarbon vapor trapped in the soil. The system will include a 360-cfm vacuum blower abated by two (2) 500 lbs Granulated Activated Carbon Vessels in series. The main compound found in the soil was Tetrachloroethylene (PCE), expected emissions were based on laboratory results from samples taken at the site.

Procedures are outlined in the conditions found below. The applicant will be required to provide written notification at the start of the operation. The applicant will be required to stay below the acute and chronic trigger levels of Regulation 2-5. 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.

Emission Calculations

Initial soil vapor data will be used to estimate precursor organic compound (POC), non-precursor organic compound (NPOC), and toxic air contaminant (TAC) emissions. It is assumed that the equipment can operate 24 hours a day, 365 days a year. The following are assumptions used to estimate emissions.

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C; 1 mole occupies 24.15 Liters (or 386.8 ft³/lb-mol)
- Toxic Air Contaminants (TAC) emissions will be based on soil vapor data submitted with this application.
- The organic influent flow rate of 360 scfm.
- The system will be abated by two (2) 500 lbs of Granulated Activated Carbon vessels in series pursuant to Regulation 8-47-301.

Table 1. SSD System Unabated Emissions for S-1						
Pollutant	CAS #	Unabated Emissions				
		Inlet Conc. (ug/m3)	Hourly Emission Rate (lb/hr)	Daily Emission Rate (lb/day)	Annual Emission Rate (lb/yr)	Annual Emission Rate (ton/yr)
Tetrachloroethylene (PCE)	127-18-4	1190	1.6E-03	3.8E-02	14.04	0.007
Trichloroethylene (TCE)	79-01-6	7.52	1.0E-05	2.4E-04	0.09	0.000

Table 2. SSD System Abated Emissions for S-1						
Pollutant	CAS #	Abated Emissions				
		Abatement Efficiency (%)	Hourly Emission Rate (lb/hr)	Daily Emission Rate (lb/day)	Annual Emission Rate (lb/yr)	Annual Emission Rate (ton/yr)
Tetrachloroethylene (PCE)	127-18-4	90	1.6E-04	3.8E-03	1.4E+00	0.001
Trichloroethylene (TCE)	79-01-6	90	1.0E-06	2.4E-05	8.9E-03	0.000

Notes:

- Influent data for PCE and TCE was obtained from Samples identified in K Prime project 1488.001.01.014. This data will be used as the pre abatement concentration.
- It is assumed that equipment will operate 24 hours a day, 365 days a year.
- Per Regulation 1-234 and 40 CFR 51.100(s)(1), PCE has been determined to have negligible photochemical reactivity and is considered a Non-Precursor Organic Compound (NPOC).

Table 3. Organic Emissions Review for S-1					
Pollutant	Effluent Volumetric Concentration (ppmv)	Hourly Emission Rate (lb/hr)	Daily Emission Rate (lb/day)	Annual Emission Rate (lb/yr)	Annual Emission Rate (ton/yr)
POC	0.01	5.4E-06	1.3E-04	0.05	0.000
NPOC	0.18	1.6E-04	3.8E-03	1.40	0.001

Notes:

- POC and NPOC emissions are based on the laboratory test results considering an abatement efficiency of 90%. The effluent volumetric concentrations are measured as methane.

Cumulative Increase

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

Toxic Risk Screening

At the given rates, PCE, the only Toxic Air Contaminant (TAC) identified is not expected to exceed the Acute and Chronic Trigger Levels in Regulation 2-5, Table 1. Therefore, a Health Risk Assessment (HRA) is not required.

Table 5. Project Acute Emissions Review - Regulation 2-5				
Pollutant	CAS #	Hourly Emission Rate (lb/hr)	Acute Trigger Level (lb/hr)	Exceeds Acute Trigger Level?
Tetrachloroethylene (PCE)	127-18-4	1.6E-04	8.8E+00	No

Table 6. Project Chronic Emissions Review - Regulation 2-5				
Pollutant	CAS #	Annual Emission Rate (lb/yr)	Chronic Trigger Level (lb/yr)	Exceeds Chronic Trigger Level?
Tetrachloroethylene (PCE)	127-18-4	1.4E+00	1.40E+01	No

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 (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 PM₁₀, PM_{2.5}, or sulfur dioxide (SO₂).

The facility is not expected to have a PTE greater than 10 tons per year of POC or NO_x, nor is the facility a major facility of PM₁₀, PM_{2.5}, and SO₂. 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 (NO_x), carbon monoxide (CO), sulfur dioxides (SO₂), particulate matter less than 10 micrometer (PM₁₀) and particulate matter less than 2.5 micrometer (PM_{2.5}).

NPOC and POC emissions are expected to be below 10 lb/day for S-1. Therefore, BACT is not required.

California Environmental Quality Act (CEQA)

This project is classified as ministerial under the District Regulation 2-1-311, because the engineering review for this project requires only the application of standard emission factors and established formulas as specified in Chapter 9.2 of the District's Permit Handbook. This project does not trigger BACT or TBACT and is not subject to the health risk assessment requirements of Regulation 2, Rule 5. This review follows objective procedures and applies standard permit conditions; and therefore, the review of this project is not discretionary as defined by CEQA. Since this project is ministerial, it is not subject to CEQA review requirement of Regulation 2-1-310, and no further CEQA analysis is required.

Compliance

Regulation 2-1-243 Public Notice. The project is not operating within an Overburdened Community (OBC) as defined in Regulation 2-1-412 and triggers an HRA, but it will be operated within 1000 feet of the Markham Elementary School located at 7220 Krause Avenue, Oakland, CA 94605. Therefore, the project

is subject to the public noticing requirement of the California Health & Safety Code and Regulation 2-1-412.

Regulation 8-47-301, any soil vapor extraction operation which emits benzene, vinyl chloride, tetrachloroethene, methylene chloride, and/or trichloroethene shall be vented to a control device which reduces emissions to the atmosphere by at least 90 percent by weight. The facility will use two 500 pounds GAC vessels in series to abate emissions.

Regulation 8-47-501 Recordkeeping. The facility is required to keep the pertinent records per condition #100130 pursuant to Regulation 8-47-501.

Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPS) do not apply to this project.

Permit Conditions

Permit Condition #100130 for S-1

1. The influent vapor flow rate shall not exceed 360 scfm from the blower of S-1. [Basis: Cumulative Increase, Regulation 2-5].
2. The owner/operator shall abate the precursor organic compound (POC)/non-precursor organic compound (NPOC) emissions from the soil vapor extraction systems with the Activated Carbon Vessels (A-1) during all periods of operation as follows:

S-1 shall be abated by A-1, consisting of a minimum of two (2) 500 lb activated carbon vessels in series.
[Basis: Regulations 8-47-301 and 8-47-302 and Regulation 2-5].
3. In no event shall the total toxic air contaminant (TAC) emissions to the atmosphere from S-1 exceed the trigger levels listed in District Regulation 2-5, Table 2-5-1. [Basis: Regulations 8-47-301 and 8-47-302 and Toxics].
4. The owner/operator shall not emit from S-1 more than 0.05 pounds of precursor organic compounds (POC) and 1.40 pounds of non-precursor organic compounds (NPOC) per 12-month consecutive period. [Basis: Cumulative Increase]
5. 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:
 - a. At the inlet to the first carbon vessel in series.
 - b. At the outlet of the carbon vessel that is last in series prior to venting to the atmosphere.
[Basis: Regulation 2-1-403, Regulation 8-47-301].
6. 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 1, 2, and 4 of this condition. [Basis: Regulation 2-1-403, Regulation 2-5].

7. 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:
 - 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 last carbon vessel in series, prior to venting to the atmosphere.[Basis: Regulations 1-523 and 2-1-403]
8. 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 1 through 6 of this condition and shall be conducted on a daily basis.
 - a. If the owner/operator can demonstrate one (1) month of consecutive daily monitoring readings where the sum of monitoring results of S-1 is lower than 0.1 ppmv, measured as methane, 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 of S-1 is lower than 0.1 ppmv, measured as methane, 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 where the monitoring results of S-1 is lower than 0.1 ppmv, measured as methane, the monitoring frequency may be reduced to monthly.

If any subsequent results from monitoring where the sum of monitoring results of S-1 exceed 0.1 ppmv, measured as methane, 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 4(a) through (c) of this condition.

[Basis: Cumulative Increase, Toxics, and Regulations 1-523 and 2-1-403]

9. 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. 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]

10. 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]
11. 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]

12. 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]

End of Conditions

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 1,000 feet of a K-12, which triggers the public notification requirements of Regulation 2-1-412. After the comments are received from the public 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 and/or a Permit to Operate for the following equipment:

- S-1 Sub-Slab Depressurization System
Airtech Vacuum Blower 3BA1800, Maximum 360 CFM
Abated by:**
- A-1 Two (2) 500 lbs of Granulated Activated Carbon vessels in series.**

By Isis Virrueta, AQ Engineer I
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