

Engineering Evaluation  
Environmental Investigation Services, Inc.  
210 East Main Street  
Los Gatos, CA 95030  
Plant # 23456; Application Number 27787

1. Background:

Environmental Investigation Services has applied for an Authority to Construct/Permit to Operate the following Soil Vapor Extraction System (SVE) located at 210 East Main Street, Los Gatos, CA 95030. The site was a former dry cleaning facility.

S-1: Soil Vapor Extraction System Consisting of a Blower 570 SCFM Maximum Capacity, made by Mako, Abated by A-1

A-1: 2-1000 Pound Activated Carbon GAC Containers in Series

The SVE system will be operated within 1000 feet of the following School and thus a Public Notice is required.

Los Gatos High School  
20 High School Court  
Los Gatos, CA 95030

2. Emission Calculations

Table 1, shows calculated Toxic Air Contaminant (TAC) emissions. The TAC emissions are based on the highest pilot test results submitted by the applicant. Thus the maximum amount that can potentially be emitted is calculated below. With the two 1000 pound activated carbon abatement system in series, a 98.5% abatement efficiency is expected.

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 concentration level:

TAC emission, lb/y = ( $\mu\text{g}/\text{m}^3$  of the TAC) X ( $6.243 \text{ E-}11 \text{ lb}/\text{ft}^3 / \mu\text{g}/\text{m}^3$ ) (570  $\text{ft}^3/\text{m}$ ) (60 m/h)(24h/d)(365 d/y)

Thus, TAC Emission before abatement, lb/y = (0.0187) X ( $\mu\text{g}/\text{m}^3$  of the TAC)

With 98.5% abatement, abated TAC emission to the atmosphere, lb/y  
= (0.015) X (0.0187) X ( $\mu\text{g}/\text{m}^3$  of the TAC)  
= ( $2.81 \text{ E-}4$ ) X ( $\mu\text{g}/\text{m}^3$  of the TAC)

**Table 1: TAC Emissions from Source S-1**

**Emission Calculations spreadsheet for SVE System**

AAQMD Plant **23456**  
Application # **27787**  
Facility Name **Environmental Investigation Services**

**Soil Vapor Extraction System**

Data Form G  
Total Flow Rate: **570** scfm  
**570** ft<sup>3</sup>/min

**Abatement Device**

Data Form A  
Select the abatement devices for the proposed project:  
**2-1000 lb Carbon System**

Enter the destruction efficiency:  
Efficiency **98.5%**  
Reduction **1.5%**

	Air Contaminants			Weight (MW) [g/mol]
Former Dry Cleaning Sites				
B				

**For unit conversion:**

	<b>365 days/year</b>
	<b>8760 hours/year</b>
	<b>1440 mins/day</b>
<b>1 lb/mole</b>	<b>386 ft<sup>3</sup></b>
<b>1lb</b>	<b>0.0005 ton</b>
<b>1 day</b>	<b>86400 s</b>
<b>1lb</b>	<b>453.6 g</b>

1. Chronic Trigger level per District's Regulation 2-5, Table 2-5-1, amended 1/6/2010

	Influent vapor concentration [µg/m <sup>3</sup> ]	Influent vapor concentration [ppmv]	Unabated Emission [lb/day]	Abated Emission [lb/day]	Abated Emission [lb/yr]	Chronic Trigger Level <sup>1</sup> [lb/year]	Emission exceeds Chronic Trigger Levels <sup>3</sup> (Yes/No)	Hourly Abated Emission [lb/hour]	Acute Trigger Level <sup>1</sup> [lb/hour]	Emission exceeds Acute Trigger Levels <sup>3</sup> (Yes/No)	Unabated Emission Factors <sup>4</sup> [lb/cubic feet]
PCE	120000		6.15	0.092	33.667	1.80E+01	Yes	3.8E-03	4.40E+01	No	7.49E-06
TCE	230		0.01	0.000	0.065	5.40E+01	No	7.4E-06	2.9 E+00	No	1.44E-08
Vinyl Chlorid	530		0.03	0.000	0.149	1.40E+00	No	1.7E-05	4.00E+02	No	3.31E-08
			<b>Total</b>	<b>6.188</b>	<b>0.093</b>	<b>33.880</b>					

2. Unit conversions on the influent vapor concentrations:

[µg/m<sup>3</sup>] to [ppmv] : Influent vapor concentration [ppmv] = Influent vapor concentration [µg/m<sup>3</sup>] \* 0.02404 / MW

3. If the emission exceeds Chronic Trigger Levels, please consult with the owner/operator if they would accept the trigger level limit in the permit conditions.

Otherwise, Health Risk Screening Analysis will be conducted to determine the maximum emission limits for the proposed project.

4. Enter the Unabated Emission Factors [lb/ cubic feet] on the Data Form G

5. Please verify if there is an appropriate abatement efficiency for Vinyl Chloride -

Using Permanganate will have 99 % destruction efficiency. Using Carbon Vessels will have 0% destruction efficiency.

3. Cumulative Increase- tons/year

Table 2 presents the Plant Cumulative Increase. Perchloroethylene is a non-precursor organic compound (NPOC). Thus the annual NPOC emission is 33.7 pounds or 0.017 ton per year. Precursor Organic Compound (POC) emission is insignificant.

**Table 2 Plant Cumulative Increase (ton/y)**

Pollutant	Current	This Application (t/y)	Total (t/y)
NPOC	0	0.017	0.017

4. Compliance Statements:

**Toxics**

Under the trigger levels as per Regulation 2-1-316, the emissions of toxic substance Perchloroethylene at 33.7 pounds per year is considered sufficient to warrant a Risk Screen Analysis. Perchloroethylene trigger = 18 lb/year. A Health Risk Screen was performed for this application to determine the risk to the maximally exposed industrial and residential receptors. The AERMOD air dispersion models were used

to estimate the pollutant concentrations in the area surrounding the site for a unit emission rate. It was determined that perchloroethylene emissions as calculated above corresponded to a risk of 4.3 in a million to the maximally exposed residential receptor as well as to the student and 1 in a million to the maximally exposed industrial receptor. This source is unlikely to cause an acute risk for perchloroethylene emissions, as the hourly trigger for perchloroethylene is 44 pounds per hour. In accordance with the District's Regulation 2-5, the impact is then insignificant since this risk is within the threshold of 10 in a million as required for sources implementing Toxic Best Available Control Technology (TBACT). Source S-1 is equipped with two 1000-pound carbon abatement equipment which is TBACT for the source. Therefore, the Toxics Section has recommended the issuing of this Authority to Construct (A/C) with a perchloroethylene emission limit of 33 pounds per year. However, the following school is within 1000 feet of the source S-1 and since there are TAC emissions from the source a Public Notification is triggered in accordance with Regulation 2-1-412. Thus the Authority to Construct will only be issued after the public notification is completed and the public comments are addressed.

Los Gatos High School  
20 High School Court  
Los Gatos, CA 95030

#### New Source Review

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

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per day of precursor organics (POC), non-precursor organics (NPOC), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>) or particulate matter (PM<sub>10</sub>).

This proposed project will not emit over 10 pounds per day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>. Thus BACT is not triggered. The source is equipped with a carbon system that will abate the emissions further reducing the TAC emissions to the atmosphere.

##### Offsets

Offsets must be provided for any new or modified source at a facility that emits more than 10 tons per year of POC or NO<sub>x</sub> per Regulation 2-2-302. Table 2 above summarizes increases in criteria pollutant emissions at the plant. Offsets are not applicable to this application, since the emissions do not exceed 10 tons/yr. Thus this facility is not subject to Regulation 2-2-302.

##### California Environmental Quality Act (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.

##### District Regulations

Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, and 8-47-302 since the POC and NPOC emissions are 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.

5. Condition

Condition # 26286 applies to the following source:

- S-1: Soil Vapor Extraction System Consisting of a Blower 570 SCFM Maximum Capacity, Made by Mako, Abated by A-1
- A-1: 2-1000 Pound Activated Carbon GAC Containers in Series

1. The owner/operator shall abate the Precursor Organic Compound (POC) and non-precursor organic compound (NPOC) emissions from Source S-1 by A-1, SVE Abatement System, consisting of two 1000 pound Activated Carbon Vessels in series during all periods of operation. Start-up and subsequent operation of each abatement device shall take place only after written notification of same has been received by the District's Engineering Division. The owner/operator shall operate the sources such that the soil vapor flow rate from S-1 shall not exceed 570 scfm. [Basis: Cumulative Increase, Regulation 8-47-301 and 302, TBACT]
2. During operation of the Activated Carbon Vessels, the owner/operator of this source shall monitor POC and NPOC emissions 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. Perchloroethylene emissions shall not exceed 33 pounds per year. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

3. The owner/operator of S-1 and/or A-1 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 2, 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 Engineering Division must be received by the owner/operator prior to a change to the monitoring schedule. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
4. The owner/operator of A-1 shall immediately 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 bed.
  - b. 10 ppmv (measured as hexane).[Basis: Cumulative Increase, Regulation 2-5, TBACT]

5. The owner/operator of A-1 shall immediately change out the last Carbon vessel with unspent Carbon upon detection at its outlet of 10 ppmv (measured as hexane). [Basis: Cumulative Increase, Regulation 2-5, TBACT]
6. The owner/operator of S-1 shall maintain the following information for each month of operation of the Activated Carbon Vessels:
  - 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 years following the date the data is recorded. [Basis: Regulation 1-523]

7. The owner/operator of S-1 and/or A-1 shall report any non-compliance 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: Cumulative Increase, Regulation 2-5, TBACT]
8. The owner/operator of S-1 and/or A-1 shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the various provisions of this conditional Authority to Construct/Permit to Operate. All measurements, records and data required to be maintained by the owner/operator shall be retained for at least two years following the date the data is recorded. [Basis: Regulation 1-523]
9. Upon final completion of the remediation project, the operator of Source S-1 shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

## 6. 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 subject to Condition 26286. 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. 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 a Permit to Operate for the following source:

- S-1: Soil Vapor Extraction System Consisting of a Blower 570 SCFM Maximum Capacity, Made by Mako, Abated by A-1
- A-1: 2-1000 Pound Activated Carbon GAC Containers in Series

by \_\_\_\_\_  
By: Hari Doss

July 13, 2016