

DRAFT Engineering Evaluation
Market and Noe Center LP
2276 Market Street, #2288, San Francisco, CA 94114
Plant No. 203229
Application No. 684078
Project Description: Sub-Slab Depressurization System

Background

Market and Noe Center LP has applied for an Authority to Construct for the following equipment:

S-1 Sub-Slab Depressurization System
Make: RadonAway, Model: HS500, max. 44 cfm

The facility is located at 2276 Market Street, #2288, San Francisco, CA 94114. Due to historic use of the property for dry cleaning, precursor organic compounds (POCs) have been detected in subsurface soil gas vapors. As part of property remodeling, a sub-slab depressurization system has been designed to convey sub-slab vapors to 16-feet above the top of the roof using an in-line fan.

The approximately 0.34-acre site, owned by Market and Noe Center LP, is located at 2276-2288 Market Street in San Francisco, California. A two-story building encompasses the entire site footprint and includes three commercial tenant spaces with rooftop parking.

The main compound found in the soil was tetrachloroethene (PCE). Emissions calculations were based on laboratory results from samples taken at the site. No emissions are expected to trigger Health Risk Assessment per Regulation 2-5, Table 1.

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).

The facility is located within 1,000 feet of Sanchez Elementary School and Everett Middle School. Therefore, public notification is required, per Regulation 2-1-412. The facility is also located within ¼ mile of Mission Dolores Academy and McKinley Elementary School.

The facility is not located within the boundary of an overburdened community.

Emission Calculations

Initial soil vapor data is 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 assumptions are used to estimate emissions.

- Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21°C; 1 mole occupies 24.15 Liters (or 386.8 ft³/pound-mol).
- Toxic Air Contaminants (TAC) emissions will be based on soil vapor data submitted with this application.
- The organic influent flow rate of 44 scfm.
- The SSD system will have no abatement.
- Emissions are from TO-15 tests completed in February of 2023 for Market and Noe Center LP by K Prime, Inc..

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)
Benzene	71-43-2	0.69	1.13E-07	2.72E-06	9.94E-04	4.97E-07
Toluene	108-88-3	2.55	4.20E-07	1.01E-05	3.68E-03	1.84E-06
Xylenes	1330-20-7	2.30	3.78E-07	9.07E-06	3.31E-03	1.66E-06
Chloroform	67-66-3	0.59	9.72E-08	2.33E-06	8.51E-04	4.26E-07
Chloromethane	74-87-3	0.77	1.27E-07	3.06E-06	1.12E-03	5.58E-07
Dichlorodifluoromethane	75-71-8	1.62	2.67E-07	6.40E-06	2.34E-03	1.17E-06
Perchloroethylene (PCE) (Tetrachloroethene)	127-18-4	1570.00	2.59E-04	6.20E-03	2.26E+00	1.13E-03
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	77.40	1.27E-05	3.06E-04	1.12E-01	5.58E-05
Ethyl benzene	100-41-4	0.45	7.48E-08	1.79E-06	6.55E-04	3.27E-07
cis-1,2-Dichloroethene	156-59-2	81.90	1.35E-05	3.24E-04	1.18E-01	5.91E-05
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	0.59	9.72E-08	2.33E-06	8.51E-04	4.26E-07
1,2,4-Trimethylbenzene	95-63-6	0.37	6.08E-08	1.46E-06	5.32E-04	2.66E-07
1,3,5-Trimethylbenzene	108-67-8	0.11	1.78E-08	4.27E-07	1.56E-04	7.79E-08
Chloroethane (Ethyl Chloride)	75-00-3	2.64	4.35E-07	1.04E-05	3.81E-03	1.90E-06
Carbon Tetrachloride	56-23-5	0.33	5.45E-08	1.31E-06	4.77E-04	2.39E-07
Dichlorotetrafluoroethane	76-14-2	0.09	1.48E-08	3.56E-07	1.30E-04	6.50E-08
Bromomethane (Methyl Bromide)	74-83-9	3.89	6.40E-07	1.54E-05	5.60E-03	2.80E-06
Trichlorofluoromethane	75-69-4	1.19	1.96E-07	4.70E-06	1.72E-03	8.58E-07
1,2-Dichloropropane	78-87-5	0.10	1.56E-08	3.75E-07	1.37E-04	6.85E-08

1,2-Dichloroethane (Ethylene Dichloride)	107-06-2	0.28	4.53E-08	1.09E-06	3.97E-04	1.98E-07
Styrene	100-42-5	0.61	1.01E-07	2.41E-06	8.81E-04	4.41E-07
1,4-Dichlorobenzene	106-46-7	0.09	1.44E-08	3.46E-07	1.26E-04	6.31E-08
Naphthalene	91-20-3	0.32	5.25E-08	1.26E-06	4.60E-04	2.30E-07

Notes:

1. It is assumed that equipment will operate 24 hours a day, 365 days a year.
2. Non-Precursor Organic Compounds (NPOCs) have been determined based on Regulation 1-234 and 40 CFR 51.100(s)(1). NPOCs have negligible photochemical reactivity.

Table 2. Organic Emissions Review for S-1					
Pollutant	Effluent Volumetric Concentration (ppmv)	Hourly Emission Rate (pound/hour)	Daily Emission Rate (pound/day)	Annual Emission Rate (pounds/year)	Annual Emission Rate (ton/year)
POC	0.264	2.89E-05	6.93E-04	0.253	1.27E-04
NPOC	2.366	2.59E-04	6.22E-03	2.270	0.001
Total	2.630	2.88E-04	6.91E-03	2.523	0.001

Notes:

1. POC and NPOC emissions are based on the laboratory test results with no abatement.
2. POC and NPOC Annual Emission Rates will normally be rounded up to 0.3 pound per year and 2.3 pounds per year respectively to be used as condition limit. However, since no abatement efficiency was taken into account for calculating the maximum potential emissions from S-1 SSD system, no organics detection limit will be included in the permit condition.

Cumulative Increase

Table 3. Cumulative Increase			
Pollutant	Current Permitted Emissions, Post 4/5/1991 (ton/year)	Application New Emissions Increase (ton/year)	New Cumulative Increase (ton/year)
POC	0.000	1.27E-04	1.27E-04

This is a new facility. Therefore, there are no existing emissions.

Toxic Risk Screening

No toxic air contaminant emissions exceed the Chronic Trigger Levels in Regulation 2-5, Table 2-5-1. Therefore, no Health Risk Assessment (HRA) was triggered for this project.

Table 4. Project Toxics Emissions Review - Regulation 2-5							
Pollutant	CAS #	Hourly Emission Rate (lb/hr)	Acute Trigger Level (lb/hr)	Exceeds Acute Trigger Level?	Annual Emission Rate (lb/yr)	Chronic Trigger Level (lb/yr)	Exceeds Chronic Trigger Level?
Benzene	71-43-2	1.13E-07	1.20E-02	No	9.94E-04	2.90E+00	No
Toluene	108-88-3	4.20E-07	2.20E+00	No	3.68E-03	1.60E+04	No
Xylenes	1330-20-7	3.78E-07	9.70E+00	No	3.31E-03	2.70E+04	No
Chloroform	67-66-3	9.72E-08	6.60E-02	No	8.51E-04	1.50E+01	No
Chloromethane	74-87-3	1.27E-07	N/A	No	1.12E-03	N/A	No
Dichlorodifluoromethane	75-71-8	2.67E-07	N/A	No	2.34E-03	N/A	No
Perchloroethylene (PCE) (Tetrachloroethene)	127-18-4	2.59E-04	8.80E+00	No	2.26E+00	1.40E+01	No
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	1.27E-05	N/A	No	1.12E-01	4.10E+01	No
Ethyl benzene	100-41-4	7.48E-08	N/A	No	6.55E-04	3.30E+01	No
cis-1,2-Dichloroethene	156-59-2	1.35E-05	N/A	No	1.18E-01	N/A	No
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	9.72E-08	3.00E+01	No	8.51E-04	3.90E+04	No
1,2,4-Trimethylbenzene	95-63-6	6.08E-08	2.70E+00	No	5.32E-04	N/A	No
1,3,5-Trimethylbenzene	108-67-8	1.78E-08	N/A	No	1.56E-04	N/A	No
Chloroethane (Ethyl Chloride)	75-00-3	4.35E-07	N/A	No	3.81E-03	1.20E+06	No
Carbon Tetachloride	56-23-5	5.45E-08	8.40E-01	No	4.77E-04	1.90E+00	No
Dichlorotetrafluoroethane	76-14-2	1.48E-08	N/A	No	1.30E-04	N/A	No
Bromomethane (Methyl Bromide)	74-83-9	6.40E-07	1.70E+00	No	5.60E-03	1.90E+02	No
Trichlorofluoromethane	75-69-4	1.96E-07	N/A	No	1.72E-03	N/A	No

1,2-Dichloropropane	78-87-5	1.56E-08	N/A	No	1.37E-04	N/A	No
1,2-Dichloroethane (Ethylene Dichloride)	107-06-2	4.53E-08	N/A	No	3.97E-04	4.00E+00	No
Styrene	100-42-5	1.01E-07	9.30E+00	No	8.81E-04	3.50E+04	No
1,4-Dichlorobenzene	106-46-7	1.44E-08	N/A	No	1.26E-04	N/A	No
Naphthalene	91-20-3	5.25E-08	N/A	No	4.60E-04	N/A	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.

Source #	Description	PM10	PM2.5	POC	NO _x	SO ₂	CO	Relevant Application
1	Sub-Slab Depressurization System	0.000	0.000	1.27E-04	0.000	0.000	0.000	Current Application
SUM		0.000	0.000	1.27E-04	0.000	0.000	0.000	

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

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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 pounds/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

The facility is located within 1,000 feet of Sanchez Elementary School (325 Sanchez St, San Francisco, CA 94114) and Everett Middle School (450 Church St, San Francisco, CA 94114). Therefore, public notification is required, per Regulation 2-1-412. The facility is also located within ¼ mile of Mission Dolores Academy (3371 16th St, San Francisco, CA 94114) and McKinley Elementary School (1025 14th St, San Francisco, CA 94114).

A 30-day public comment period commenced on TBD and ended on TBD. [Will include a summary of the public comments received and addressed.]

Regulation 8-47-301 requires that 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. However, Regulation 8-47-113 exempts operations with total emissions of less than 1 pound per day of the pollutants listed above, given that Section 8-47-301 is satisfied. The proposed SSD operation results in the maximum potential daily benzene emission of 2.7E-06 pound, perchloroethylene emission of 6.2E-03 pound, and trichloroethylene emission of 3.1E-04 pound without abatement and does not trigger health risk assessment. Therefore, the project does not warrant an abatement device with 90 percent control efficiency.

The facility is required to keep the pertinent records per condition # 100139 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) are not triggered.

Permit Conditions

Permit Condition # 100139 for S-1

1. The influent vapor flow rate shall not exceed 44 scfm from the blower of S-1. [Basis: Cumulative Increase, Regulation 2-5].
2. In no event shall benzene, vinyl chloride, perchloroethylene, methylene chloride, and trichloroethylene emissions to the atmosphere from S-1 exceed 1 pound per day. [Basis: Regulations 8-47-301, 8-47-113 and Toxics].
3. In no event shall the 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: Regulation 2-5].
4. The owner/operator shall not emit from S-1 more than 0.3 pounds of precursor organic compounds (POC) and 2.3 pounds of non-precursor organic compounds (NPOC) per 12-month consecutive period. [Basis: Cumulative Increase]
5. 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, 3, and 4 of this condition. [Basis: Regulation 2-1-403, Regulation 2-5].
6. 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]
7. 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]
8. 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]

9. 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 Air 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 triggers public notification requirements per Regulation 2-1-412. After the comments are received from the public and reviewed, the Air District will make a final determination on the permit.

I recommend that the District initiates 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**
Make: RadonAway, Model: HS500, max. 44 cfm



Youjin Kim, Air Quality Engineer
November 29, 2023