

Engineering Evaluation
Hewlett Packard Company Valley Site; Plant Number 278
Application Number 8680

Background

On behalf of the Hewlett Packard Company (HP), GeoSyntec Consultants, Inc. (GCI) is applying for an AC/PO for a Sub-slab vapor displacement system at the former site of a semiconductor manufacturing facility located at 1201 Piner Road in Santa Rosa. In 1982, it was determined that chemical releases at the facility had impacted groundwater. HP has been operating a groundwater treatment system (Source S-35, groundwater treatment system) at this site off and on since 1987 to address contaminated groundwater at the site. Buildings at the site have been remodeled and currently house offices of the Sonoma County Department of Health Services (SCDHS) as well as K-12 School. Indoor air sampling was performed in 1990 and 1992 on behalf SCDHS and it was determined that no VOC's were present above laboratory detection limits. In April of 2002, the Department of Toxic Substances Control (DTSC) and the North Coast Regional Water Quality Control Board determined that the previous study should be reassessed and initiated further air sampling. DTSC then conducted a Health Risk Assessment to determine the potential health effects of VOC's detected in the air within the building. In June of 2003, DTSC presented their conclusions and recommended that immediate action be taken to mitigate the risks to the building occupants. In response to this recommendation, HP has contracted with GCI to install system to remove vapors from beneath the slab in order to prevent vapor intrusion to the building. The proposed system is considered an active soil vapor extraction system and will consist of a regenerative vacuum blower (S-1) with a maximum operating capacity of 100 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 at least two 180 pound minimum 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. GCI 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 Lattice Foundation School, and as such this application requires Public Notification via Reg. 2-1-412. A Public Notice was 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. Copies of the Public Notice were sent to the Principal of the School. A phone line was set-up at the district to receive public comments and ?? was received. ?? comments were received by Email.

Attached to this report are copies of the Public Notice, and a summary of the Public comments received. The total cost of the Public Notification amounted to \$??,000. This amount exceeded the \$914.00 Public Notice fee. All fees including the standard AC/PO fees of \$1,854.00 have been paid.

Emission Calculations

GCI has provided emission estimates based on soil vapor sampling performed at the site. The evaluating engineer has estimated vapor concentrations based on these results combined with conservative engineering judgment. For a conservative estimate of toxic emissions we assume that the system will be operated for the entire year. Generalized assumptions follow:

- * Standard conditions: Pressure = 1 Atm; Temperature = 70°F; 1 mole occupies 24.15 L.
- * Influent concentrations based on estimates provided by applicant: trichloroethylene = 20 ug/L; perchloroethylene = 2.5 ug/L; Total Organics = 25 ug/L.
- * Influent flow rate based on operational parameters of equipment: 100 scfm (maximum); abatement efficiency = 90% for each Carbon Vessel (99% aggregate).

Abated emissions of individual toxic compounds take the following form:

$$C_i * Q * C_o * (1 - 0.99) = E$$

where:

- E = Abated Emissions in #/day;
- C_i = Influent Concentration in ug/L;
- Q = Flow Rate in scfm (100);
- C_o = Dimensional Constant;

$$C_o = \frac{1 \#}{4.53593E8ug} * \frac{28.317 L}{1 ft^3} * \frac{1440 min}{1 day}$$

$$C_o = 8.99E-5 \{ \#*L*min \} / \{ ug*ft^3*day \}.$$

Thus, for operation of the SVE System, we have maximum abated emissions of:

<u>Compound(s)</u>	<u>Emissions in lbs/day</u>	<u>Emissions in lbs/yr</u>	<u>Trigger</u>
Trichloroethylene	1.8E-3	6.6E-1	9.70E+1
Perchloroethylene	2.3E-4	8.2E-2	3.30E+1
Total Organics	2.3E-3	8.2E-1	

Summary of Emissions of Precursor Organics:

Highest Daily Emissions	=	2.3E-3 #/day
Annual Average	=	2.3E-3 #/day
RFP	=	4.2E-4 t/yr

Toxics

Under the trigger levels as per Regulation 2-1-316, the emissions of toxic substances are not considered sufficient to warrant a Risk Screen Analysis. Perchloroethylene trigger = 0.09 #/day; trichloroethylene trigger = 0.27 #/day. In accordance with the Toxic Section Risk Management Policy, the impact is then insignificant since these emissions are unlikely to cause a risk greater than 10 in a million. This is the maximum acceptable level for sources implementing TBACT; therefore, the Toxics Section has recommended the issuing of this A/C with standard operating conditions for carbon adsorption vessels.

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. 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. The District performed the Public Notification and GCI was invoiced for the services required. Fees in the amount of \$???.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 100 max scfm vacuum blower, and ancillary equipment, abated by A-1, at least two (180 lb minimum capacity) Carbon Adsorption Vessels.

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 100 scfm.
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 (measured as C₁).

5. The last Carbon vessel shall be immediately changed out with unspent Carbon upon detection at its outlet of 10 ppmv (measured as C₁).
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.

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 _____

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