

**DRAFT  
 ENGINEERING EVALUATION REPORT  
 ARCADIS U.S., INC.  
 PLANT NUMBER 23690  
 APPLICATION NUMBER 28228**

3 California Drive  
 Burlingame, CA 94010

**Background**

ARCADIS U.S., Inc. (Arcadis) has applied to obtain an Authority to Construct and a Permit to Operate for a Dual Phase extraction system at the above referenced petroleum hydrocarbon contaminated site (Former ARCO Service station) in Burlingame, CA. The system consists of a blower with a capacity of up to 300 cfm and ancillaries. Soil vapor will be extracted and abated by an electric catalytic oxidizer. Any liquid phase wastewater that is collected from the knockout drums will be discharged to the city sewer after treatment. Emission monitoring for operation of the equipment will be conducted according to established Source Test methodology. Procedures are outlined in the permit conditions.

The application covers the following source:

- S-1 Dual Phase Extraction System, Dresser Roots, URAI 56, 300 scfm, or equivalent, abated by A-1.**
- A-1 Electric Catalytic Oxidizer, Mako, ECAT, 300 scfm.**

**Emission Calculations**

For a conservative estimate of yearly emissions, it is assumed that the system is operated for an entire year at a maximum flow rate.

**Basis:**

- \* **Operating conditions:** Pressure = 1 atm; Inlet Temperature = 21°C
- \* **Flow rate** = 300 cfm (max.)
- \* **Influent Soil vapor concentrations:**
  - TPH (total petroleum hydrocarbons) = 19,725 ug/L
  - Benzene = non-detect
  - Toluene = non-detect
  - Ethylbenzene = non-detect
  - Xylene = non-detect
  - MTBE = non-detect
- \* **Abatement efficiency** = 99% @ all concentrations per the vendor specifications

**Emissions, lb/day = ug/L\*cfm\*1440 min/day\*28.32 L/cf\*E-6g/ug\*1 lb/454 g\*(1-0.99)**

Emissions are calculated for only total petroleum hydrocarbons using the above equation and the basis because concentrations of its constituents were non-detect.

**TPH as gasoline emissions (VOC) = 19,725 ug/L\*300 cfm\*1440 min/day\*28.32 L/cf\*E-6 g/ug\*1 lb/454 g \*(1-0.99)**  
 = 5.31 lb/day  
 = 1,939.8 lb/yr @365 days/yr  
 = 0.970 tpy

## Plant Cumulative Increase

Precursor Organic compounds (POC) = 0.970 tpy

## Toxics Emissions and Health Risks

Benzene, Ethylbenzene, Toluene, MTBE, and Xylene are the toxic compounds expected to be emitted from the operation. Since none of them were detected in the influent stream their emissions can-not be accurately estimated. Based on the maximum amount of benzene allowed in gasoline (<1.5%) and the detected concentration of total petroleum hydrocarbons in the soil vapor, benzene concentration in the soil vapor is expected to be far below the test method detection limit. Therefore, calculating emissions based on the detection would vastly over-predict TAC emissions and is not appropriate for this case. Instead, the District will limit the TAC emissions from this project to less than the health risk assessment (HRA) trigger levels for each TAC. Since TAC emissions will not exceed the HRA trigger levels, and HRA is not required for this project.

## Best Available Control Technology (BACT)

POC emissions from the proposed project will be < 10 pounds per highest day and therefore are not subject to the BACT requirements of Regulation 2-2-301.

**2-2-301 Best Available Control Technology Requirement:** An applicant for an authority to construct or a permit to operate shall apply BACT to any new or modified source:

301.1 Which results in an emission from a new source or an increase in emissions from a modified source and which has the potential to emit 10.0 pounds or more per highest day of precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub> or carbon monoxide (CO). BACT shall be applied for any of the above pollutants which meets both criteria.

*(Amended 6/15/94; 10/7/98; 5/17/00)*

## Offsets

Offsets requirements of Regulation 2-2-302 are not triggered for facility wide or permitted POC emissions < 10 tpy.

## California Environmental Quality Act (CEQA)

The project is considered to be ministerial under the Districts 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 evaluated as per the guidance in Chapter 9.2 of the permit handbook.

## Statement of Compliance

Based on the information submitted, the source is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds, and 8-47-302, Organic compounds. The VOC emissions will be vented through an electric catalytic oxidizer at all times of operation.

The project is located within 1000 feet of the nearest K-12 school, Washington Elementary School, and therefore is subject to the public notice requirements of Regulation 2-1-412. The project will be public noticed for a period of 30 days.

Prevention of Significant Deterioration, New Source Performance Standards, and National Emission Standards of Hazardous Air Pollutants are not triggered.

## Permit Conditions

**S-1 Dual Phase Extraction System, Dresser Roots, URAI 56, 300 scfm, or equivalent, abated by A-1.**  
**A-1 Electric Catalytic Oxidizer, Mako, ECAT, 300 scfm.**

1. The owner/operator shall abate the Volatile Organic Compound (VOC) emissions from Source S-1 by A-1, Electric Catalytic Oxidizer during all periods of operation. The owner/operator shall operate the source such that the soil vapor flow rate from S-1 shall not exceed 300 scfm and VOC emissions shall not exceed 1940 pounds per year. The owner/operator shall not operate the source if toxic compounds are detected in the exhaust gas stream and their emissions exceed the respective toxic trigger levels given in the Table 2-5-1 of the District Regulation 2, Rule 5 without obtaining reauthorization from the District. [Basis: Cumulative Increase, Regulation 8-47-301 and 302, TBACT, Regulation 2-5]
2. The owner/operator shall operate A-1 Electric Catalytic Oxidizer such that the VOC abatement efficiency shall be maintained at a minimum of 99% by weight for all detected inlet VOC concentrations (measured as hexane). The abatement efficiency shall be waived if outlet VOC and toxic compounds concentrations are shown to be non-detect. [Basis: Cumulative Increase, Regulation. 2-5, TBACT]
3. While operating the Electric Catalytic Oxidizer, the owner/operator shall not operate A-1 below a minimum operating temperature of 600 degrees Fahrenheit. [Basis: Cumulative Increase, Regulation 2-5, TBACT]
4. To determine compliance with part 3, the owner/operator shall equip the A-1, Electric Catalytic Oxidizer with continuous measuring and temperature recording instrumentation. The owner/operator shall collect and maintain the temperature data from the temperature recorder in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded. [Basis: Regulation 1-523]
5. To determine compliance with parts 1, 2 and 3, within ten days after start-up of the Electric Catalytic Oxidizer and monthly afterwards, the owner/operator of this source shall:
  - a. Analyze inlet gas stream to determine the flow rate and concentration of VOC and toxic compounds present.
  - b. Analyze exhaust gas to determine the flow rate, and the concentration of VOC and toxic compounds present.
  - c. Calculate the VOC and toxic compounds emission rates based on the exhaust gas analysis and the operating exhaust flow rate. The owner/operator shall decrease the soil vapor flow rate, if necessary to demonstrate compliance with parts 1 and 2.
  - d. Calculate the VOC abatement efficiency based on the inlet and exhaust gas analysis. For the purpose of determining compliance with part 2, the owner/operator shall report the VOC concentration as hexane.
  - e. Submit to the District's Engineering Division the test results and emission calculations within one week from the testing date. The owner/operator shall analyze samples according to modified EPA test methods 8015 and 8020 or their equivalent to determine the concentrations of VOC and toxic compounds.
 [Basis: Cumulative Increase, Regulation 2-5, TBACT]
6. The owner/operator of this source shall maintain the following records for each month of operation of the Electric Catalytic Oxidizer:
  - a. Days and hours 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 years following the date the data is recorded. [Basis: Regulation 1-523]

7. The owner/operator 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 shall 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 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 owner/operator of Sources S-1 shall notify the Engineering Division within two weeks of decommissioning the operation. [Basis: Cumulative Increase, Regulation 2-5, TBACT]

### **Recommendations**

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 the District, State, and federal air-quality related regulations. However, the project is subject to public notification requirements of Regulation 2-1-412 because there is a school within 1000 feet of the project. A final determination will be made after public notification and addressing comments received.

### **Exemptions**

None

**By:** \_\_\_\_\_  
Dharam Singh, PE  
Air Quality Engineer II