



# California Regional Water Quality Control Board

## Los Angeles Region



Alan C. Lloyd, Ph.D.  
Agency Secretary

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

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Arnold Schwarzenegger  
Governor

July 6, 2005

Mr. Chris Swartz  
ConocoPhillips Company  
3611 Harbor Boulevard Suite 200  
Santa Ana, CA 92704

Dear Mr. Swartz:

**GENERAL WASTE DISCHARGE REQUIREMENTS FOR OZONE INJECTION AT PETROLEUM HYDROCARBON FUEL AND/OR VOLATILE ORGANIC COMPOUND IMPACTED SITES – 76 STATION 4330, 4870 BELLFLOWER BOULEVARD, LAKEWOOD (UST FILE NO. R-24759) (ORDER NO. R4-2005-0030, SERIES NO. 005; CI NO. 8913)**

We have completed our review of your application for coverage under General Waste Discharge Requirements for the injection of ozone at the site referenced above in Lakewood, California.

Following leak detection investigations from March 1992 to December 2004, numerous corrective activities were conducted at the site. During these activities several groundwater monitoring wells, vapor extraction wells and C-sparge™ points were installed at the site. The results of these investigations indicated that the underlying soil and groundwater had been contaminated with volatile organic compounds (VOCs). The highest concentration of total petroleum hydrocarbon as gasoline (TPHg), benzene, and methyl tertiary butyl ether (MTBE) detected in the soil were 3,500 milligrams per kilogram (mg/Kg), 38 mg/Kg, and 150 mg/Kg, respectively. Maximum groundwater hydrocarbon concentrations were 35,000 micrograms per liter (µg/L) TPHg (B-13), 9,200 µg/L benzene (B-12), 2,700 µg/L toluene (B-12), 2,000 µg/L ethylbenzene (B-4), 2,900 µg/L total xylenes (B-12), 17,000 µg/L MTBE (B-4), 35,000 µg/L tertiary butyl alcohol (TBA) (B-4).

On June 21, 2004, Board staff approved the "Feasibility Testing Report and Remediation Action Plan" dated February 13, 2004. In the Remedial Action Plan, the Discharger proposed to use a combination of soil vapor extraction (SVE) and air sparging (C-Sparge™ Technology) to remediate hydrocarbons in soil and dissolved-phase fuel constituents in groundwater. The C-Sparge™ technology combines low-flow [3 to 5 cubic feet per minute (cfm)] air sparging with ozonation to oxidize petroleum hydrocarbons into benign byproducts, carbon dioxide and water. Ozone is generated onsite using a control panel with a built-in compressor and ozone generator. Using perforated sparge points, microbubbles [10 to 50 micrometer (µm)] of encapsulated ozone are introduced below the water table, where the oxidation reactions take place. Eight C-Sparge™ injection wells will be installed onsite within the dissolved-phase plume (Figure 3) and two sparge points will be nested in the same borehole to allow for sparging at different depths below water table. The C-Sparge™ injection wells will be located at approximately 38 feet below ground (fbg) and 50 fbg, respectively. During sparging, no

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(76 Station 4330)

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groundwater or vapors will be extracted. Sparging will be performed on a cycled basis for 5 to 10 minutes.

Board staff have determined that the proposed injection of ozone meets the conditions specified in Order No. R4-2005-0030, "*General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites*," adopted by this Regional Board on May 5, 2005.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2005-0030 (Series No. 005) and Monitoring and Reporting Program No. CI-8913 and Standard Provisions.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (October 15, 2005) under Regional Board Order No. R4-2005-0030. All monitoring reports shall be sent to the Regional Board, ATTN: Information Technology Unit.

When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to Compliance File No. CI-8913, which will assure that the reports are directed to the appropriate file and staff. Do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

We are sending a copy of Order No. R4-2005-0030 only to the applicant. A copy of the Order will be furnished to anyone who requests it.

If you have any questions, please contact Mr. Rod Nelson at (213) 620-6119.

Sincerely,

Jonathan S. Bishop  
Executive Officer

Enclosures: 1. Board Order No. R4-2005-0030  
2. Monitoring and Reporting Program No. CI-8913

Cc: Ms. Yvonne Shanks, SWRCB, Underground Storage Tank Cleanup Fund  
Ms. Nancy Mastumoto, Water Replenishment District of Southern California  
Mr. Tim Smith, LACoDPW, Environmental Programs Division, Underground Tanks  
Mr. Bryen Woo, TRC Customer-Focused Solutions

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