STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

RESOLUTION NO. R04-020

APPROVING THE INITIAL STUDY AND ADOPTING A MITIGATED NEGATIVE DECLARATION FOR CONOCOPHILLIPS COMPANY 76 STATION NO. 6923 (OZONE INJECTION FOR GROUNDWATER CLEANUP) (FILE NO. 04-133)

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) finds that:

1. The ConocoPhillips Company (hereafter Discharger) owns the 76 Station No. 6923 (hereinafter Site) located at 2383 Sycamore Drive, Simi Valley, California. The Site, an active 76 Service Station, is located at the southwest corner of the intersection of Sycamore Drive and Cochran Streets in Simi Valley at latitude 34°16'42" and longitude 118°44'35". ConocoPhillips acquired the Site in 2001 and has been operating it as a retail motor vehicle fuel service station. Currently, there are two 12,000-gallon gasoline underground storage tanks (USTs), one 10,000-gallon diesel UST, three fuel dispenser islands, and a station kiosk building at the Site.

2. On September 25, 2003, the Discharger filed a Report of Waste Discharge for injecting gaseous ozone into the shallow aquifer to remediate contaminated groundwater at the site.

3. Petroleum hydrocarbon contaminated soil was first detected at the site in 1990 in conjunction with UST removal activities. Maximum concentrations of 7,000 milligrams per kilograms (mg/kg) total petroleum hydrocarbons as gasoline (TPH_G) and 51 mg/kg benzene were detected in the soil samples collected under each of the three gasoline USTs. Petroleum hydrocarbon contaminated soil was also identified adjacent to the central dispenser island at concentrations of 22 mg/kg as TPH_G, 6,700 mg/kg total petroleum hydrocarbons as diesel (TPH_D) and 0.08 mg/kg of benzene. Based on these findings, approximately 360 cubic yards of contaminated soil were removed from the Site.

4. Subsequent onsite and offsite assessment activities have resulted in the installation of seventeen groundwater monitoring wells (MW-1 through MW-17), three soil vapor extraction (SVE) wells (B-3 through B-5), and two nested air sparge (AS) wells (AS/SVE-1 and AS/SVE-2. In the wells installed adjacent to the southern dispenser island and to the northwest of the former gasoline USTs, maximum concentrations of 4,400 mg/kg TPH_G, 20 mg/kg benzene, and 3.7 mg/kg methyl tertiary butyl ether (MTBE) were detected in the soil.

5. In June 1997, a soil vapor extraction (SVE) pilot test was conducted at the site. TPH_G concentrations reported in soil vapor samples collected at the beginning and end of the SVE test were 7,100 parts per million by volume (ppmv) and 8,100 ppmv, respectively. In addition, a radius of influence (ROI) of approximately 38 feet was estimated based on the test results.

6. In September and October 2002, additional site assessment was conducted including the installation of two clustered wells (SVE-4S and SVE-4D) and the abandonment and replacement of well B-3 with new well SVE-3. Results of the investigation indicated that detectable concentrations of petroleum hydrocarbon were present in soil beneath the site in depths ranging from 41 feet to 120.5 feet below ground surface (bgs).

7. Results of the monitoring and sampling event conducted at the Site during the second quarter of 2003 indicated that dissolved-phase petroleum hydrocarbons extend offsite to the west. Maximum dissolved-phase petroleum hydrocarbon concentrations of 190,000 micrograms per liter (µg/L) of TPH_G, 32,000 µg/L benzene and 44,000 µg/L MTBE were reported in groundwater samples collected from well AS/SVE-2. An earlier sampling event also showed the same contaminants present in SVE-4D.

8. Based on an evaluation of current site conditions and the results of SVE pilot testing activities, the Discharger proposed to remediate the petroleum hydrocarbon contaminated soil within the vadose zone and capillary fringe using SVE and the dissolved-phase petroleum hydrocarbon impacted groundwater using C-Sparge™ technology.

9. The site is located within the Simi Valley Groundwater Basin. Two active municipal water supply wells are located within one-half mile of the site according to the records of Southern California Water Company (SCWC). The first well, known as Sycamore Well #3, is located approximately 1,056 feet south of the site and the second well, known as Niles Well is located approximately 1,584 feet south of the site. Groundwater quality in the Simi Valley Groundwater Basin is generally poor due to high concentration of total dissolved solids. Based on historic groundwater data, the groundwater flow direction observed beneath the site has been to the west-southwest making the SCWC production wells appear to be located cross-gradient to the Site. The groundwater gradient at the site does not appear to be influenced by groundwater production from the SCWC wells.

10. Depth to groundwater at the Site, measured during the groundwater sampling event for the fourth quarter of 2002, ranged from 71.92 feet to 80.5 feet below ground surface (bgs). Groundwater flow direction was to the west with a hydraulic gradient of approximately 0.004 foot per foot (ft/ft).

11. On August 29, 2003, the Discharger submitted to the Ventura County Environmental Health Division (VCEHD) a revised Remedial Action Plan (RAP) proposing to use C-Sparge™ ozone injection technology to remediate the dissolved-phase petroleum hydrocarbon plume beneath the site. The revised RAP was approved on November 25, 2003.

12. Because of the sustained presence of elevated dissolved phase hydrocarbons in the wells located northwest of the former USTs and in the adjacent property, soil and groundwater remediation were considered for the site. SVE/high vacuum dual-phase extraction and ozone sparging using the C-Sparge™ system were chosen as the cost-effective and feasible technologies to remediate the petroleum hydrocarbon-affected soil and groundwater beneath the site. The SVE system will utilize vertical extraction wells and lateral subsurface conveyance piping to transport petroleum hydrocarbon-affected soil vapor to a thermal/catalytic oxidizer for treatment

13. The Discharger proposes to install and operate a C-Sparge™ system to remediate the dissolved-phase plume beneath the site. 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. Five C-Sparge points will be installed onsite within and around the dissolved-phase plume, where highest concentrations of dissolved-phase benzene and TPH_G are detected, and down gradient from the former gasoline USTs and dispenser island (Figure 3). The C-Sparge™ wells will be installed so that the bottom of the 30-inch long spare tips are set at depths between 76.5 and 79 feet. During sparging, no groundwater or vapors will be extracted. Sparging will be performed on a cycled basis.

4. Ozone will chemically react with hydrocarbons in the immediate vicinity of each injection point to form intermediate by-products of various smaller chain hydrocarbons and oxygenates. The following table shows the laboratory-isolated breakdown by-products that could be produced during the ozone oxidation process with the hydrocarbons:

Constituent	Breakdown Products
TPH	acetate, butyrate, formate, propionate
BTEX	Carboxylic acids
MTBE	TBA (tertiary butyl alcohol), TBF (tertiary butyl formate), formate, oxygen, hydrogen peroxide
ETBE	TBA, TBF, acetate, oxygen, hydrogen peroxide
TBA	Formaldehyde, acetate, carbon dioxide, water

Finally, the residual oxygen formed from the initial ozone reduction reaction encourages bioremediation, which consumes the listed by-products and converts them to carbon dioxide and water, thereby completing the remediation process.

12. Prior to initiating the C-Sparge™ technology, baseline samples will be collected from monitoring wells AS/SVE-2, SVE-4D, MW-1, MW-3, MW-10, MW-11 and MW-13 and analyzed for the following parameters: TPH_G, TPH_D, BTEX, MTBE, TBA, tertiary amyl methyl ether (TAME), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), ethanol, pH, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP), and dissolved ferrous iron. In addition, groundwater samples from well MW-2, SVE-2,

MW-10 and MW-13 will be analyzed for total chromium and chromium 6. After the ozone injections, groundwater samples will be collected bi-weekly during the first month of system operation and analyzed according to a groundwater monitoring program required by the Regional Board. Data collected during the testing period will be used to evaluate the C-Sparge™ effectiveness at this site.

13. On June 13, 1994, the Regional Board adopted a revised *Water Quality Control Plan for Coastal Watersheds of Los Angeles and Ventura Counties* (Basin Plan) which was amended on January 27, 1997 by Regional Board Resolution No. 97-02. The Basin Plan (i) designates beneficial uses for surface waters and groundwater, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State anti-degradation policy (*Statement of Policy with Respect to Maintaining High Quality Waters in California*, State Water Resources Control Board (State Board) Resolution No. 68-16, October 28, 1968), and (iii) describes implementation programs to protect all waters in the Region. In addition, the Basin Plan incorporates by reference applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. The Regional Board prepared the 1994 update of the Basin Plan to be consistent with previously adopted State and Regional Board plans and policies. This project implements the plans, policies and provisions of the Regional Board's Basin Plan.

14. The Basin Plan designated beneficial uses and water quality objectives for groundwater within the Simi Valley Groundwater Basin as follows:

    Existing: municipal and domestic supply; industrial service supply; industrial process supply, and agricultural supply.

15. The requirements contained in the waste discharge requirements Order for this project are based on the Basin Plan, and as they are met, will be in conformance with the goals of the aforementioned water quality control plans and will project and maintain existing beneficial uses of the groundwater.

16. The permitted discharge is consistent with the anti-degradation provisions of State Board Resolution No. 68-16 (Anti-degradation Policy). The discharge may result in some localized temporary exceedance of background concentrations of dissolved oxygen, dissolved ferrous iron, total dissolved solids, sulfate, chloride, and boron. However, any parameter change resulting from the discharge:

    a. will be consistent with maximum benefit to the people of the State,
    b. will not unreasonably affect present and anticipated beneficial uses of such waters, and
    c. will not result in water quality less than that prescribed in the Water Quality Control Plan for groundwater within the Santa Monica Basin of the Los Angeles Coastal Plain.

17. This Regional Board has assumed lead-agency role for this project under the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) and has conducted an Initial Study in accordance with section 15063 of the "State CEQA Guidelines" at California Code of Regulations, title 14, section 15000 et seq. Based

upon the Initial Study, Regional Board staff prepared a Mitigated Negative Declaration that the project, as mitigated, will not have a significant adverse effect on the environment.

18. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations.

19. Copies of the Initial Study, the proposed Mitigated Negative Declaration, and Tentative Waste Discharge Requirements were transmitted to all agencies and persons known to be interested in the matter.

20. Regional Board staff has addressed all comments received. The Regional Board considered all testimony and evidence at a public hearing held on November 4, 2004, and good cause was found to approve the Initial Study and adopt a Mitigated Negative Declaration.

THEREFORE BE IT RESOLVED BY THE REGIONAL BOARD THAT:

1. The Regional Board hereby approves the Environmental Checklist and adopts the Mitigated Negative Declaration for the ConocoPhillips Company, project known as Injection of Gaseous Ozone for the Remediation of Groundwater.

2. A copy of this Resolution shall be forwarded to the State Water Resources Control Board.

3. A copy of this Resolution shall be forwarded to all interested parties.

4. The discharge of ozone into the shallow aquifer shall conform to all the requirements, conditions, and provisions set forth in *A. "Discharge Specifications," B. "Discharge Prohibitions,"* and *C. "Provisions"* of ORDER NO. R4-2004-0180.

CERTIFICATION

I, Jonathan Bishop, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region on December 13, 2004.

_____ December 13, 2004
JONATHAN S. BISHOP Date
Executive Officer