

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 West 4th Street, Suite 200, Los Angeles, California 90013

FACT SHEET
WASTE DISCHARGE REQUIREMENTS
FOR
PARAPLAST AREA
FORMER NORTHROP GRUMMAN FACILITY
1515 RANCHO CONEJO BOULEVARD, NEWBURY PARK, CALIFORNIA
(SCP NO. 252, SITE ID NO. 2047100)

ORDER NO. R4-2007-0019, CI-9067 (revised)

FACILITY ADDRESS

Paraplast Area
Former Northrop Grumman Facility
1515 Rancho Conejo Boulevard
Newbury Park, California 91320

FACILITY MAILING ADDRESS

Mr. Michael T. Martin
Northrop Grumman Systems Corporation
One Hornet Way M/S PA13/W5
El Segundo, California 90245-2840

PROJECT DESCRIPTION

Former Northrop Grumman Facility is located at Latitude N34° 12' 01", Longitude W118° 55' 41" in Newbury Park.

The former Paraplast Area is one of three areas at the approximately 100 acres site, which was formerly owned by Northrop for manufacturing aircraft subassemblies. The Paraplast Area is impacted with chlorinated VOCs, including trichloroethene (TCE). The former Paraplast Area is located in the western portion of the site on Parcels 8 and 9 (Figure 1). Groundwater monitoring and several investigations have been performed in this area. Groundwater analytical data from existing wells indicate the presence of TCE at concentrations up to 9,000 micrograms per liter ($\mu\text{g/L}$) (Well No. PPIRZ-04) in the uppermost groundwater unit (Zone A), which consists predominately of fine-grained alluvium. Unconfined groundwater Zone A occurs at depths ranging from approximately 33 to 76 feet below ground surface (bgs). Groundwater flow direction has been reported as west-northwest in the western portion of the site and north-west in the northern portion of the site.

ISCO FIELD DEMONSTRATION TEST

In-Situ Chemical Oxidation (ISCO) field demonstration (pilot test) was performed in the Former Paraplast area using permanganate for treatment of TCE concentration exceeds 100 $\mu\text{g/L}$ in the groundwater from September 2006 through May 2007 under Monitoring and Reporting Program (MRP) No. CI-9067. Based on the pilot test results, permanganate solution can be effectively injected into the groundwater to treat TCE-impacted groundwater in Zone A. Approximately 3,300 pounds of crystalline potassium permanganate were used to prepare a 2 percent by weight permanganate solution and 21,970 gallons of two percent permanganate solution was injected into the four injection wells. The injection flow rates ranged from 0.7 to 5 gallon per minutes per injection well, and injection pressures at the wellheads ranged from 3.5 to 11 pounds per square inch. The effective injection radius of influence (ROI) was estimated to be approximately 10-15 feet based on the increased concentrations of permanganate and decreased TCE concentrations observed in the monitoring wells.

December 31, 2008

A TCE concentration range from 74 to 3,400 µg/L in the monitoring wells decreased to less than 50 µg/L (non-detect) in the monitoring wells. A significant TCE reduction was observed in injection wells and monitoring wells when elevated concentrations of permanganate were present during the injection activities. During the post-injection monitoring event, TCE concentrations had increased in injection wells, indicating that up-gradient TCE impacted groundwater migration was occurring. Upon the depletion of permanganate solution in the injection wells, TCE concentrations were detected. Based on the field demonstration results, additional permanganate injections will further reduce TCE and other chlorinated VOC concentrations in groundwater.

FULL SCALE ISCO IN ZONE A

On November 13, 2008, the Regional Board approved the *Work Plan for Implementation of Full-Scale In-Situ Chemical Oxidation in the Former Paraplast Area* (Work Plan), dated January 29, 2008, and the *ISCO Work Plan Addendum*, dated November 6, 2008. The full-scale ISCO activities will include injection of potassium permanganate solution into 32 injection wells (17 shallow injection wells and 15 deep injection wells) in the shallow water-bearing zone (Zone A) to treat VOC (mainly TCE) that exceeds 100 µg/L (Figures 2). In addition, some of the injection wells will be used as monitoring wells.

VOLUME AND DESCRIPTION OF DISCHARGE (INJECTION)

Thirty-two injection wells (17 shallow injection wells, PA-ISCO-5S through PA-ISCO-21S and 15 deep injection wells, PA-ISCO-5D through PA-ISCO-19D) and 12 dual-nested monitoring wells (12 shallow monitoring wells, PA-MW-3S through PA-MW-14S and 12 deep monitoring wells, PA-MW-3D through PA-MW-14D) will be used for the full-scale ISCO field activities. The shallow injection and monitoring wells will be installed to a total depth of approximately 60 feet bgs, and have a screen interval from 48 through 58 feet bgs. The deep injection and monitoring wells will be installed to a total depth of approximately 70 feet bgs, and have a screen interval from 58 to 68 feet bgs.

It is estimated that approximately 330 pounds of crystalline potassium permanganate will be mixed with 1,980 gallons of potable water from a fire hydrant to make the 2-percent solution for each injection well. Up to 17,000 pounds of crystalline potassium permanganate will be used for the full-scale injection event.

A phased injection program will be conducted. The first phase will consist of injecting a total volume of 2,200 gallons of 2-percent potassium permanganate solution into each well, PA-ISCO-16S and PA-ISCO-17D. Wells PA-ISCO-13S, PA-ISCO-16D, PA-ISCO-18D, PA-MW-09 and PPIRZ-06 (down-gradient wells), PA-MW-08 and PA-MW-11 (cross-gradient wells) and PA-MW-06 (up-gradient well) will be utilized as monitoring wells. Based on the visual observation and field parameter data from the first phase injection event, the remaining injection well locations will be modified, if necessary. Once the optimal well spacing has been established, the remaining injection wells will be installed and the subsequent injection phases will be initiated on the remaining injection wells.

For each injection event, a total of approximately 24 hours of injection time will be required based on an average predicted injection flow rate of 1.5 gallons per minute. The total number and frequency of injection events will be determined based on the results of the first injection event. If a second injection is warranted, the injection will be targeted on the wells where the VOC concentration is the highest.

It is anticipated that after a full-scale injection event has been conducted, two limited injection events may be required. The second event is assumed to require injection into approximately 25 percent of the wells that were injected into during the first full-scale event. A third event, if necessary, is estimated to require

injection into 25 percent of the second injection event injection wells. A total injection volume of approximately 19,800 gallons and 2,970 pounds of crystalline potassium permanganate will be consumed during the second event and approximately a total injection volume of 4,950 gallons of solution and 743 pounds of crystalline potassium permanganate will be consumed in the third event.

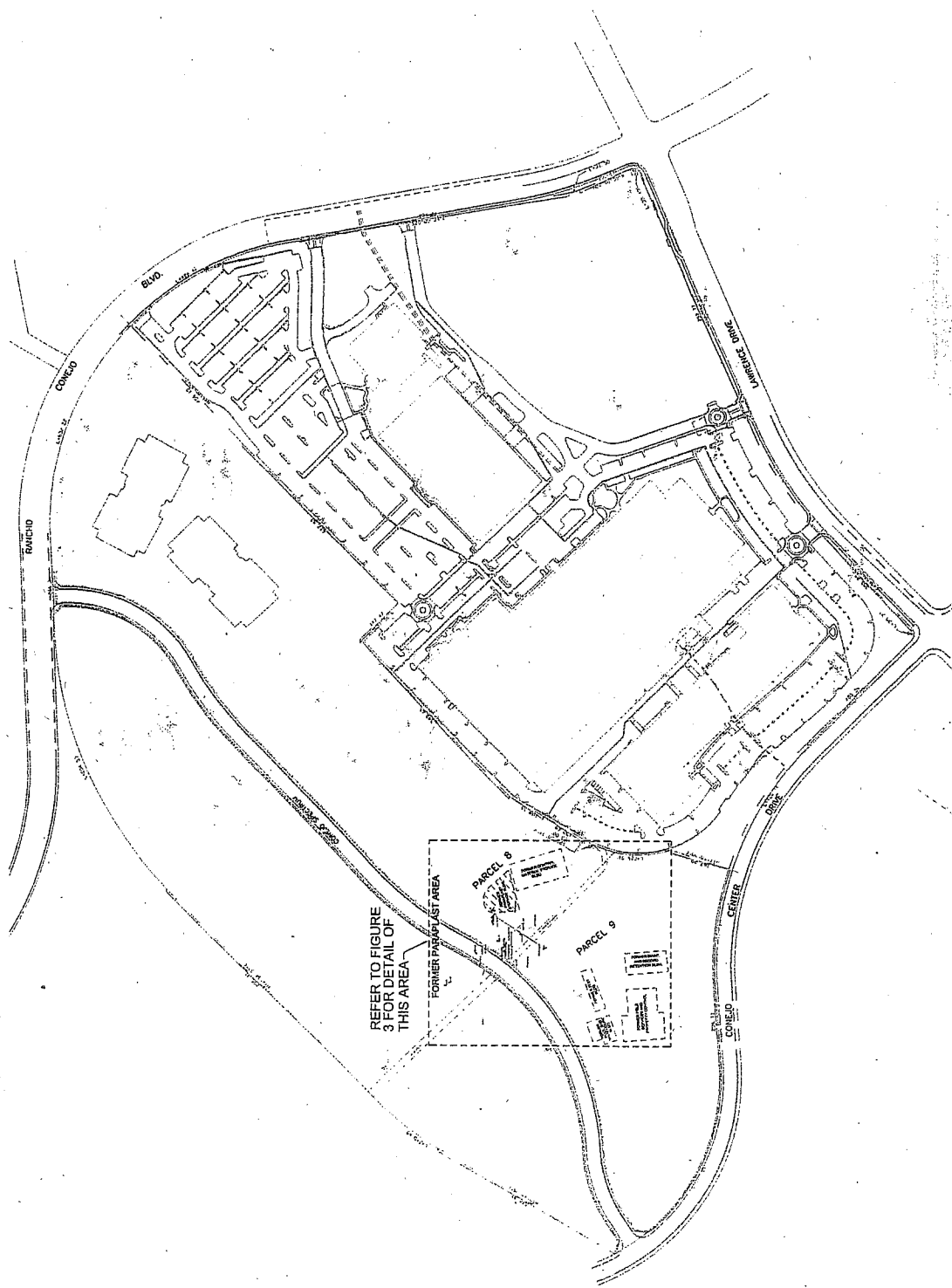
The quantities of permanganate solution injected into groundwater are required to be documented per MRP No. CI-9067 (revised). Groundwater samples will be collected to monitor for all required parameters during the full scale ISCO injection activities in accordance with the MRP No. CI-9067 (revised).

JUSTIFICATION FOR GENERAL WASTE DISCHARGE REQUIREMENTS

The proposed potassium permanganate solution injection for in-situ remediation purposes satisfies all criteria specified in Regional Board Order No. R4-2007-0019, "Revised General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Impacted Sites," adopted by this Regional Board on March 1, 2007.

- **Discharge to groundwater of remediation compounds** - Potassium permanganate solution is authorized remediation compound per Order No. R4-2007-0019;
- **Discharger must have an approved Remedial Action Plan** – On November 13, 2008, this Regional Board approved, *Work Plan for Implementation of Full-Scale In-Situ Chemical Oxidation in the Former Paraplast Area* (Work Plan), dated January 29, 2008, and ISCO Work Plan Addendum, dated November 6, 2008.
- **CEQA requirements** – The Regional Board has prepared an Initial Study and Mitigated Negative Declaration for the issuance of these general waste discharge requirements in accordance with the provisions of the California Environmental Quality Act (CEQA).
- **Discharge has a rating of 3A** – At the end of the project, it is expected that the in-situ remediation will be complete, that the potassium permanganate will have consumed, without any degradation associated with the groundwater. Any potential adverse water quality impacts that may result will be localized, of short-term duration, and will not expect to impact any existing or prospective uses of groundwater.
- **Monitoring and reporting** – On December 31, 2008, the Regional Board staff issued monitoring and reporting program CI-9067 (revised) for the Discharger.
- **Application/Annual Fee** – Revision to the existing General WDR; therefore, annual fee applies.

LEGEND ABANDONED GROUNDWATER EXTRACTION WELL GROUNDWATER MONITORING WELL INJECTION WELL GROUNDWATER MONITORING WELL PA-15CO-014 PA-15N-01 PPRZ-06 MW-20 IRZ-11 MW-8 [---] FORMER BUILDING	 APPROXIMATE SCALE IN FEET: 1 INCH = 200 FEET	Project Number CA000514.0013.00001
		Drawing Date 1/20/08
Project Manager N. SHUKLA		Figure 2
Task Manager V. SAJJAR		Technical Review T. HENDERSON



SITE PLAN WITH WELL LOCATIONS

FIGURE 1: FORMERPARAPLAST AREA

NORTHROP GRUMMAN SYSTEMS CORPORATION
 NEWBURY PARK, CALIFORNIA

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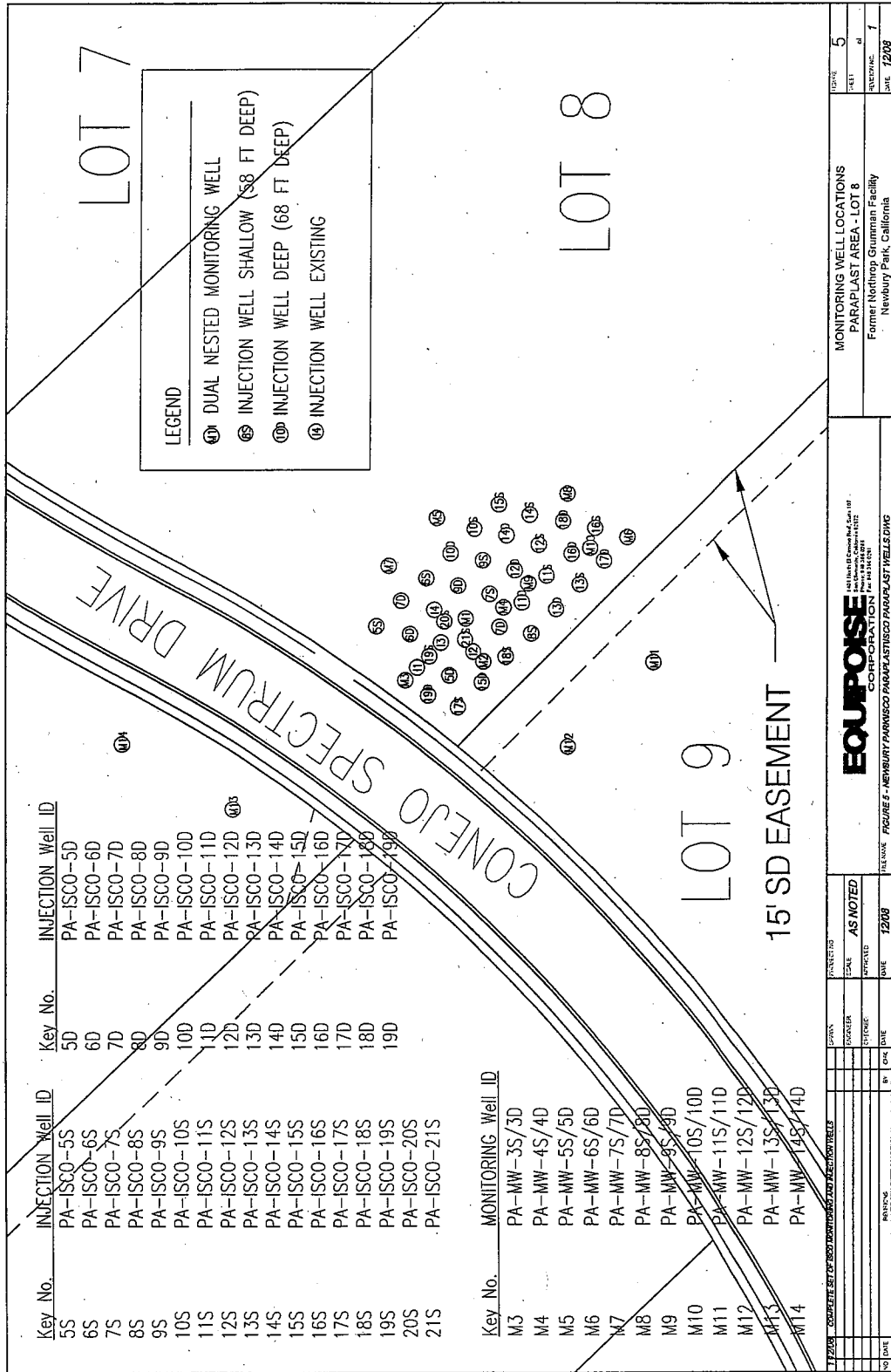


Figure 2: Proposed Injection and Monitoring Wells Location