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
RAYTHEON SYSTEMS COMPANY
(FORMER HUGHES MISSILE SYSTEM COMPANY)
8433 FALLBROOK AVENUE, CANOGA PARK, CALIFORNIA
(SLIC NO. 0693, SITE ID NO. 2043T00)

ORDER NO. R4-2005-0030, CI-8947

FACILITY ADDRESS
Raytheon Systems Company
(Former Hughes Missile Company)
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Canoga Park, California

FACILITY MAILING ADDRESS
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PROJECT DESCRIPTION

Raytheon Systems Company (Former Hughes Missile System Company) is located at Latitude N34° 13' 24", Longitude W118° 37' 35" in Canoga Park.

Volatile Organic Compounds (VOCs), mainly 1,1-dichoroethene (1,1-DCE) is the predominant groundwater contaminant across the site. In May 2002, the Regional Board approved a pilot test using lactic acid to evaluate the ability of Enhanced In-Situ Bioremediation (EISB) to reduce chlorinated ethenes in saturated soil and groundwater. In September and October 2003, subsurface injections of lactic acid were performed. Based on the analytical results, EISB pilot test showed a significant reduction of contaminants to a low level of concentrations.

On May 9, 2005, the Regional Board approved the *Remediation Action Plan Addendum Enhanced In-Situ Bioremediation Work Plan (Work Plan),* dated March 25, 2005 and May 6, 2005 (revised pages only), prepared by TN & Associates, Inc. The Work Plan proposes a comprehensive remediation program for shallow groundwater in two phases – Phase I and Phase II. The Phase I proposes to implement the EISB system using lactic acid, sodium lactate, vegetable oils, whey, milk, molasses, and newer "designer" commercial products, such as HRC® in the high concentration areas to treat the chlorinated ethene plume source and allow natural attenuation processes to degrade chlorinated ethene outside the plume source area. . The EISB system will apply in four different treatment areas, A through D. Remediation progress will be evaluated using verification groundwater sampling results after completion of Phase I to determine if the Phase II remediation is required.

Groundwater gradient direction within the Site regionally flows from northwest to southeast, but on the western side of the property, there is a westward component due to the local topography. The depth to groundwater is between 10 and 65 feet below ground surface. The hydraulic gradient of the regional groundwater is approximately 0.0047 foot per foot (ft/ft); however, groundwater gradient in the northwest portion of the Site, which contains the main VOCs plume, is consistently westward and ranges from 0.01 to 0.02 ft/ft.

VOLUME AND DESCRIPTION OF DISCHARGE (INJECTION)

The substrate/groundwater solution is proposed to consist of lactic acid sufficient to deliver ten percent (by weight) of estimated hydrogen demand per injection area, and emulsified soybean oil delivering 90% by weight of the demanded hydrogen. An emulsified oil product is proposed to compose of soybean oil and food-grade surfactant. Prior to injection, proposed substrates will be mixed with water. It is proposed that groundwater from the treated effluent stream of existing interim groundwater treatment system be used so that the solution is anaerobic and without high chlorine content of tap water. Projected mixing ratios for lactic acid is between 2:1 solution (2 gallons of groundwater per 1 gallon of lactic acid) and 4:1. Projected mixing ratios for emulsified vegetable oil is between 2:1 solution (2 gallons of groundwater per 1 gallon of emulsified vegetable oil) to 4:1. The ratio proportion of substrate and water will be adjusted appropriately in a field to optimize substrate distribution.

The project area will be divided into two primary treatment areas: “A” in the source zone and “B” in the northwest part of the main plume; and additional two areas, “C” in the CM-13 Plume area, and “D” in the CM-8 Plume area. It is anticipated that minimum 5,000 gallons of groundwater will be extracted and used in the mixing process. The exact solution ratio will be determined and recorded during the fieldwork. The substrate composition will be the same for each treatment area. On average, approximately 120 gallons of the substrate/groundwater solution will be injected at each injection point in areas A, C, and D; and 98 gallons of the substrate/groundwater solution will be injected at each injection point in area B. The injection program will be performed in sequence, starting from area A and finishing in area D, and injections in each area will be completed before starting in another area. The quantities of substrate/groundwater injected are required to be documented per the Monitoring and Reporting Program No. CI-8947.

Groundwater samples will be collected to monitor progress of the bioremediation process. There are 16 remediation progress monitoring wells will be purged using low-flow purging method with the flow rate of approximately 0.5 liter per minute or less. During purging, water quality parameters, such as, pH, oxidation-reduction potential, turbidity, and temperature will be measured, and samples will be collected when stabilization is achieved after three consecutive readings are within specified range listed in the Work Plan. The groundwater samples will be collected for analyses listed on the Monitoring and Reporting Program No. CI-8947. An initial or baseline sampling will be conducted to identify pre-substrate/groundwater injection groundwater conditions. After the initial application of the substrate/groundwater, monthly and quarterly sampling intervals will be performed to evaluate the effectiveness of the EISB. Refer to Figure 1 and Figure 2 for proposed EISB Project Areas A, B, C, and D.

Any potential adverse water quality impacts that may result will be localized, of short-term duration, and will not impact any existing or prospective uses of groundwater. Groundwater quality will be monitored to verify no long-term adverse impact to water quality. There may be small increases associated with soluble gases such as methane, ethane, ethylene, and sulfate.