



# California Regional Water Quality Control Board Central Valley Region

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N60211\_000833  
CROWS LANDING  
SSIC NO. 5090.3.A

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## **DRAFT PHASE 3 BIOREMEDIATION TREATABILITY STUDY REPORT, SITE 17 ADMINISTRATION AREA, CROWS LANDING FLIGHT FACILITY, CROWS LANDING, STANISLAUS COUNTY**

The referenced Phase 3 Bioremediation Treatability Study is a good supporting document to the 30 August 2010 Draft Feasibility Study in which enhanced bioremediation with recirculation was the selected remedial option to cleanup groundwater at the project site. The results of the Treatability Study support the selection of enhanced bioremediation as the remedy for the site.

Different substrates were used for the three phases of the treatability study. HRC-Advanced<sup>®</sup> 3DMe was used in Phase 1 and EOS<sup>®</sup> 598B42 was used in Phase 2. Both tested products appeared to be effective in creating conditions conducive to anaerobic biodegradation through reductive dechlorination of carbon tetrachloride (CT) and 1,2-dichloroethane (1,2-DCA). EOS<sup>®</sup> 450 was used as the injected substrate during Phase 3 (a less expensive product). Results were not as definitive as shown during Phases 1 and 2, but the poorer performance appeared attributable to low natural groundwater flow conditions at the time of the Phase 3 injection. Phase 3 injection occurred in November, which is at a time of the year when agricultural pumping for irrigation purposes is very low and groundwater flows are less affected, as opposed to when Phases 1 and 2 occurred, which was during irrigation season. Active agricultural pumping resulted in greater groundwater movement which aided in the subsurface distribution of the injected product during Phases 1 and 2. Regardless of the less definitive results of Phase 3, it appears the Navy has adequately demonstrated that enhanced bioremediation is a viable cleanup alternative for Crows Landing.

The Central Valley Regional Water Quality Control Board's only comment regarding the Treatability Study is in regard to Section 4.2.1 Groundwater Elevation and Flow Direction. In that section, the report indicates that potentiometric maps could not be constructed because relative elevations between the wells appears to have been skewed by damage to surface completions or to subsidence. Given this as the case, it would appear prudent for the Navy to resurvey the site's monitoring wells so that accurate and representative groundwater maps can be drawn.

**California Environmental Protection Agency**

If you have any questions, please contact Greg Issinghoff at 559-488-4390.

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