



California Regional Water Quality Control Board

Central Valley Region

Robert Schneider, Chair



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CROWS LANDING
SSIC NO. 5090.3.A

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5 APRIL 2004 PROPOSED PROCESS FOR ASSESSING RISK FROM PETROLEUM HYDROCARBONS IN SOIL AT UST SITE 109, NASA CROWS LANDING FLIGHT FACILITY, CROWS LANDING, STANISLAUS COUNTY

Your consultant, Shaw Environmental, Inc. (Shaw), has submitted a 5 April 2004 transmittal letter outlining a proposed process for assessing risk from petroleum hydrocarbons in soil at UST Site 109. Active bioventing has been conducted at UST Site 109 and performance evaluations conducted in 2001 showed a reduction in petroleum hydrocarbon concentrations in soil. The only location where significant concentrations of petroleum hydrocarbons are reported to remain are between the former UST location and Building 109.

The transmittal letter submitted by Shaw proposes a process that will be followed to assess risk for petroleum hydrocarbons in the vadose zone at UST Site 109. The general process for assessing risk will use data from the most recent field measurements of contaminant concentrations, contaminant type, plume distribution, soil properties, and current groundwater concentrations. Shaw assumes that the potential for direct exposure to contaminants in soil is limited from ground surface to three feet below grade for a residential exposure scenario, and from three to ten feet below ground surface for an industrial exposure scenario. Tank removal records indicate the release at UST Site 109 occurred at the base of the UST and that excavation activities removed impacted soil to a depth of 11 feet below grade. Based on these data, Shaw states that risk of direct exposure through either residential or industrial exposure scenarios is minimal and, therefore, the risk assessment would focus on risk of impact to groundwater by leaching. This appears to be a reasonable assumption.

The leaching potential of petroleum hydrocarbons remaining in the vadose zone at Site 109 will be evaluated using the VLEACH (version 2.2) model. The model determines the potential mass of contaminants that leach into groundwater (mass loading) over a period of time. The Summer's model is then used to estimate the potential concentration of contaminants in groundwater based on the mass leached at the groundwater interface. Information available on the USEPA's website indicates that biological and chemical degradation is not considered in the VLEACH model, and therefore, the program provides a conservative estimate of contaminant migration in soil. Similarly, the Summer's program does not consider attenuation processes such as biodegradation, first-order decay, volatilization, or other attenuation processes (other than sorption) and therefore can be considered a conservative model. Based

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on their conservative nature, it appears the VLEACH and Summer's models are appropriate for assessing Site 109 conditions as Shaw has proposed.

The overall proposed approach in using the VLEACH and Summer's models is to compare the modeling results to groundwater cleanup goals to determine if groundwater cleanup goals could potentially be exceeded by the leachate generated from impacted soil. If the results indicate that the groundwater cleanup goals would not be exceeded, then no further remediation would be needed. If the modeling indicates that groundwater cleanup goals would be exceeded, then additional remediation would be required. In this situation, the models would then be used to calculate the maximum concentration of contaminants that could remain in soil that would not generate leachate exceeding groundwater cleanup goals. This overall approach appears reasonable. However, the calculated petroleum hydrocarbon concentrations that are deemed acceptable to remain in soil must appear reasonable. Concentrations of petroleum hydrocarbons in the tens of thousands of micrograms per kilogram in soil, for example, would likely not be acceptable to remain in place.

The 5 April 2004 transmittal letter states the following: "The groundwater cleanup goals used to determine the risk associated with the leaching of contaminants from soil at Site 109 will be based on the proposed future use of groundwater defined in the property transfer documents." Our 4 February 2004 letter discusses this very same issue and can be repeated here: "The manner in which this item is worded makes it appear that cleanup of groundwater in the buffer zone will be given a less stringent cleanup level. The Regional Board considers the current and future beneficial uses of groundwater in the buffer zone to be municipal, industrial, and agricultural, regardless of the conditional use agreement that exists for groundwater within the buffer zone. As such, cleanup levels for groundwater in the buffer zone will be no different than anywhere else at the Crows Landing facility. Because the conditional use buffer zone is in place, the only consideration the Regional Board may give is an extended timeframe to achieve groundwater cleanup goals. The intent of the conditional use agreement is primarily to prevent migration of the groundwater plume and to prevent use of, and human exposure to, contaminated groundwater until cleanup can be achieved." As such, this must be kept in mind when establishing groundwater cleanup goals.

The overall approach proposed in the 4 April 2004 transmittal letter appears reasonable. As such, with those comments noted above, the Regional Water Control Board concurs with the proposed methodology and requests that the Navy commence the modeling work. We request that a report summarizing the modeling findings be submitted by **9 July 2004**.

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



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see attached sheet for cc list.

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